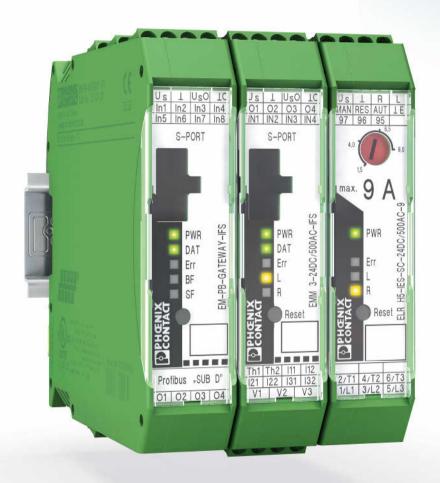
Interface Technology and Switching Devices 2013/2014







PCB connection technology and electronics housing

- PCB terminal blocks and plug-in connectors
- Electronics housing



Connection technology for field devices

- Plug-in connectors
- Cables and connectors



Modular terminal blocks

· Modular terminal blocks



Sensor/actuator cabling and industrial plug-in connectors

- Sensor/actuator cabling
- · Cables and connectors
- Plug-in connectors



Marking systems, tools, and mounting material

- · Marking and labeling
- Tools
- · Installation and mounting material



Surge protection and power supply units

- Lightning monitoring system
- Surge protection and interference filters
- · Power supply units and UPS
- Protective devices



Interface technology and switching devices



Control technology, I/O systems and automation infrastructure

- Ethernet networks Functional safety HMIs and industrial PCs I/O systems
- · Industrial lighting and signaling · Industrial communication technology
- Fieldbus components and systems Wireless data communication
- Process infrastructure Software Controllers

Table of contents

Complete overview

Electronic switching devices and motor control	7
Measurement and control technology	53
Monitoring	193
Relay modules	265
System cabling for controllers	417

2

Complete overview

Product range overview

Electronic switchgear and motor control



Motor management



Page 18

Hybrid motor starters



Page 38

Solid-state contactors



IP67 motor starters

Measurement and control technology

Page 12



Digital displays

Page 150



Ex i isolating amplifiers with functional safety Page 152



Multiplexers for HART signals Page 186



Ex i 2-conductor field devices

Page 187

Page 48

Monitoring



Compressed air meters

Page 208



Current transformers

Page 212



Test disconnect terminal blocks See Catalog 3



Current transducers, current protectors Page 229



Compact monitoring relays

Page 250



Multifunctional monitoring relays



Ultra-narrow timer relays

Page 258



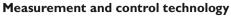
Multifunctional timer relays

Product range overview



Frequency inverters

Page 50





Highly compact isolating amplifiers Page 64



Isolating amplifiers with functional safety Page 100



Isolating amplifiers, special designs Page 130



Shield fast connection and test plugs Page 191



Controllers See Catalog 8

Monitoring



Energy meters



Complete packages for data logging
Page 206



Voltage transducers, AC and DC Page 236



PV system monitoring

Page 134



Residual current monitoring





Components for E-Mobility

Page 247



Special function modules

Page 262



Lightning current measuring system See Catalog 6



HMIs See Catalog 8



Signal towers See Catalog 8

Complete overview

Product range overview

Relay modules







Page 322

Page 470

PLC series



Page 372

Page 369

PR series



DEK series

Page 397

System cabling for controllers

Page 276



Front adapters



Termination boards



V8 adapters



System cables

Page 500

Product range overview



Multi-channel relay modules

Page 550



Safety devices See Catalog 8



Monitoring relays

Page 250



Timer relays

Page 258



Universal interface modules

Page 524



Potential distributors



Electronic switchgear and motor control

Switching devices for starting, reversing, and protecting electric motors are some of the most frequently used components in automation technology. These are often designed redundantly for safety-sensitive applications. When it comes to reducing installation time and space requirements, CONTACTRON hybrid motor starters are the state-of-the-art alternative.

This is because CONTACTRON hybrid motor starters combine up to 4 functions in a single device. Integration in popular field-bus systems is implemented using the SmartWire-DT TM wiring system.

For protection of the entire system, the product range now includes the electronic motor manager (EMM). In addition to typical measured values such as voltage and current, the behavior of the system is monitored and protected by means of real power measurement. The process data in all popular fieldbus systems can be supplied via gateways and evaluated by a controller.

Product range overview	
Product overview	8
Electronic motor management	10
3-phase hybrid motor starters	16
Hybrid motor starters with short-circuit protection	29
Hybrid motor starters with SmartWire-DT™ support	31
3-phase solid-state reversing contactors	38
3-phase solid-state contactors	40
Solid-state reversing contactor for DC motors	44
Single-phase solid-state contactors	46
IP67 motor starters	48
IP20 frequency inverters	50

Electronic switchgear and motor control

Page 12

Product overview

Motor management



Electronic motor management



Gateways Page 14



Software Page 15



Reversing load relays with soft starter Page 42

Solid-state contactors



3-phase solid-state reversing contactors
Page 3



Page 40

3-phase solid-state contactors



Solid-state reversing contactor for DC motors Page 44



Single-phase solid-state contactors
Page 46

Frequency inverters



Inline frequency inverters for the control cabinet

Page 50

Product overview

Hybrid motor starters



3-phase hybrid motor starters

Page 18



3-phase hybrid motor starters with short-circuit protection Page 29



Hybrid motor starters with SmartWire-DT™ support



Accessories

Page 31

Page 36

IP67 motor starters

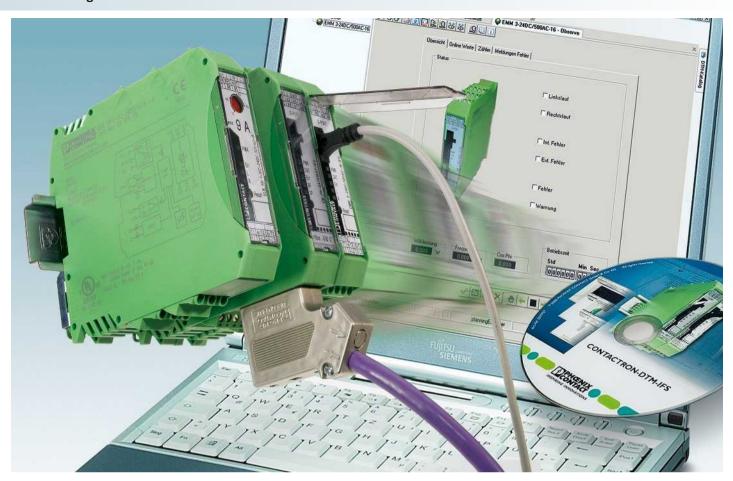


PROFINET motor starters

Page 48



Stainless steel base, IP67 protection Page 49



Electronic motor management (EMM)

The electronic motor management modules offer all the advantages of modern real power monitoring.

ELR-MM modules combine fast, wear-free electronic reversing load relays with modern measurement and evaluation electronics. EMM offers the same functionality for all performance classes, only without a power section.

Power within limits

Monitoring is based on freely parameterizable switching and signaling thresholds for overload and underload detection. Identical or separate settings can be made for the thresholds relating to the two directions of rotation. Parameterization relies on the real power consumed (calculated from three currents, voltages, and the phase angle), thereby offering a much more precise basis than if only the current is taken into consideration, as it is independent of voltage fluctuations and drive load. If a switching threshold is exceeded or not reached, the ELR-MM or EMM initiates an emergency shutdown of the motor immediately (or after an adjustable "delay time"). In addition, a message can be sent via an output.

This state can only be deactivated via a defined reset. If the effective power consumed is determined as being above or below the message thresholds, all that occurs is that a check-back is returned for the duration for which the module was addressed.

In addition, signals are generated by the module for the recognition of the direction of rotation. Asymmetry and phase failures are detected and signalized.

Permanent status monitoring with high scanning rates and the fast semiconductor switch enable complete system protection, including motor protection.

Without any extra wiring - and with just a single device - pumps, actuating drives, fans, and tools are monitored for proper functioning, contamination (filter or similar), and wear. The adjustable "inrush suppression" time can be used to mask out the switching operation from the monitoring process.



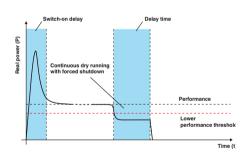
Protection against dry running, blocking, and cavitation, warning thresholds to indicate filter contamination.



Protection against blocking, warning thresholds for bearing wear and other cases that trigger overload.



Protection against blocking and broken tools, warning thresholds for tool and bearing wear.



In the case of motor-driven pumps, the

Forced shutdown of the drive can be delayed by the "delay time".

This prevents forced shutdown in the event of air bubbles.

Signaling threshold Tool wear Tool positioning

used to resolve this issue. Additionally, a message threshold signals tool wear in advance.

Tooling machines are monitored and pro-

tected in a similar way when drilling, milling

or grinding. If the feed value on a milling ma-

chine is set too high, a tool may break in the

"worst-case" scenario. The power threshold - parameterized accordingly - can be

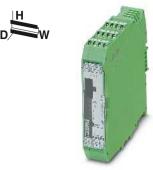
lower performance threshold provides reliable protection against hazardous dry running.

11

Electronic motor management

The EMM motor management module (with/without current transformer) for all performance classes monitors and protects 3-phase loads, such as electrical drives.

- Freely parameterizable signaling or switching thresholds
- Digital outputs control external switching elements
- Optional connection to INTERFACE system and PROFIBUS-GATEWAY-IFS via TBUS



.(U).

24 V DC

Type

EMM 3- 24DC/500AC-IFS1)

0.8 ... 1.25

Allows the use of external current transformers

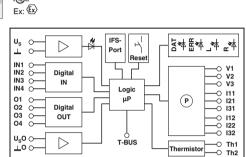


:**(**€x) Ex: ⟨€x⟩

With integrated current transformers



1) EMC: Class A product, see page 571



Technical data

230 V AC

10 mA

U _s 0 24 VDC IN1 0 Digital IN3 0 IN	IFS- Port Reset	DAT ### ERR ### PR
01 0 Digital 03 0 OUT 04 0	иР П	P 3/L2
_0 0	T-BUS	Thermistor Th1

Input data Rated control supply voltage U_S Rated control supply voltage range with reference to U_S Rated control supply current I_S at U_S Input data of digital inputs Number of inputs Rated actuating voltage U_C Rated actuating current I_C Power measurement Voltage measuring input Nominal current, voltage measuring input Current measuring input Output power of the converter Internal resistance EMM Output data for confirmation contacts O1 - O4 in the case of 1 signal General data Rated insulation voltage Rated surge voltage Ambient temperature (operation) Standards/regulations EMC regulations Degree of protection according to IEC 60529/ EN 60529 Mounting position Screw connection solid / stranded / AWG W/H/D Dimensions

EMM 3- 24DC/500AC-IFS1)	EMM 3-230AC/500AC-IFS ¹)			
4 (IN1 - IN4)	4 (IN1 - IN4)			
24 V DC	230 V AC			
3.3 mA	3.5 mA			
42 V AC 575 V AC	42 V AC 575 V AC			
< 0.5 mA	< 0.5 mA			
5 A Secondary external converter	5 A Secondary external convert			
> 1.25 VA	> 1.25 VA			
0.02 Ω	0.02 Ω			
24 V DC (semiconductor output) /500 mA	230 V AC (relay output/500 mA / 500 mA			
500 V				
6 kV/safe isolation	6 kV/safe isolation			
-25°C 70°C				
EN 60947 / EN 60947-4-2				
EN 61000-6-2 / EN 61000-6-3 / E	N 61000-6-4			
IP20				
Vertical (horizontal DIN rail)				
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 2	26 - 12			
22.5 mm / 99 mm / 114.5 mm				
Orderin	ng data			
ordoring data				

Technical data				
24 V DC	230 V AC			
0.8 1.25	0.4 1.1			
25 mA	10 mA			
EMM 3- 24DC/500AC-16-IFS1)	EMM 3-230AC/500AC-16-IFS1)			
4 (IN1 - IN4)	4 (IN1 - IN4)			
24 V DC	230 V AC			
3.3 mA	3.5 mA			
-	-			
- max. 16 A	- max. 16 A			
-	-			
24 V DC (semiconductor output) / 500 mA	230 V AC (relay output/500 mA) / 500 mA			
500 V				
6 kV/safe isolation	6 kV/safe isolation			
-25°C 70°C EN 60947 / EN 60947-4-2				
EN 61000-6-2 / EN 61000-6-3 / EN 61000-6-4				
IP20				
Vertical (horizontal DIN rail)				
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 12				
22.5 mm / 99 mm / 114.5 mm				

Description
Electronic motor management
Programming adapter for configuring modules with S-PORT interface
DIN rail connector
Voltage transducer for 690 V, for EMM 3/500AC-IFS, comprising 3 modular terminal blocks and cover

Multi-functional memory block for the INTERFACE system

EMM 3-230AC/500AC-IFS1)	2297507	1			
Accessories	Accessories				
IFS-USB-PROG-ADAPTER ¹)	2811271	1			
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50			
UT 4-MTD-R/CVC 690/SET	2901667	1			
IFS-CONFSTICK¹)	2986122	1			
IFS-CONFSTICK-L	2901103	1			
MC 1,5/ 5-ST-3,81	1803604	50			
IMC 1,5/ 5-ST-3,81	1857919	50			

Order No.

2297497

Type

Pkt

EMM 3- 24DC/500AC-16-IFS1)	2297523	1			
EMM 3-230AC/500AC-16-IFS1)	2297536	1			
Accessories	Accessories				
IFS-USB-PROG-ADAPTER1)	2811271	1			
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50			
IFS-CONFSTICK¹) IFS-CONFSTICK-L	2986122 2901103	1 1			
MC 1,5/ 5-ST-3,81 IMC 1,5/ 5-ST-3,81	1803604 1857919	50 50			

Ordering data

Order No.

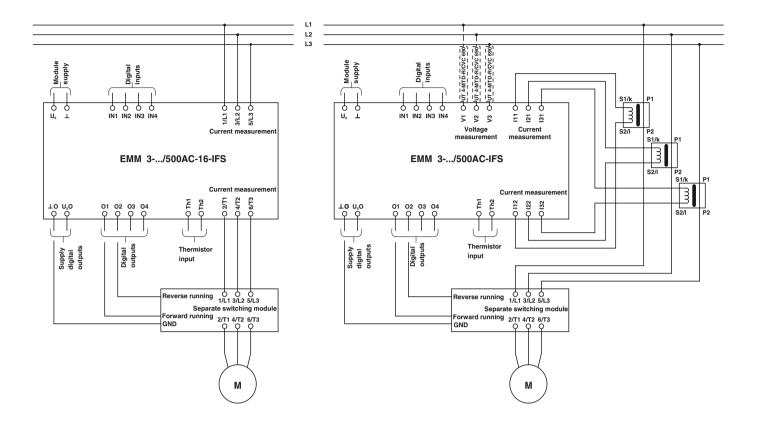
Pkt

- Flat design - Tall design

- Socket contact

Mini COMBICON connectors

Electronic motor management



The electronic motor management modules offer all the advantages of modern effective power monitoring. Every 6.6 ms, the effective power of a drive system or of any other 3-phase consumer is calculated from three currents, voltages and the phase angle. Currents of up to 16 A can be directly acquired and currents >16 A are supplied via external converters. Digital outputs can be used to control separate mechanical or electronic switching elements that adopt the actual switching of the load. In this configuration, the EMM reliably protects connected loads – irrespective of their power consumption – against overload and underload, and provides permanent status monitoring.

Up to 8 freely parameterizable switching, message thresholds and up to four freely configurable inputs and outputs enable the protection of electrical drives and the system.

The EMM modules can record the following data:

- Apparent effective and reactive power
- Currents and voltages
- Phase angle
- Switching-cycle and operating-hours
- Power meter.
- Additional Functions:
- Adjustable bimetal function class 5-30
- Thermistor monitor
- Recording measured values
- PROFIBUS connection via TBUS
- Pre-configured motor exits such as reversing starters, star delta starters, etc.

The EMM modules can be used to record complete "curves that can be used for system documentation.

The operating modes forward and reversing running, reverse and limit switch operation (with integrated restart inhibit) switch actuating and regulating drives, pumps etc. and also check for wear.

Current transformer

The external converters should be selected with a secondary nominal current of 5 A. The primary current is determined by the current consumption of the consumer (refer to connection diagram). For suitable current transformers, see catalog INTERFACE.

DIN rail connector TBUS

The **TBUS** (Order No. 2707437) can be used to supply several EMMs with 24 V DC or to couple up to 31 EMMs (for example) to the PROFIBUS-GATEWAY-IFS.

Switching element

Depending on the particular requirement of the application, either an electro-mechanical contactor or reversing contactor combination, or a semiconductor contactor or a solid-state reversing contactor is to be used for the actual task of switching the load. These switching elements are controlled via the digital outputs of the EMM modules.

IFS gateways for electronic motor management modules

EM...GATEWAY-IFS for connecting EMM...IFS modules to popular bus systems: PROFIBUS DP, Modbus, Modbus TCP, DeviceNet TM , and CANopen®.

- Communication via T-BUS with up to 31 EMM…IFS modules
- Equipped with freely parameterizable digital inputs and outputs
- Digital switching outputs for direct control of EMM...IFS (forward/reverse running)

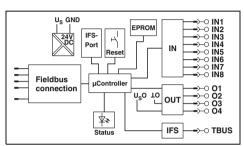
Notes:

1) EMC: Class A product, see page 571









Technical data

Input data	
Operating voltage U _B Nominal input current at U _{IN} Input circuit	
Digital inputs	
Input voltage Nominal input current at U _{IN} Input circuit	
Digital outputs	
Maximum switching voltage	
Max. switching current	
Residual voltage	
Output protection	
IFS interface	
Connection method	
General data	
Test voltage data interface/power supply Ambient temperature (operation) Nominal operating mode Standards/regulations Degree of protection Mounting position/mounting	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

	24 V DC -20 % +25 % 85 mA Polarity protection, surge protection
	24 V DC ±20% 3 mA Polarity protection, surge protection
	,, , , , , , , , , , , , , , , , , , , ,
	23 V DC (U $_{\!B}$ - $U_{resid.}$ of the output) 500 mA 1 V
	Parallel protection against polarity reversal, pay attention to the fuse
	TBUS
	1.5 kV -35°C 50°C 100% operating factor EN 50178 IP20 Any /- 0.2 2.5 mm² / 0.2 2.5 mm² / 24 - 12
/ D	22.5 mm / 99 mm / 114.5 mm

Descripti	on				
IFS gate	ways for electr	onic motor r	nanagement	modules	
PROFIB	JS DP				
RS-232					
RS-485					
Modbus	TCP				
DeviceN	et™				
CANope	n®				

Programming adapter for configuring modules with S-PORT interface	
DIN rail connector	
Mini COMBICON connectors	
- Socket contact	
- Pin contact	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EM-PB-GATEWAY-IFS1) EM-RS232-GATEWAY-IFS EM-RS485-GATEWAY-IFS EM-MODBUS-GATEWAY-IFS EM-DNET-GATEWAY-IFS EM-CAN-GATEWAY-IFS	2297620 2901526 2901527 2901528 2901529 2901504	1 1 1 1 1	
A			

Accessories		
IFS-USB-PROG-ADAPTER ¹)	2811271	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
MC 1,5/ 5-ST-3,81 IMC 1,5/ 5-ST-3,81	1803604 1857919	50 50

Device Type Manager (DTM) for motor management modules EMM...IFS

- CONTACTRON-DTM-IFS, programming adapter, and user manual on CD available as configuration package
- Also available as USB programming adapter even individually
- CONTACTRON-DTM-IFS also available free of charge as a separate download from www.phoenixcontact.com

o		s.	

1) EMC: Class A product, see page 571



	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
Configuration package for the EMMIFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD			
	MM-CONF-SET	2297992	1
	Accessories		
Programming adapter for configuring modules with S-PORT interface	IFS-USB-PROG-ADAPTER ¹)	2811271	1

Electronic switchgear and motor control

Hybrid motor starters



Hybrid motor starters for controlling 3-phase asynchronous motors combine up to four functions in one device as required. These include forward running, reverse running with optional reversing function including load wiring. The locking circuit for the reversing function is also integrated and certified as a single electronic reversing starter according to UL 508a and the new UL 60947-1. Furthermore, the devices protect the motor by means of an integrated motor protection relay with automatic and remote reset function. The implemented safety function according to Performance Level e (PL e) of EN ISO 13849-1 provides the emergency stop requirement. A PDT confirmation contact provides information regarding the availability of the device, and the motor state. This means that in the event of motor control without an error message the integrated current measurement and symmetry scanning ensures that the motor is turning. Even with these numerous functions, the hybrid motor starter is just 22.5 mm wide.

Short-circuit-proof hybrid motor starters with integrated protective devices, for mounting on 35 mm DIN rails and 60 mm busbar systems and connection to popular bus systems via SmartWire-DT™ complete the product portfolio.



Hybrid motor starters with up to four functions in one device: forward running, reverse running, motor protection, and emergency stop.



Short-circuit-proof hybrid motor starters with integrated fuses for mounting on 35 mm DIN rails and 60 mm busbar systems.



Connection of hybrid motor starters in a bus system via SmartWire-DT TM . Gateways are provided for the main bus systems: PROFIBUS, Modbus TCB, EtherNet/IP TM , and CANopen $^{\otimes}$.



The uniform design of the control side enables the combination of short-circuit-proof hybrid motor starters with SmartWire-DT TM adapters for integration in a bus system.

"4 in 1" hybrid motor starter with reversing function, motor protection, and emergency stop

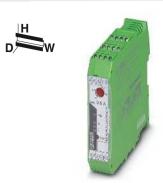
These 3-phase "4 in 1" hybrid motor starters combine four functions in one device: right contactor, left contactor, motor protection relay, and emergency stop up to category 3.

Offer the following advantages:

- 22.5 mm wide
- They save wiring
- Bi-metal function can be set up to 9 A
- Long service life
- Space-saving
- 3-phase loop bridging Safety level according to:
- IEC 61508-1: SIL3
- ISO 13849: PL e

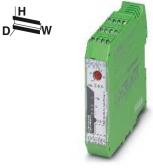
Input data





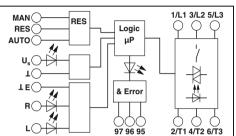
Ex: Ex

For reversing 3~ AC motors up to 550 V AC/3 x 0.6 A



For reversing 3~ AC motors up to 550 V AC/3 x 2 A

elle scheme Ex: (Ex)



٦.			
	MAN RES AUTO	Logic µP	1/L1 3/L2 5/L3
	U _s		
	RO RO	& Error	
	LO N	97 96 95	○ ○ ○ 2/T1 4/T2 6/T3

mpar acta
Rated control supply voltage U _S
Rated control supply voltage range with reference to U _S
Rated control supply current I _S at U _S
Rated actuating voltage U _C R/L
Rated actuating voltage range with reference to U _C
Detect estima surrent et
Rated actuating current I _C at U _C
Input circuit
Operating voltage / status / error indicator
Output data load side
Output voltage range
Load current
Curren aurenant
Surge current
Min. load current
Residual voltage
Output protection
General data
Rated insulation voltage
Rated surge voltage
Ambient temperature (operation)
Electrical service life
Standards/regulations
Mounting position
Mounting Connection data solid / stranded / AWG

Hated control supply voltage range with reference to Us
Rated control supply current I_S at U_S Rated actuating voltage U_C R/L Rated actuating voltage range with reference to U_C
Rated actuating current $\rm I_{\rm C}$ at $\rm U_{\rm C}$ Input circuit
Operating voltage / status / error indicator
Output data load side
Output voltage range
Load current
Surge current Min. load current Residual voltage Output protection General data Rated insulation voltage Rated surge voltage Ambient temperature (operation) Electrical service life Standards/regulations Mounting position Mounting Connection data solid / stranded / AWG Dimensions W/H/D
Safety data EC-type examination certificate according to ATEX
LO-type examination certificate according to ATEX

"4 in 1" hybrid motor starter, incl. right contactor, left contactor,

"4 in 1" hybrid motor starter, incl. right contactor, left contactor, motor protection relay, and emergency stop, terminals L1, L2, L3 and T1, T2, T3 rotated

Technic	cal data
24 V DC 0.8 1.25	230 V AC (50/60 Hz) 0.4 1.1
40 mA 24 V DC 0.8 1.25	4 mA 230 V AC 0.4 1.1
5 mA Protection against polarity reversal, Surge protection Green LED / Yellor	7 mA Surge protection
arcon LEB / Tone	W ELD / FICU ELD
42 V AC 550 V AC max. 600 mA (see derating curve) 100 A (t = 10 ms) 75 mA < 0.2 V	42 V AC 550 V AC max. 600 mA (see derating curve) 100 A (t = 10 ms) 75 mA < 0.2 V
	rotection
3.7	
500 V 6 kV/safe isolation -25°C 70°C 3 x 10° cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail)	6 kV/safe isolation
Can be aligned with spacing = 20 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 22.5 mm / 99 mm / 114.5 mm	
(EX) II (2) G, (EX) II (2) D PTB 07 ATEX 3145	☼ II (2) G, ⓒ II (2) D PTB 07 ATEX 3145

(Ex) (2) G, (Ex) (2) D PTB 07 ATEX 3145	(호) II (2) G, (호) II (2) D PTB 07 ATEX 3145	
Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR H5-IES-SC- 24DC/500AC- ELR H5-IES-PT-24DC/500AC- ELR H5-IES-SC-230AC/500AC	0,6 2903902	1 1 1

Technic	al data
24 V DC 0.8 1.25	230 V AC (50/60 Hz) 0.4 1.1
40 mA 24 V DC 0.8 1.25	4 mA 230 V AC 0.4 1.1
5 mA Protection against polarity reversal, Surge protection	
Green LED / Yello	w LED / Red LED
42 V AC 550 V AC max. 2.4 A (see derating curve) 100 A (t = 10 ms) 180 mA	42 V AC 550 V AC max. 2.4 A (see derating curve) 100 A (t = 10 ms) 180 mA
< 0.3 V Surge pr	< 0.3 V
54.35 p.	
500 V 6 kV/safe isolation -25°C 70°C 3 x 10 ⁷ cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail)	6 kV/safe isolation
Can be aligned with spacing = 20 0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 2 22.5 mm / 99 mm / 114.5 mm	
	(C) 11 (2) 2 (C) 11 (2) 2
(Ex) (2) G, (Ex) (2) D PTR 07 ATEX 3145	(₹x) (2) G, (₹x) (2) D

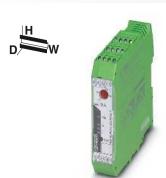
PIB 07 ATEX 3145 PIB 07 ATEX 3145			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR H5-IES-SC- 24DC/500AC ELR H5-IES-PT-24DC/500AC- ELR H5-IES-SC-230AC/500AC	2 2903904	1 1 1	
ELR W3- 24DC/500AC- 2I	2297031	1	
ELR W3-230AC/500AC- 2I	2297044	1	

motor protection relay, and emergency stop

Screw connection Push-in connection Screw connection

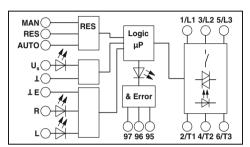
Structure with CONTACTRON

Hybrid motor starters



For reversing 3~ AC motors up to 550 V AC/3 x 9 A





Technical data

24 V DC 230 V AC (50/60 Hz)

0.8 ... 1.25 0.4 ... 1.1

40 mA 4 mA 24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1

5 mA 7 mA

Protection against polarity reversal, Surge protection

Surge protection

Green LED / Yellow LED / Red LED

42 V AC ... 550 V AC 42 V AC ... 550 V AC max. 9 A max. 9 A

(see derating curve) (see derating curve) 100 A (t = 10 ms) 100 A (t = 10 ms) 1.5 A

1.5 A < 0.5 V< 0.5 VSurge protection

500 V

6 kV/safe isolation 6 kV/safe isolation -25°C ... 70°C

3 x 107 cycles DIN EN 50178 / EN 60947

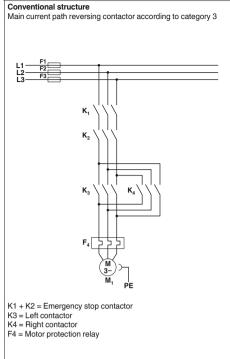
Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm

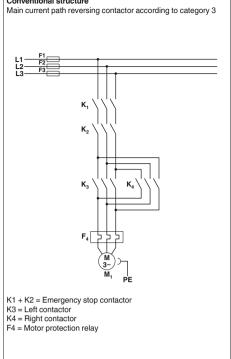
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

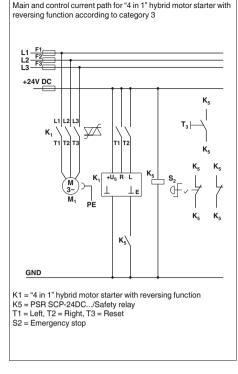
22.5 mm / 99 mm / 114.5 mm

€ II (2) G, € II (2) D (€x) || (2) G, (€x) || (2) D PTB 07 ATEX 3145 PTB 07 ATEX 3145

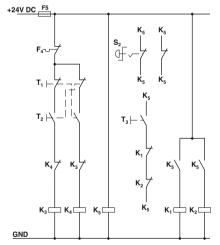
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR H5-IES-SC- 24DC/500AC-9 ELR H5-IES-PT-24DC/500AC-9 ELR H5-IES-SC-230AC/500AC-9	2900421 2903906 2900422	1 1 1	
ELR W3- 24DC/500AC- 9I ELR W3-230AC/500AC- 9I	2297057 2297060	1	











K1 + K2 = Emergency stop contactor

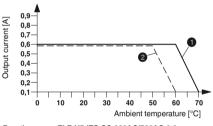
K3 = Left contactor

K4 = Right contactor

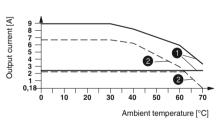
K5 = PSR SCP-24DC.../Safety relay T1 = Left, T2 = Right, T3 = Reset

S2 = Emergency stop

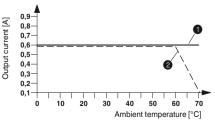
F4 = Motor protection relay



Derating curve ELR H5-IES-SC-230AC/500AC-0,6 100% operating time

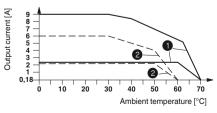


Derating curve ELR H5-IES-SC-24DC/500AC-2 and ELR H5-IES-SC-24DC/500AC-9 100% operating time



Derating curve ELR H5-IES-SC-24DC/500AC-0,6 100% operating time

- Aligned with > 20 mm spacing
- 2 Aligned without spacing



Derating curve ELR H5-IES-SC-230AC/500AC-2 and ELR H5-IES-SC-230AC/500AC-9 100% operating time

"3 in 1" hybrid motor starter with motor protection and emergency stop

These 3-phase "3 in 1" hybrid motor starters combine three functions in one device: right contactor, motor protection relay, and emergency stop up to category 3.

Offer the following advantages:

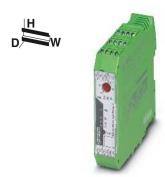
- 22.5 mm wide
- They save wiring
- Bi-metal function can be set up to 9 A
- Long service life
- Space-saving
- 3-phase loop bridging
 Safety level according to:
- IEC 61508-1: SIL3
- ISO 13849: PL e





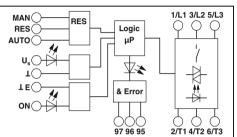
Ex: Ex

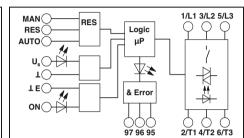
For starting 3~ AC motors up to 550 V AC/3 x 0.6 A



Ex: Ex

For starting 3~ AC motors up to 550 V AC/3 x 2 A





Input data Rated control supply voltage U _S Rated control supply voltage range with reference to U _S Rated control supply current I _S at U _S Rated actuation voltage U _C ON Rated actuating voltage range with reference to U _C Rated actuating current I _C at U _C
Rated control supply voltage range with reference to U_S Rated control supply current I_S at U_S Rated actuation voltage U_C ON Rated actuating voltage range with reference to U_C
Rated control supply current I_S at U_S Rated actuation voltage U_C ON Rated actuating voltage range with reference to U_C
Rated actuation voltage U_{C} ON Rated actuating voltage range with reference to U_{C}
Rated actuation voltage U_{C} ON Rated actuating voltage range with reference to U_{C}
Rated actuating voltage range with reference to U _C
Rated actuating current I _C at U _C
Input circuit
input on out
Operating voltage / status / error indicator
Output data load side
Output voltage range
Load current
Surge current
Min. load current
Residual voltage
Output protection
General data
Rated insulation voltage
Rated surge voltage
Ambient temperature (operation)
Electrical service life
Standards/regulations
Mounting position
Mounting
Connection data solid / stranded / AWG
Dimensions W/H/D
Safety data
EC-type examination certificate according to ATEX

Technical data				
24 V DC	230 V AC (50/60 Hz)			
0.8 1.25	0.4 1.1			
40 mA	4 mA			
24 V DC	230 V AC			
0.8 1.25	0.4 1.1			
5 mA	7 mA			
Protection against polarity reversal, Gurge protection	Surge protection			
Green LED / Yello	w LED / Red LED			
42 V AC 550 V AC	42 V AC 550 V AC			
max. 600 mA	max. 600 mA			
(see derating curve)	(see derating curve)			
100 A (t = 10 ms)	100 A (t = 10 ms)			
75 mA	75 mA			
< 0.2 V	< 0.2 V			
	rotection			
9-1				
500 V				
6 kV/safe isolation	6 kV/safe isolation			
-25°C 70°C				
3 x 10 ⁷ cycles				
DIN EN 50178 / EN 60947				
Vertical (horizontal DIN rail)				
Can be aligned with spacing $= 20$				
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² /	26 - 14			
22.5 mm / 99 mm / 114.5 mm				
🖾 (2) G, 🗟 (2) D	€ II (2) G, € II (2) D			
PTB 07 ATEX 3145	PTB 07 ATEX 3145			
Orderi	ng data			
		Doo		

	Technical data					
	24 V DC 0.8 1.25	230 V A	C (50/60 Hz)			
	40 mA 24 V DC 0.8 1.25	4 mA 230 V A 0.4 1				
	5 mA Protection against polarity reversal, Surge protection Green LED / Yello	0 .				
	Green LED/ Tello	W LED /	ned LED			
	42 V AC 550 V AC max. 2.4 A (see derating curve)	max. 2.	C 550 V AC 4 A rating curve)			
	100 A (t = 10 ms) 180 mA < 0.3 V	180 mA < 0.3 V	t = 10 ms)			
	Surge protection					
	500 V 6 kV/safe isolation -25°C 70°C 3 x 10° cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 22.5 mm / 99 mm / 114.5 mm	mm	fe isolation			
	□ II (2) G, □ II (2) D □ PTB 07 ATEX 3145) G, 🐼 II (2) D ATEX 3145			
	Orderi	ng dat	а			
/	Туре		Order No.	Pcs./ Pkt.		

Description
"3 in 1" hybrid motor starter, incl. right contactor, motor protection relay, and emergency stop Screw connection Push-in connection Screw connection

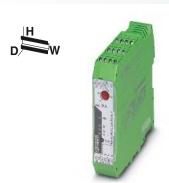
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR H3-IES-SC- 24DC/500AC-0,6	2900566	1		
ELR H3-IES-PT-24DC/500AC-0,6	2903914	1		
ELR H3-IES-SC-230AC/500AC-0,6	2900689	1		

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR H3-IES-SC- 24DC/500AC-2	2900567	1
ELR H3-IES-PT-24DC/500AC-2	2903916	1
ELR H3-IES-SC-230AC/500AC-2	2900568	1

Main and control current path for "3 in 1" hybrid motor starter

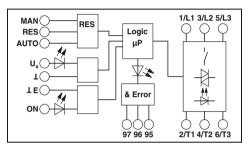
Structure with CONTACTRON

Hybrid motor starters



For starting 3~ AC motors up to 550 V AC/3 x 9 A

Ex: Ex



Technical data

24 V DC 230 V AC (50/60 Hz)

0.8 ... 1.25 0.4 ... 1.1

40 mA 4 mA 24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1

5 mA 7 mA

Protection against polarity reversal, Surge protection

Surge protection

Green LED / Yellow LED / Red LED

42 V AC ... 550 V AC max. 9 A max. 9 A (see derating curve) 42 V AC ... 550 V AC see derating curve)

100 A (t = 10 ms) 100 A (t = 10 ms) 1.5 A 1.5 A < 0.5 V < 0.5 V Surge protection

6 kV/safe isolation 6 kV/safe isolation

-25°C ... 70°C 3 x 10⁷ cycles

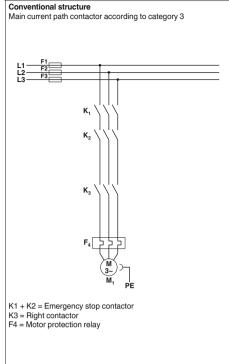
500 V

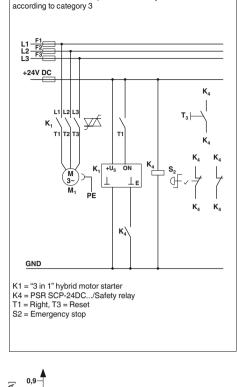
DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail)

Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

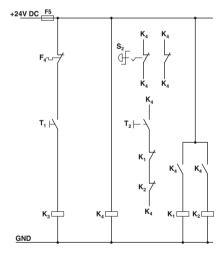
22.5 mm / 99 mm / 114.5 mm

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
ELR H3-IES-SC- 24DC/500AC-9 ELR H3-IES-PT-24DC/500AC-9	2900569 2903918	1 1			
ELR H3-IES-SC-230AC/500AC-9	2900570	1			





Conventional structure Control current path contactor according to category 3



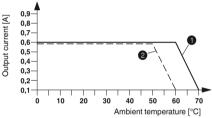
K1 + K2 = Emergency stop contactor

K3 = Right contactor

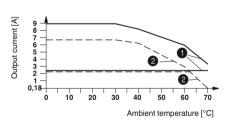
K4 = PSR SCP-24DC.../Safety relay

T1 = Right, T3 = Reset S2 = Emergency stop

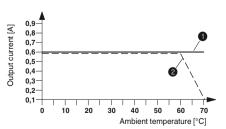
F4 = Motor protection relay



Derating curve ELR H3-IES-SC-230AC/500AC-0,6 100% operating time

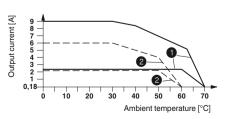


Derating curve ELR H3-IES-SC-24DC/500AC-2 and ELR H3-IES-SC-24DC/500AC-9 100% operating time



Derating curve ELR H3-IES-SC-24DC/500AC-0,6 100% operating time

- 1 Aligned with > 20 mm spacing
- 2 Aligned without spacing



Derating curve ELR H3-IES-SC-230AC/500AC-2 and ELR H3-IES-SC-230AC/500AC-9 100% operating time

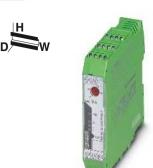
"3 in 1" hybrid motor starter with reversing function and motor protection

These 3-phase "3 in 1" hybrid motor starters combine three functions in one device: right contactor, left contactor, and motor protection relay.

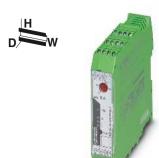
Offer the following advantages:

- 22.5 mm wide
- They save wiring
- Bi-metal function can be set up to 9 A
- Long service life
- Space-saving
- 3-phase loop bridging

Notes: Type of housing: Polyamide PA non-reinforced, color: green. Marking systems and mounting material See Catalog 5



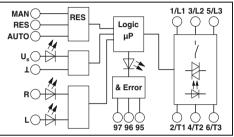
For starting 3~ AC motors up to 550 V AC/3 x 0.6 A



For starting 3~ AC motors up to 550 V AC/3 x 2 A

.(N).: CB

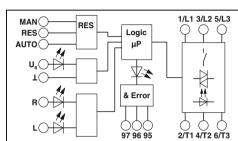
24 V DC



Technical data

230 V AC (50/60 Hz)





Technical data

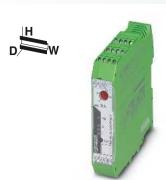
Input data	
Rated control supply voltage U _S	
Rated control supply voltage range with reference to	Js
Rated control supply current I _S at U _S	
Rated actuation voltage U _C ON	
Rated actuating voltage range with reference to U _C	
Rated actuating current I _C at U _C	
Input circuit	
Operating voltage / status / error indicator	
Output data load side	
Output voltage range	
Load current	
Surge current	
Min. load current	
Residual voltage	
Output protection	
General data	
Rated insulation voltage	
Rated surge voltage	
Ambient temperature (operation)	
Electrical service life	
Standards/regulations	
Mounting position	
Mounting	
Screw connection solid / stranded / AWG	
Dimensions	W/H/D

input circuit		Surge protection
Operating voltage / status / error indicator		Gr
Output data load side		
Output voltage range Load current		42 V AC 550 V max. 600 mA (see derating curv
Surge current Min. load current Residual voltage Output protection		100 A (t = 10 ms) 75 mA < 0.2 V
General data		
Rated insulation voltage Rated surge voltage Ambient temperature (operation) Electrical service life Standards/regulations Mounting position Mounting Screw connection solid / stranded / AWG Dimensions	W/H/D_	500 V 6 kV/safe isolation -25°C 70°C 3 x 107 cycles DIN EN 50178 / ET Vertical (horizonta Can be aligned wit 0.14 - 2.5 mm² / 0. 22.5 mm / 99 mm /
Description		Туре

0.8 1.25	0.4 1.1			
40 mA 24 V DC 0.8 1.25	4 mA 230 V AC 0.4 1.1			
5 mA Protection against polarity reversal, Surge protection	7 mA Surge protection			
Green LLD / Tell	SW ELD / Hed ELD			
42 V AC 550 V AC max. 600 mA (see derating curve)	42 V AC 550 V AC max. 600 mA (see derating curve)			
100 A (t = 10 ms) 75 mA < 0.2 V	100 A (t = 10 ms) 75 mA < 0.2 V			
ourge p	TOTECTION			
500 V 6 kV/safe isolation -25°C 70°C 3 x 10 ⁷ cycles	6 kV/safe isolation			
DIN EN 50178 / EN 60947				
Vertical (horizontal DIN rail) Can be aligned with spacing = 20) mm			
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14				
22.5 mm / 99 mm / 114.5 mm				
Orderi	ng data			

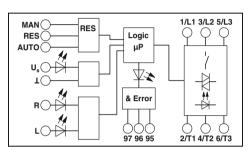
	041170	0001/40/50/0011								
	24 V DC 0.8 1.25	230 V AC (50/60 Hz) 0.4 1.1								
	0.8 1.25	0.4 1.1								
	40 mA	4 mA								
	24 V DC	230 V AC								
	0.8 1.25	0.4 1.1								
	5 mA	7 mA								
	Protection against polarity reversal,	Surge protection								
	Surge protection	3.1.								
	Green LED / Yello	ow LED / Red LED								
	42 V AC 550 V AC	42 V AC 550 V AC								
	max. 2.4 A	max. 2.4 A								
	(see derating curve)	(see derating curve)								
	100 A (t = 10 ms)	100 A (t = 10 ms)								
	180 mA	180 mA								
	< 0.3 V	< 0.3 V								
	Surge p	rotection								
	500 V									
	6 kV/safe isolation	6 kV/safe isolation								
	-25°C 70°C									
	3 x 10 ⁷ cycles									
DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 76 - 14										
					2.0 7 2.0 7 2.0					
					22.5 mm / 99 mm / 114.5 mm					

Dimensions W / H	I/D 22.5 mm / 99 mm / 114.5 mm			22.5 mm / 99 mm / 114.5 mm		
	Ordering da	Ordering data		Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. Pkt.
"3 in 1" hybrid motor starter, incl. right contactor, left contact and motor protection relay	or,					
	ELR H5-I-SC- 24DC/500AC-0,6 ELR H5-I-SC-230AC/500AC-0,6	2900573 2900691	1 1	ELR H5-I-SC- 24DC/500AC-2 ELR H5-I-SC-230AC/500AC-2	2900574 2900575	1



For starting 3~ AC motors up to 550 V AC/3 x 9 A

.**(I)**... СВ



Technical data

24 V DC 230 V AC (50/60 Hz)

0.8 ... 1.25 0.4 ... 1.1

40 mA 4 mA 24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1

7 mA 5 mA

Protection against polarity reversal, Surge protection

Surge protection

Green LED / Yellow LED / Red LED

42 V AC ... 550 V AC 42 V AC ... 550 V AC max. 9 A max. 9 A (see derating curve) (see derating curve) 100 A (t = 10 ms) 100 A (t = 10 ms)

1.5 A 1.5 A < 0.5 V< 0.5 V

Surge protection

6 kV/safe isolation 6 kV/safe isolation

-25°C ... 70°C 3 x 107 cycles

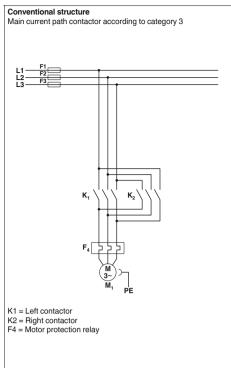
500 V

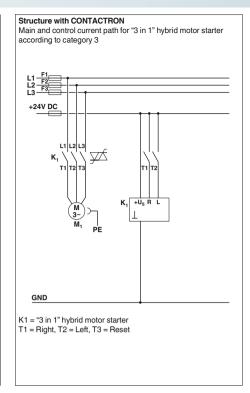
DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail)

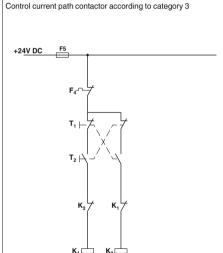
Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

22.5 mm / 99 mm / 114.5 mm

22.3 11111/ 99 11111/ 114.3 11111				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR H5-I-SC- 24DC/500AC-9 ELR H5-I-SC-230AC/500AC-9	2900576 2900578	1 1		





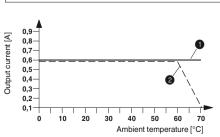


K1 = Left contactor K2 = Right contactor T1 = Right, T2 = Left, T3 = Reset

GND

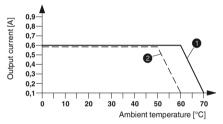
Conventional structure

F4 = Motor protection relay

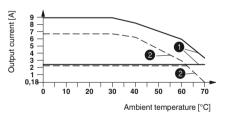


Derating curve ELR H5-I-SC-24DC/500AC-0,6 100% operating time

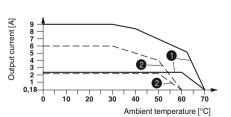
- 1 Aligned with > 20 mm spacing
- Aligned without spacing



Derating curve ELR H5-I-SC-230AC/500AC-0,6 100% operating time



Derating curve ELR H5-I-SC-24DC/500AC-2 and ELR H5-I-SC-24DC/500AC-99 100% operating time



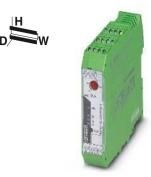
Derating curve ELR H5-I-SC-230AC/500AC-2 and ELR H5-I-SC-230AC/500AC-9 100% operating time

"2 in 1" hybrid motor starter with motor protection

These 3-phase "2 in 1" hybrid motor starters combine two functions in one device: right contactor and motor protection.

The devices offer the following advantages:

- 22.5 mm wide
- They save wiring
- Bi-metal function can be set up to 9 A
- Low-wear switching
- Long service life
- Space-saving
- 3-phase loop bridging



For starting 3~ AC motors up to 550 V AC/3 x 0.6 A



For starting 3~ AC motors up to 550 V AC/3 x 2 A

Notes:

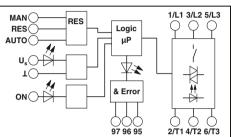
Type of housing:

Polyamide PA non-reinforced, color: green.

Marking systems and mounting material

MAN(

.ரு., CB



Technical data

230 V AC (50/60 Hz)

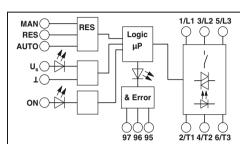
0.4 ... 1.1

230 V AC

0.4 ... 1.1

4 mA

.(Ju).. CB



Technical data

ln	put	do	at a
ш	μuι	uc	ıιa

Rated control supply voltage $U_{\rm S}$

Rated control supply voltage range with reference to U_S

Rated control supply current I_S at U_S

Rated actuation voltage $U_{\rm C}$ ON

Rated actuating voltage range with reference to U_C

Rated actuating current I_C at U_C

Input circuit

Operating voltage / status / error indicator

Output data load side Output voltage range

Load current

Surge current Min. load current Residual voltage

Output protection General data Rated insulation voltage Rated surge voltage

Ambient temperature (operation) Electrical service life

Standards/regulations Mounting position

Mounting Screw connection solid / stranded / AWG

motor protection relay

Description

Dimensions W/H/D

"2 in 1" hybrid motor starter, incl. right contactor and

24 V DC 0.8 1.25
40 mA 24 V DC 0.8 1.25
5 mA Protection ag Surge protec
42 V AC max. 600 m (see deratin
100 A (t = 1 75 mA < 0.2 V
500 V 6 kV/safe is -25°C 70 3 x 10 ⁷ cycl DIN EN 50 ¹ Vertical (ho Can be alig 0.14 - 2.5 m

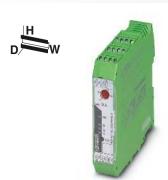
7 mA tection against polarity reversal, Surge protection ge protection Green LED / Yellow LED / Red LED V AC ... 550 V AC 42 V AC ... 550 V AC x. 600 mA max. 600 mA e derating curve) (see derating curve) 0 A (t = 10 ms) 100 A (t = 10 ms) mΑ 75 mA 1.2 V < 0.2 VSurge protection ١٧ V/safe isolation 6 kV/safe isolation °C ... 70°C 107 cycles N EN 50178 / EN 60947 rtical (horizontal DIN rail) n be aligned with spacing = 20 mm 4 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

22.5 mm / 99 mm / 114.5 mm					
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
ELR H3-I-SC- 24DC/500AC-0,6 ELR H3-I-SC-230AC/500AC-0.6	2900542 2900685	1			

24 V DC	230 V AC (50/60 Hz)
).8 1.25	0.4 1.1
10 mA	4 mA
24 V DC	230 V AC
0.8 1.25	0.4 1.1
mA	7 mA
Protection against polarity reversal, Gurge protection	Surge protection
Green LED / Yell	ow LED / Red LED
42 V AC 550 V AC	42 V AC 550 V AC
max. 2.4 A	max. 2.4 A
see derating curve)	(see derating curve)
00 A (t = 10 ms)	100 A (t = 10 ms)
180 mA	180 mA
< 0.3 V	< 0.3 V
Surge p	protection
500 V	
kV/safe isolation	6 kV/safe isolation
25°C 70°C	
x 10 ⁷ cycles	
DIN EN 50178 / EN 60947	

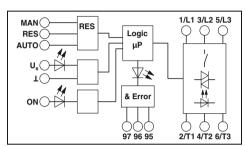
Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 22.5 mm / 99 mm / 114.5 mm

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
ELR H3-I-SC- 24DC/500AC-2	2900543	1			
ELR H3-I-SC-230AC/500AC-2	2900544	1			



For starting 3~ AC motors up to 550 V AC/3 x 9 A

c (Vi) es CB



Technical data

24 V DC 230 V AC (50/60 Hz)

0.8 ... 1.25 0.4 ... 1.1

40 mA 4 mA 24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1

5 mA 7 mA

Protection against polarity rever- Surge protection

sal, Surge protection

Green LED / Yellow LED / Red LED

42 V AC ... 550 V AC 42 V AC ... 550 V AC max. 9 A (see derating curve) 42 V AC ... 550 V AC (see derating curve)

100 A (t = 10 ms) 1.5 A <0.5 V 1.5 A

Surge protection

500 V

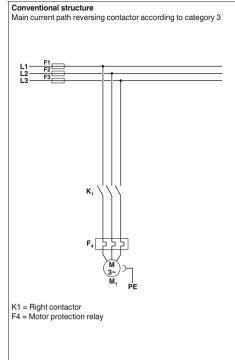
6 kV/safe isolation 6 kV/safe isolation -25°C ... 70°C

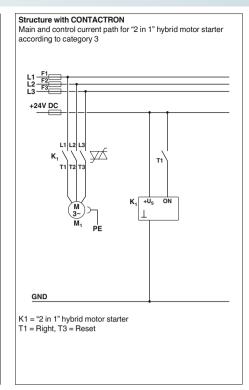
3 x 10⁷ cycles DIN EN 50178 / EN 60947

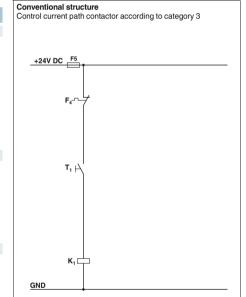
Vertical (horizontal DIN rail)
Can be aligned with spacing = 20 mm
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

22.5 mm / 99 mm / 114.5 mm

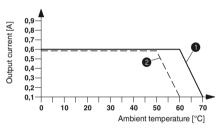
22.5 11111/ 99 11111/ 114.5 11111				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR H3-I-SC- 24DC/500AC-9 ELR H3-I-SC-230AC/500AC-9	2900545 2900546	1 1		



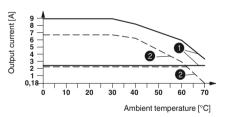




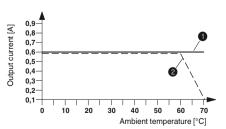
K1 = Right contactor T1 = Right, T3 = Reset F4 = Motor protection relay



Derating curve ELR H3-I-SC-230AC/500AC-0,6 100% operating time

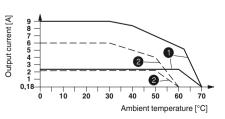


Derating curve ELR H3-I-SC-24DC/500AC-2 and ELR H3-I-SC-24DC/500AC-9 100% operating time



Derating curve ELR H3-I-SC-24DC/500AC-0,6 100% operating time

- 1 Aligned with > 20 mm spacing
- Aligned without spacing



Derating curve ELR H3-I-SC-230AC/500AC-2 and ELR H3-I-SC-230AC/500AC-9 100% operating time

Electronic switchgear and motor control

Hybrid motor starters

"2 in 1" hybrid motor starter with reversing function

3-phase hybrid motor starter for reversing three-phase induction motors

The devices offer the following advantages:

- 22.5 mm wide
- They save wiring
- Up to 9 A
- Low-wear switching
- Long service life
- Space-saving
- 3-phase loop bridging

Notes:

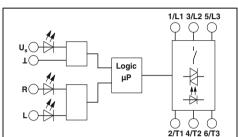
Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material



up to 550 V AC/3 x 9 A

.(N) .: CB



Rated control supply voltage $U_{\rm S}$

Rated control supply voltage range with reference to U_S

Rated control supply current I_S at U_S

Rated actuating voltage $U_C R/L$

Rated actuating voltage range with reference to U_C

Rated actuating current I_C at U_C

Input circuit

Operating voltage / status / error indicator

Output data load side Output voltage range

Load current

Surge current Minimum load current

Residual voltage

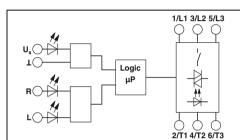
Output protection

General data

Rated insulation voltage Rated surge voltage

Ambient temperature (operation)

For reversing 3~ AC motors



Technical data

24 V DC	230 V AC (50/60 Hz)
0.8 1.25	0.4 1.1
40 mA	4 mA
24 V DC	230 V AC
0.8 1.25	0.4 1.1

5 mA 7 mA

Protection against polarity reversal, Surge protection

Surge protection

Green LED / Yellow LED / Red LED

42 V AC ... 550 V AC 42 V AC ... 550 V AC max. 9 A max. 9 A (see derating curve) (see derating curve) 100 A (t = 10 ms) 100 A (t = 10 ms)

0 A 0 A < 0.5 V < 0.5 V

Surge protection

500 V

6 kV/safe isolation 6 kV/safe isolation

-25°C ... 70°C 3 x 107 cycles DIN EN 50178 / EN 60947

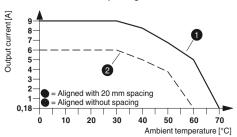
Vertical (horizontal DIN rail)

Can be aligned with spacing = 20 mm $0.14 - 2.5 \, \text{mm}^2 / 0.14 - 2.5 \, \text{mm}^2 / 26 - 14$

22.5 mm / 99 mm / 114.5 mm

Output current[A]	1− ĕ		ed with 2			`\`		0
	0,18						$\neg \neg$	
	0	10	20	30	40	50	60	70
					Aml	pient te	mperatu	ure [°C]

Derating curve for ELR H3-SC-24DC/500AC-9 100% operating time



Derating curve for ELR H3-SC-230AC/500AC-9 100% operating time

/ imbient temperature (operation)	
Electrical service life	
Standards/regulations	
Mounting position	
Mounting	
Screw connection solid / stranded / AWG	
Dimensions	W/H/D

Description	
"2 in 1" hybrid motor starter, incl. right contactor and left contactor	

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR H5-SC- 24DC/500AC-9	2900538	1		
ELR H5-SC-230AC/500AC-9	2900539	1		

"1 in 1" hybrid motor starter

3-phase hybrid motor starter for starting three-phase induction motors

The devices offer the following advantages:

- 22.5 mm wide
- Low-wear switching
- Up to 9 A
- Long service life
- Space-saving
- 3-phase loop bridging

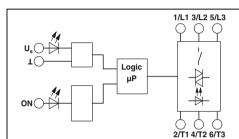
Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material





For starting 3~ AC motors up to 550 V AC/3 x 9 A



Input data

Rated control supply voltage $U_{\mathbb{S}}$

Rated control supply voltage range with reference to U_S

Rated control supply current I_S at U_S Rated actuation voltage $U_{\rm C}$ ON

Rated actuating voltage range with reference to $\mathbf{U}_{\mathbb{C}}$

Rated actuating current I_C at U_C

Input circuit

Operating voltage / status / error indicator

Output data load side Output voltage range

Load current

Surge current

Minimum load current Residual voltage

Output protection

General data

Rated insulation voltage

Rated surge voltage

Ambient temperature (operation)

Electrical service life

Standards/regulations Mounting

Screw connection solid / stranded / AWG

Dimensions W/H/D

.(Ju)... CB

Technical data

24 V DC 230 V AC (50/60 Hz) 0.8 ... 1.25 0.4 ... 1.1

40 mA 4 mA 24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1

7 mA

Protection against polarity reversal, Surge protection Surge protection

(see derating curve)

Green LED / Yellow LED / Red LED

(see derating curve)

42 V AC ... 550 V AC 42 V AC ... 550 V AC max. 9 A max. 9 A

100 A (t = 10 ms) 100 A (t = 10 ms) 0 A 0 A

< 0.5 V < 0.5 VSurge protection

500 V

6 kV/safe isolation 6 kV/safe isolation

-25°C ... 70°C 3 x 107 cycles

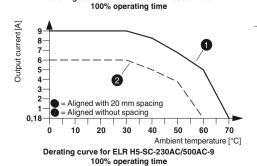
DIN EN 50178 / EN 60947

Can be aligned with spacing = 20 mm

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

22.5 mm / 99 mm / 114.5 mm

Output current[A]	1⊣ĕ	= Aligne				<u></u>	`\\	•
	0,18 	10	20	30	40	50	60	70
					Am	bient te	mperat	ure [°C]
	Der	ating cu	rve for	ELR H	5-SC-24	1DC/50	0AC-9	



Description "1 in 1" hybrid motor starter, incl. right contactor

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR H3-SC- 24DC/500AC-9	2900530	1		
ELR H3-SC-230AC/500AC-9	2900531	1		

Electronic switchgear and motor control

Hybrid motor starters

CONTACTRON hybrid motor starters with short-circuit protection



These short-circuit-proof 3-phase "4 in 1" hybrid motor starters for mounting on 30 mm DIN rails or 60 mm busbars combine four functions in one device: right contactor, left contactor, motor protection relay, and emergency stop up to category 3.

Offer the following advantages:

- 22.5 mm wide
- Bi-metal function can be set up to 9 A
- Long service life
- Space-saving
- They save wiring
- 3-phase loop bridging
- Plug-in motor output terminal block
- Coordination type 2 according to IEC/EN 60947-4-2

Input data

Rated control supply voltage $U_{\rm S}$

Rated control supply voltage range with reference to U_S

Rated control supply current I_S at U_S Rated actuating voltage U_C R/L

Rated actuating voltage range with reference to U_C

Rated actuating current I_C at U_C

Input circuit

Operating voltage / status / error indicator Output data load side

Output voltage range

Load current

Minimum load current

Residual voltage

Output protection General data

Rated insulation voltage

Rated surge voltage

Ambient temperature (operation)

Electrical service life

Standards/regulations Mounting position

Mounting

Screw connection solid / stranded / AWG

Dimensions

W/H/D

Description

Short-circuit-proof hybrid motor starters

Hybrid motor starters DIN rail adapter

Power rail adapter, 160 mm

Power rail adapter, 200 mm

Set consisting of short-circuit-proof hybrid motor starter and

DIN rail adapter

Coordination type 2 to 10 kA/500 V Coordination type 2 to 5 kA/400 V Coordination type 1 to 30 kA/500 V





For reversing 3~ AC motors up to 550 V AC/3 x 0.6 A



Ex: (Ex)



For reversing 3~ AC motors up to 550 V AC/3 x 2.4 A

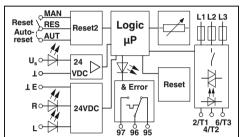


Ex: (Ex)



For reversing 3~ AC motors up to 550 V AC/3 x 9 A

Ex: (Ex)

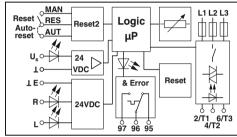


Reset Auto-AUT reset VDC L1 L2 L3

AUT Reset A

97 96 95

Technical data



Technical data
24 V DC
0.8 1.25
40 mA 24 V DC 0.8 1.25
5 mA
Protection against polarity reversal, Surge protection Green LED / Yellow LED / Red LED
G. 100.17 ELES / 1.00.017 ELES / 1.100 ELES

42 V AC ... 550 V AC max. 600 mA

75 mA
< 0.3 V
Surge protection, short-circuit protection

500 V 6 kV/safe isolation -25°C ... 70°C 3 x 107 cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 22.5 mm / 160 mm / 114.5 mm

24 V DC	
0.8 1.25	
40 mA	
24 V DC	
0.8 1.25	
5 A	
5 mA	
Protection against polarity reversal, Surge protection Green LED / Yellow LED / Red LED	
Green LLD / Tellow LLD / Ned LLD	
42 V AC 550 V AC	
max. 2.4 A	
180 mA	
< 0.4 V	
Surge protection, short-circuit protection	
500.1/	
500 V	
6 kV/safe isolation -25°C 70°C	
3 x 10 ⁷ cycles	
DIN EN 50178 / EN 60947	

25°C ... 70°C
3 x 10⁷ cycles
DIN EN 50178 / EN 60947
Vertical (horizontal DIN rail)
Can be aligned with spacing = 20 mm
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
22.5 mm / 160 mm / 114.5 mm

R • 24V	97 96 95	2/T1 6/T3 4/T2
1	Technical data	
24 V DC 0.8 1.25		
40 mA 24 V DC 0.8 1.25		
5 mA		

Protection against polarity reversal, Surge protection

1.5 A
< 0.6 V
Surge protection, short-circuit protection
500 V
6 kV/safe isolation
-25°C ... 70°C
3 x 10° cycles
DIN EN 50178 / EN 60947

Green LED / Yellow LED / Red LED

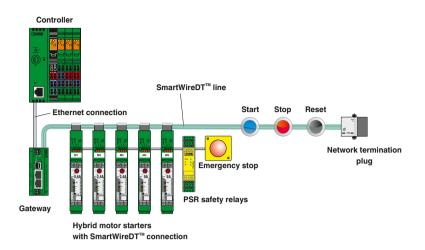
42 V AC ... 550 V AC

max. 9 A

Vertical (horizontal DIN rail)
Can be aligned with spacing = 20 mm
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
22.5 mm / 160 mm / 114.5 mm

22.5 mm / 160 mm / 114.5 mm			22.5 mm / 160 mm / 114.5 mm			22.5 mm / 160 mm / 114.5 mm		
Ordering dat	а		Ordering dat	ta		Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
ELR H51-IESSC-24DC500AC-06 EM RD-ADAPTER EM RI-ADAPTER COMPACT EM RI-ADAPTER CLASSIC ELR H51-0.6-DIN-RAIL-SET	2902746 2902747 2902748 2902831	1 1 1 1	ELR H51-IESSC-24DC500AC-2 EM RD-ADAPTER EM RI-ADAPTER COMPACT EM RI-ADAPTER CLASSIC ELR H51-2.4-DIN-RAIL-SET	2902744 2902747 2902748 2902831 2902953	1 1 1 1	ELR H51-IESSC-24DC500AC-9 EM RD-ADAPTER EM RI-ADAPTER COMPACT EM RI-ADAPTER CLASSIC ELR H51-9-DIN-RAIL-SET	2902745 2902747 2902748 2902831	1 1 1 1
Accessories Accessories			Accessories					
FUSE-10X38-16A-GR FUSE-10X38-20A-GR FUSE-10X38-30A-MR	2903126 2903384 2903119	10 10 10	FUSE-10X38-16A-GR FUSE-10X38-20A-GR FUSE-10X38-30A-MR	2903126 2903384 2903119	10 10 10	FUSE-10X38-16A-GR FUSE-10X38-20A-GR FUSE-10X38-30A-MR	2903126 2903384 2903119	10 10 10

CONTACTRON hybrid motor starters with SmartWire-DT™ support



Switch and reverse motors safely and reliably with CONTACTRON compact hybrid motor starters. The CONTACTRON "4 in 1" combines all the functions of a conventional reversing contactor circuit in a single device - for motors up to 4 kW, with a design width of just 22.5 mm.

The SmartWire-DT™ communication system makes the complex cabling of the control and signal levels easier and clearer. You can also combine the hybrid motor starters with standard fieldbus systems.

The hybrid motor starters, as well as the command and signaling devices, are directly connected to the controller with SmartWire-DT $^{\text{TM}}$ via a gateway. Safe shutdown is implemented with a PSR safety relay. Thanks to SmartWire-DT™, the amount of wiring is significantly reduced. You benefit from clearly arranged and compact control cabinets.

Notes:

Switching device technical data

You can download the SmartWire-DT™ Assist software for easy creation of SmartWire-DT™ networks free of charge at www.phoenixcontact.com

SmartWire-DT™ is a registered trademark of Eaton Corporation.

Input data

Rated control supply voltage U_S

Rated control supply voltage range with reference to Us

Rated control supply current $\rm I_{S}$ at $\rm U_{S}$

Rated actuating voltage $U_C R/L$

Rated actuating voltage range with reference to U_C

Rated actuating current I_C at U_C

Input circuit

Operating voltage / status / error indicator

Output data load side

Output voltage range

Load current

Surge current

Minimum load current Residual voltage

Output protection

General data

Rated insulation voltage

Rated surge voltage Ambient temperature (operation)

Electrical service life

Standards/regulations

Mounting position

Mounting

Screw connection solid / stranded / AWG

Dimensions (including adapter)

W/H/D

Safety data

EC-type examination certificate according to ATEX

Description

Reversing starter + emergency stop + motor protection + SmartWire-DT™ adapter as a set





Reversing starter + emergency stop + motor protection + SmartWire-DT™ adapter, as a set 550 V AC/3 x 0.6 A



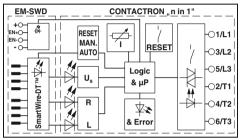


Reversing starter + emergency stop + motor protection + SmartWire-DT™ adapter, as a set 550 V AC/3 x 2.4 A

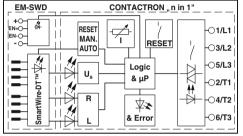




Reversing starter + emergency stop + motor protection + SmartWire-DT™ adapter, as a set 550 V AC/3 x 9 A



Technical data



RESET / -01/L1 RESET / -03/L2 -05/L3 -02/T1	EM-SWD_	CONTACTRON_nin 1"
R & Error 8.6773	+0 # EN+0 #	RESET -01/L1 RESET -03/L2 Us Logic & µP -02/T1 R -04/T2

24 V DC 0.8 1.25
40 mA 24 V DC 0.8 1.25
5 mA Protection against polarity reversal, Surge protection Green LED / Yellow LED / Red LED
42 V AC 550 V AC max. 600 mA (see derating curve)
100 A (t = 10 ms) 75 mA < 0.2 V Surge protection
500 V 6 kV/safe isolation -25°C 70°C 3 x 107 cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

DIN EN 50178 / EN 60947					
Vertical (horizontal DIN rail)					
Can be aligned with spacing = 20 mm					
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14					
22.5 mm / 165 mm / 114.5 mm					
5 5					
Ordering data					
_		Pcs./			

PTB 07 ATEX 3145		
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
ELR H5-IES-SC-SWD/500AC-0,6	2903116	1

	_
Technical data	
24 V DC 0.8 1.25	
40 mA 24 V DC 0.8 1.25	
5 mA Protection against polarity reversal, Surge protection Green LED / Yellow LED / Red LED	
42 V AC 550 V AC max. 2.4 A (see derating curve)	
100 A (t = 10 ms) 180 mA < 0.3 V Surge protection	
500 V	

6 kV/safe isolation -25°C ... 70°C 3 x 10⁷ cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 22.5 mm / 165 mm / 114.5 mm

Ordering

(E) II (2) G, (E) II (2) D PTB 07 ATEX 3145

ELR H5-IES-SC-SWD/500AC-2

Type

RESET MAN. AUTO RESET MAN. AUTO RESET WAN. AUTO RESET	01/ 03/ 05/ 02/ 04/ 06/	L2 L3 T1
Technical data		
24 V DC 0.8 1.25		

rechnical data
24 V DC
0.8 1.25
40 mA
24 V DC
0.8 1.25
5 mA
Protection against polarity reversal, Surge protection Green LED / Yellow LED / Red LED
Green LLD/ Tellow LLD/ Ned LLD
42 V AC 550 V AC
max. 9 A (see derating curve)
100 A (t = 10 ms)
1.5 A
< 0.5 V
Surge protection
500 V
6 kV/safe isolation -25°C 70°C
-25 0 10 0

3 x 107 cycles DIN EN 50178 / EN 60947 Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 22.5 mm / 165 mm / 114.5 mm

€ II (2) G, € II (2) D

			P1B 07 A1EX 3145		
j data			Ordering dat	а	
	Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs. / Pkt.
	2903117	1	ELR H5-IES-SC-SWD/500AC-9	2903118	1

SmartWire-DT™ accessories

With the "EM SWD-ADAPTER" SmartWire-DT™ adapter for the CONTACTRON 24 V DC "n in 1" devices, the device concerned can be seamlessly integrated into the fieldbus environment using SmartWire-DT™. Corresponding gateways are available for the following bus systems:

- PROFIBUS-DP
- CANopen
- Modbus TCP/Ethernet IP



SmartWire DT adapter

		Technical data
Input data		
Supply voltage U _{AUX}		-
Rated current I _{AUX}		-
Supply voltage U _{POW}		-
Rated current I _{POW}		-
Input data		
Description		Enable input
Input voltage		24 V DC
Input current		5 mA
Output data		
Description		-
Output supply		-
Output current		-
SmartWire-DT interface		
Connection method		Pin strip, 8-pos.
Data rate		125 kBd / 250 kBd
Current consumption I _{AUX}		120 mA
Current consumption I _{POW}		25 mA
General data		
Ambient temperature (operation)		-25°C 55°C
Standards/regulations		IEC 60947-1 / EN 60947-1
Degree of protection according to IEC 60529/ EN 60529		IP20
Mounting position		Any
Mounting		On CONTACTRON hybrid motor starter
Connection data solid / stranded / AWG		0.14 - 1 mm ² / 0.14 - 1 mm ² / 26 - 18
Dimensions	W/H/D	22.5 mm / 165 mm / 114.5 mm

	Ordering dat	а	
Description	Туре	Order No.	Pcs./ Pkt.
SmartWire-DT™ adapter	EM SWD-ADAPTER	2902776	1
Gateways CANopen® PROFIBUS Ethernet			
I/O modules Digital, 4 inputs, 4 outputs Digital, 4 inputs Digital, 8 outputs Analog, 2 inputs, 2 outputs			
Power feed module for supplying further SmartWire-DT™ devices			









D W



Input/output modules

Power feed









Technical data	Technical data		Technical data
	-	-	
24 V DC -15% +20%	-	-	24 V DC -15% +20%
3 A	-	-	3 A
24 V DC -15% +20%	-	-	24 V DC -15% +20%
700 mA	-	-	700 mA
	-	-	
-	Digital inputs	Analog inputs	-
•	24 V DC	-	•
	Typ. 4 mA	-	•
	-	-	
•	Digital outputs	Analog outputs	•
•	24 V DC -15% +20%	-	•
	Typ. 500 mA	-	
	-	-	
Pin strip, 8-pos.	Pin strip, 8-pos.	Pin strip, 8-pos.	Pin strip, 8-pos.
125 kBd / 250 kBd	125 kBd / 250 kBd	125 kBd / 250 kBd	125 kBd / 250 kBd
-	-	-	-
-	•	-	
0500 5500			
-25°C 55°C	- -		- EN 50450
EN 50178 IP20	EN 50178		EN 50178
	IP20		IP20
Any	Any		Any
0.2 - 1.5 mm ² / 0.2 - 1.5 mm ² / 24 - 16	0.2 - 1.5 mm ² / 0.2 - 1.5 mm ² / 2	24 - 16	- 0.2 - 1.5 mm ² / 0.2 - 1.5 mm ² / 24 - 16
35 mm / 90 mm / 127 mm	35 mm / 90 mm / 101 mm		35 mm / 90 mm / 124 mm

Ordering data		Ordering data Ordering of		Ordering dat	а			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
EU5C-SWD-CAN PXC EU5C-SWD-DP PXC EU5C-SWD-EIP-MODTCP PXC	2903098 2903100 2903244	1 1 1						
			EU5E-SWD-4D4D PXC EU5E-SWD-4DX PXC EU5E-SWD-X8D PXC EU5E-SWD-2A2A PXC	2903101 2903102 2903103 2903104	1 1 1			
						EU5C-SWD-PF2-1 PXC	2903113	1

SmartWire-DT™ accessories



Plug tools



Flat-ribbon cable, 8-pos.

Description	Color
Pliers for device plugs	
Pliers for flat plugs	
Flat-ribbon cable, 8-pos., 100 m	
Flat-ribbon cable, assembled with 2 flat plugs, 8-pe	os., 3 m

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
SWD4-CRP-1 PXC	2903110	1		
SWD4-CRP-2 PXC	2903114	1		

Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
SWD4-100LF-8-24 PXC	2903111	1
SWD4-3LF8-24-2S PXC	2903112	1

SmartWire-DT™ accessories

Accessories for SmartWire-DT™ and SmartWire-DT™ devices for connecting digital and analog input and output signals.



Plug and coupler



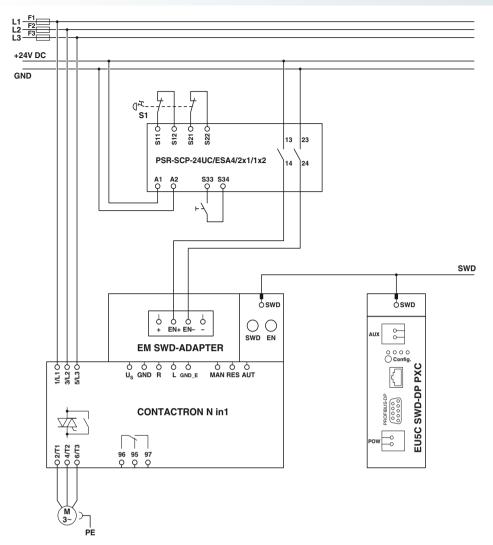
Programming adapter

Description	Color
Plug and coupling	
Network dummy plug	
Device plug, 8-pos.	
Flat plug, 8-pos.	
Coupling for 8-pos. flat plug	
Programming adapter	

Ordering data		
Туре	Order No.	Pcs. / Pkt.
SWD4-RC8-10 PXC SWD4-8SF2-5 PXC SWD4-8MF2 PXC SWD4-8SFF2-5 PXC	2903106 2903107 2903108 2903109	1 10 10 1

Ordering data		
Туре	Order No.	Pcs. / Pkt.
EU4A-RJ45-USB-CAB1 PXC	2903465	1

Hybrid motor starters



Intended use

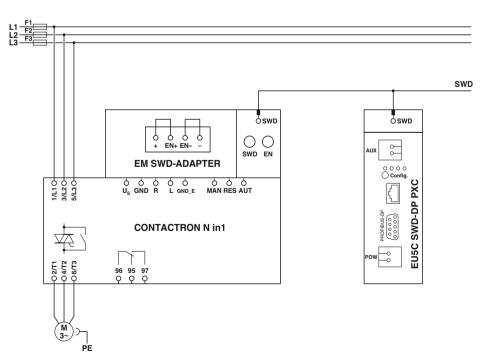
The SmartWire-DT™ adapter is approved exclusively for use in conjunction with the following CONTACTRON hybrid motor starters. If other switching devices are used, correct operation, in particular of the safety function, cannot be ensured.

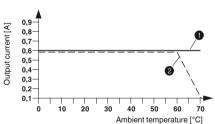
Motor protection and safe shutdown		
2900582	ELR H5-IES-SC-24DC/500AC-0,6	
2900414	ELR H5-IES-SC-24DC/500AC-2	
2900421	ELR H5-IES-SC-24DC/500AC-9	
2900566	ELR H3-IES-SC-24DC/500AC-0,6	
2900567	ELR H3-IES-SC-24DC/500AC-2	
2900569	ELR H3-IES-SC-24DC/500AC-9	
2297031	ELR W3- 24DC/500AC-2I	
2297057	ELR W3- 24DC/500AC-9I	
2902952	ELR H51-0,6-DINRAIL-SET	
2902953	ELR H51-2,4-DINRAIL-SET	
2902954	ELR H51-9-DINRAIL-SET	
2902746	ELR H51-IESSC-24DC500AC-06	
2902744	ELR H51-IESSC-24DC500AC-2	
2902745	ELR H51-IESSC-24DC500AC-9	
Motor protection only		

ELR H5-I-SC-24DC/500AC-0,6 2900573 2900574 ELR H5-I-SC-24DC/500AC-2 2900576 ELR H5-I-SC-24DC/500AC-9 2900542 ELR H3-I-SC-24DC/500AC-0.6 ELR H3-I-SC-24DC/500AC-2 2900543 2900545 ELR H3-I-SC-24DC/500AC-9

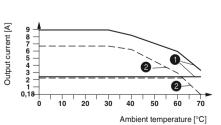
Emergency stop wiring example (two-channel)

Wiring example without emergency stop





Derating curve for ELR H5-IES-SC-SWD/500AC-0,6 100% operating time



Derating curve for ELR H5-IES-SC-SWD/500AC-2 and ELR H5-IES-SC-SWD/500AC-9 100% operating time

Aligned with > 20 mm spacingAligned without spacing

Hybrid motor starters

CONTACTRON bridge

The flexible CONTACTRON loop bridge (BRIDGE-...) simplifies the supply and looping through of phases L1, L2, and L3. It is available in 2- to 10-way versions for modules in the CONTACTRON family with 22.5 mm housing width.

Features of the 3-phase loop bridge:

- Saves considerable wiring
- Suitable for CONTACTRON series
 - ELR H3...
 - ELR H5...
 - ELR (W)3...
 - EMM...ÍFS
- Bridging of 2 to 10 devices with maximum module spacing of 22.5 mm
- Up to 575 V AC/3 x 25 A
- Additional bridge versions available on request

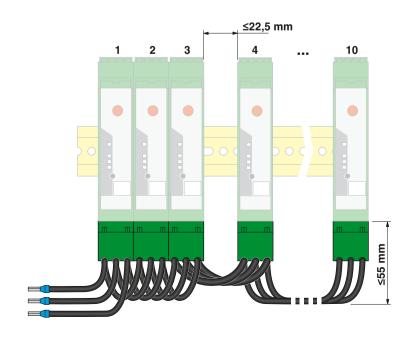


0.3 m connecting cable with ferrules

Technical data

General data	
Nominal voltage U _N	575 V AC
Nominal current at U _N	25 A
Cross section	2.5 mm ²

	Ord	ering data
Description	Туре	Order No. Pcs. / Pkt.
3-phase loop bridge		
2-way	BRIDGE- 2	2900746 1
3-way	BRIDGE- 3	2900747 1
4-way	BRIDGE- 4	2900748 1
5-way	BRIDGE- 5	2900749 1
6-way	BRIDGE- 6	2900750 1
7-way	BRIDGE- 7	2900751 1
8-way	BRIDGE- 8	2900752 1
9-way	BRIDGE- 9	2900753 1
10-way	BRIDGE-10	2900754 1







3 m connecting cable without ferrules

	Technical data	
575 V AC		
25 A		
2.5 mm ²		

Ordering data		
Туре	Order No.	Pcs. / Pkt.
BRIDGE- 2-3M BRIDGE- 3-3M BRIDGE- 4-3M BRIDGE- 5-3M BRIDGE- 6-3M BRIDGE- 7-3M BRIDGE- 9-3M BRIDGE- 9-3M BRIDGE- 9-3M	2901543 2901656 2901659 2901545 2901697 2901700 2901701 2901702	1 1 1 1 1 1 1

Electronic switchgear and motor control

Solid-state contactors

Three-phase solid-state reversing contactors

The three-phase solid-state reversing contactor with an integrated locking circuit and load wiring are intended for applications such as control valves, slides, separating filters, ship steering gears, etc. The scope of performance ranges from 575 V AC/3 x 2 A to 575 V AC/3 x 37 A.

Advantages of three-phase solid-state reversing contactors:

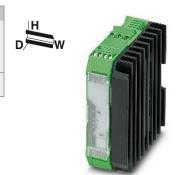
- Noise-free and wear-free switching
- Integrated protective circuit
- Stable and short switching times
- Long service life
- High switching frequency
- Integrated locking and load wiring
- Thermal fuse optional

Notes:

Type of insulation housing: ELR W 3...2, ELR W 3...9 Polyamide PA non-reinforced, color: green ELR W 3...16, ELR W 3...37

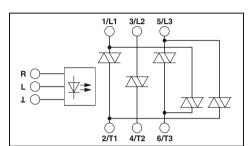
Polyester PBT non-reinforced, color: green

Marking systems and mounting material



For reversing 3~ AC motors up to 575 V AC/3 x 2 A

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า	nut	data

Rated actuating voltage U_C R/L

Rated actuating voltage range with reference to $U_{\mathbb{C}}$

Rated actuating current $I_{\text{\tiny C}}$ at $U_{\text{\tiny C}}$

Input circuit

Operating voltage / status / error indicator

Output data load side Output voltage range

Periodic peak reverse voltage

Load current

Surge current Minimum load current Residual voltage Leakage current

Maximum load value I2 x t (t = 10 ms)

Output protection General data

Rated insulation voltage Rated surge voltage Reversing frequency Switching frequency

Ambient temperature (operation)

Standards/regulations

Power station requirements

Degree of protection according to IEC 60529/ EN 60529

Mounting position

Mounting

Screw connection solid / stranded / AWG

- Control side - Load side

Technical data 230 V AC

12.7 mA Protection against polarity reversal, Surge protection

11 2 mA

0.4 ... 1.1

Surge protection

24 V DC

0.8 ... 1.25

- / Yellow LED / Red LED

48 V AC ... 575 V AC 48 V AC ... 575 V AC 1200 V 1200 V max. 2 A max. 2 A (see derating curve) (see derating curve)

200 A (t = 10 ms) 200 A (t = 10 ms) 100 mA 100 mA < 1.5 V < 1.5 V 6 mA 6 mA 250 A²s 250 A2s

RCV circuit

500 V

6 kV/basic isolation 6 kV/basic isolation max. 10 Hz max. 2 Hz max. 5 Hz max. 1 Hz

-25°C ... 70°C

DIN EN 50178 / EN 60947 DWR 1300 / ZXX01/DD/7080.8d

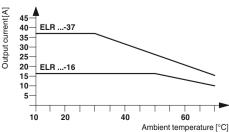
Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12

40 mm / 99 mm / 114.5 mm

rent[A]	10 ELR9	
Output current[A]	8 – 7 – 6 – 5 – 4 – 3 – ELR2	
	2 1 10 20 40 60 Ambient temperature [°C	-

Load current as a function of the ambient temperature Operating time: 100% operating factor



Load current as a function of the ambient temperature Operating time: 100% operating factor

Dimensions	W/H/D
Description	
3-phase solid-state reversing contactor	
5-phase solid-state reversing contactor	
Thermal fuse	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR W3- 24DC/500AC- 2 ELR W3-230AC/500AC- 2	2297293 2297303	1 1	
Accessories			
THERMAL FUSE TF104	2900796	1	



For reversing 3~ AC motors up to 575 V AC/3 x 9 A



For reversing 3~ AC motors up to 575 V AC/3 x 16 A

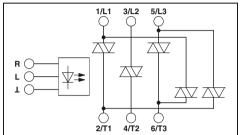
(**UL**) 15 (EL)



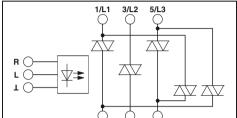
For reversing 3~ AC motors up to 575 V AC/3 x 37 A

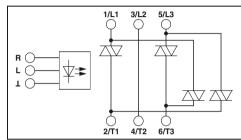
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Technical data





24 V DC	230 V AC
0.8 1.25	0.4 1.1
12.7 mA	11.2 mA
Protection against polarity reversa Surge protection	al, Surge protection
0 1	LED / Red LED
48 V AC 575 V AC	48 V AC 575 V AC
1200 V	1200 V
max. 9 A	max. 9 A
(see derating curve)	(see derating curve)
300 A (t = 10 ms)	300 A (t = 10 ms)
100 mA	100 mA
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A ² s	580 A ² s
RC	CV circuit
500 V	
6 kV/basic isolation	6 kV/basic isolation
max. 10 Hz	max. 2 Hz
max. 5 Hz	max. 1 Hz
-25°C 70°C	
DIN EN 50178 / EN 60947	

Туре		Order No.	Po P
0	rdering dat	а	
0.14 - 2.5 mm ² / 0.14 - 2.5 0.14 - 2.5 mm ² / 0.14 - 2.5 67.5 mm / 99 mm / 114.5 r	mm² / 26 - 12		
IP20 Vertical (horizontal DIN rai Can be aligned with spacin	I)		
-25°C 70°C DIN EN 50178 / EN 60947 DWR 1300 / ZXX01/DD/70			
max. 5 Hz	max. 1	Hz	

Vertical (horizontal DIN rail) Can be aligned with spacing = 20 mm			
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12 67.5 mm / 99 mm / 114.5 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR W3-24DC/500AC-9 ELR W3-230AC/500AC-9	2297316 2297329	1 1	
Accessories			
THERMAL FUSE TF104	2900796	1	

2/11	4/12 0/13
Techni	cal data
24 V DC	230 V AC
0.8 1.25	0.4 1.1
12.7 mA	11.2 mA
Protection against polarity reversal, Surge protection	Surge protection
- / Yellow LE	ED / Red LED
48 V AC 575 V AC	48 V AC 575 V AC

48 V AC 575 V AC 1200 V max. 16 A (see derating curve)	48 V AC 575 V AC 1200 V max. 16 A (see derating curve)
300 A (t = 10 ms) 100 mA < 1.5 V 6 mA 580 A ² s	300 A (t = 10 ms) 100 mA < 1.5 V 6 mA 580 A ² s RCV circuit
500 V 6 kV/basic isolation	6 kV/basic isolation

Ord	dering data	
147.5 mm / 99 mm / 114.5 n	nm	
$0.5 - 16 \text{ mm}^2 / 0.5 - 16 \text{ mm}^2$	/ 20 - 6	
0.2 - 4 mm ² / 0.2 - 2.5 mm ² /	24 - 12	
Can be aligned with spacing	j = 40 mm	
Vertical (horizontal DIN rail)		
IP20		
DWR 1300 / ZXX01/DD/708	60.8d	
DIN EN 50178 / EN 60947		
-25°C 70°C		
max. 5 Hz	max. 1 Hz	
max. 10 Hz	max. 2 Hz	

147.5 mm / 99 mm / 114.5 mm	147.5 mm / 99 mm / 114.5 mm		
Ordering dat	Order		
Туре	Order No.	Pcs. / Pkt.	Туре
ELR W3- 24DC/500AC-16 ELR W3-230AC/500AC-16	2297332 2297345	1 1	ELR W2+1- 24DC/500AC-37 ELR W2+1-230AC/500AC-37
Accessories			Acce
THEDMAI FIISE TE104	2000706	-1	THEDMAI EIISE TE104

Technical data				
24 V DC	230 V AC			
0.8 1.25	0.4 1.1			
12.7 mA	11.2 mA			
Protection against polarity reversal, Surge protection	Surge protection			
- / Yellow LE	D / Red LED			
48 V AC 575 V AC 1200 V	48 V AC 575 V AC			

1200 V	1200 V
max. 37 A	max. 37 A
(see derating curve)	(see derating curve)
1300 A (t = 10 ms)	1300 A (t = 10 ms)
, ,	, ,
200 mA	200 mA
< 1.5 V	< 1.5 V
6 mA	6 mA
9000 A ² s	9000 A ² s
	RCV circuit
E00.1/	

500 V	
6 kV/basic isolation	6 kV/basic isolation
max. 10 Hz	max. 2 Hz
max. 5 Hz	max. 1 Hz
-25°C 70°C	
DIN EN 50178 / EN 60947	
DWR 1300 / ZXX01/DD/7080.8d	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40	mm
0.2 - 4 mm ² / 0.2 - 2.5 mm ² / 24 - 1	
0.5 - 16 mm ² / 0.5 - 16 mm ² / 20 -	6

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR W2+1- 24DC/500AC-37 ELR W2+1-230AC/500AC-37	2297374 2297387	1	

ELIT WZ+1-200A0/300A0-07	2231301		
Accessories			
THERMAL FUSE TF104	2900796	1	

Electronic switchgear and motor control

Solid-state contactors

Three-phase semiconductor contactor

Motors of mixers, machine tools, conveying systems, pumps, and fans up to 575 V AC/3 x 37 A (equivalent to 1 kW to 18.5 kW) can be controlled using the CONTACTRON three-phase semiconductor contactors.

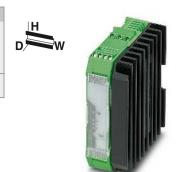
Advantages of three-phase semiconductor contactors:

- Noise-free and wear-free switching
- Integrated protective circuit
- Stable and short switching times
- Long service life
- High switching frequency
- Thermal fuse optional

Type of insulation housing: ELR 3...2, ELR 3...9 Polyamide PA non-reinforced, color: green ELR 3...16, ELR 3...37

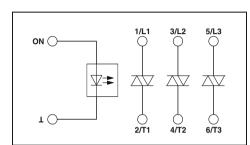
Polyester PBT non-reinforced, color: green

Marking systems and mounting material



For switching 3~ AC motors up to 575 V AC/3 x 2 A

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Input data

Rated actuation voltage U_C ON

Rated actuating voltage range with reference to $U_{\mathbb{C}}$

Rated actuating current $I_{\text{\tiny C}}$ at $U_{\text{\tiny C}}$

Input circuit

Operating voltage / status / error indicator

Output data load side Output voltage range Periodic peak reverse voltage

Load current

Surge current Minimum load current Residual voltage Leakage current

Maximum load value I2 x t (t = 10 ms)

Output protection General data Rated insulation voltage Rated surge voltage

Switching frequency Ambient temperature (operation) Standards/regulations

Power station requirements Degree of protection according to IEC 60529/ EN 60529

Mounting position

Mounting

Screw connection solid / stranded / AWG

- Control side

- Load side Dimensions

Thermal fuse

W/H/D

Technical data

24 V DC 230 V AC 0.8 ... 1.25 0.4 ... 1.1 12.5 mA 8.3 mA

Surge protection Protection against polarity reversal. Surge protection

- / Yellow LED / Red LED

48 V AC ... 575 V AC 48 V AC ... 575 V AC 1200 V 1200 V max. 2 A max. 2 A (see derating curve) (see derating curve)

200 A (t = 10 ms) 200 A (t = 10 ms) 100 mA 100 mA < 1.5 V < 1.5 V

6 mA 6 mA 250 A²s 250 A2s RCV circuit

500 V 6 kV/basic isolation 6 kV/basic isolation max. 10 Hz

-25°C ... 70°C DIN EN 50178 / EN 60947

DWR 1300 / ZXX01/DD/7080.8d

Vertical (horizontal DIN rail)

Can be aligned with spacing = 20 mm

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12 40 mm / 99 mm / 114.5 mm

	10	, י	20	 40	Ambient temp	
	Load				ambient temp rating factor	
Output current[A]	45— 40— 35— 30— 25— 20— 15— 10—		37	 _		<u></u>

Ambient temperature [°C] Load current as a function of the ambient temperature Operating time: 100% operating factor

60

Description
Three-phase semiconductor contactor

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
ELR 3-24DC/500AC-2 ELR 3-230AC/500AC-2	2297196 2297206	1 1		
Accessories				
THERMAL FUSE TF104	2900796	1		

10

20

ELR

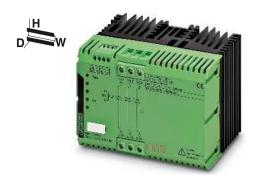
ELR

8-7-6-5-4-

Output current[A]



For switching 3~ AC motors up to 575 V AC/3 x 9 A



For switching 3~ AC motors up to 575 V AC/3 x 16 A

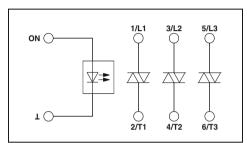
(**UL**) 15 (EL)

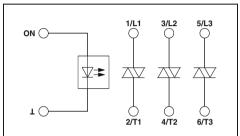


For switching 3~ AC motors up to 575 V AC/3 x 37 A

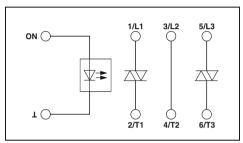
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Technical data



Technical data

Technical data	
24 V DC 0.8 1.25	230 V AC 0.4 1.1
8.3 mA Protection against polarity reversal, Surge protection	12.5 mA Surge protection
- / Yellow LE	ED / Red LED
48 V AC 575 V AC 1200 V max. 9 A (see derating curve)	48 V AC 575 V AC 1200 V max. 9 A (see derating curve) 300 A (t = 10 ms)
100 mA	100 mA
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A ² s	580 A ² s
	circuit
500 V	
6 kV/basic isolation max. 10 Hz -25°C 70°C DIN EN 50178 / EN 60947 DWR 1300 / ZXX01/DD/7080.8d	6 kV/basic isolation max. 1 Hz

6 mA	6 mA	
580 A ² s	580 A ² s	
	RCV circuit	
500 V		
6 kV/basic isolation	6 kV/basic isolation	
max. 10 Hz	max. 1 Hz	
-25°C 70°C		
DIN EN 50178 / EN 609	47	
DWR 1300 / ZXX01/DD/7080.8d		
IP20		
Vertical (horizontal DIN rail)		
Can be aligned with spacing = 20 mm		
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 12		
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 12		

0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 12			
67.5 mm / 99 mm / 114.5 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ELR 3-24DC/500AC-9 ELR 3-230AC/500AC-9	2297219 2297222	1	
Accessories			
THERMAL FUSE TF104	2900796	1	

24 V DC	230 V AC
0.8 1.25	0.4 1.1
0.0 1.20	0.4 1.1
8.3 mA	12.5 mA
Protection against polarity reversal,	
Surge protection	Surge protection
0 1	ED / Red LED
-/ Yellow L	ED / Red LED
48 V AC 575 V AC	48 V AC 575 V AC
1200 V	1200 V
max. 16 A	max. 16 A
(see derating curve)	(see derating curve)
300 A (t = 10 ms)	300 A (t = 10 ms)
100 mA	100 mA
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A ² s	580 A ² s
000710	/ circuit
nev	Circuit
500 V	
000 1	
6 kV/basic isolation	6 kV/basic isolation
max. 10 Hz	max. 1 Hz
-25°C 70°C	
DIN EN 50178 / EN 60947	

DWR 1300 / ZXX01/DD/7080.8d IP20				
Vertical (horizontal DIN rail)				
Can be aligned with spacing = 40 mm				
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6 147.5 mm / 99 mm / 114.5 mm				
Ordering data				
Type Order No. Pcs. / Pkt.				
ELR 3- 24DC/500AC-16 ELR 3-230AC/500AC-16	2297235 2297248	1		
Accessories				

THERMAL FUSE TF104

24 V DC	230 V AC
0.8 1.25	0.4 1.1
8.3 mA Protection against polarity reversal,	12.5 mA Surge protection
Surge protection - / Yellow LE	D / Red LED
48 V AC 575 V AC 1200 V max. 37 A (see derating curve)	48 V AC 575 V AC 1200 V max. 37 A (see derating curve)
1300 A (t = 10 ms) 200 mA < 1.5 V 6 mA 9000 A ² s	1300 A (t = 10 ms) 200 mA < 1.5 V 6 mA 9000 A ² s circuit
500 V	
0.137//	0.137//

O and a site		
147.5 mm / 99 mm / 114.5 mm		
0.5 - 16 mm ² / 0.5 - 16 mm ² / 20 -	6	
0.2 - 4 mm ² / 0.2 - 2.5 mm ² / 24 -		
Can be alighed with spacing = 40	111111	
Can be aligned with spacing = 40	mm	
Vertical (horizontal DIN rail)		
IP20		
DWR 1300 / ZXX01/DD/7080.8d		
DIN EN 50178 / EN 60947		
-25°C 70°C		
max. 10 Hz	max. 1 Hz	
6 kV/basic isolation	6 kV/basic isolation	
500 V		

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR 2+1- 24DC/500AC-37 ELR 2+1-230AC/500AC-37	2297277 2297280	1
Accessories		
THERMAL FUSE TF104	2900796	1

2900796

Electronic reversing load relay, with integrated soft switch

The ELR W 3/9-400 S soft switch can be used to increase the service life of a 3-phase induction motor.

- Parameterization is performed directly on the device via display and keyboard
- Friction time
- Torque, start
- Start time
- Stop time
- Torque, stop
- Braking time
- Braking torque
- Drive can be controlled locally via keyboard

Notes:	
Type of housing: Polycarbonate PC, color: green.	
Marking systems and mounting material See Catalog 5	

1) EMC: Class A product, see page 571





24V DC U _N	Parameterization 1/L1 0 3/L2
24V DCO & & Alarn	Logic 5/L3 2/T1 0 2/T1 0 4/T2 6/T3

Input data

Supply nominal voltage U_{VN}

Supply voltage range with reference to U_{VN}

Quiescent current

Control voltage U_{ST} right/left

Control voltage range in reference to U_{ST}

Typ. input current at U_N

Input circuit

Operating voltage / status / error indicator

Output data load side

Maximum switching voltage

Output voltage range

Periodic peak reverse voltage

Load current

Surge current Minimum load current Residual voltage Leakage current

Output protection General data

Test voltage input/output

Ambient temperature (operation)

Standards/regulations Power station requirements

EMC regulations

Degree of protection according to IEC 60529/ EN 60529

Mounting position

Mounting

Screw connection solid / stranded / AWG

Dimensions

Technical data

24 V DC 0.8 ... 1.2

85 mA 24 V DC

0.8 ... 1.2

Protection against polarity reversal, Surge protection

Green LED / Yellow LED / Red LED

440 V AC (L1/T1)

440 V AC (L2/T2) 440 V AC (L3/T3)

110 V AC ... 433 V AC

1000 V

< 8 A (IL1, at 20°C Tu, see derating)

< 8 A (IL2, at 20°C Tu, see derating)

< 8 A (IL3, at 20°C Tu, see derating) 230 A (tp = 10 ms, at 25°C)

150 mA

Typ. 1.5 V (For IL)

5 mA (IL1, in switched-off state)

RC element, surge protection

2.5 kV

-20°C ... 60°C

DIN EN 50178 / Safe isolation

DWR 1300 / ZXX01/DD/7080.8d

EN 61000-6-2 / EN 61000-6-4

IP20

Type

ELR W

<u>W/H</u>/D

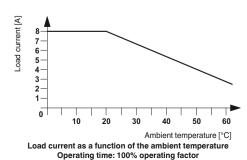
Vertical (horizontal DIN rail)

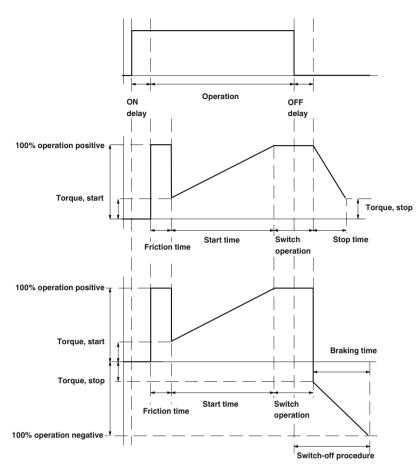
Can be aligned with > 20 mm spacing $0.2 - 6 \text{ mm}^2 / 0.2 - 4 \text{ mm}^2 / 24 - 10$

62 mm / 94 mm / 122 mm

Description
Electronic reversing load relay, with an integrated soft switch

Ordering data		
	Order No.	Pcs. / Pkt.
V3/ 9-400 S¹)	2963569	1





The figure shows the control of the reversing load relay with a soft starter and the operation of a three-phase current load.

Electronic switchgear and motor control

Solid-state contactors

Electronic reversing load relay for DC motors

The ELR-DC electronic reversing load relays allow mechanically commutated DC motors to be switched. They reverse and reduce the speed of DC motors up to 24 V/6 A in a wear-free manner. A short-circuit, surge-voltage, and overload-proof output guarantees reliable use in the plant.

If a 24 V DC signal is applied to the "left" input, the ELR-DC is interconnected so that the output supplies the motor with voltage. If the "right" input is triggered, the polarity of the voltage is inverted on the output. By triggering both inputs, i.e., "right" and "left", the motor is short-circuited internally via the ELR-DC and reduces the speed.

Thanks to the internal interlocking circuit and load wiring, wiring expense is reduced to a minimum.

Notes:	
Type of housing: Polycarbonate PC, color: green.	
Marking systems and mounting material See Catalog 5	
PWM = Pulse Width Modulation	
1) EMC: Class A product see page 571	

Input data

Control voltage U_{ST} right/left Control voltage range in reference to UST

Operating voltage / status / error indicator

Pulse width repetition rate of the PWM

Current limitation at short-circuits

Ambient temperature (operation) Nominal operating mode

Operating voltage / status / error indicator

Screw connection solid / stranded / AWG

Degree of protection according to IEC 60529/ EN 60529

3-phase solid-state reversing contactor, for controlling DC motors

Maximum clock frequency of the PWM at the control inputs

Typ. input current at U_N Input circuit

Output data load side Output voltage range Load current

Quiescent current

Output protection

Standards/regulations

Mounting position

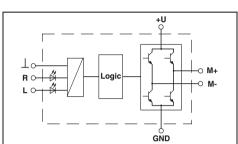
Dimensions

Description

General data Test voltage input/output







Technical data

24 V DC	24 V DC		
0.8 1.2	0.8 1.2		
3 mA	3 mA		

Protection against polarity reversal, Surge protection Green LED / LED yellow, forward running (R), LED yellow, reverse running (L) / -

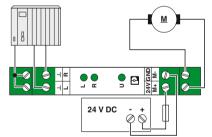
1000 Hz	1000 Hz
0% 100%	0% 100%
10 V DC 30 V DC	10 V DC 30 V DC
2 A	6 A
(Mounted in rows with zero spacing)	(see derating curve)
Approx. 7 mA	Approx. 7 mA
(When switched off)	(When switched off)
15 A	20 A
Protection against polar	ity reversal, Surge protection
Green	LED/-/-

2.5 kV AC -20°C ... 60°C 100% operating factor EN 50178 / Basic insulation IP20 Vertical (horizontal DIN rail) 0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10 12.5 mm / 99 mm / 114.5 mm

W/H/D

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR W1/ 2-24DC¹) ELR W1/ 6-24DC¹)	2963598 2982090	1

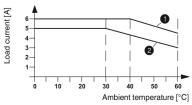
Application example



Status table

Input		Output	
Right	Left	M +	M -
0	0	High resistance	High resistance
1	0	+24 V	GND
0	1	GND	+24 V
1	1	GND	GND

Load current depending on ambient temperature Operating time: 100% OT



Aligned without spacing

44 PHOENIX CONTACT

Single-phase solid-state contactors

Single-phase solid-state contactors are used in AC voltage networks wherever silent switching, high switching frequencies, and a practically unlimited service life are required.

The sturdy power semi-conductors switch in zero voltage crossing and thus produce no additional high-frequency interferences. The modules are insensitive to shock loads and vibrations - even use in aggressive, polluted environments is unproblematic.

They offer the following advantages:

- High switching frequency
- Wear-free and output-free
- Input voltage versions 24 V DC and 230 V AC

Common areas of application are:

- Production machines
- Temperature controllers
- Conveyor equipment
- Light and lighting systems.

Notes:

Type of housing: Polycarbonate PC, color: green.

Marking systems and mounting material

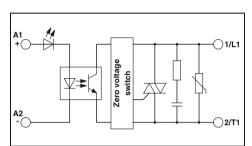




For switching 1~ AC motors up to 660 V AC/20 A

c**91**0s

Α



Technical data

Input data	
Input voltage range	
Typ. input current at U _N	
Switching level	1 signal ("H")
	0 signal ("L")
Transmission frequency f _{limit}	
Operating voltage / status / error indicator	
Output data load side	
Output voltage range	
Periodic peak reverse voltage	
Load current	

Surge current Minimum load current Residual voltage Leakage current

Phase angle (cos ϕ) Maximum load value I2 x t (t = 10 ms)

Output protection General data

Test voltage input/output Ambient temperature (operation) Standards/regulations

Mounting position

Mounting

Screw connection solid / stranded / AWG

Single-phase electronic load relay

- Control side

- Load side Dimensions

Description

V DC 32 V DC	24 V AC 275 V AC
Approx. 12 mA	Approx. 17 mA
4 V DC	≥ 22 V AC
1 V DC	≤6 V AC

6 Hz Green LED / - / -

42 V AC ... 660 V AC (45/65 Hz) 42 V AC ... 660 V AC (45/65 Hz)

20 A (see derating curve) 20 A (see derating curve)

250 A (t = 10 ms) 250 A (t = 10 ms)

350 mA 350 mA < 1.6 V < 1.6 V < 3 mA (In off state) < 3 mA (In off state)

0.5 0.5

525 A²s 525 A²s RCV circuit

4 kV_{rms} -30°C ... 70°C

W/H/D

EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 /

EN 61000-4-6 / EN 55011 / Basic insulation

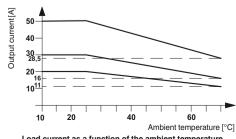
Vertical (horizontal DIN rail)

Can be aligned with ≥ 22.5 mm spacing

0.5 - 2.5 mm² / 0.5 - 2.5 mm² / 20 - 14 0.5 - 4 mm² / 0.5 - 4 mm² / 20 - 12

22.5 mm / 103 mm / 103 mm

LL.O IIIIII / TOO IIIIII / TOO IIIIII		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR 1-24DC/600AC-20 ELR 1-230AC/600AC-20	2297138 2297141	1



Load current as a function of the ambient temperature Operating time: 100% operating factor





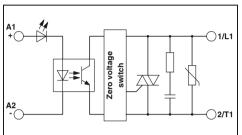
For switching 1~ AC motors up to 660 V AC/30 A



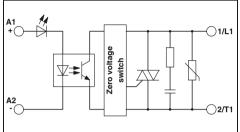


For switching 1~ AC motors up to 660 V AC/50 A

c**91**0s







Tec	hnica	l data
-----	-------	--------

4 V DC 32 V DC	24 V AC 275 V AC
Approx. 12 mA	Approx. 17 mA
≥ 4 V DC	≥ 22 V AC
≤ 1 V DC	≤ 6 V AC
25 Hz	6 Hz
	Green LED / - / -

42 V AC ... 660 V AC (45/65 Hz) 42 V AC ... 660 V AC (45/65 Hz) 1200 V

30 A (see derating curve) 30 A (see derating curve)

400 A (t = 10 ms) 400 A (t = 10 ms) 150 mA 150 mA < 1.6 V < 1.6 V

< 3 mA (In off state) < 3 mA (In off state)

0.5 0.5 1800 A²s 1800 A²s RCV circuit

4 kV_{rms} -30°C ... 70°C

EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 /

EN 61000-4-6 / EN 55011 / Basic insulation

Vertical (horizontal DIN rail)

Can be aligned with ≥ 22.5 mm spacing

0.5 - 2.5 mm² / 0.5 - 2.5 mm² / 20 - 14 0.5 - 4 mm² / 0.5 - 4 mm² / 20 - 12

22.5 mm / 103 mm / 103 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR 1- 24DC/600AC-30 ELR 1-230AC/600AC-30	2297154 2297167	1 1

Technical data

4 V DC ... 32 V DC 24 V AC ... 275 V AC Approx. 12 mA Approx. 17 mA ≥ 4 V DC ≥ 22 V AC ≤ 1 V DC ≤ 6 V AC 25 Hz 6 Hz Green LED / - / -

42 V AC ... 660 V AC (45/65 Hz) 42 V AC ... 660 V AC (45/65 Hz)

50 A (see derating curve) 50 A (see derating curve)

1900 A (t = 10 ms) 1900 A (t = 10 ms) 150 mA 150 mA < 1.6 V < 1.6 V

< 3 mA (In off state) < 3 mA (In off state)

0.5 0.5 18,000 A²s 18,000 A²s

RCV circuit

4 kV_{rms} -30°C ... 70°C

EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 55011 / Basic insulation

Vertical (horizontal DIN rail)

Can be aligned with ≥ 22.5 mm spacing

0.5 - 4 mm² / 0.5 - 4 mm² / 20 - 12 4 - 25 mm² / 4 - 25 mm² / 12 - 3

45 mm / 103 mm / 103 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ELR 1-24DC/600AC-50 ELR 1-230AC/600AC-50	2297170 2297183	1

IP67 motor starters

PROFINET motor starter

Motor starters in robust stainless steel housing (IP67) can be used directly in the system as a compact function unit. This eliminates the complex wiring of individual functions in the control cabinet.

The motor starter can be used to control three-phase asynchronous motors in two directions of rotation, completely via PROFINET. Distributed sensors and actuators can be directly connected to PROFINET without the need for further intermediate stations or additional cabling. A complete PROFINET motor starter consists of three products. For example:

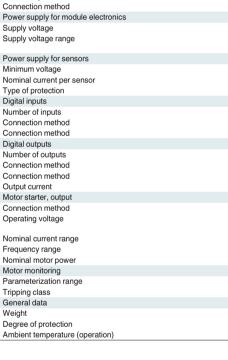
- ELR 5011 IP PN
- IBS IP 400 MBH-F
- IBS PG SET

Additional features:

- Performance classes: 0.06 kW to 3.0 kW
- Simple assembly
- Plug-in connection system
- Exchangeable module electronics
- Status and diagnostic indicators on the module
- 10 digital inputs for connecting sensors
- 4 digital outputs for connecting actuators
- One- and two-motor reversing starters

Notes:

1) EMC: Class A product, see page 571



Interface Fieldbus system



Electronic motor starters, 1 x 1.1 kW and 2 x 1.1 kW

PROFIBUS

Technical data						
ELR 5011 IP PN	ELR 5011-2 IP PN					
PROF	FINET					
8-pos. RJ45 sock	et on motor starter					
24 V DC (
20 V DC 30 V D	C (including ripple)					
$U_{INI} = U_{S1}$						
500						
Short-circuit/ove	erload protection					
•	0					
M12 plug-ir	n connector					
2, 3, 4-c	onductor					
4	•					
M12 plug-ir	n connector					

max. 500 mA (per channel)

POWER-COMBICON
360 V AC ... 550 V AC (line voltage 50/60 Hz)

2-conductor

0.18 A ... 2.4 A 50 Hz ... 60 Hz (mains frequency) 1.1 kW (at U_{mains}= 400 V AC)

0.2 A ... 2.4 A Based on class 10 A of IEC 60947

115 g 2425 g IP67 according to IEC 60529 -25°C ... 50°C (no condensation)

Ambient temperature (operation)	-25°C 50°C (r	-25°C 50°C (no condensation)			
	Orderi	ng data			
Description	Туре	Order No.	Pcs. / Pkt.		
PROFINET motor starter					
- 1-channel reversing starter, 1.1 kW - 2-channel reversing starter, 1.1 kW	ELR 5011 IP PN ELR 5011-2 IP PN	2700745 2701007	1 1		
PROFINET motor starter - 1-channel reversing starter, 3.0 kW - 2-channel reversing starter, 3.0 kW					
Lower part of the housing, stainless steel					
- Standard version	IBS IP 400 MBH -F1)	2732868	1		
Pg screw connection , plastic (IP67), for INTERBUS and PROFINET motor starters and variable frequency drives.					
	IBS PG SET	2836599	1		
	Acces	sories			
RJ45 connector, shielded, with bend protection sleeve, x 2					
- gray for straight cables	FL PLUG RJ45 GR/2	2744856	1		
- green for crossed cables	FL PLUG RJ45 GN/2	2744571	1		
Bus system cable	VS-937/	1402611	1		
Crimping pliers, for assembling the RJ45 connectors	FL CRIMPTOOL	2744869	1		

Electronic motor starters, 1 x 3.0 kW and 2 x 3.0 kW



High-grade steel lower part, IP67 degree of protection



N

Technic	al data	Technical data		
ELR 5030 IP PN	ELR 5030-2 IP PN	IBS IP 400 MBH -F1)		
PROF 8-pos. RJ45 socke			-	
o-pos. no45 socke	torrinotor starter		-	
24 V DC (l	J _{S1} / U _{S2})		-	
20 V DC 30 V DC	(including ripple)		-	
$U_{INI} = U_{S1} r$	ninus 1 V		-	
500			-	
Short-circuit/over	load protection		-	
10			-	
M12 plug-in			-	
2, 3, 4-co	nductor		-	
4			-	
M12 plug-in	connector		-	
2-conductor			-	
max. 500 mA (per channel)		-	
POWER-CO	OMBICON			
360 V AC 550 V AC (line voltage 50/60 Hz)		-	
2.4 A .	6 Δ		_	
50 Hz 60 Hz (m			-	
3 kW (at U _{mains} = 400 V AC)				
0.44	2.4 A 6 A			
=:::::	2.4 A 6 A Based on class 10 A of IEC 60947			
based on slass to A of the stoom				
2115 g	2425 g	1130 g		
IP67 according		IP67 according to IEC 60529	-	
-25°C 50°C (no	Condensation)		-	

-25 O 50 O (110 conde					
Ordering da	ta	Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
ELR 5030 IP PN ELR 5030-2 IP PN	2701006 2701008	1			
IBS IP 400 MBH -F1)	2732868	1	IBS IP 400 MBH -F1)	2732868	1
IBS PG SET	2836599	1	IBS PG SET	2836599	1
Accessories			Accessories		
FL PLUG RJ45 GR/2	2744856	1	FL PLUG RJ45 GR/2	2744856	1
FL PLUG RJ45 GN/2	2744571	1	FL PLUG RJ45 GN/2	2744571	1
VS-937/	1402611	1	VS-937/	1402611	1
FL CRIMPTOOL	2744869	1	FL CRIMPTOOL	2744869	1

Inline frequency inverters

Inline frequency inverters for the control cabinet are the compact solution for extending your Easy Automation solution to include electronic speed regulation for asynchronous motors. The devices seamlessly integrate into the Inline system and have IP20 protection. Depending on the drive task, you can select frequency inverters from various performance classes, up to a maximum of 4 kW. In order to connect to the Inline system via the Fieldline local bus, you just need the IB IL 24 FLM-PAC Inline module. The Inline frequency inverter can be connected to a Phoenix Contact controller via the Inline module.

Additional features:

- Maximum motor power0.75 kW, 1.5 kW, 2.2 kW, and 4.0 kW
- 3 x 400 V mains input (±15%) 50/60 Hz
- DTM for parameterization and diagnostics
- 8 freely programmable parameter records
- PTC evaluation for
 2.2 kW and 4.0 kW s
- 2.2 kW and 4.0 kW versions
- Integrated line filter
- U/f linear and U/f square operating modes
- S-ramp function
- Motor protection function (I2t)
- Connection of a braking resistor
- DC braking
- Evaluation of the temperature switch in the motor
- Voltage boost
- 1 x analog input, 1 x analog output,
 1 x relay output

Notes:

1) EMC: Class A product, see page 571



Fieldline local bus

9-pos. D-SUB plug/socket



0.75 kW

Technical data

Name
Connection method
Power supply for module electronics
Supply voltage
Supply voltage range
Digital inputs
Number of inputs
Connection method
Connection method
Digital outputs
Number of outputs
Connection method
Connection method
Motor starter, output
Connection method
Nominal current range
Frequency range
Nominal motor power
Tripping class
General data
Weight
Degree of protection
Width
Height
Depth
Бори

Interface

24 V DC ±15% 20.4 V DC 27.6 V DC ±15%				
5 COMBICON Spring-cage connection				
1 COMBICON Spring-cage connection				
PCB terminal block 2.6 A (Short-term peak current, 1.5 times the permissible continuous current, 1.2 times the				
0 Hz 400 Hz 0.75 kW 5.6 A OC tripping current				
1400 g IP20 86.8 mm 184 mm 132.9 mm				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		

Description
Inline frequency inverters for the control cabinet
mine nequency invested on and control outsinot
Inline Modular branch terminal for coupling one
Fieldline Modular M8 local bus at the end of an Inline station
Remote bus cable, highly stranded, 3 x 2 x 0.25 mm ²

VFD 5007 IL IB	2701054	1
Accesso	ories	
IB IL 24 FLM-PAC¹)	2736903	1
IBS RBC/F-T/	2740151	1

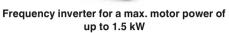
N

IP20 frequency inverters

N











Frequency inverter for a max. motor power of up to 2.2 kW





Frequency inverter for a max. motor power of up to 4.0 kW

Technical data			Technical data			Technical data		
Fieldline local bus 9-pos. D-SUB plug/socket			Fieldline local bus 9-pos. D-SUB plug/socket		Fieldline local bus 9-pos. D-SUB plug/socket			
24 V DC ±15% 20.4 V DC 27.6 V DC ±15%			24 V DC ±15% 20.4 V DC 27.6 V DC ±15%			24 V DC ±15% 20.4 V DC 27.6 V DC ±15%		
5 COMBICON Spring-cage connection			5 COMBICON Spring-cage connection			5 COMBICON Spring-cage connection		
1 COMBICON Spring-cage connection			1 COMBICON Spring-cage connection			1 COMBICON Spring-cage connection		
PCB terminal block 4.1 A (Short-term peak current, 1.5 times the nominal current for 30 s; permissible continuous current, 1.2 times the nominal current range)			PCB terminal block 5.8 A (Short-term peak current, 1.5 times the nominal current for 30 s; permissible continuous current, 1.2 times the nominal current range)		PCB terminal block 9.1 A (Short-term peak current, 1.5 times the nominal current for 30 s; permissible continuous current, 1.2 times the nominal current range)			
0 Hz 400 Hz 1.5 kW 8.8 A OC tripping current			0 Hz 400 Hz 2.2 kW 12.5 A OC tripping current		0 Hz 400 Hz 4 kW 21 A OC tripping current			
1400 g IP20 86.8 mm 184 mm 132.9 mm			2006 g IP20 114 mm 184 mm 153 mm		2006 g IP20 114 mm 184 mm 153 mm			
Orderi	ng data		Orderin	g data		Orderi	dering data	
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VFD 5015 IL IB	2701055	1	VFD 5022 IL IB	2701057	1	VFD 5040 IL IB	2701058	1
Accessories			Accessories		Acces	ssories		
IB IL 24 FLM-PAC ¹)	2736903	1	IB IL 24 FLM-PAC¹)	2736903	1	IB IL 24 FLM-PAC¹)	2736903	1
IBS RBC/F-T/	2740151	1	IBS RBC/F-T/	2740151	1	IBS RBC/F-T/	2740151	1



Measurement and control technology

The modular analog converters for measurement and control technology prevent analog signals from being distorted by disturbance variables. With accurate conversion, isolation, filtering or amplification of analog signals, they secure and increase transmission quality and therefore the quality of closed-loop control circuits.

We offer the following product ranges:

Highly compact isolating amplifiers – MINI Analog

For significant space savings and efficiency

- Design width of just 6.2 mm
- System cabling and multiplexer solutions
- 3-way electrical isolation

Isolating amplifiers with SIL functional safety – MACX Analog

For maximum signal safety

- Consistent SIL certification
- Safe 3-way electrical isolation

Isolating amplifiers, special types, and digital displays – MCR Analog

For special applications in signal processing

- Electrical isolation
- Record and convert temperatures directly in the field

Ex i isolating amplifiers with SIL functional safety – MACX Analog Ex

For intrinsically safe circuits in the Ex area

- Maximum explosion protection for all Ex zones and gas groups
- Design width of just 12.5 mm for all single- and two-channel devices
- Safe 3-way electrical isolation

Product range overview	
Product overview	54
Selection guide for isolating amplifiers	56
Basics	58
Highly compact isolating amplifiers –	
MINI Analog	64
Analog IN/Analog OUT	66
Temperature	76
Frequency	82
Potentiometers	84
Limit values	85
Digital IN	86
Accessories	87
Isolating amplifiers with SIL functional safety – MACX Analog	100
Analog IN/Analog OUT	102
Temperature potentiometers/limit values	110
Digital IN	120
Accessories	126
Isolating amplifiers, special designs, and digital displays – MCR Analog	130
Analog IN/Analog OUT	131
Temperature potentiometers/limit values	136 144
Frequency	• • • •
Limit values	146 149
Accessories	
Digital displays	150
EX i isolating amplifiers with	450
SIL functional safety – MACX Analog Ex	152
Analog IN	160 164
Analog OUT	165
Temperature	
Digital IN	172 179
Digital OUT Accessories	
	182
Multiplexers for HART signals	186
Ex i 2-conductor field devices	187
Accessories	190

Measurement and control technology

Product overview

Highly compact isolating amplifiers



MINI Analog

Page 64



Supply components, feed-through terminal blocks, marking material Page 88



System cabling, termination carriers



Surge protection

Page 98

Digital displays



For standard signals, setpoint adjusters

Ex i isolating amplifiers with functional safety

Page 152



MACX Analog Ex



Supply components, marking material Page 182



System cabling, termination carriers Page 184

Energy and power measuring technology



EMpro energy meters

Page 200



EMpro special function and communication modules Page 202



PSK data logger kits

Page 206



PSK compressed air meters

Page 208



Current protectors, AC

Page 235



Voltage transducers

Page 236



SOLARCHECK PV string monitoring Page 134



EMD-BL compact monitoring relays

Page 250

Product overview

Isolating amplifiers with functional safety



MACX Analog

Page 100



Supply components, marking material Page 126



System cabling, termination carriers Page 128

Isolating amplifiers Special designs



MCR Analog

Page 130

Multiplexers



Multiplexers for HART signals

Page 186

Ex i 2-cond. field devices



Ex i 2-conductor field devices

Page 187

Accessories



Shield fast connection



Test plugs

Page 191

Current transformers



PACT current transformers

Page 212

Test disconnect terminal blocks



Test disconnect terminal blocks See Catalog 3

Current and voltage measuring technology

Page 191



Current transducers, AC/DC

Page 229



Current transducers, AC

Page 232

Controllers



EMD multifunctional monitoring relays Page 252

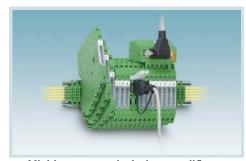
Controllers See Catalog 8

Surge protection



Surge protection for measurement and control technology See Catalog 6

Selection guide for isolating amplifiers



Highly compact isolating amplifiers - MINI Analog

		Tillel Allalog
Analog IN/Analog OUT		Page
		Page
3-way isolating amplifiers	Configurable	From 66
	Fixed signal combinations	71
4-way signal duplicators	Configurable	72
3-way repeater power supplies	1-channel	73
	Signal duplicators	
	2-channel	
2-way passive isolators	Supplied by an input loop	74
	Supplied by an output loop	75
3-way output isolators	Fixed signal combinations	
Digital displays	Standard signals	
	Setpoint adjuster	
T emperature		
•		
emperature transducers	Universal	
	Universal, supplied by an output loop	
	For resistance thermometers (RTD)	76
	For resistance thermometers (RTD), passive	
	For Pt 100	From 77
	For Pt 100, supplied by an output loop	79
	For thermocouples	80
	For thermocouples, type J and K	81
Temperature head transmitters	Universal, supplied by an output loop	
•	Pt 100, supplied by an output loop	
_		
Frequency		
Frequency transducers	Universal	82
Analog frequency transducers		83
Potentiometer/resistor		
Otiposition transducers		84
Setpoint potentiometers		
limit malma		
_imit values		
Threshold value switches	Standard analog signals, universal	
	Standard analog signals	85
	Temperature	
Digital IN		
solation amplifiers	NAMUR sensors, floating contacts	86
	NAMUR sensors, floating contacts, 2-channel	
	NAMUR sensors, floating contacts, wide range	
	NAMUR sensors on NAM	
Digital OUT		
Solenoid drivers	Loop-powered	
	With line fault detection	
A		
Accessories		
Configuration	Configuration software	
	Cables	119
	Display unit and operator interface, removable	
	Holder module for display unit and operator interface	
Constant voltage source	Constant voltage source	87
Setpoint potentiometers		
System cabling	System components	94
.,,	1:1 feed-through terminal block	88
	Termination carriers	97
Multiplexers	Analog multiplexers	95
inicpieseis		
	Multiplexers for HART signals	
Supply components	Power terminal block/error message modules/ T-Connectors/system power supply	From 89
Marking material		88
Surge protection		98
Shield fast connection		191
Test plugs		
Resistance circuit	For line fault detection	183
tosseance en eure	1 of thre fault detection	100

Selection guide for isolating amplifiers



Isolating amplifiers with functional safety - MACX Analog



Special types of isolating amplifiers and digital displays



Ex i isolating amplifiers with functional safety - MACX Analog Ex

	_	_	
	Page	P age	Page Page
	From 102	131	160
		132	130
	106	/-	160
	107		161
			162
		134	
	109		164
	109	150	104
		151	
	From 114	136	From 168
	110111114	140	187
	110		165
		138	
	110	141	166
	112		166
	-	142	188
		143	189
		144	
		1-74	
	From 444		From 400
	From 114	148	From 168
		140	
		146	
		147 139	
	116	146	170
		···	
	120 124		172 176
	122		174
	125		177
	123		175
			178
			From 179
			179
		149	149
-	119	149	149
	118		
	118		
		148	
	129		184
			186
	From 126		126
	127		127
	191	191	191
	191	.51	191
	183		183

Input

Maximum input signal

The maximum input signal describes the value achieved before any damage occurs to the module and the signal generator. If these values are exceeded, suppresser diodes can be triggered to short circuit this input when a surge voltage is detected. The transmission range of the analog signals is located exclusively within the specified input ranges.

Input resistance

The input resistance of an isolating amplifier or measuring transducer is determined in such a way as to ensure that the input signal is loaded only slightly. This results in a low-resistance input for current inputs and a high-resistance input for voltage inputs.

Voltage drop

In the case of passive isolators, the input voltage drop occurs as a result of the voltage drop of the operational load and the auxiliary power requirements of the module. The greater the auxiliary power requirements of the passive isolator, the smaller the operational output load is allowed to be. Low auxiliary power requirements are regarded as an indicator of device quality.

Common mode rejection

In the case of isolating amplifiers, operational amplifiers are used internally for transmission purposes. In theory, operational amplifiers should display ideal transmission and amplification behavior. However, it is a different matter in practice. When both input voltages are changed in the same direction, i.e., exactly the same voltage to ground is applied to both input terminal blocks, this leads to an unintended output signal. Theoretically, if the operational amplifier is ideal, no output signal should appear since the differential input signal is "0 V". Common mode rejection indicates the factor (in dB) by which the common input voltage at both inputs is amplified to a lesser extent than the difference in voltage between the two inputs.

Analog output

Maximum output signal

If the devices operate without fault conditions, an overload at the input cannot cause greater values than this maximum to occur at the output.

Zero/span adjustment

When the zero point is set, the zero point of an analog output is adjusted and set in relation to the input signal.

When the "amplification" span is set, the analog output is adjusted in relation to the input signal. In this case, the output characteristic is increased or decreased by an amplification factor.

Load

The load on the output side indicates the load-carrying capacity of a measuring transducer or an isolating amplifier. Current outputs can usually drive a maximum of 500 Ω , voltage outputs can be loaded with a minimum of up to 10 $k\Omega$

Residual ripple/ripple

A superimposed ripple can appear on the output signal due to signal conditioning required by the circuit. The residual ripple is indicated in mV_{pp} or mV_{rms} .

Open circuit response

With some measuring transducers, the input signal is permanently monitored for possible open circuits in the signal cable. If the signal exceeds or falls below a tolerance limit, an open circuit is detected and a defined output signal is sent. With programmable devices, the output signals can be freely selected.

Digital output

Relays

Many of the products with a relay output that are shown in the catalog feature hard gold-plated relay contact material. The voltage range has an important role to play in terms of how this contact material can be used. Up to 50 mA can be transmitted with voltage ranges of up to 30 V AC/36 V DC. Even very small currents are transmitted perfectly. If the aforementioned voltage range is exceeded and values of 250 V AC/DC are processed, currents of up to 2 A can flow. However, in this case the subsequent transmission of small currents can no longer be guaranteed.

Transistor

A PNP transistor switching output can be used to transmit 24 V DC switching signals up to approximately 100 mA.

General data

Supply voltage

The product range includes DC and AC power supply units for specific products. There is a standard power supply unit available in the form of a 24 V DC version that operates within a voltage range of 20 ... 30 V DC. For other supply voltages, please refer to the technical data.

Current consumption

The value specified here describes the auxiliary power requirements of the devices. It also includes the output current and, where applicable, the switching output load.

Transmission errors

The transmission precision is a gauge of the quality of a measuring transducer. It is the deviation from the ideal transmission characteristic curve and includes linearity, span, and offset errors.

Non-linearity

Non-linearity is the deviation from the ideal transmission precision without including span and offset errors.

The non-linearity of a signal makes it possible to evaluate the course from zero to end point. Normally, the linearity errors are expressed as a percentage that indicates the extent of deviation from the ideal transmission characteristic curve.

Temperature coefficient

The temperature coefficient provides an assessment of the extent to which precision deviates when the ambient temperature around an isolating amplifier or measuring transducer changes. In most cases this is specified as a percentage. An alternative definition is ppm/K (parts per million/Kelvin). Example: 250 ppm/K = 0.025%/K.

Limit frequency

Isolating amplifiers are basically designed to transmit DC signals. However, signal changes call for a dynamic form of behavior so that small AC quantities (normally: 30 Hz) can also be transmitted. This is achieved by defining a limit frequency. At the same time, a low limit frequency can be used to suppress higher-frequency AC components.

Step response

The step response indicates the response time of the output signal when an input signal step occurs (10 ... 90%). The step response is inversely proportional to the limit frequency. This means that the response time decreases as the limit frequency increases.

Test voltage

The test voltage indicates the dielectric strength of an isolated distance and is determined by type tests. In this test, a 50 Hz voltage is applied for one minute; it describes the value achieved before a disruptive discharge is able to move to another potential level in the device.

Safe isolation

"Safe isolation" is defined as protection against hazardous shock currents. When module specifications are provided in accordance with EN 61010, a distinction is made between faultless operation and operation under fault conditions. Nominal supply voltages of 30 V AC/60 V DC are deemed valid for faultless operation.

Ambient temperature range

The temperature limits specified here relate exclusively to operation. These limits do not apply to storage and transport. It is here where the temperature limits of the materials used are the decisive factor. If the devices are outside of the specified temperature range during assembly, they must be brought back within the specified temperature range prior to system startup. It is important to make sure that no condensation occurs during this process.

Protective circuit

In order to protect the measurement and control modules against surge voltages, suppressor diodes are connected upstream of the signal and supply paths. These diodes behave in a similar manner to conventional Zener diodes, except for the fact that suppressor diodes have faster response times and a higher maximum current.

Information on directives and standards

When carrying out further processing of non-independent items of equipment (components), the applicable regulations pertaining to installation must be observed.

The relevant device-specific regulations also apply with regard to installation in devices.

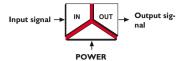
(Standards applicable at the time of going to print)

Directives	EU	International
EMC Directive (electromagnetic compatibility)	2004/108/EC	-
Low Voltage Directive (LVD)	2006/95/EC	-
Ex Directive (ATEX)	94/9/EC	-
Product standards		
Electronic equipment for use in power installations	EN 50178:1997	-
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1:2001	IEC 61010-1:2004
Programmable controllers - Part 2: Equipment requirements and tests	EN 61131-2:2007	IEC 61131-2:2007
EMC		
EMC - Part 6-2: Generic standards - Immunity for industrial environments	EN 61000-6-2:2005	IEC 61000-6-2:2005
EMC - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4:2007	IEC 61000-6-4:2006
Electrical equipment for measurement, control and laboratory use EMC requirements	EN 61326-1:2006	IEC 61326-1:2005
ATEX		
Electrical apparatus for explosive gas atmospheres - Part 0: General requirements	EN 60079-0:2006	IEC 60079-0:2007
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	EN 60079-11:2007	IEC 60079-11:2006
Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection "n" electrical apparatus	EN 60079-15:2005	IEC 60079-15:2005
Environmental tests		
Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1:2007	IEC 60068-2-1:2007
Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2:2007	IEC 60068-2-2:2007
Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6:2008	IEC 60068-2-6:2008

Basics

Active isolation

3-way isolation

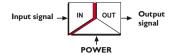


In the case of modules with this isolation method, all components that are connected to the input, output or power supply are protected against interference from each other. All three directions (input, output, and power supply) are electrically isolated from one another accordingly.

The 3-way isolation provides electrical isolation between the measurement sensor and the controller as well as between the controller and the actuator.

On the input side, the modules need active signals. On the output side, they provide a filtered and amplified signal.

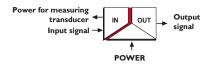
Input isolation



In the case of modules with this isolation method, the electronics connected on the output side (e.g., the controller) are to be protected from interference from the field. For this reason, only the input is electrically isolated from the output and the power supply that are at the same potential.

On the input side, the modules need active signals (e.g., from measurement sensors). On the output side, they provide a filtered and amplified signal (e.g., from the controller).

Repeater power supply



Repeater power supplies use the signal input side not only for measured value acquisition, but also to provide the necessary power to the passive measurement sensors connected on the input side.

On the output side, they provide a filtered and amplified signal (e.g., from the controller).

The isolation method used by these modules is input isolation.

Passive isolation

Passive isolation, supplied on the input side



The modules draw the power needed for signal transmission and electrical isolation from the active input circuit. On the output side, a conditioned current signal is provided to the controller or to actuators.

This passive isolation allows signal conditioning (interruption of ground loops) and filtering without an additional power supply.

Passive isolation, supplied on the output side (loop-powered)

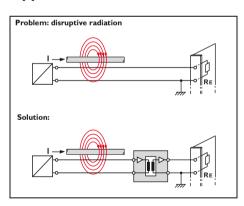


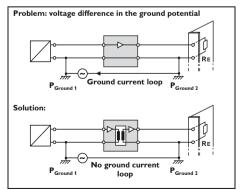
The modules draw the power needed for signal transmission and electrical isolation from the active output circuit, ideally from a PLC input board that supplies power.

On the output side, the loop-powered modules operate with a 4 ... 20 mA standard signal. On the input side, the passive isolator processes active signals.

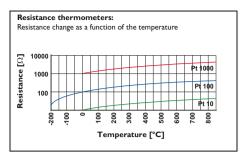
When this isolation method is used, it is important to make sure that the active signal source connected on the output side (e.g., an active PLC input board) is able to supply the passive isolator with power, as well as operate its load.

Applications





Resistance thermometers



Resistance thermometers (e.g., Pt 100, Ni 1000) change their resistance value depending on the temperature. The MCR temperature transducers detect this change and convert it into a proportional analog signal.

To avoid unwanted self-heating of the sensor, the constant measured current used is kept as low as possible (MCR-T-UI... \rightarrow 250 μ A).

Two-conductor connection technology

The resistance thermometer is connected to the MCR measuring transducer using a two-core cable. Please note



that the supply cable resistances are added to the measured resistance and consequently distort the result.

A distance of 10 m should not be exceeded

Example: a 50 m long copper cable with a cross section of 0.5 mm² has a specific resistance of 3.4 Ω A Pt 100 sensor has a resistance change of 0.384 Ω per 1 K temperature change. This corresponds to an error of 8.8°C.

Three-conductor connection technology

Three-conductor technology is normally used to minimize the effect of cable resistances. An additional cable is connected to the resistance



thermometer, so that the latter can be measured using two measuring circuits, one of which acts as a reference. In this way, it is possible to compensate for the cable resistance.

Identical cable lengths and an identical ambient temperature are essential here.

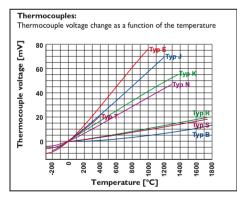
Since this is more or less the case in the majority of applications, three-conductor technology is the most commonly encountered today. Line compensation is not necessary.

Four-conductor connection technology

Four-conductor connection technology is an ideal connection technology for resistance thermometers.

The measurement result is affected neither by cable resistances nor by their temperature-dependent fluctuations. The voltage drop on the supply and return lines can therefore be measured and compensated for separately. Line compensation is not necessary.

Thermocouples



In contrast to resistance thermometers, thermocouples are active sources that generate a voltage in the microvolt range. The temperature difference measured between the measurement junction and the cold junction is converted into an absolute temperature with the help of cold junction compensation.

Operating principle:

If different metals are joined together, a thermal voltage is produced in the metal atoms as a result of the different binding energies of the electrons. This voltage is dependent firstly on the metals themselves and secondly on the temperature.

If the same temperature prevails at the measuring junction (ϑ_1) and the cold junction (ϑ_2) , no current will flow because the generated



partial voltages cancel each other out. However, if the temperatures at the measuring junction and the cold junction are different, different voltages are produced. These voltages do not completely cancel each other out, and so current flows.

A thermocouple therefore always measures only one temperature difference. This is derived from the difference between the thermal voltages at the measuring junction and at the cold junction.

The voltage produced by the thermoelectric effect is very low; only a few microvolts per Kelvin.

Example: if a type J thermocouple (FE-CuNi) is connected to a copper terminal block, thermal voltages with opposite polarity will be generated (at the iron-copper and copper-constantan transitions) and cancel each

Therefore, only the difference in the thermal voltages between constantan (Cu-Ni) and iron is of relevance.

A role is also played by the temperature at the terminal point. If it is known, the temperature at the measuring junction can be derived by adding the thermal voltage measured at the same junction.

The MCR temperature transducers for thermocouples therefore detect the temperature at the terminal points and compensate this value, which is also referred to as the reference junction or the cold junction.

This process is sometimes called cold junction compensation.

Basics

Digital displays

Use of the freely programmable characteristic curve

The freely programmable characteristic curve, i.e., the assignment of the displayed value to the input value, is important in process applications for indicating flow rates or liquid levels.

The purpose of level measurements is very often not to determine how much liquid is still inside the tank, but rather to establish how much has been drawn out of it. In this case, the characteristic curve can simply be inverted in order to display the required value.

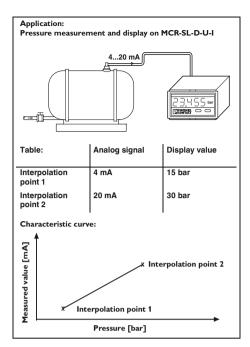
Parameterization of the characteristic curve using interpolation points

With non-linear input signals, the received analog values can be assigned to the value to be displayed by means of a programmable characteristic curve. This curve can consist of up to 24 interpolation points. This allows flow sensors with a non-linear characteristic curve to be adapted, for instance. The analog signal digital displays in the Function Line additionally feature a summing function which - to take a typical example from bottling technology - allows you to switch over at the touch of a button from the instantaneous value (= flow rate in

l/min) to the total flow integrated in the background, which can be displayed in any unit. This saves space and money, because there is no need for a second digital display.

Limit values can also be called at the touch of a button. Limit values 1 and 2 can be assigned to either the actual value or the cumulative value. If the latter value is exceeded, one of the two output relays is activated.

Other applications include indicating liquid levels, pressures, and temperatures. With servo motors, the analog output signals (0 ... 10 V) generated by the tachometer can be supplied to the input of the digital display in order to indicate the motor speed.



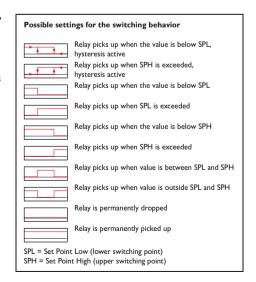
Switching behavior of relay or transistor outputs:

A different kind of switching behavior can be defined for each relay or each transistor when it reaches a preset switching point.

All the possible settings for the switching behavior are shown and explained in the list:

- The first two options include hysteresis, i.e., the behavior of the relay depends on the direction from which a switching point is reached.
- For the remaining options, with the exception of the last two ("on" and "off"), a switching tolerance is taken into account to prevent the relay contact from "chattering". The relay is not switched until the switching point plus switching tolerance has been reached.

- In the "on" state, the relay is permanently picked up. It only responds if there is an open circuit and it has been set to drop out when this happens.
- In the "off" state, the relay only responds if there is an open circuit and it has been set to pick up when this happens.



Non-intrinsically safe signal transmission in potentially explosive areas

Electrical equipment operated in systems with potentially explosive areas is subject to different usage requirements, depending on the application.

For example, electrical equipment could be used in the following locations when analog signals are being transmitted:

- Sensors and actuators can be located in zone 0, zone 1 or zone 2.
- Signal transmitters can be located in zone 1, zone 2 or the safe area.
- The controller, e.g., PLC, is in the safe area.

For examples of the kinds of electrical devices that can be installed for the purpose of transmitting signals, please see the figure.

Devices must be designed to offer a suitable protection type if they are to be used in zone 2. The MINI Analog and MACX Analog ranges are designed to provide protection type "n" for this purpose and must be installed in zone 2 in suitable and approved housing (EN 60079-15 and

EN 60079-0) with IP54 protection minimum.

Example:

A sensor/actuator with protection type "n" can be connected to an isolator from the MINI Analog or MACX Analog ranges in zone 2.

When selecting suitable devices for zone 2, it must be ensured that the electrical data of the sensors/actuators is not exceeded.

If the sensors/actuators are mounted in explosion-proof housing or if they have their own explosion-proof housing, they can also be installed in zone 1.

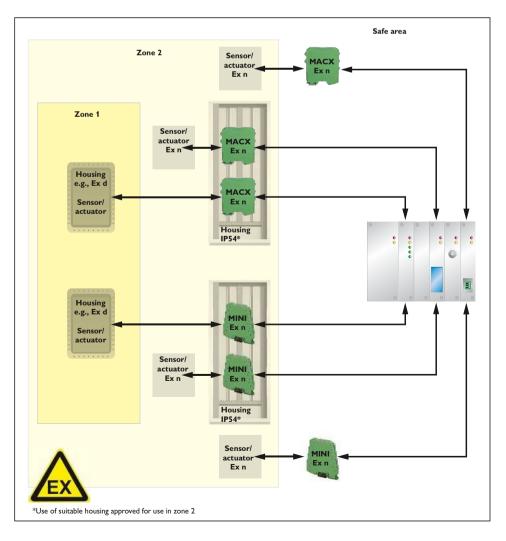
Installation requirements

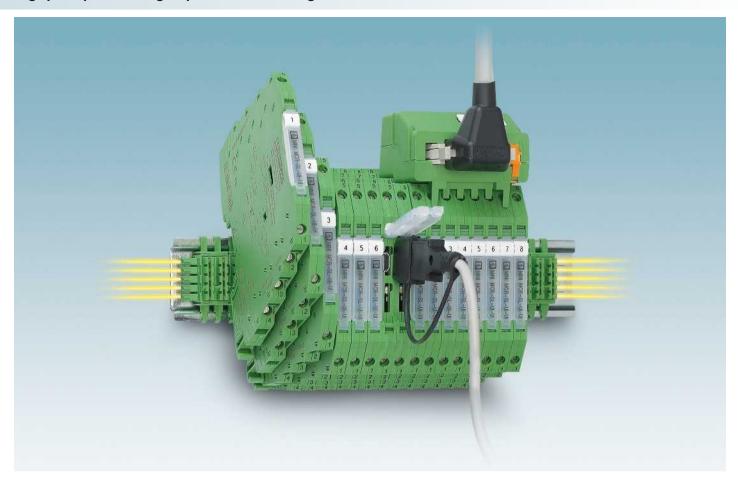
The figure shows a range of options for installing electrical devices in areas with a danger of gas explosions. Special requirements regarding the configuration, selection, and installation of electrical systems in areas with a danger of gas explosions can be found in EN 60079-14.

In the 2008 edition, the relevant contents of EN 61241-14 were incorporated in EN 60079-14.

EN 61241-14 must still be observed when installing electrical equipment in areas containing combustible dust. Other important factors when it comes to running systems in potentially explosive areas are inspection, maintenance, and repairs. Stipulations regarding these matters can be found in EN 60079-17 and EN 60079-19.

Installation of electrical devices for signal transmission





Highly compact and efficient

MINI Analog isolating amplifiers isolate, convert, filter, and amplify your analog signals – with a design width of just 6.2 mm.

The isolating amplifiers from the MINI Analog range offer the full spectrum of analog signal conditioning. They are therefore extremely efficient with regard to saving costs, space, and energy.

The comprehensive approval package means that they can be used in a variety of areas.

Choose the right MINI Analog isolating amplifier for your application:

Analog IN/OUT

- Universal and standard 3-way isolating amplifiers
- 3-way repeater power supplies
- 4-way signal duplicators
- 2-way passive isolators
- Output loop-powered isolators

Temperature

- Universal measuring transducers for resistance thermometers and thermocouples
- Active measuring transducers for Pt 100 and thermocouples
- Output loop-powered Pt 100 measuring transducers

Frequency

- Frequency transducer up to 80 kHz
- Analog frequency transducers

Potentiometer/resistor

Potentiometer measuring transducers with automatic potentiometer detection

Limit values

- Threshold value switches with PDT relay

Digital IN

NAMUR isolating amplifiers with relay output

Accessories

- Supply components
- Fault monitoring module
- System cabling
- Marking material
- Surge protection

Fault monitoring

Fault monitoring is a modular solution for convenient error evaluation in multi-channel applications.

Depending on the module type, the following errors can be indicated by means of a group error message:

- Overrange
- Underrange
- Open circuit
- Short circuit
- Module error

It is also possible to detect and indicate the failure of a supply voltage at the power terminal block.

The modularity is characterized by the ability to freely adjust error evaluation, both on the device side and in the evaluation module.

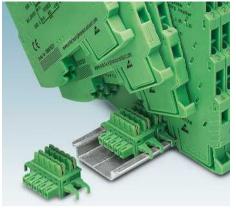
Fault monitoring is compatible with and can be used for the following isolating amplifier ranges:

- MINI Analog
- MACX Analog



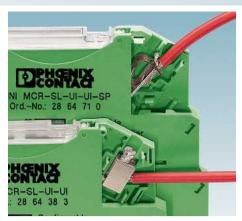
Space savings of up to 65%

 Compared to other isolating amplifiers on the market with design widths up to 17.5 mm.



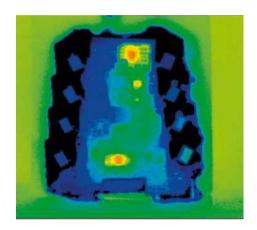
Fault monitoring and power bridging

 The DIN rail connector simplifies supply and enables group error monitoring.



Clearly arranged wiring

 Eight connections, with a choice of screw or spring-cage terminal blocks.



Low power consumption

 The resulting minimal self-heating results in a long service life and a high degree of operational reliability.



High operational reliability

 3-way electrical isolation increases the operational reliability against system disturbances.



Easy configuration

 Can be configured easily via DIP switches or software, for extended functionality and monitoring.



Reduction in analog inputs on controllers

 The MINI Analog multiplexer reduces up to eight analog signals to a single 4 ... 20 mA signal.



Time-saving system cabling

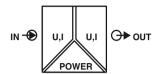
 Plug and play – for eight channels on the isolating amplifier and controller side.



Fast and error-free signal connection

 Compact termination carriers connect MINI Analog devices to the automation system – plug and play and hot-swappable.

Analog IN / Analog OUT 3-way isolating amplifier



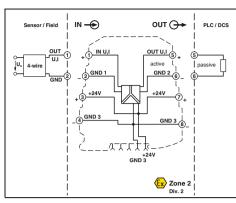
- Highly compact isolating amplifier for electrical isolation, conversion, amplification, and filtering of standard analog sig-
- Up to 36 signal combinations can be configured using DIP switches
- 3-way isolation
- Low power consumption
- Power supply possible through the foot element (T-Connector)
- Standard configuration: 0 ... 10 V input, 0 ... 20 mA output

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data Input signal Input resistance Output data Output signal Maximum output signal No-load voltage Short-circuit current Load R_B Ripple General data

Power consumption

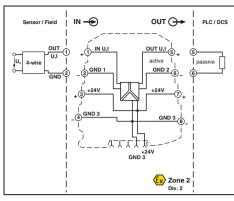
Current consumption

Supply voltage U_R Nominal supply voltage

Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Electrical isolation Test voltage, input/output/supply Degree of protection Ambient temperature (operation) Mounting Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance

GL

ATEX UL, USA / Canada





Configurable, up to 36 signal combinations

c**SN** u<u>s</u> (EL Ex: (1) (Ex)

Housing width 6.2 mm						
Tech	nical data					
U input	l input					
0 5 V / 1 5 V 0 10 V / 2 10 V	0 20 mA / 4 20 mA					
Approx. 100 kΩ	Approx. 50 Ω					
U output	I output					
0 5 V / 1 5 V 0 10 V / 2 10 V	0 20 mA / 4 20 mA					
Approx. 12.5 V	28 mA					
	Approx. 12.5 V					
Approx. 22 mA						
≥ 10 kΩ	< 500 Ω (at 20 mA)					
$<$ 20 mV _{PP} (at 10 k Ω)	$< 20 \text{ mV}_{PP} \text{ (at 500 }\Omega\text{)}$					
U output	I output					
19.2 V DC 30 V DC 24 V DC						
< 9 mA (Voltage output, at 24 V DC incl. load)	< 19 mA (Current output, at 24 V DC incl. load)					

< 450 mW (Current output)

≤ 0.1% (of final value) < 0.01%/K, typ. < 0.002%/K Approx. 100 Hz Approx. 3.2 ms Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.)

< 200 mW (Voltage output)

IP20 -20°C ... 65°C Any PBT 6.2 / 93.1 / 102.5 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 \, \text{--} \, 12$

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant II 3 G Ex nA IIC T4 Gc X UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 GL FMC 2 D

	G2 21110 2 3		
	Ordering dat	а	
	Туре	Order No.	Pcs. / Pkt.
on	MINI MCR-SL-UI-UI1)	2864383	1
nn.	MINI MCR-SL-UI-UI-SP1)	2864710	1
on	MINI MCR-SL-UI-UI-NC1)	2864150	1
nn.	MINI MCR-SL-UI-UI-SP-NC1)	2864163	1

Description	
MCR 3-way isolating amplifier, fo analog signals,	r electrical isolation of
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

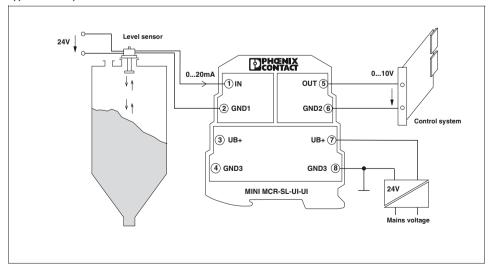
Order key MINI MCR-SL-UI-UI (Standard configuration entered as example)

Order No.	Input	Output	certificate
2864383 /	IN03	/ OUT01	/ NONE
2864383 ≘ UI-UI 2864710 ≘	IN01 = 020 mA IN02 = 420 mA IN03 = 010 V IN04 = 210 V	OUT01	NONE
UI-UI-SP	IN05	OUT05	certificate with 5 measuring points (fee)

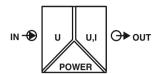
Combination table for input and output signals

			DIP switch SW 2						
Input	Output	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 1	DIP 2
0 - 10 V	0 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
	0 - 10 V	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
	2 - 10 V	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
	0 - 5 V	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
	1 - 5 V	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
2 - 10 V	0 - 20 mA	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	0 - 10 V	ON	OFF	ON	ON	ON	OFF	OFF	OFF
	2 - 10 V	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
	0 - 5 V	ON	ON	OFF	ON	ON	OFF	OFF	OFF
	1 - 5 V	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
0 - 5 V	0 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
	0 - 10 V	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
	2 - 10 V	ON	OFF	ON	OFF	OFF	ON	ON	OFF
	0 - 5 V	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
	1 - 5 V	ON	ON	OFF	OFF	OFF	ON	ON	OFF
1 - 5 V	0 - 20 mA	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
	0 - 10 V	ON	OFF	ON	ON	ON	OFF	ON	OFF
	2 - 10 V	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
	0 - 5 V	ON	ON	OFF	ON	ON	OFF	ON	OFF
	1 - 5 V	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
0 - 20 mA	0 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
	0 - 10 V	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
	2 - 10 V	ON	OFF	ON	OFF	OFF	ON	OFF	ON
	0 - 5 V	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
	1 - 5 V	ON	ON	OFF	OFF	OFF	ON	OFF	ON
4 - 20 mA	0 - 20 mA	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
	4 - 20 mA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
	0 - 10 V	ON	OFF	ON	ON	ON	OFF	OFF	ON
	2 - 10 V	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
	0 - 5 V	ON	ON	OFF	ON	ON	OFF	OFF	ON
	1 - 5 V	ON	ON	OFF	OFF	OFF	OFF	OFF	ON

Application example: Level measurement



Analog IN / Analog OUT 3-way isolating amplifier

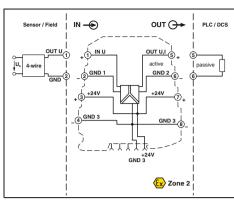


- Highly compact isolating amplifier for electrical isolation, conversion, amplification, and filtering of mV signals to create standard analog signals
- Ideal for converting signals in the case of shunt measurements
- Up to 280 signal combinations can be configured using DIP switches
- 3-way isolation
- Low power consumption
- Power supply possible through the foot element (T-Connector)
- Standard configuration: 0 ... 50 mV input, 0 ... 20 mA output

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input signal (can be configured using DIP switches) Maximum input signal Input resistance

Output data

Output signal (configurable using the DIP switch)

Maximum output signal Load R_B Ripple General data Supply voltage U_B Nominal supply voltage Power consumption Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Electrical isolation Test voltage, input/output/supply Degree of protection Ambient temperature (operation)

Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

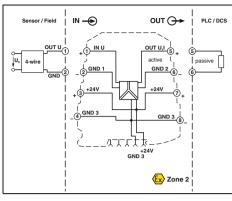
Conformance / approvals

Conformance ATEX

Mounting

UL, USA / Canada

GL





Configurable, for shunt measurements

EX: Ex

Housing width 6.2 mm

Technical data 0 ... 50 mV Approx. 30 V DC Approx. 10 kΩ U output I output 0...5V/1...5V 0 ... 20 mA / 4 ... 20 mA 0 ... 10 V / 2 ... 10 V -5 ... 5 V / -10 ... 10 V (The bi-polar output can be used only for bi-polar input signals.)

12.5 V 28 mA ≥ 10 kΩ $< 500 \Omega$ (at 20 mA) < 20 mV_{PP} (at 10 k Ω) < 20 mV_{PP} (at 500 Ω)

19.2 V DC ... 30 V DC 24 V DC < 450 mW (Current output) ≤ 0.2% < 0.01%/K, typ. < 0.002%/K (100 Hz / 30 Hz switchable) 3.5 ms (At 100 Hz)

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) IP20

-20°C ... 65°C Any

PBT 6.2 / 93.1 / 102.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant II 3 G Ex nA IIC T4 Gc X UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 applied for

GL EMC 2 D

Description	
MCR 3-way isolating amplifier, for restandard signals,	ealization of mV voltages in
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
MINI MCR-SL-SHUNT-UI MINI MCR-SL-SHUNT-UI-SP	2810858 2810874	1					
MINI MCR-SL-SHUNT-UI-NC1) MINI MCR-SL-SHUNT-UI-SP-NC1)	2810780 2810793	1					

Order key MINI MCR-SL-SHUNT-UI-... (standard configuration entered as an example)

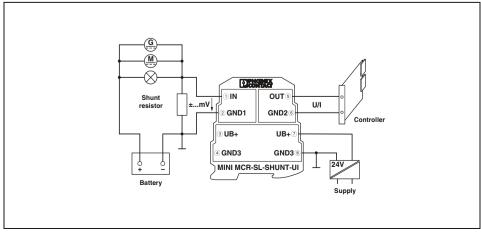
Order No.	Input				Output	Limit frequency	Factory calibration certificate FCC
2810858	1		IN40		OUT01	/ 100	/ NONE
2810858 ≘ SHUNT-UI 2810874 ≘ SHUNT-UI-SP	IN40	IN28	IN53	IN17	OUT01	30 ≘ 30 Hz 100 ≘ 100 Hz	NONE Second by the content of th

Note:
A bipolar output (-5...+5 V, -10...+10 V) can only be used for a bipolar input signal.

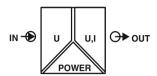
Combination table for input and output signals

			Current output					
Input	-10+10 V	010 V	210 V	-5+5 V	05 V	15 V	020 mA	420 mA
050 mV		Х	Х		Х	х	х	х
060 mV		Х	Х		Х	Х	Х	х
075 mV		Х	Х		Х	Х	х	х
080 mV		Х	Х		Х	х	Х	х
0100 mV		Х	Х		Х	х	Х	х
0120 mV		Х	Х		Х	х	Х	Х
0150 mV		Х	Х		Х	х	Х	х
0200 mV		Х	Х		Х	Х	Х	х
0240 mV		Х	Х		Х	Х	Х	х
0300 mV		Х	Х		Х	х	Х	х
0500 mV		Х	Х		Х	х	Х	х
0600 mV		Х	х		Х	х	х	х
0750 mV		Х	х		Х	х	х	х
0800 mV		х	Х		Х	х	х	х
01 V		Х	Х		Х	Х	Х	х
01.2 V		Х	Х		Х	Х	х	х
01.5 V		Х	Х		Х	х	Х	х
02 V		Х	Х		Х	Х	Х	х
02.4 V		Х	Х		Х	Х	Х	х
03 V		Х	Х		Х	Х	х	х
-5050 mV	х	Х	Х	Х	Х	Х	х	х
-6060 mV	х	Х	Х	х	Х	х	х	х
-7575 mV	х	Х	Х	Х	Х	Х	х	х
-8080 mV	х	Х	Х	Х	Х	Х	х	х
-100100 mV	х	Х	Х	Х	Х	Х	х	х
-120120 mV	х	Х	х	х	х	х	х	x
-150150 mV	х	Х	х	х	х	х	х	x
-200200 mV	х	Х	Х	Х	Х	Х	X	X
-240240 mV	х	Х	х	х	х	х	х	x
-300300 mV	x	Х	Х	Х	Х	Х	x	x
-500500 mV	х	х	Х	Х	Х	Х	х	x
-600600 mV	x	х	Х	Х	Х	Х	x	x
-750750 mV	х	х	х	х	Х	х	х	х
-800800 mV	х	х	Х	Х	Х	Х	х	x
-11 V	х	х	х	х	Х	х	х	х
-1.21.2 V	х	Х	х	Х	Х	х	х	х
-1.51.5 V	х	х	х	х	Х	Х	х	х
-22 V	х	х	х	х	Х	х	х	х
-2.42.4 V	х	Х	х	Х	Х	х	х	х
-33 V	х	х	х	х	х	х	Х	Х

Application example: Monitoring of loading and unloading currents



Analog IN / Analog OUT 3-way isolating amplifier



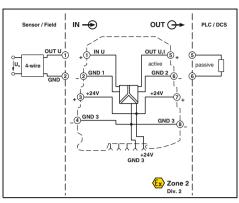
- Highly compact isolating amplifier for electrical isolation, conversion, amplification, and filtering of 24 V or 30 V DC signals to create standard analog signals
- Up to 12 signal combinations can be configured using DIP switches
- 3-way isolation
- Low power consumption
- Power supply possible through the foot element (T-Connector)
- Standard configuration: 0 ... 30 V input, 0 ... 20 mA output

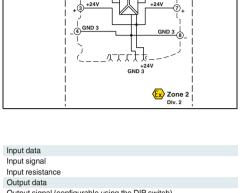
Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571





Output signal (configurable using the DIP switch) Maximum output signal No-load voltage Short-circuit current Load R_B Ripple General data Supply voltage U_B Power consumption Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Electrical isolation Test voltage, input/output/supply Ambient temperature (operation) Housing material Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals

Conformance ATEX UL, USA / Canada GL



Configurable, for 0 ... 24 V / 0 ... 30 V input signals

c**SZL**u<u>s</u> (EL Ex: (1) (Ex) Housing width 6.2 mm

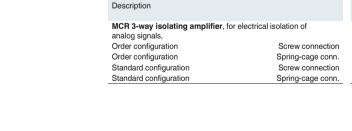
•						
Technical data						
0 24 V / 0 30 V						
Approx. 125 kΩ (0 24 V)						
U output	I output					
0 5 V / 1 5 V	0 20 mA / 4 20 mA					
0 10 V / 2 10 V						
≤ 12.5 V	28 mA					
	≤ 12.5 V					
≤ 22 mA						
> 10 kΩ	< 500 Ω (at 20 mA)					
$<$ 20 mV _{PP} (at 10 k Ω)	$<$ 20 mV _{PP} (at 500 Ω)					
19.2 V DC 30 V DC						

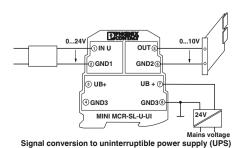
< 450 mW < 0.1% (of final value) < 0.01%/K, typ. < 0.002%/K Approx. 100 Hz Approx. 3.5 ms Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.) -20°C ... 65°C PRT 6.2 / 93.1 / 102.5 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 \, \text{--} \, 12$

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

CE-compliant II 3 G Ex nA IIC T4 Gc X UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 GL EMC 2 D

GL EIVIC 2 D								
Ordering data								
Туре	Order No.	Pcs. / Pkt.						
MINI MCR-SL-U-UI¹)	2864053	1						
MINI MCR-SL-U-UI-SP1) MINI MCR-SL-U-UI-NC1)	2811213 2865007	1						
MINI MCR-SL-U-UI-SP-NC1)	2810078	1						

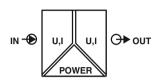




Order key MINI MCR-SI -II-III (standard configuration entered as exa

Order No.	Input			Output	
2864053	IN39		/	OUT01	
2864053 ≘U-UI 2811213 ≘U-UI-SP		≘ 024 V ≘ 030 V		OUT02 OUT03 OUT04 OUT05	 â 020 mA â 420 mA â 010 V â 210 V â 05 V â 15 V

Analog IN / Analog OUT 3-way isolating amplifier

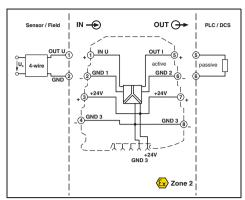


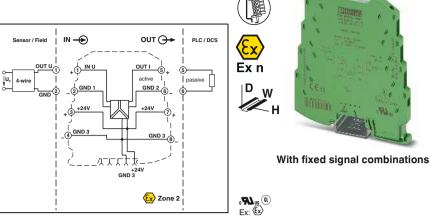
- Highly compact isolating amplifier for electrical isolation, conversion, amplification, and filtering of standard analog signals
- Fixed signal combinations
- Entry-level alternative to configurable isolating amplifiers
- 3-way isolation
- Low power consumption
- Power supply possible through the foot element (T-Connector)

Notes:

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571





Input data Input resistance Output data Maximum output signal No-load voltage Short-circuit current Load R_B Ripple General data Supply voltage U_R Nominal supply voltage Current consumption Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Degree of protection Electrical isolation Test voltage, input/output/supply Ambient temperature (operation) Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals

Conformance UL, USA / Canada

GL

Too	hnical data
rec	innicai data
U input	I input
Approx. 100 kΩ	Approx. 50 Ω
U output	I output
12.5 V	28 mA
	Approx. 12.5 V
Approx. 2 mA	
≥ 10 kΩ	≤ 500 Ω
$< 20 \text{ mV}_{PP} \text{ (at 10 k}\Omega\text{)}$	$< 20 \text{ mV}_{PP} \text{ (at 500 }\Omega\text{)}$
19.2 V DC 30 V DC	
24 V DC	
< 20 mA	

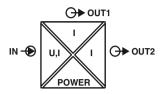
≤ 0.1% (of final value) < 0.01%/K, typ. < 0.002%/K Approx. 100 Hz Approx. 3.5 ms IP20 Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.) -20°C ... 65°C PRT 6.2 / 93.1 / 102.5 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 - 12$ $0.2 \dots 2.5 \text{ mm}^2 / 0.2 \dots 2.5 \text{ mm}^2 / 24 - 12$

CE-compliant UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 applied for GL EMC 2 D

Description	Input signal	Output signal	Тур
MCR 3-way isolating amplifier, fo analog signals,	r electrical isolati	ion of	
Screw connection	0 10 V	0 20 mA	MIN
Spring-cage conn.	0 10 V	0 20 mA	MIN
Screw connection	0 10 V	4 20 mA	MIN
Spring-cage conn.	0 10 V	4 20 mA	MIN
Screw connection	0 20 mA	0 10 V	MIN
Spring-cage conn.	0 20 mA	0 10 V	MIN
Screw connection	4 20 mA	0 10 V	MIN
Spring-cage conn.	4 20 mA	0 10 V	MIN
Screw connection	0 20 mA	0 20 mA	MIN
	4 20 mA	4 20 mA	
Spring-cage conn.	0 20 mA		MIN
	4 20 mA	==	
Screw connection	0 10 V -10 10 V		MIN
Carian			BAINI
Spring-cage conn.	0 10 V -10 10 V	0 10 V -10 10 V	MIN
	-10 10 V	-10 10 V	

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MINI MCR-SL-U-I-0¹) MINI MCR-SL-U-I-0-SP¹) MINI MCR-SL-U-I-4¹) MINI MCR-SL-U-I-4-SP¹) MINI MCR-SL-I-U-0-SP¹) MINI MCR-SL-I-U-0-SP¹) MINI MCR-SL-I-U-4-SP¹) MINI MCR-SL-I-U-4-SP¹) MINI MCR-SL-I-I-1-SP¹)	2813512 2813570 2813525 2813583 2813541 2813554 2813554 2813567 2864406 2864723	1 1 1 1 1 1 1 1 1 1
MINI MCR-SL-U-U') MINI MCR-SL-U-U-SP')	2864684 2864697	1

Analog IN/Analog OUT signal duplicators

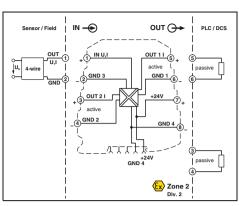


- Highly compact isolating amplifier for electrical isolation, conversion, amplification, filtering, and duplication of standard analog signals
- Duplication of a standard analog signal on two current outputs
- Up to 8 signal combinations can be configured using DIP switches
- 4-way isolation
- Power supply possible through the foot element (T-Connector)
- Standard configuration: Input: 0 ... 10 V, output 1: 0 ... 20 mA, output 2: 0 ... 20 mA

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data
Input signal
Maximum input signal
Input resistance
Output data
Output signal (configurable using the DIP switch)
Maximum output signal
No-load voltage
Load R _B
Ripple
General data
Supply voltage U _B
Current consumption
Power consumption

Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (0 - 99%) Electrical isolation Test voltage, input/output/supply Ambient temperature (operation)

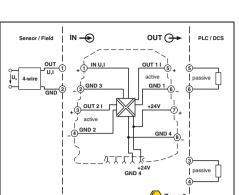
Housing material Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance ATEX

UL, USA / Canada

GL





Configurable, with two current output signals

c**Fl**us (61 Ex: c(l) vs (Ex)

Housing width 6.2 mm

Technical data U input 0 ... 10 V / 1 ... 5 V 0 ... 20 mA / 4 ... 20 mA 50 mA Approx. 100 kΩ Approx. 50 Ω

2x; 0 ... 20 mA / 4 ... 20 mA

22 mA

 \leq 250 Ω (at 20 mA) $< 20 \text{ mV}_{PP} \text{ (at 250 }\Omega)$

19.2 V DC ... 30 V DC < 30 mA (at 24 V DC incl. load)

< 600 mW

 \leq 0.2% (of final value), typ. < 0.1% < 0.01%/K, typ. < 0.004%/K

Approx. 35 Hz Approx. 10 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) -20°C ... 60°C

PRT

6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 \, \text{--} \, 12$ 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant II 3 G Ex nA IIC T4 Gc X UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5 GL EMC 2 D

Ordering data Order No. Type Pkt. MINI MCR-SI -UI-211) 2864794 MINI MCR-SL-UI-2I-SP1 2864804 MINI MCR-SL-UI-2I-NC1) 2864176 MINI MCR-SL-UI-2I-SP-NC1) 2864189

Description	
MCR signal duplicator, for duplication analog signals	on and electrical isolation of
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

Order key for MINI MCR-SL-UI-2I (standard configuration entered as an example)

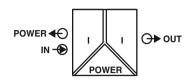
Order No.	Input	Output combination 1)	Behavior of the analog outputs	Factory calibration certificate (FCC)
2864794	/ IN03	/ A	0	/ NONE
2864794 ≘ UI-2I	IN01	A B C	0	NONE ≘ without FCC YES ≘ with FCC (a fee is charged)
2864804 ≘ UI-2I-SP	IN06			YESPLUS FCC with 5 measuring points (a fee is charged)

¹⁾ For explanations, see adjacent text on the right; for further details, see data sheet: www.phoenixcontact.net/products

explanation	tor	out	put	com	binatic	n:
		_	-			

	Output 1	Output 2
Α	020 mA	020 mA
В	020 mA	420 mA
С	420 mA	420 mA

Analog IN / Analog OUT repeater power supplies

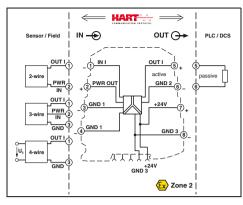


- Highly compact repeater power supplies for electrical isolation, amplification, and filtering of standard analog signals
- Supply of 2-conductor and passive 3-conductor sensors
- Can also be used as an isolator without supply
- 3-way isolation
- Alternatively bidirectional HART transmission
- Power supply possible through the foot element (T-Connector)

Notes:

Information about power bridging, system cabling, and marking components can be found starting at page $73\,$

1) EMC: Class A product, see page 571



Input data
Input signal

Input resistance Transmitter supply voltage

Output data

Output signal Maximum output signal No-load voltage Load R_B Ripple General data Supply voltage U_B Nominal supply voltage Current consumption Power consumption

Maximum transmission error

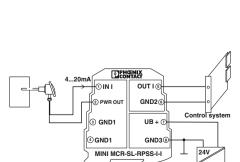
Temperature coefficient Limit frequency (3 dB) Communication

Step response (10 - 90%)
Electrical isolation
Test voltage, input/output/supply
Degree of protection
Ambient temperature (operation)
Mounting
Housing material
Dimensions W / H / D
Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals Conformance ATEX UL. USA / Canada

GL



Description

MCR repeater power supplies

with HART® protocol Screw connection
with HART® protocol Spring-cage conn.
Screw connection
Spring-cage conn.
Spring-cage conn.



Optionally available with HART transmission

®L Ex: Œx

Housing width 6.2 mm

Housing width 6.2 mm			
Technic	echnical data		
MINI MCR-SL-RPSS-I-I ¹)	MINI MCR-SL-RPS-I-I ¹)		
0 20 mA, isolator operation / 4 20 mA	0 20 mA, isolator operation / 4 20 mA		
Approx. 50 Ω 16.5 V	Approx. $50~\Omega$ 14.7 V DC 25.5 V DC (U _B - max. 4.5 V for load 0 mA 20 mA)		
0 20 mA / 4 20 mA 21 mA Approx. 12.5 V \leq 500 Ω (at I = 20 mA) < 20 mV _{ms} (at 500 Ω)	0 20 mA / 4 20 mA 28 mA Approx. 12.5 V \leq 500 Ω (at I = 20 mA) < 20 mV _{rms} (at 500 Ω)		
20.4 V DC 30 V DC 24 V DC	19.2 V DC 30 V DC 24 V DC		
< 900 mW (at 24 V DC and in repeater power supply operation)	< 900 mW (at 24 V DC and in repeater power supply operation)		
\leq 0.2% (of final value), typ. \leq 0.1% (of final value)	\leq 0.2% (of final value), typ. \leq 0.1% (of final value)		
< 0.005%/K, typ. < 0.002%/K 175 Hz (typ.) HART specification in both operating modes (RPSS isolator / RPSS repeater power supply)	< 0.01%/K, typ. < 0.002%/K Approx. 100 Hz		
< 2 ms (typ.)	Approx. 3.5 ms		

Rapidox 3.3 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.)

IP20

IP20

-20°C ... 60°C

Any

Any

Any

PBT PBT 6.2/93.1/102.5 mm 6.2/93.1/102.5 mm 0.2 ... 2.5 mm²/26 - 12

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

(☑) II 3 G Ex nA IIC T4 Gc X

UL 508 Recognized applied for Class I, Div. 2, Groups A, B, C, D

T5 applied for GL EMC 2 D

CE-compliant

(☑) II 3 G Ex nA IIC T4 Gc X

UL 508 Recognized

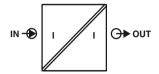
Class I, Div. 2, Groups A, B, C, D

T5

GL EMC 2 D

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MINI MCR-SL-RPSS-I-I1)	2864079	1	
MINI MCR-SL-RPSS-I-I-SP1)	2810230	1	
MINI MCR-SL-RPS-I-I1)	2864422	1	
MINI MCR-SL-RPS-I-I-SP1)	2864752	1	

Analog IN / Analog OUT passive isolators



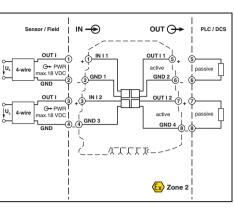
- Highly compact 2-conductor passive isolators for electrical isolation and filtering of standard analog signals
- Input loop-supplied
- Does not require any additional auxiliary voltage
- 2 channels in conj. with a design width of just 6.2 mm
- Voltage drop on isolating amplifier of just 1.7 V

Notes:

When using passive isolators, make sure that the current sourcing voltage of the measuring transducer U_B is sufficient to drive the maximum current of 20 mA via the passive isolator with a voltage drop $U_V = 1.7 \text{ V}$ and load R_B . This means:

 $U_B \ge U_E = 1.7 \text{ V} + 20 \text{ mA x R}_B$

Information on components for power bridging, system cabling, and marking can be found in the INTERFACE catalog or at www.phoenixcontact.net/products



Input data Input signal

Voltage drop

Output data Output signal

General data

Load R_B

Ripple

Response current

Maximum input voltage

Maximum transmission error

Additional error per 100 Ω load

. Maximum input current / overload



Either 1- or 2-channel

c**SU**us (EL Ex: (EX) c**SU**us Housing width 6.2 mm

Technical data

0 ... 20 mA / 4 ... 20 mA 1.7 V (at I = 20 mA) Approx. 190 μA 40 mA 18 V

0 ... 20 mA / 4 ... 20 mA $< 600 \Omega$ (at I = 20 mA output signal)

 $< 10 \text{ mV}_{rms} \text{ (at 600 }\Omega)$ ≤ 0.1% (of final value) 0.03% (of measured value / 100 Ω load)

 \leq 0.002%/K (of measured value / 100 Ω load) 75 Hz 5 ms (At 600 Ω load)

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) IP20

-20°C ... 65°C Any PBT

6.2 / 93.1 / 102.5 mm

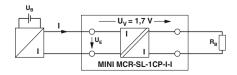
 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 \, \text{--} \, 12$ $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

CE-compliant UL 508 Recognized Class I, Div. 2, Groups A, B, C, D GL EMC 2 D

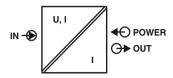
Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Flectrical isolation Test voltage input/output Degree of protection Ambient temperature (operation) Mounting Housing material Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance ATEX UL, USA / Canada GL

Description	
MCR passive isolator, for electric without auxiliary power	cal isolation of current signals
two-channel	Screw connection
two-channel	Spring-cage conn.
single-channel	Screw connection
single-channel	Spring-cage conn.

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MINI MCR-SL-2CP-I-I MINI MCR-SL-2CP-I-I-SP MINI MCR-SL-1CP-I-I MINI MCR-SL-1CP-I-I-SP	2864655 2864781 2864419 2864749	1 1 1	



Analog IN/Analog OUT loop-powered isolator

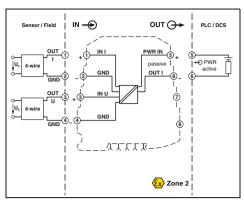


- Highly compact isolating amplifier for electrical isolation, conversion, and filtering of standard analog signals
- Supplied by an output loop
- Does not require any additional auxiliary voltage
- Up to 74 signal combinations can be configured using DIP switches
- Voltage input from mV voltages right up to 30 volts
- Current input from 2 mA right up to 40 mA
- 2-way isolation
- Standard configuration: Input 2...10 V, output 4...20 mA

Other input signals that have not been listed can be provided on re-

Information on components for power bridging, system cabling, and marking can be found in the INTERFACE catalog or at www.phoenixcontact.net/products

1) EMC: Class A product, see page 571



Input signal (configurable using the DIP switch)

Maximum input signal

Input resistance

Output data Output signal Maximum output signal Load R_B

Ripple General data Supply voltage U_B Current consumption Power consumption Maximum transmission error

Temperature coefficient ZERO / SPAN adjustment Limit frequency (3 dB) Step response (10 - 90%)

Electrical isolation Test voltage input/output

Degree of protection

Ambient temperature (operation)

Mounting

Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance

UL, USA / Canada



Configurable, up to 74 signal combinations, loop-powered

Applied for: cUL/UL Housing width 6.2 mm

Technical data

2 ... 10 V, additional areas can be configured, see table

< 40 V < 50 mA (Dielectric strength up to 30 V)

≤ 50 Ω Approx 100 kO (At < 1 V

otherwise approximately 1 MΩ)

4 ... 20 mA 35 mA

((U_R - 8 V) / 22 mA) < 20 mV_{PP} (at 500 Ω)

8 V DC ... 30 V DC

< 3.5 mA (without signal current) 28 mW (without signal)

< 0.1% (of final value) 0.01%/K, typ. 0.005%/K

+2% / +2% Approx. 30 Hz Approx. 16 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) IP20

-25°C ... 70°C

Any PBT

6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \text{ mm}^2 / 0.2 \dots 2.5 \text{ mm}^2 / 26 - 12$

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

CE-compliant UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5

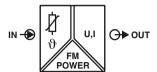
		Ordering data		
Description		Туре	Order No.	Pcs. / Pkt.
MCR loop-powered isolator	Screw connection Spring-cage conn.	MINI MCR-SL-UI-I-LP-NC¹) MINI MCR-SL-UI-I-LP-SP-NC¹)	2902829 2902830	1

Possible input signal ranges (configurable via DIP switch)

040 mA		030 V	010 V	210 V	01000 mV	±30 V	±10 V	±1000 mV
030 mA		025 V	07.5 V		0750 mV	±25 V	±7.5 V	±750 mV
020 mA	420 mA	020 V	05 V	15 V	0500 mV	±20 V	±5 V	±500 mV
012 mA		015 V	03 V		0300 mV	±15 V	±3 V	±300 mV
010 mA	210 mA	012.5 V	02.5 V		0250 mV	±12.5 V	±2.5 V	±250 mV
08 mA		012 V	02 V		0200 mV	±12 V	±2 V	±200 mV
07.5 mA			01.5 V		0150 mV		±1.5 V	±150 mV
06 mA			01.25 V		0125 mV		±1.25 V	±125 mV
05 mA	15 mA		01.2 V		0120 mV		±1.2 V	±120 mV
04 mA					0100 mV			±100 mV
03 mA					075 mV			±75 mV
02.5 mA					060 mV			±60 mV
0 2 mA					0 50 mV			+50 mV



Temperature Temperature transducers for resistance thermometers



Universal temperature transducer for electrical isolation, conversion, amplification, and filtering of resistance thermometers and remote resistance-type sensors

- High level of accuracy over the entire measuring range
- For 2-, 3- or 4-conductor sensors according to IEC 751, JIS, GOST
- Configurable via DIP switches and soft-
- Software available free of charge on the Internet
- Power supply possible through the foot element (T-Connector)
- Supports fault monitoring
- Standard configuration: Pt 100 sensor IEC 751; 3-conductor; -50 ... 150°C; 4 ... 20 mA output; error evaluation according to NE43 (downscale); fault monitoring contact responds on any error

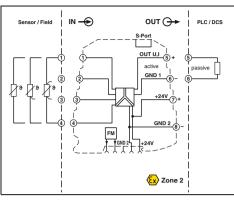
Notes:

The configuration software can be downloaded from the Internet: www.phoenixcontact.net/products

For information on the programming adapter, refer to page 119

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input signal (can be configured using DIP switches)

Temperature range

Measuring range span

Linear resistance measuring range

Output data

Output signal

Maximum output signal

Load R_B Ripple

General data

Supply voltage U_B Current consumption

Power consumption

Transmission error

Temperature coefficient

Step response (0 - 99%)

Electrical isolation

Test voltage, input/output/supply

Ambient temperature (operation)

Housing material

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals Conformance

ATFX

UL, USA / Canada

GL



Universal measuring transducer for resistance thermometers

Housing width 6.2 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor

-200°C ... 850°C (Range depending on the sensor type)

0 $\Omega \dots$ 4000 Ω (Minimum measuring span: 10% of the selected

measuring range)

U output I output 0 5 V / 1 5 V

0 ... 20 mA / 4 ... 20 mA 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA

Approx. 12.3 V 24.6 mA

10 kO 500 Ω (at 20 mA) $< 20 \text{ mV}_{PP}$ < 20 mV_{PP} (at 500 Ω)

9.6 V DC ... 30 V DC

< 27 mA (at 24 V DC)

 \leq 700 mW (at I_{OUT} = 20 mA, 9.6 V DC, load 500 $\Omega)$

0.1% * 350 K/ set measuring range; 0.1% > 350 K (Pt/Ni) 0.3% * 200 K/ set measuring range; 0.3% > 200 K (Cu)

0.01%/K

Typ. 200 ms (2-conductor) Typ. 500 ms (3-conductor)

Typ. 500 ms (4-conductor)

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) -20°C ... 65°C

PBT

6.2 / 93.1 / 102.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

(E) II 3 G Ex nA IIC T4 Gc X

UL 508 Recognized applied for

Class I, Div. 2, Groups A, B, C, D T5 applied for

GL applied for						
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MINI MCR-RTD-UI-NC¹) MINI MCR-RTD-UI-SP-NC¹)	2902849 2902850	1				

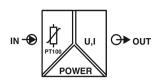
MINI MCR-RTD-UI-SP-NC1)	2902850	1				
Accessories						
IFS-USB-PROG-ADAPTER ¹)	2811271	1				

Description					
Temperature transducers for resistance thermometers					
Standard configuration	Screw connection				
Standard configuration	Spring-cage conn.				

ammino RT interf	g adapter face	for confi	igurir	ng m	odules	with
T			_			

Sensor type	Standard	Measuring range	Smallest measuring range span
Pt100	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C +850°C	50 K
Pt200	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C +850°C	50 K
Pt500	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C +850°C	50 K
Pt1000	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C +850°C	50 K
Pt100	GOST 6651-2009 (α = 0.00391)	-200°C +850°C	50 K
Pt1000	GOST 6651-2009 (α = 0.00391)	-200°C +850°C	50 K
Pt100	JIS C1604-1997	-200°C +850°C	50 K
Pt1000	JIS C1604-1997	-200°C +850°C	50 K
Ni100	DIN 43760	-60°C +250°C	50 K
Ni1000	DIN 43760	-60°C +250°C	50 K
Cu50	GOST 6651-2009 (α = 1.428)	-180°C +200°C	50 K
Cu100	GOST 6651-2009 (α = 1.428)	-180°C +200°C	50 K
Cu53	GOST 6651-2009 (α = 1.426)	-50°C +180°C	50 K

Temperature Temperature transducer for Pt 100



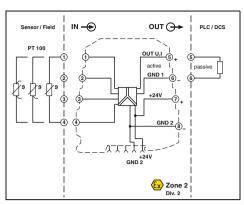
- Highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of Pt 100 signals to create standard signals
- Optimized temperature measuring range of -50°C to +200°C for increased accuracy
- For 2-, 3- or 4-conductor Pt 100 sensors according to IEC 60751
- Input and output signals can be configured via DIP switches
- 3-way isolation
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data
Input signal (can be configured using DIP switches)
Temperature range
Measuring range span
Output data
Output signal
Maximum output signal
Load R _B
Ripple
General data
Supply voltage U _B
Current consumption
Power consumption
Transmission error for the full/set measurement range
Temperature coefficient
Step response (0 - 99%)
Electrical isolation

Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Test voltage, input/output/supply

Ambient temperature (operation)

Conformance

UL, USA / Canada

Housing material

Description

GL



Configurable, for a temperature measuring range of -50°C ... +200°C



Housing width 6.2 mm

Technical data

Pt 100 (IEC 60751/EN 60751): 2, 3, 4-conductor

-50°C ... 200°C (configurable)

min. 50 K

U output I output 0 ... 5 V / 1 ... 5 V 0 ... 20 mA / 4 ... 20 mA 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA Approx. 12.5 V 23 mA

> 10 kΩ < 500 Ω (at 20 mA) < 20 mV_{PP} (at 500 Ω) $< 20 \text{ mV}_{pp} \text{ (at } 10 \text{ k}\Omega)$

19.2 V DC ... 30 V DC < 21 mA (at 24 V DC)

< 500 mW \leq 0.25%; ((50 K / Δ Temp) + 0.05)%

< 0.02%/K < 200 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) -20°C ... 65°C

PRT 6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 - 12$ $0.2 \dots 2.5 \text{ mm}^2 / 0.2 \dots 2.5 \text{ mm}^2 / 24 - 12$

CE-compliant UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5

GL EMC 2 D

	Ordering dat	а	
	Туре	Order No.	Pcs. / Pkt.
nection	MINI MCR-SL-PT100-UI-200	2864309	1
e conn. nection	MINI MCR-SL-PT100-UI-200-SP1) MINI MCR-SL-PT100-UI-200-NC1)	2864192 2864370	1 1
conn.	MINI MCR-SL-PT100-UI-200-SP-NC1)	2864202	1

MCR temperature measuring transducer, for Pt 100 temperature sensors Order configuration Screw conn Order configuration Spring-cage Unconfigured Screw conn Unconfigured Spring-cage

Order key for MINI MCR-SL-PT100-UI-200 (standard configuration entered as an example)

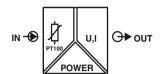
Order No.		nection nology			ng range [°C]	Output		ilure in-		actory c	alibration	Fa	ilure informa	ation (depend	s on the out		
2864309	/ Lech	3	Sta / C	art /	End 100	OUT01	 /	A	 /	eruncau	NONE		020 mA	Overrange 420 mA	010 V	020 mA	pen circ 420 m
2864309 ≘ PT100-UI-200	2 ≘ 3 ≘	2-con- ductor 3-con- ductor	-1 -1	0	Range (increment)	OUT01 = 020 mA OUT02 = 420 mA OUT03 = 010 V OUT05 = 05 V		A B C		NONE YES	≘ without FCC≘ with FCC (a fee is charged)	A B C D	20 mA	20.5 mA 20.5 mA 20 mA 20 mA	10.25 V 10.25 V 10 V 10 V	21 mA 21 mA 21 mA 0 mA	21 mA 21 mA 21 mA 4 mA
2864192 ≘ PT100-UI-200-SF	4 ≘	4-con- ductor	-2 -3 -4 -5	0	0200 (3 K)	OUT06 = 15 V OUT07 = 200 mA OUT08 = 204 mA OUT09 = 100 V		Ь	YI	ESPLUS	5 ≘ FCC with 5 measuring points (a fee is charged)	A B C	020 mA 0 mA 0 mA 0 mA	Underrange 420 mA 4 mA 3.5 mA 4 mA		020 mA 0 mA 0 mA 21 mA	420 m 4 mA 3 mA 21 mA

1) For explanations, see adjacent text on the right; for further details, see data sheet: www.phoenixcontact.net/products

			Overrange		0	pen circui	t
		020 mA	420 mA	010 V	020 mA	420 mA	010 V
ſ	Α	20.5 mA	20.5 mA	10.25 V	21 mA	21 mA	10.5 V
	В	20.5 mA	20.5 mA	10.25 V	21 mA	21 mA	10.5 V
	С	20 mA	20 mA	10 V	21 mA	21 mA	10.5 V
	D	20 mA	20 mA	10 V	0 mA	4 mA	0 V
			Underrange)	S	hort circui	t
		020 mA	420 mA	010 V		420 mA	010 V
	Α					420 mA 4 mA	010 V 0 V
	В	020 mA	420 mA 4 mA 3.5 mA	010 V 0 V 0 V	020 mA 0 mA 0 mA	4 mA 3 mA	0 V 0 V
		020 mA 0 mA	420 mA 4 mA	010 V 0 V	020 mA 0 mA	4 mA	0 V

Temperature

Temperature transducer for Pt 100



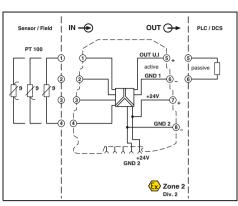
- Highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of Pt 100 signals to create standard signals
- Temperature measuring range of -150°C to +850°C
- For 2-, 3- or 4-conductor Pt 100 sensors according to IEC 60751
- Input and output signals can be configured via DIP switches
- 3-way isolation
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data Input signal (can be configured using DIP switches) Temperature range Measuring range span Output data Output signal (configurable using the DIP switch)

Maximum output signal Load R_B Ripple General data

Supply voltage U_B Current consumption Power consumption

Transmission error for the full/set measurement range

Temperature coefficient Step response (0 - 99%) Electrical isolation

Test voltage, input/output/supply Ambient temperature (operation)

Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG

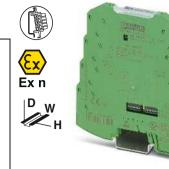
Spring-cage connection (solid/stranded/AWG)

Conformance / approvals Conformance

ATFX

UL, USA / Canada

GL



Configurable, for a temperature measuring range of -150°C ... +850°C

c**F11** us (€1 Ex: (√1) us (€x)

Housing width 6.2 mm

Technical data

Pt 100 (IEC 60751/EN 60751): 2, 3, 4-conductor

-150°C ... 850°C (configurable)

min. 50 K

U output I output 0...5V/1...5V

0 ... 20 mA / 4 ... 20 mA 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA Approx. 12.5 V 23 mA

≥ 10 kΩ < 500 Ω (at 20 mA) $< 20 \text{ mV}_{PP} \text{ (at } 500 \, \Omega)$ $< 20 \text{ mV}_{PP} \text{ (at 10 k}\Omega)$

19.2 V DC ... 30 V DC < 21 mA (at 24 V DC)

< 500 mW

 \leq 0.2%; ((100 K / set measurement range [K]) + 0.1%)

< 0.02%/K

< 160 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz. 1 min.) -20°C ... 65°C

PBT

6.2 / 93.1 / 102.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

🖾 II 3 G Ex nA IIC T4 Gc X

UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5

GL EMC 2 D

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MINI MCR-SL-PT100-UI1)	2864435	1				
MINI MCR-SL-PT100-UI-SP	2864736	1				
MINI MCR-SL-PT100-UI-NC1)	2864273	1				
MINI MCR-SL-PT100-UI-SP-NC1)	2864286	1				

Description	
MCR temperature measuring tra Pt 100 temperature sensors	nsducer, for
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Jnconfigured	Screw connection
Unconfigured	Spring-cage conn.

Order key for MINI MCR-SL-PT100-UI (standard configuration entered as an example)

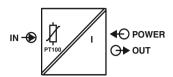
Order No.	Connection technology	Measuring range [°C] Start End		Output	Failure in- formation 1)	Factory calibration certificate (FCC)	
2864435 /	3	/ 0	100	OUT01	/ A	/ NONE	
	2 2-conduc-	0	Range	OUT01	Α	NONE	
2864435 ≘	tor	-10	(increment)	OUT02	В	YES	
PT100-UI	3	-20		OUT03	С	is charged)	
	tor	-30	0100 (5 K)	OUT05	D		
2864736 ≘	4	-40	110300 (10 K)	OUT06		YESPLUS ≘ FCC with	
PT100-UI-SP	tor	-50	320700 (20 K)	OUT07		5 measuring	
		-100	750850 (50 K)	OUT08		points (a fee is	
		-150		OUT09		charged)	

-150	OU109 ≘ 100 V	
1) For explanations, see adjacent text on the right; for furth	ner details, see data sheet:	
www.phoenixcontact.net/products		

Failure information (depends on the output signal range):

Overrange 4...20 mA Open circuit 0...20 mA | 4...20 mA | 0...10 V 0...20 mA 0...10 V 20.5 mA 20.5 mA 10.25 V 21 mA 21 mA 10.5 V 20.5 mA 20 mA 20 mA 20.5 mA 20 mA 20 mA 10.25 V 10 V 10 V 21 mA 21 mA 21 mA 10.5 V 10.5 V 0 V 21 mA Underrange Short circuit 0...10 V .10 V 0...20 mA 4...20 mA .20 mA 4...20 mA 0 0 mA 4 mA 0 V 0 mA 4 mA 0 V 3.5 mA 0 V 0 V 0 mA 21 mA 0 V 10.5 V 0 mA 21 mA 4 mA 4 mA 0 V 0 mA 0 V

Temperature Temperature transducer for Pt 100



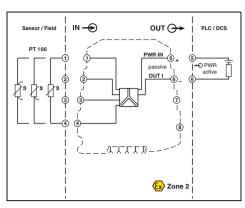
- Highly compact loop-powered temperature transducer for electrical isolation, conversion, amplification, and filtering of Pt 100 signals to create standard signals
- Supplied by an output loop
- Does not require any additional auxiliary voltage
- Temperature measuring range of -150°C to +300°C
- 2-, 3- or 4-conductor Pt 100 sensors
- Input signals can be configured via DIP switches
- 2-way isolation
- Error signaling via diagnostic LED and analog signal

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data
Input signal (can be configured using DIP switches)
Temperature range
Measuring range span
Output data
Output signal
Maximum output signal
Load R_B
Ripple
General data
Supply voltage U_B
Current consumption
Power consumption
Transmission error for the full/set measurement range

Temperature coefficient
Step response (0 - 99%)
Electrical isolation
Test voltage, input/output/supply
Degree of protection
Ambient temperature (operation)
Mounting
Housing material
Dimensions W / H / D
Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals Conformance

UL, USA / Canada

ATFX



Configurable, for a temperature measuring range of -150°C ... +300°C, loop-powered

91∪s Ex: €x

Housing width 6.2 mm

Technical data

Pt 100 (IEC 60751/EN 60751) : 2, 3, 4-conductor -150°C ... 300°C (configurable)

min. 50 K

 $\begin{array}{l} 4 \; ... \; 20 \; \text{mA} \; / \; 20 \; ... \; 4 \; \text{mA} \\ 23 \; \text{mA} \\ ((\text{U}_{\text{supply}} \text{--} \; 12 \; \text{V}) \; / \; 22 \; \text{mA}) \\ < 20 \; \text{mV}_{\text{PP}} \; (\text{at} \; 500 \; \Omega) \end{array}$

12 V DC ... 30 V DC

< 3.5 mA (without signal current)

< 42 mW (without signal current)

 $\leq 0.25\%$; ((90 K / set measuring range [K]) + 0.05%)

< 0.02%/K

< 200 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.)

IP20

-20°C ... 65°C Anv

PBT

6.2 / 93.1 / 102.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

(E) II 3 G Ex nA IIC T4 Gc X

UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5 applied for

Description	
MCR temperature measuring transpt 100 temperature sensors, loop-pe	
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Unconfigured	Screw connection
Unconfigured	Spring-cage conn.

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MINI MCR-SL-PT100-LP	2810298	1	
MINI MCR-SL-PT100-LP-SP	2810382	1	
MINI MCR-SL-PT100-LP-NC1)	2810308	1	
MINI MCR-SL-PT100-LP-NC-SP1)	2810395	1	

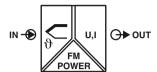
Order key for MINI MCR-SL-PT100-LP (standard configuration entered as an example)

Order No.	Connection technology	Measuring ra	ange [°C] End	Output	Failure in- formation 1)	Factory calibration certificate (FCC)
2810298	/ 3	/ 0	/ 100	/ OUT02	/ 1	/ NONE
2810298 ≘	2 = 2-conductor	0 -10	Range (increment)	OUT02	1	NONE
PT100-LP	3 ≘ 3-conductor	-20 -30	0300 (5 K)	OUT08	2 3	is charged)
2810382 ≘ PT100-LP-SP	4 ≘ 4-conductor	-40 -50 -100 -150			4	YESPLUS ≘ FCC with 5 measuring points (a fee is charged)

¹⁾ For explanations, see adjacent text on the right; for further details, see data sheet: www.phoenixcontact.net/products

Fa	Failure information					
	Overrange	Open circuit				
1 2 3 4	- 21.5 mA 3.5 mA 21.5 mA	Start of range 21.5 mA 3.5 mA 21.5 mA				
	Underrange	Short circuit				
1 2 3 4	- 21.5 mA 3.5 mA 3.5 mA	Start of range 21.5 mA 3.5 mA 3.5 mA				

Temperature Temperature transducers for thermocouples



Highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of thermocouple signals.

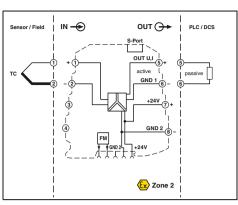
- For thermocouples according to IEC 584 and GOST
- Internal cold junction compensation
- Configurable via DIP switches and soft-
- Software available free of charge on the
- Power supply possible through the foot element (T-Connector)
- Supports fault monitoring
- Standard configuration: TC sensor type | IEC 584 TC; cold junction compensation "ON"; -200 ... 1200°C; 4 ... 20 mA output; error evaluation according to NE43 (downscale); fault monitoring contact responds on any error.

For information on the programming adapter, refer to page 119

The configuration software can be downloaded from the Internet: www.phoenixcontact.net/products

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input signal (can be configured using DIP switches)

Temperature range

Measuring range span Output data

Output signal (configurable using the DIP switch)

Maximum output signal No-load voltage Short-circuit current Load R_B

General data Supply voltage U_B Current consumption Power consumption

Transmission error

Cold junction errors Temperature coefficient Step response (0 - 99%) Electrical isolation

Test voltage, input/output/supply Ambient temperature (operation)

Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance ATEX

UL, USA / Canada



for thermocouples

Housing width 6.2 mm

Technical data

B, E, J, K, N, R, S, T, L, U, A-1, A-2, A-3, M, L

-250°C ... 2500°C (Range depending on the sensor type)

min. 50 K

U output I output 0 ... 5 V / 1 ... 5 V 0 ... 20 mA / 4 ... 20 mA 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA

Approx. 12.3 V 24.6 mA

≥ 10 kΩ < 500 Ω (at 20 mA) < 20 mV_{PP} $< 20 \text{ mV}_{PP} \text{ (at } 500 \Omega)$

9.6 V DC ... 30 V DC

< 27 mA (at 24 V DC)

 \leq 700 mW (at I_{OUT} = 20 mA, 9.6 V DC, load 500 Ω)

0.1% * 600 K / set measuring range; 0.1% > 600 K (E, J, K, N, T, L, U, M Gost, L Gost) 0.2% * 600 K / set measuring range; 0.2% > 600 K (B, R, S, A1, A2, A3)

< 3 K (typ. < 2 K)≤ 0.01%/K

Typ. 400 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) -20°C ... 65°C

6.2 / 93.1 / 102.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12

CE-compliant

 II 3 G Ex nA IIC T4 Gc X UL 508 Recognized applied for

Class I, Div. 2, Groups A, B, C, D T5 applied for

GL applied for

Description	
Universal temperature transducer for	or thermocouples
Standard configuration	Screw connection

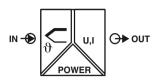
Programming adapter for configuring modules with

az applica ici					
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MINI MCR-TC-UI-NC1)	2902851	1			
Accessories					
IFS-USB-PROG-ADAPTER ¹)	2811271	1			

Sensor type	Standard	Measuring range
В	IEC 584-1	+500°C +1820°C
E	IEC 584-1	-230°C +1000°C
J	IEC 584-1	-210°C +1200°C
K	IEC 584-1	-250°C +1372°C
N	IEC 584-1	-200°C +1300°C
R	IEC 584-1	-50°C +1768°C
S	IEC 584-1	-50°C +1768°C
T	IEC 584-1	-200°C +400°C

Sensor type	Standard	Measuring range	
L	DIN 43710	-200°C +900°C	
U	DIN 43710	-200°C +600°C	
A-1	GOST 8.585	0°C +2500°C	
A-2	GOST 8.585	0°C +1800°C	
A-3	GOST 8.585	0°C +1800°C	
M	GOST 8.585	-200°C +100°C	
L	GOST 8.585	-200°C +800°C	
Customer-specific characteristic curves			

Temperature Temperature transducer for J- and K-type thermocouples



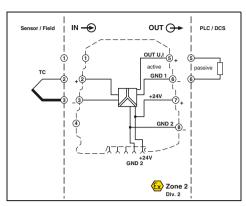
- Highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of thermocouple signals to create standard signals
- Temperature measuring range of -150°C to +1350°C
- For J and K thermocouples according to IEC 584-1
- Internal cold junction compensation
- Input and output signals can be configured via DIP switches
- 3-way isolation
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key; see below.

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input signal (can be configured using DIP switches)

Temperature range

Measuring range span

Output data

Output signal (configurable using the DIP switch)

Maximum output signal No-load voltage Short-circuit current

Load R_o Ripple

General data

Supply voltage U_B Current consumption

Power consumption

Transmission error for the full/set measurement range

MCR temperature measuring transducer, for thermocouples

Cold junction errors

Temperature coefficient

Step response (0 - 99%) Electrical isolation

Test voltage, input/output/supply Ambient temperature (operation)

Housing material

Dimensions W/H/D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

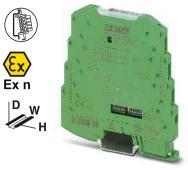
ATEX UL, USA / Canada

Order configuration

Unconfigured

GL

Description



Configurable, for a temperature measuring range of -150°C ... +1350°C

c**F11** us (61 Ex: c(1) vs (£x)

Housing width 6.2 mm

Technical data

Thermocouples type J, K (IEC 584-1)

Typ J:-150°C ... 1200°C (configurable)

Typ K: -150°C ... 1350°C

min. 50 K

U output I output

0 ... 20 mA / 4 ... 20 mA 0 ... 5 V / 1 ... 5 V 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA

Approx. 12.5 V 23 mA

Approx. 12.5 V

Approx. 10 mA

≥ 10 kΩ < 500 Ω (at 20 mA) < 20 mV_{PP} (at 500 Ω)

 $< 20 \text{ mV}_{PP} \text{ (at } 10 \text{ k}\Omega)$

19.2 V DC ... 30 V DC < 25 mA (at 24 V DC)

< 500 mW

 \leq 0.2%; ((150 K / set measurement range [K]) + 0.1%)

< 3 K (typ. < 2 K)

< 0.02%/K < 30 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.)

-20°C ... 65°C PBT

6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 12$

CE-compliant

UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5

GL EMC 2 D

Screw connection

Screw connection

-	GE LIVIO 2 B					
	Ordering data					
	Туре	Order No.	Pcs. / Pkt.			
_	MINI MCR-SL-TC-UI¹) MINI MCR-SL-TC-UI-NC¹)	2864448 2864299	1 1			

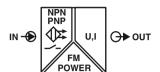
Order key for MINI MCR-SL-TC-UI (standard configuration entered as an example)

Order No.	Sens	sor type	Measu Start	rir	ng range [°C] End		Output		Failure in- formation 1)		Factory c	alibration certifi-
2864448		J	/ 0	/	1000	/	OUT01	/	Α	/		NONE
	J ≘	Type J	0	П	Range	Π	OUT01	Ī	Α		NONE	without FCC
			-10		(increment)		OUT02		В		YES	
	K ≘	Type K	-20				OUT03		С			is charged)
			-30				OUT05		D			
			-40		0 300 (10 K)		OUT06				YESPLUS	
			-50		320 700 (20 K)		OUT07					5 measuring
			-100		7501350 (50 K)		OUT08					points (a fee is
			-150			П	OUT09					charged)

1) For explanations, see adjacent text on the right; for further details, see data sheet: www.phoenixcontact.net/products

-	ilure information (depends on the output signal range):						
. [Overrange	-	0	pen circui	t	
	020 mA	420 mA	010 V	020 mA	420 mA	010 V	
Α		20.5 mA	10.25 V	21 mA	21 mA	10.5 V	
В	20.5 mA	20.5 mA	10.25 V	21 mA	21 mA	10.5 V	
C	20 mA	20 mA	10 V	21 mA	21 mA	10.5 V	
ID	20 mA	20 mA	10 V	0 mA	4 mA	0 V	
T		Underrange	1	1			
Ī	020 mA	Underrange 420 mA	010 V				
Α	020 mA						
В	020 mA 0 mA 0 mA	420 mA	010 V 0 V 0 V				
	020 mA 0 mA 0 mA	420 mA 4 mA	010 V 0 V				

Frequency Frequency transducers For up to 80 kHz



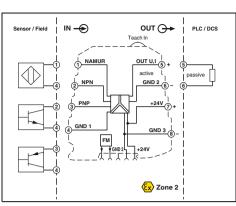
Configurable 3-way isolated frequency transducer.

- Suitable for the connection of NAMUR proximity sensors (IEC 60947-5-6 and EN 50227) as well as for sensors with NPN and PNP outputs that generate a frequency signal
- The device is configured via DIP switches
- Frequency range is freely adjustable via a press/slide button ("teach-in wheel")
- Supports fault monitoring
- Standard configuration: NAMUR sensor; mean-value generation "OFF"; 0.002 Hz ... 20 kHz frequency range; 4 ... 20 mA output; error evaluation NE43 (downscale); fault monitoring contact responds on any error

Notes:

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



D

Frequency transducer for up to 80 kHz

Housing width 6.2 mm

Technical data

NPN/PNP transistor outputs NAMUR initiators Floating relay contact (dry contact) 0.002 Hz ... 20 kHz (DIP switch) 0.002 Hz ... 80 kHz (Teach-in wheel) 30 V (incl. DC voltage)

U output I output 0 ... 20 mA / 4 ... 20 mA 0...5V/1...5V 0 ... 10 V / 10 ... 0 V 20 ... 0 mA / 20 ... 4 mA Approx. 12.3 V 24.6 mA ≥ 10 kΩ 500 Ω (at 20 mA) $< 20 \text{ mV}_{PP}$ $< 20 \text{ mV}_{PP} \text{ (at 500 }\Omega)$

9.6 V DC ... 30 V DC < 800 mW (at I_{OUT} = 20 mA, 9.6 V DC, load 500 $\Omega)$

Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.) IP20 -20°C ... 65°C Anv

< 35 ms (At f > 500 Hz)

0.01%/K

PBT 6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 12$ 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant (E) II 3 G Ex nA IIC T4 Gc X UL 508 Recognized applied for Class I, Div. 2, Groups A, B, C, D T5 applied for GL applied for

Ordering data Pcs./ Order No. Type Pkt MINI MCR-SL-F-UI-NC1) 2902832 MINI MCR-SL-F-UI-SP-NC1) 2902833

Maximum output signal Load R_B Ripple General data Supply voltage U_p Power consumption Transmission error of the full measuring span Temperature coefficient Step response (0 - 99%) Test voltage, input/output/supply

Electrical isolation

Input data Input sources

Output data

Output signal

Frequency measuring range

Maximum input signal

Degree of protection

Ambient temperature (operation) Mounting

Housing material Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

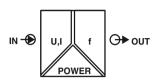
Conformance ATFX

UL, USA / Canada

GL

Description	
MCR frequency transducers	
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

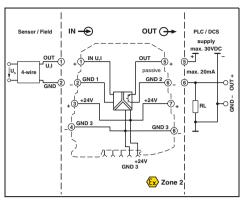
Frequency **Analog-frequency transducer**

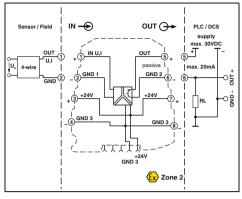


- Highly compact analog-to-frequency transducer for electrical isolation, amplification, conversion, and filtering of standard signals to create frequencies or PWM signals
- Configurable interference filter
- Input and output signals can be configured via DIP switches
- 3-way isolation
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)
- PWM output of 5 ... 95%

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571





Input signal (configurable using the DIP switch)

Output signal (can be configured using DIP switches)

Maximum input signal

Input resistance

Output data

Minimum load Maximum load current

General data

Supply voltage U_B

Maximum switching voltage

Overrange/underrange Protective circuit

Nominal supply voltage

Temperature coefficient

Step response (0 - 99%)

Electrical isolation

Housing material Dimensions W / H / D

Conformance **ATEX** UL, USA / Canada

GL

Mounting

Degree of protection

Conformance / approvals

Maximum transmission error

Test voltage, input/output/supply

Ambient temperature (operation)

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Current consumption Power consumption

D



Configurable, frequency and PWM output

> Technical data I input

Ex: Ex

Housing width 6.2 mm

TCOIIII	oui data
U input	I input
0 5 V / 1 5 V	0 20 mA / 4
0 10 V / 2 10 V	0 10 mA / 2
30 V DC	100 mA
Approx. 110 kΩ	Approx. 50 Ω
Frequency output	PWM output
0 Hz 10 kHz / 0 Hz 5 kHz 0 Hz 2.5 kHz / 0 Hz 1 kHz 0 Hz 500 Hz / 0 Hz 250 Hz	7.8 kHz (10 bit) / 1.9 kHz (12 bit) / 488 Hz (14 bit) /
0 Hz 100 Hz / 0 Hz 50 Hz	122 Hz (16 bit) / 6
$4 \text{ mA} \le (U_1 / R_1) \le 20 \text{ mA}$	$12 \text{ mA} \le (U_1 / R_1)$
20 mA	12 IIIA 3 (O[/ II[)
30 V	
Can be set (via DIP switch)	
Short-circuit protection, polarity re	eversal protection
19.2 V DC 30 V DC	
24 V DC	
< 10 mA (at 24 V DC)	
< 200 mW	
≤ 0.1% (> 7 kHz ≤ 0.2%)	
< 0.02%/K	
< 15 ms (+ (1/f) smallest filter) < 1 s (+ (1/f) largest filter)	
Basic insulation according to EN	61010
1.5 kV (50 Hz, 1 min.)	

PWM output 7.8 kHz (10 bit) / 3.9 kHz (10 bit) 1.9 kHz (12 bit) / 977 Hz (12 bit) 488 Hz (14 bit) / 244 Hz (14 bit) 122 Hz (16 bit) / 61 Hz (16 bit) 12 mA \leq (U_L / R_L) \leq 20 mA

0 ... 20 mA / 4 ... 20 mA

0 ... 10 mA / 2 ... 10 mA -

V (50 Hz, 1 min.) IP20 -20°C 65°C Any PRT

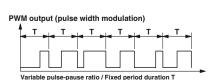
6.2 / 93.1 / 102.5 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 - 12$ $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24$ - 12

CE-compliant UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5 applied for

GL EMC 2 D

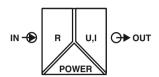
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		1 1 1				



Description	
MCR frequency transducer	
	Screw connection
	Spring-cage conn.

022022						
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MINI MCR-SL-UI-F¹) MINI MCR-SL-UI-F-SP¹)	2864082 2810243	1 1				

Potentiometer Potiposition transducer

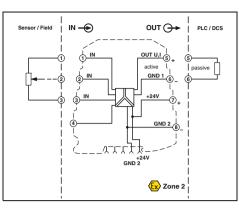


- Highly compact potiposition transducer for electrical isolation, conversion, amplification, and filtering of potentiometer signals to create standard signals
- Automatic potentiometer detection without manual adjustment
- For potentiometers from 100 Ω to 100 $k\Omega$
- Configurable measuring range and output signals
- A potentiometer sub-range can be linearized via the "teach-in" switch on the device
- Input and output signals can be configured via DIP switches
- 3-way isolation
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)

Notes:

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data	
Potentiometer	
Reference voltage source	
Output data	
Output signal	
Maximum output signal	
No-load voltage	
Short-circuit current	
Load R _B	
Ripple	
Behavior in the event of a sensor error	
General data	
Supply voltage U _B	
Nominal supply voltage	
Current consumption	
Power consumption	
Maximum transmission error	
Temperature coefficient	
Step response (0 - 99%)	
Electrical isolation	
Test voltage, input/output/supply	
Degree of protection	
Ambient temperature (operation)	
Mounting	
Housing material	
Dimensions W / H / D	

Screw connection solid / stranded / AWG

Conformance / approvals

MCR potiposition transducer

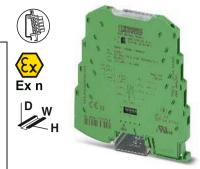
Conformance

Description

GL

UL, USA / Canada

Spring-cage connection (solid/stranded/AWG)



Configurable, automatic potentiometer detection

EX: Ex

Housing width 6.2 mm

•					
Technical data					
100 Ω 100 kΩ < 3.6 V					
U output	I output				
0 5 V / 1 5 V 0 10 V / 10 0 V 12.5 V	0 20 mA / 4 20 mA 20 0 mA / 20 4 mA 23 mA Approx. 12.5 V				
Approx. 10 mA $> 10 \text{ k}\Omega$ $< 20 \text{ mV}_{PP}$ (at 10 kΩ) $0\% \dots 105\%$ (configurable)	$< 500 \Omega$ (20 mA) $< 20 \text{ mV}_{PP}$ (at 500 Ω)				

19.2 V DC ... 30 V DC 24 V DC < 25 mA (at 24 V DC) < 500 mW < 0.2%/ < 30 ms

Basic insulation according to EN 61010

1.5 kV (50 Hz, 1 min.) IP20 -20°C ... 65°C Any PBT

6.2 / 93.1 / 102.5 mm

 $\begin{array}{l} 0.2 \dots 2.5 \; mm^2 \, / \, 0.2 \dots 2.5 \; mm^2 \, / \, 26 \, \text{-} \; 12 \\ 0.2 \dots 2.5 \; mm^2 \, / \, 0.2 \dots 2.5 \; mm^2 \, / \, 24 \, \text{-} \; 12 \end{array}$

CE-compliant

II 3 G Ex nA IIC T4 Gc X

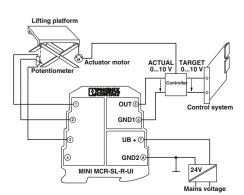
UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5 applied for

GL EMC 2 D

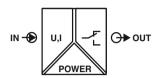
Screw connection Spring-cage conn.

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MINI MCR-SL-R-UI¹) MINI MCR-SL-R-UI-SP¹)	2864095 2810256	1				



Height adjustment of a lifting platform with setpoint and actual value control

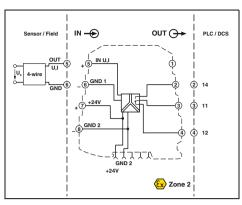
Limit values Threshold value switch



- Highly compact threshold value switch for switching analog limit values
- Input signal, hysteresis, and delay time can be configured via DIP switches
- Limit value can be freely adjusted via potentiometer on front
- 3-way isolation
- PDT relay at output
- Operating current/quiescent current
- Status and error signaling via two diagnostic LEDs
- Power supply possible through the foot element (T-Connector)

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Sensor / Field	 IN - ⊕	оит ⊖+ ¦	PLC / DCS
UI, OUT UI, GND	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\) 11
	GND 2 +24V	Ex Zone 2	

Input signal (configurable using the DIP switch) Maximum input signal Input resistance Specification of the switching point Switching output Relay output Contact material Max. switching voltage

Limiting continuous current Hysteresis (configurable using the DIP switch) Operating and closed circuit current behavior

Setting range of the response delay (configurable using the DIP switch)

General data Supply voltage U_B

Nominal supply voltage Current consumption Power consumption Linearity error

Temperature coefficient Step response (0 - 99%)

Electrical isolation Test voltage input/power supply

Degree of protection

Ambient temperature (operation)

Mounting Housing material Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

MCR threshold value switch

Conformance ATEX UL, USA / Canada

Description

UL, USA UL, Canada GL



Configurable, with relay PDT output

ε**Αλ**υς (ξί Εχ: ε(θί) »: (ξίχ)

Housing width 6.2 mm

Technic	cal data
U input	I input
0 10 V	0 20 mA
30 V	100 mA
> 100 kΩ	50 Ω
With 25-speed potentiometer	

AgSnO₂, hard gold-plated

250 V AC 2 A

(0.1%; 1%; 2.5%; 5%) Switchable using DIP switch

0 s ... 10 s (0 s; 1 s; 2 s; 3 s; 4 s; 6 s; 8 s; 10 s)

19.2 V DC ... 30 V DC

24 V DC

< 14 mA (at 24 V DC)

< 330 mW (at 24 V DC)

< 0.05% (of final value)

< 0.02%/K

< 35 ms

Basic insulation according to EN 61010

1.5 kV AC (50 Hz, 1 min.)

IP20

-20°C ... 65°C

Any PBT

6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 \, \text{--} \, 12$

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

CE-compliant

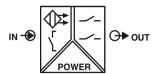
UL 508 Recognized

Class I, Zone 2, AEx nC IIC T6

Class I, Zone 2, Ex nC IIC T6 GL EMC 2 D

	Ordering data		
	Туре	Order No.	Pcs. / Pkt.
Screw connection Spring-cage conn.	MINI MCR-SL-UI-REL¹) MINI MCR-SL-UI-REL-SP¹)	2864480 2864493	1 1

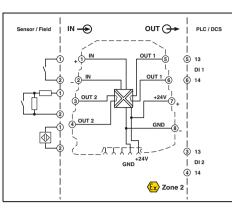
Digital IN NAMUR isolation amplifiers



- Highly compact isolation amplifier for electrical isolation, amplification, and duplication of proximity sensor signals
- For proximity sensors in accordance with IEC 60947-5-6 and EN 50227
- Floating contacts and contacts with resistance circuit can be connected
- Input and output signals can be configured via DIP switches
- N/O contacts at output
- Second output can be used as a doubler or error signaling output
- 3-way isolation
- Switchover between operating current and quiescent current (inverted switching behavior)
- Error signaling via diagnostic LED and analog signal
- Power supply possible through the foot element (T-Connector)

Information about power bridging, system cabling, and marking components can be found starting at page 88

1) EMC: Class A product, see page 571



Input data Input signal

Control circuit

No-load voltage

Switching points (according to IEC 60947-5-6)

Line error detection

Switching output

Relay output

Contact material

Maximum switching voltage Maximum switching current

Minimum contact current

Switching frequency

General data

Supply voltage $U_{\rm B}$ Nominal supply voltage

Current consumption

Power consumption

Electrical isolation

Test voltage, input/output/supply

Degree of protection

Ambient temperature (operation)

Mounting

Housing material

Dimensions W/H/D

Screw connection solid / stranded / AWG

MCR NAMUR switching amplifier

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

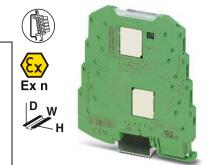
Conformance

ATEX

Description

UL, USA / Canada

GL



Configurable, for NAMUR sensors and floating contacts

EX: Ex

Housing width 6.2 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Open circuit switch contacts

Switch contacts with resistance circuit

8.2 V DC ±10%

< 1.2 mA (blocking)

> 2.1 mA (conductive)

> 6 mA (in the event of a short-circuit)

< 0.35 mA (With wire break)

2 N/O contacts

Hard gold plated AgNi

250 V AC

2 A

1 mA (for 5 V DC) 0.5 Hz (240 V AC / 30 V DC / 2 A)

10 Hz (without load)

19.2 V DC 30 V DC

24 V DC

< 25 mA < 600 mW

Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.)

IP20

-20°C ... 65°C

Any PRT

6.2 / 93.1 / 102.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 12$

 $0.2 \dots 2.5 \text{ mm}^2 / 0.2 \dots 2.5 \text{ mm}^2 / 24 - 12$

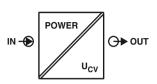
CE-compliant ⟨E⟩ II 3 G Ex nA nC IIC T4 Gc X

UL 508 Recognized

Class I, Div. 2, Groups A, B, C, D T5 applied for

	GL EIVIC 2 D		
	Ordering data		
	Туре	Order No.	Pcs./ Pkt.
Screw connection Spring-cage conn.	MINI MCR-SL-NAM-2RNO¹) MINI MCR-SL-NAM-2RNO-SP¹)	2864105 2810269	1

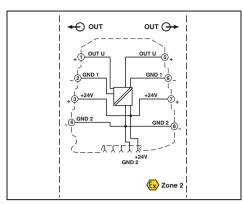
Accessories Constant voltage source



- Constant voltage source for potentiometers, measuring bridges, encoders
- Highly precise
- Input signal corresponds to power supply
- Input signal and, in turn, the power supply can be provided via the foot element (T-Connector)
- Standard configuration: Output 10 V DC

Information on components for power bridging, system cabling, and marking can be found in the INTERFACE catalog or at www.phoenixcontact.net/products

1) EMC: Class A product, see page 571



Output data			
Output signal (can be configured using DIP switches)			
Short-circuit current			
Ripple			
General data			
Supply voltage U _B			
Power consumption			
Maximum transmission error			
Temperature coefficient			
Electrical isolation			
Test voltage input/output			
Degree of protection			
Ambient temperature (operation)			

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals

Conformance ATEX UL, USA / Canada

Resistance value 4.7 k Ω Resistance value 10 k Ω

Housing material

Dimensions W / H / D

Input data Input signal





Configurable, output signals 2.5 V / 5 V / 7.5 V / 10 V

Ex: (Ex) Applied for: cUL / UL Housing width 6.2 mm

Technical data 9.6 ... 30 V 10 V DC 7.5 V DC 5 V DC 2.5 V DC Approx. 32 mA < 20 mV_{PP}

9.6 V DC ... 30 V DC < 600 mW (at 24 V IN) ≤ 0.1% (of final value) < 0.01%/K, typ. < 0.002%/K Basic insulation according to EN 61010 1.5 kV (50 Hz, 1 min.) IP20 -20°C ... 65°C PBT 62/931/1025 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 26 - 12$

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5

		Ordering data	
Description		Туре	Order No.
MCR constant voltage source With screw connection With spring-cage connection	Screw connection Spring-cage conn.	MINI MCR-SL-CVS-24-5-10-NC ¹) MINI MCR-SL-CVS-24-5-10-SP-NC ¹)	2902822 2902823
		Accessories	\$
Setpoint potentiometer, to set setpoints in	ndividually		

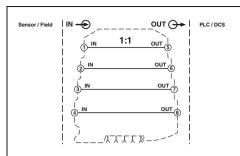


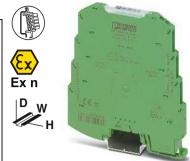
Accessories			
EMG 30-SP- 4K7LIN	2940252	10	
EMG 30-SP-10K LIN	2942124	10	

Pcs. /

Accessories Feed-through terminal blocks

- Feed-through terminal block for 1:1 forwarding of signals in the MINI Analog group
- For plugging gaps in system cabling with the V8 system adapter, e.g., when there are fewer than eight signals
- Used in conjunction with the MINI Analog multiplexer
- For direct mounting in the case of applications without signal conversion and without electrical isolation





1:1 connection

Technical data

General data
Degree of protection
Ambient temperature (operation)
Mounting
Housing material
Dimensions W / H / D
Screw connection solid / stranded / AWG
Conformance / approvals
ATEX
GL

Screw connection

Description

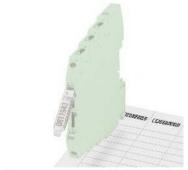
MINI Analog feed-through terminal block

Ordering data
(Ex) II 3 G Ex nA IIC T4 Gc X GL EMC 2 D
6.2 / 93.1 / 102.5 mm 0.2 2.5 mm ² / 0.2 2.5 mm ² / 24 - 12
PBT
Any
IP20 -20°C 65°C

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
MINI MCR-SL-TB	2811420	1

Accessories Marking material

- Flexible labeling system with pivoting transparent cover and matching insert strips
- Transparent cover that can be snapped onto the module instead of the standard cover
- Insert strips on pre-punched paper sheets
- Marking option for standard cover in the form of ZBF 6 zack marker strip marking labels



Transparent cover with insert strips

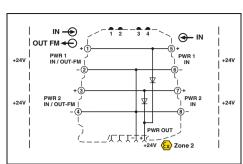
	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
Fold-up transparent cover, for labeling MINI Analog modules with insert strips	MINI MCR DKL	2308111	10
	Accessories		
Insert strips, stamped, for transparent cover	MINI MCR-DKL-LABEL	2810272	10
Zack marker strip, flat UniCard sheets, for marker groove	ZBF 6 (see Catalog 5) UC-TMF 6 (see Catalog 5)		

Accessories Power terminals

- For up to 80 MINI Analog modules
- The MINI MCR-SL-PTB-FM(-SP) power terminal block is used to supply the supply voltage to the DIN rail connector
- Monitoring of supplies in combination with the fault monitoring module
- Flexible redundant supply from one or both module sides
- Extended supply voltage range from 0 ... 30 V DC



1) EMC: Class A product, see page 571





Power terminal block, can be monitored

Input data
Input voltage range
Output data
Output voltage
Output current
General data
Ambient temperature (operation)
Conformance / approvals
Conformance
ATEX
UL, USA / Canada
GL

Description	Туре
MINI Analog power terminal blocks	MINI

Technical data	
0 V DC 30 V DC	
(Input voltage - 0.8 V)	
<2 A	
-20°C 65°C	
20 0 00 0	
05	
CE-compliant	
⟨Ex⟩ II 3 G Ex nA IIC T4 Gc X	
UL 508 Recognized applied for	
Class I, Div. 2, Groups A, B, C, D T5 applied for	
GL applied for	

Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
MINI MCR-SL-PTB-FM¹) MINI MCR-SL-PTB-FM-SP¹)	2902958 2902959	1

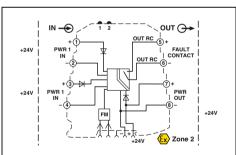
Accessories Error message modules

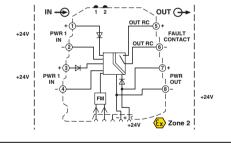
Fault monitoring module for evaluating and reporting group errors from the fault monitoring system.

- Monitoring of supply voltages of MINI MCR-SL-PTB-FM(-SP) power terminal blocks
- Drawing off the supply is possible
- The error is reported via an N/C contact
- Standard configuration: group error detection "ON"; redundancy monitoring "ON"; relay "active"

Notes:

1) EMC: Class A product, see page 571







Technical data

Input data/output data
Input signal
Output signal
Output signal maximum current
Switching output
Maximum switching voltage
Maximum switching current
Test voltage input/output
Conformance / approvals
Conformance
ATEX
UL, USA / Canada
GL

	Ordering data
_	CE-compliant
	,
	50 mA 1.5 kV AC (50 Hz, 1 min.)
	30 V DC
	9.6 V DC 30 V DC 9.6 V DC 30 V DC 2 A

		Ordering data		
Description		Туре	Order No.	Pcs. / Pkt.
MINI Analog error message modules Standard configuration Standard configuration	Screw connection Spring-cage conn.	MINI MCR-SL-FM-RC-NC1) MINI MCR-SL-FM-RC-SP-NC1)	2902961 2902962	1 1

N

Accessories ME 6,2 TBUS... T-Connector

- For bridging the supply voltage
- Reduces wiring costs
- Module can be replaced without interrupting the supply to the remaining modules (hot swap)
- One T-Connector for two MINI Analog modules
- Current carrying capacity of 2 A to MINI Analog modules



For bridging the supply voltage

Description
DIN rail connector (TBUS), for bridging the supply voltage, can be snapped onto 35 mm DIN rails as per EN 60715, with UL approval

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	10	

Accessories Power terminals

- For supplying the supply voltage via the foot element (T-Connector) where DC voltages of up to 30 V are already available
- Option of redundant supply decoupled from diode
- For up to 80 MINI analog modules
- For up to 2 A
- Status and error signaling via diagnostic LEDs

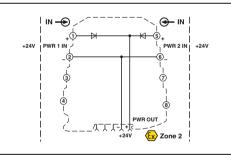
Notes:

Recommended fuse for power terminal block:

Fuse according to IEC 60127-2/V Nominal current: 2.5 A Characteristics: Slow-blow

(e.g., Wickmann 5 x 20 mm/No. 195 - glass fuse)

1) EMC: Class A product, see page 571





Redundant supply for existing 24 V

Input data
Input voltage range
Output data
Output voltage
Output current
General data
Ambient temperature (operation)
Housing material
Conformance / approvals
Conformance
ATEX
UL, USA / Canada
GL

Description		
MCR power terminal block		

Technical data
201/20 201/20
20 V DC 30 V DC
(Input voltage - 0.8 V) ≤ 2 A
-20°C 65°C PBT
CE-compliant II 3 G Ex nA IIC T4 Gc X UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 GL EMC 2 D
Ordering data

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MINI MCR-SL-PTB1) MINI MCR-SL-PTB-SP1)	2864134 2864147	1

Accessories ME 17,5 TBUS-...T-Connector

- For bridging the supply voltage when using a MINI POWER system power supply

If the system power supply is used, you need two ME 17,5 TBUS T-Connectors to establish the connection with the ME 6,2 TBUS T-Connectors of the MINI Analog system and provide an effective power supply.



For system power supply

	Ordering data	a	
Description	Туре	Order No.	Pcs. / Pkt.
DIN rail connector, for bridging the supply voltage, can be snapped onto 35 mm DIN rails as per EN 60715, with UL approval, wo pieces are required per system power supply			
	ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10

Accessories System power supply

- For supplying the supply voltage via the foot element (T-Connector) where AC voltages are available
- 100 ... 240 V AC nominal input voltage range
- 24 V DC output voltage
- For up to 60 MINI Analog modules
- For up to 1.5 A, secondary
- Status and error signaling via diagnostic **LEDs**



For applications with local voltages of over 100 V

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
System power supply unit, primary-switched with zone 2 approval. More information is given in the INTERFACE Power Supply catalog part.			
	MINI-PS-100-240AC/24DC/1.5/EX	2866653	1
System power supply unit , primary-switched (not for zone 2). More information is given in the INTERFACE Power Supply catalog part.			
	MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Accessories System cabling

A high number of channels enables analog signal transmission across 6 mm in a confined space for many applications. In this kind of context, in particular, it is really important to have access to wiring solutions that avoid errors and are time-efficient, thereby cutting costs.

The MINI Analog system cabling solution allows you to wire up to eight channels quickly, easily, and without errors.

System cabling can take various forms.

System cabling with a front adapter This includes:

- A 16-pos. FLK cable

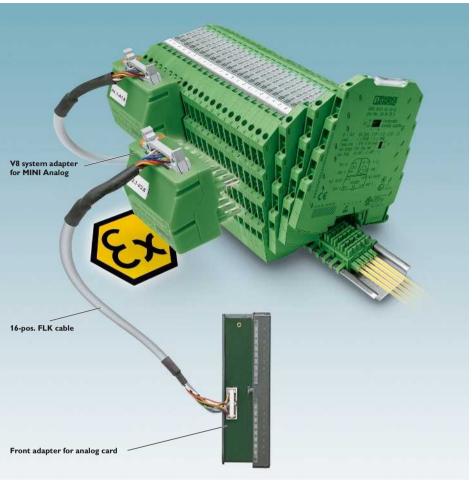
- The V8 system adapter for MINI Analog
- A front adapter that needs to be specifically selected based on the analog card of the controller

With this solution, all you need to do is connect the components together. There is virtually no wiring effort involved. What's more, it completely rules out wiring errors, as the pre-assembled components ensure correct assignment by virtue of their design.

System cabling without a front adapter

The version that does not require the use of a front adapter is the ideal addition.

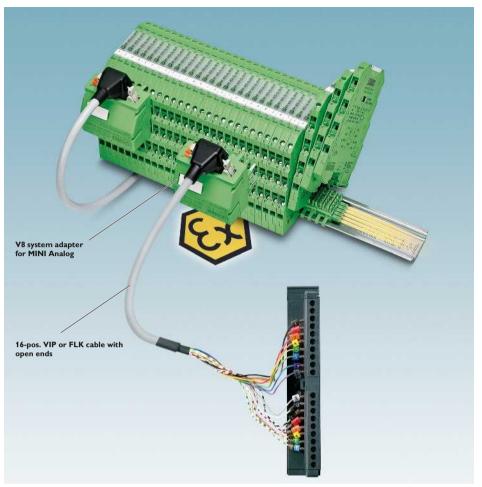
This solution involves using a 16-pos. FLK cable with open ends on one side. The open ends are fitted with ferrules and are numbered. This allows you to create a system cabling connection to virtually any module without having to fit a front adapter. The other advantage is that you can implement system cabling on the module side quickly, easily, and without errors.



System cabling with a front adapter

The tables below are designed to serve as a configuration aid. Details of other solutions are available on the Internet or on request.

Configuration aid for				
Controller	Analog card	Front adapter	FLK cable	V8 system adapter for MINI Analog
Siemens SIMATIC S7-300 / ET 200 M	6ES7-331-7KF02-0AB0 6ES7-331-7KB02-0AB0 6ES7-331-7KB81-0AB0 6ES7-331-7TF00-0AB0 6ES7-332-8TF01-0AB0 (for current signals) 6ES7-331-5HF00-0AB0 (for current signals)	FLKM 16-PA-S300/MINI-MCR (in the catalog on page 454) FLKM 16-PA-331-1KF/I/MINI-MCR (in the catalog on page 455) FLKM 16-PA-332-SHF/I/MINI-MCR (in the catalog on page 455)	FLK 16/EZ-DR//KONFEK (non-molded plugs, in the catalog on page 506)	MINI MCR-SL-V8-FLK 16-A (in the catalog on page 94)
Yokogawa Centum CS 3000 R3	AAI 141 AAI 143	Not required	CABLE-40/2/FLK16//YUC (non-molded plugs, in the catalog on page 467)	2 x MINI MCR-SL-V8-FLK 16-A (in the catalog on page 94)
Miscellaneous controllers / actuators / sensors	All cards	Not required	CABLE-FLK16/OE/0,14/M (non-molded plugs. in the catalog on page 502) or alternatively VIP-CAB-FLK16/FR/OE/0,14/M (molded plugs, in the catalog on page 502)	MINI MCR-SL-V8-FLK 16-A (in the catalog on page 94)



System cabling without a front adapter

Innovative concept

Thanks to its innovative design concept, the MINI MCR-SL-V8-FLK 16 A MINI Analog system adapter can be used on both the input and output side. Consequently, there is nothing at all to prevent you from using the same components for system cabling on both output and input modules.

Complete flexibility

The proven FLK cable series offers complete flexibility in terms of selection and is the ideal solution for system cabling with a front adapter. The flat and flexible plug connections mean that the products can be easily installed in any analog module.

Increased protection

The new VIP cables with molded FLK plugs offer enhanced protection in harsh industrial environments. If you opt for system cabling without a front adapter, you can enjoy all the advantages of the new VIP cables on the system adapter side.

Addition

If the application demands a form of system cabling with fewer than eight channels, the MINI MCR-SL-TB feed-through terminal block (page 88) represents the perfect addition.



Plug-in connection



Innovative concept



Complete flexibility



Increased protection



Addition

Measurement and control technology

Highly compact isolating amplifiers - MINI Analog

Accessories MINI Analog system adapter

- Time-saving wiring solution thanks to unique plug-in concept
- System cabling on PLC side
- Plug and play
- For up to eight channels
- Reduces wiring costs and errors





System adapter

c**91** us (€L Ex: (€x)

Housing width 50.4 mm

	i echnicai data
General data	
Contact resistance	< 10 mΩ
Current carrying capacity	≤1 A
Test voltage	500 V (50 Hz, 1 min. from channel to channel)
Vibration resistance	≤ 0.7 g
Surge voltage category / Pollution degree	III/2
Ambient temperature (operation)	-20°C 60°C
Housing material	PBT
Dimensions W / H / D	50.4 / 46.2 / 45.5 mm
Connection to the signal level	Flat-ribbon cable plug connector according to IEC 60603-13
Insertion/withdrawal cycles (System adapter / FLK 16)	10 / ≥ 200

Conformance / approvals

System adapter, for MINI analog modules with screw connection

ATEX

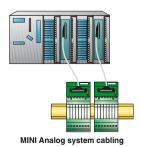
Description

UL, USA / Canada

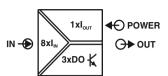
GL

(E) II 3 G Ex nA IIC T4 Gc X UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5 applied for GL EMC 2 D

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MINI MCR-SL-V8-FLK 16-A	2811268	1				



Accessories **MINI** Analog multiplexer



- Two clock cycles for execution can be se-

- Can be easily snapped onto MINI Analog

- Huge reduction in analog inputs at con-

- System cabling on the output side using

pre-assembled FLK cables with open

For six, four or two channels you will also need the corresponding number of feed-through terminal blocks (i.e., two, four or six).

modules with screw connection method

ond clock)

trollers

ends.

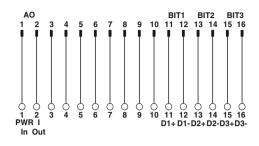
Notes:

- Supplied by an output loop

1) EMC: Class A product, see page 571

- For 4 ... 20 mA current signals

lected via DIP switches (one- or two-sec-





Technical data

FLK pin strip assignment

- Generates an analog output from up to eight analog input signals - parallel analog signals are transmitted serially via a cable - The desired number of channels is selected via DIP switches (8, 6, 4 or 2 channels)

- The channel currently switched is indicated as a bit pattern via three digital outputs

> Current consumption Power consumption

Maximum transmission error Temperature coefficient

Housing material

Connection to control level

Insertion/withdrawal cycles (System adapter / FLK 16)

Conformance / approvals

ATFX

Conformance UL, USA / Canada

MINI Analog feed-through terminal block

For round cable with one open end, see

"System cabling for controllers" section

For round cable with one open end, see "System cabling for controllers" section

Via DIP switches

2 or 1 sec. (can be selected)

4 ... 20 mA

4 ... 20 mA

 $((U_{\text{supply}} - 7 \text{ V}) / I_{\text{max}})$

3 x PNP optocouplers

< 30 mA

30 V DC

Housing width 50.4 mm

Input data . Description Can be configured/parameterized Input signal Maximum input signal Switching cycles Output data Output signal Maximum output signal Load R. Status indication Active input Switching output Maximum switching voltage General data Supply voltage U_B Ambient temperature (operation) Dimensions W/H/D

7 V DC ... 30 V DC (Loop-powered) < 3.5 mA (without signal current) < 24 mW (without signal current) 0.3% (0.1%, typical) < 0.01%/K -20°C ... 65°C

1, 2, 3-bit digital output (can be selected)

2, 4, 6, or 8-channel (can be switched over)

PRT 50.4 / 45.5 / 46.2 mm

Flat-ribbon cable plug connector according to IEC 60603-13

10 / ≥ 200

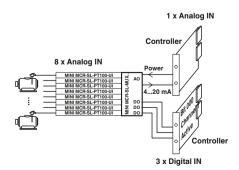
CE-compliant UL 508 Recognized applied for Class I, Div. 2, Groups A, B, C, D T5 applied for

CABLE-FLK16/OE/0,14/...

Description
Multiplexer for MINI Analog modules with screw connection

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MINI MCR-SL-MUX-V8-FLK 161)	2811815	1			
Accession					

MINI MCR-SL-TB 2811420 VIP-CAB-FLK16/FR/OE/0,14/...



Monitoring of eight motor temperatures with just one analog control input

Termination carrier for MINI Analog isolating amplifier







Select module carrier

TC... termination carriers are compact solutions for conveniently and smoothly connecting standard DIN rail isolating amplifiers from the MINI Analog series to input/output cards of automation systems using system cables.

The most compact isolating amplifiers combined with the most compact and flexible module carriers on the market enable you to achieve a hitherto unparalleled packing density in your control cabinet together with professional system cabling.

Compact

- The compact design associated with MINI Analog saves up to 65% of space in the control cabinet

Robust and reliable

- Stable, vibration-resistant aluminum carrier device profile
- PCB is completely decoupled from isolating amplifiers
- PCB without active electronics
- Redundant supply via separate DIN rail module
- Horizontal or vertical DIN rail mounting

Flexible

- Profile sections without pitch markings
- Quick and safe module connection with plug-in cable sets
- Horizontal or vertical DIN rail mounting
- Can be flexibly adapted to suit any controller or higher-level control system
- Solutions tailored to your requirements on request
- Available pre-assembled with modules and wired, or for self-assembly



Select controller-specific front adapter and system cable



Solutions are also available for MACX Analog, MACX Analog Ex, and Safety

Termination carrier for MINI Analog isolating amplifier

The TC-D37SUB-ADIO16-M-P-UNI

universal termination carrier is a compact solution which connects isolating amplifiers from the MINI Analog series to input/output cards of automation systems.

The TC-D37SUB-AIO16-M-PS-UNI termination carrier version also enables the coupling and decoupling of HART signals.

- Connection of up to 16 channels
- Can be universally connected, thanks to 37-pos. D-SUB cable with open ends. This enables flexible connection to automation systems
- Redundant power supply, decoupled from diode via separate MINI MCR-PTB power module and MINI MCR-SL-TB feedthrough terminal block

Notes:

Contact us: together, we can develop optimum solutions for your automation system with the termination carrier for MINI Analog.

1) EMC: Class A product, see page 571



Housing width 136 mm

Technical data General data Connection to the control system level D-SUB pin strip Number of positions Maximum operating voltage Maximum permissible current Rated insulation voltage

Surge voltage category Pollution degree Rated surge voltage Air and creepage distances Degree of protection Ambient temperature range

Shock Vibration (operation) Inflammability class according to UL 94 Dimensions W/H/D Power supply via power module Input voltage range Redundant supply Polarization and surge protection

Fuse

Status indication

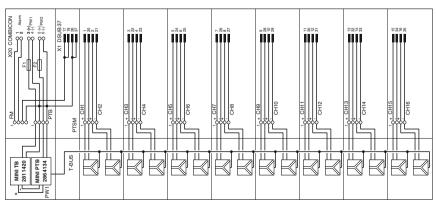
pp
37
< 50 V DC (Per signal/channel)
1 A (Signal/channel)
50 V
II
2
0.5 kV
DIN EN 50178 (Basic insulation)
IP20
-40°C 80°C (Please observe module specifications)
15g, according to IEC 60068-2-27
2g, according to IEC 60068-2-6
V0

136 / 170 / 160 mm 19.2 V DC ... 30 V DC ves, decoupled from diodes Yes 2.5 A Slow-blow

2 x red LED (error) 1 x green LED (PWR) Ordering data

	0.00
Description	Туре
Module carrier for 16 MINI Analog channels, power and feed-through module - With connection for MACX MCR-S-MUX HART multiplexer	TC-D37SUB-ADIO16-M-P-UNI TC-D37SUB-AIO16-M-PS-UNI ¹
- Will confection of MACA MCA-5-MCA HART muliplexel	Acces
MINI Analog power terminal blocks	MINI MCR-SL-PTB-FM1)

- With connection for MACX MCR-S-MUX HART multiplexer	TC-D37SUB-AIO16-M-PS-UNI¹)	2902934	1
	Accessories		
MINI Analog power terminal blocks	MINI MCR-SL-PTB-FM1)	2902958	1
MINI Analog error message modules	MINI MCR-SL-FM-RC-NC1)	2902961	1
HART multiplexer, 32-chanel, including two 14-wire flat-ribbon cables	MACX MCR-S-MUX	2865599	1



TC-D37SUB-ADIO16-M-P-UNI and TC-D37SUB-AIO16-M-PS-UNI connection scheme

Order No.

2902933

Pkt

Accessories Surge protection LINETRAB LIT

The ideal addition to MINI Analog - the innovative surge protection solution in 6.2 mm housing.

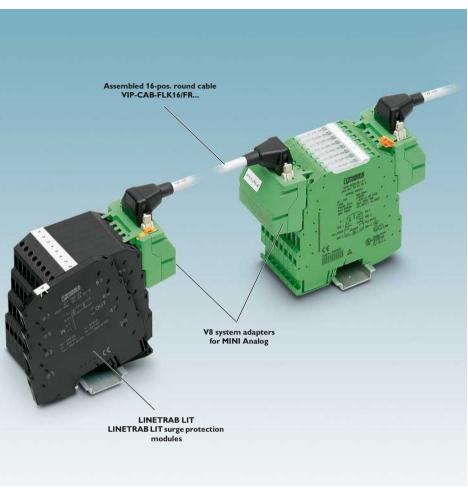
Because the LINETRAB LIT and MINI Analog housing is the same shape, you can benefit from the numerous advantages of system cabling. The advantage of combining MINI Analog and LINETRAB LIT products is that it enables you to set up a space-saving, protected, and optimally coordinated signal chain from the sensor right up to the controller.

The tables below are designed to serve as configuration aids for combining MINI Analog and LINETRAB products.

On the left, you will find a list of the components and combination options for setting up system cabling between MINI Analog and LINETRAB.

For details of system cabling solutions that can be used between MINI Analog and the controller side, please refer to page 92.

For more detailed information on LINETRAB LIT surge protection modules, please see the TRABTECH catalog.



Reliable and systematic measurements - LINETRAB LIT and MINI Analog

Configuration aid for LINETRAB LIT - MINI Analog

Cabling via MINI Analog system adapter (8 modules)					
LINETRAB LIT (surge protection)		MINI Analog			
Туре	Order No.	Туре	Order No.		
		MINI MCR-SL-UI-UI	2864383		
		MINI MCR-SL-UI-UI-NC	2864150		
		MINI MCR-SL-U-UI-NC	2865007		
		MINI MCR-SL-U-I-0	2813512		
		MINI MCR-SL-U-I-4	2813525		
		MINI MCR-SL-I-U-0	2813541		
		MINI MCR-SL-I-U-4	2813538		
		MINI MCR-SL-I-I	2864406		
		MINI MCR-SL-U-U	2864684		
LIT 1X2-24	2804610	MINI MCR-SL-UI-2I	2864794		
		MINI MCR-SL-UI-2I-NC	2864176		
		MINI MCR-SL-RPS-I-I	2864422		
		MINI MCR-SL-RPSS-I-I	2864079		
		MINI MCR-SL-1CP-I-I	2864419		
		MINI MCR-SL-UI-F	2864082		
		MINI MCR-SL-NAM-2RNO	2864105		
		MINI MCR-SL-UI-REL	2864480		
		MINI MCR-SL-SHUNT-UI	2810858		
		MINI MCR-SL-SHUNT-UI-NC	2810780		

Components required for system cabling						
Available 16-pos. VIP round cables				V8 system adapter for MINI Analog		
Туре	Length	Order No.		Туре		
VIP-CAB-FLK16/FR/FR/0,14/0,5M	0.5 m	2900154		a Minimage of Marin 44 A		
VIP-CAB-FLK16/FR/FR/0,14/1,0M	1.0 m	2900155		2 x MINI MCR-SL-V8-FLK 16-A (in the catalog on page 94)		
VIP-CAB-FLK16/FR/FR/0,14/2,0M	2.0 m	2900156		(

VIP... round cables are available in special lengths on request.

VIP system cable

The new VIP cables provide a way of setting up secure and robust connections, even in harsh industrial environments.

Innovative concept

The MINI Analog system adapter does not just support system cabling on the input and output sides. It also allows cabling to be installed with LINETRAB surge protection modules quickly, easily, and without errors.

Increased protection

In addition to all the advantages associated with electrical isolation, filtering, amplification, and the conversion of standard analog signals using MINI Analog, there is now also the option of effective surge protection.

Surge protection

Surge protection is a reliable means of actively preventing and protecting against system damage and downtimes. LINETRAB is able to limit transient surge voltages safely and without affecting the signal - all in a compact device with a design width of just 6.2 mm.



VIP system cable



Innovative concept



Increased protection



Surge protection

Configuration aid for LINETRAB LIT - MINI Analog

Manual cabling					
LINETRAB LIT (surge protection)		MINI Analog			
Туре	Order No.	Туре	Order No.		
		MINI MCR-SL-UI-UI	2864383		
		MINI MCR-SL-UI-UI-NC	2864150		
		MINI MCR-SL-UI-UI-SP	2864710		
		MINI MCR-SL-UI-UI-SP-NC	2864163		
		MINI MCR-SL-SHUNT-UI-SP	2810874		
		MINI MCR-SL-SHUNT-UI-SP-NC	2810793		
		MINI MCR-SL-U-UI-SP	2811213		
		MINI MCR-SL-U-UI-SP-NC	2810078		
		MINI MCR-SL-U-I-0-SP	2813570		
LIT 1X2-24	2804610	MINI MCR-SL-U-I-4-SP	2813583		
		MINI MCR-SL-I-U-0-SP	2813554		
		MINI MCR-SL-I-U-4-SP	2813567		
		MINI MCR-SL-I-I-SP	2864723		
		MINI MCR-SL-U-U-SP	2864697		
		MINI MCR-SL-UI-2I-SP	2864804		
		MINI MCR-SL-UI-2I-SP-NC	2864189		
		MINI MCR-SL-RPS-I-I-SP	2864752		
		MINI MCR-SL-RPSS-I-I-SP	2810230		
		MINI MCR-SL-1CP-I-I-SP	2864749		
LIT 2X2-24	2804623	MINI MCR-SL-2CP-I-I	2864655		
LII 2/12/27	2007023	MINI MCR-SL-2CP-I-I-SP	2864781		
		MINI MCR-SL-PT100-UI-200	2864309		
		MINI MCR-SL-PT100-UI-200-NC	2864370		
		MINI MCR-SL-PT100-UI-200-SP	2864192		
LIT 2-12	2804665	MINI MCR-SL-PT100-UI-200-SP-NC	2864202		
(for 2-conductor connection		MINI MCR-SL-PT100-UI	2864435		
technology)		MINI MCR-SL-PT100-UI-NC	2864273		
LIT 4-12	2804678	MINI MCR-SL-PT100-UI-SP	2864736		
(for 3- and 4-conductor connection		MINI MCR-SL-PT100-UI-SP-NC	2864286		
technology)		MINI MCR-SL-PT100-UI-LP	2810298		
		MINI MCR-SL-PT100-UI-LP-NC	2810308		
		MINI MCR-SL-PT100-UI-LP-SP	2810382		
		MINI MCR-SL-PT100-UI-LP-SP-NC	2810395		
		MINI MCR-SL-UI-F-SP	2810243		
LIT 1X2-24	2804610	MINI MCR-SL-NAM-2RNO-SP	2810269		
		MINI MCR-SL-UI-REL-SP	2864493		
LIT 4-24	2804678	MINI MCR-SL-R-UI	2864095		
LII 7-21	2007070	MINI MCR-SL-R-UI-SP	2810256		



Reliable and safe

MACX Analog - safe and high-performance signal isolating amplifiers. This product range enables you to safely isolate, condition, filter, and amplify all the signals of your system.

In all phases of the product life cycle, the MACX Analog range has been consistently developed and produced according to standards for functional safety. Save planning and operating costs - by combining high signal flexibility with safe isolation and SIL evaluation.

The universal nature of the product range provides you with a solution for all applications using analog signal transmission. You are free to choose between either multifunctional high-end devices or reasonablypriced standard modules with exactly the right functions.

Choose the right MACX Analog isolating amplifier for your application:

Analog IN/OUT

- Configurable 3-way isolating amplifiers
- Repeater power supplies with HART signal transmission for supplying 2-conductor transmitters
- Output isolating amplifiers with HART signal transmission

Temperature

- Universal temperature transducers for resistance thermometers, resistance-type sensors, potentiometers, thermocouples, and mV sources - also with safe limit value relays as an option
- Configurable temperature transducer for resistance thermometers and resistancetype sensors
- Configurable temperature transducer for thermocouples and mV sources

Digital IN

- Isolation amplifiers with input for NAMUR proximity sensor or switch
- Single-channel with PDT or passive transistor output
- Single-channel with double N/O contact output
- Two-channel with one N/O contact output per channel
- Two-channel with one PDT or passive transistor output per channel

Functional safety - from the initial idea to the finished product

Phoenix Contact meets the requirements of functional safety according to IEC 61508 in a standardized development process. Here, all fault avoidance and fault control measures are taken into consideration, from the very development and production of a device right up to device operation. These measures are audited within the scope of a full assessment by an independent test center.

Phoenix Contact therefore makes a significant contribution to high system safety and availability.



DIN rail connector-compatible

The DIN rail connector enables the modular bridging of the 24 V supply voltage.



Wide-range power supply

The modules featuring a wide-range power supply (...-UP) can be used in all power supply networks the world over without the need for additional power supply units.



Safe and reliable functions

- Consistent SIL certification. This ensures the highest level of reliability and safety for your systems.



Precise transmission and high operational reliability

Thanks to patented transmission concept



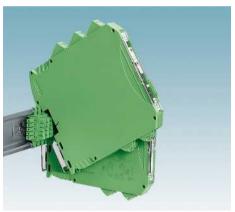
Easy configuration

- Without software via DIP switches on the device front or with the operator interface and display unit.



Easy configuration and monitoring

- Either via FDT/DTM or user-friendly stand-alone software - with integrated monitoring function.



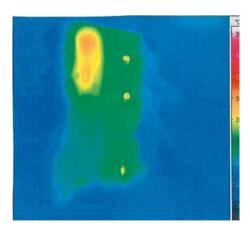
Flexible power bridging

- The DIN rail connector simplifies wiring, system expansion or module replacement during operation.



Easy-maintenance connection technology

- Plug-in connection terminal blocks with screw connection or fast push-in technology - coded, with integrated sockets.



Precise transmission, long service life

- Patented circuit concepts ensure precise signal transmission and minimal self-heating.



Even for the Ex area

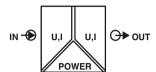
- Maximum explosion protection for all Ex zones with the MACX Analog Ex range.



Fast and error-free signal connection

- Compact termination carriers connect MACX Analog devices to the automation system - plug and play.

Analog IN / Analog OUT 3-way isolating amplifier



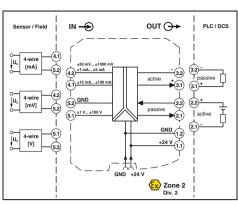
Universal isolating amplifier for operating 4-conductor measuring transducers

- Analog isolating amplifier for isolating, filtering, amplifying, and converting standard analog signals
- Configurable input and output signals, including bipolar current and voltage signals
- 3-way electrical isolation
- Over 1600 signal conversions can be set via DIP switches on the front
- 10 kHz limit frequency for time-critical applications
- Output active or passive
- Plug-in capable screw or spring-cage connection method
- Power supply via DIN rail connector possible
- Status indicator for supply voltage
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permissible

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

1) EMC: Class A product, see page 571



Input signal (configurable using the DIP switch)

Maximum input signal Input resistance

Output data

Output signal (configurable using the DIP switch)

General data

Supply voltage U_B Power dissipation

Maximum transmission error Temperature coefficient

ZERO / SPAN adjustment

Limit frequency (3 dB)

Step response (10 - 90%)

Electrical isolation

Input/output/power supply

Degree of protection Ambient temperature (operation)

Mounting

Housing material

Dimensions W / H / D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

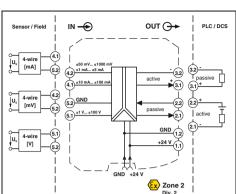
Conformance / approvals

Conformance

ATEX

IECE×

UL, USA / Canada Functional safety (SIL)











Universal, more than 1600 signal combinations

Functional safety Ex: 😥 🖺 // Applied for: cUL / UL

Housing width 12.5 mm

Technical	data

I input U input 0 ... 10 V, please indicate if different setting when ordering

±100 V ±100 mA

Approx. 1 MΩ (±1 V DC ... ±100 V DC) Approx. 10 Ω (±10 mA DC ... ±100 mA DC)

U output I output

0 ... 20 mA, please indicate if different setting when ordering

≥ 1 kΩ (10 V) ≤ 600 Ω (20 mA; active) (passive: ≤ (UB-2 V) / I_{outmax})

12 V DC ... 24 V DC (-20% / +25%) < 0.7 W (at 24 V DC / 20 mA) ≤ 0.1% (Compared to the final value) 0.0075%/K ±4% / ±4%

10 kHz (Can be switched to 30 Hz) 35 μs (at 10 kHz) 11 ms (at 30 Hz)

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2,

safe isolation as per EN 61010, EN 50178)

IP20 -20°C ... 70°C Any PA 66-FR 12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24$ - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant II 3 G Ex nA IIC T4 Gc Ex nA IIC T4 Gc UL applied for SIL 2

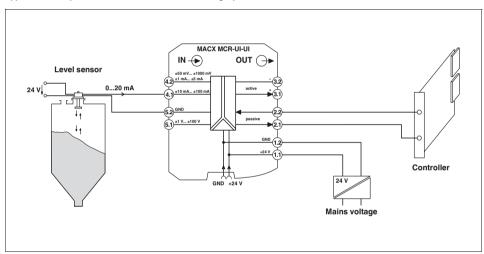
Description	
3-way isolating amplifier, for e	electrical isolation of analog signals
Order configuration	Screw connection
Order configuration	Spring-cage connection
Standard configuration	Screw connection
Standard configuration	Spring-cage connection

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-UI-UI') MACX MCR-UI-UI-SP') MACX MCR-UI-UI-NC') MACX MCR-UI-UI-SP-NC')	2811284 2811572 2811446 2811556	1 1 1	

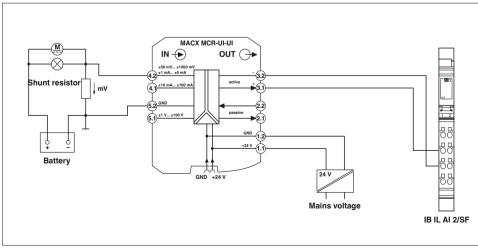
Order key for MACX MCR-UI-UI-... (standard configuration entered as an example)

Order No.	Input			Output		Limit frequency	Factory calibration certifi- cate (FCC)
2811284	1	IN03		/ OU	JT01	/ 10K	/ NONE
2811284 ≘ UI-UI	IN40 ≘ 050 mV IN24 ≘ 060 mV IN41 ≘ 075 mV IN25 ≘ 0100 mV	IN53 ≘ -50+50 mV IN13 ≘ -60+60 mV IN54 ≘ -75+75 mV IN14 ≘ -100+100 mV	IN70	OUT19	OUT15	30 ≘ 30 Hz 10K ≘ 10 kHz	NONE
2811572 ≘ UI-UI-SP	IN43 = 0120 mV IN44 = 0150 mV IN26 = 0200 mV IN27 = 0300 mV IN28 = 0500 mV IN66 = 01000 mV IN50 = 01.5 V IN50 = 01.5 V IN50 = 05 V IN50 = 05 V IN65 = 05 V IN68 = 010 V IN69 = 010 V IN69 = 010 V IN69 = 010 V	IN56	IN36 ≜ 05 mA IN37 ÷ 010 mA IN37 ÷ 015 mA IN01 ≜ 020 mA IN75 ė 030 mA IN76 ė 050 mA IN77 è 0100 mA IN83 ≜ -1.0+1.5 mA IN84 ≜ -1.5+1.5 mA IN85 è -2.0+2.0 mA IN86 è -3.0+3.0 mA IN33 ≜ -5+5 mA IN34 è -10+10 mA IN35 ≜ -20+2.0 mA IN35 ≜ -20+2.0 mA IN39 ≜ -10+10 mA IN87 è -15+15 mA IN38 ≜ -30+30 mA IN90 ≜ -100+100 mA IN91 ≜ 15 mA IN92 ≜ 210 mA IN92 ≜ 210 mA IN92 ≜ 210 mA	OUT20 = -2.5+2.5 V OUT13 = -5+5 V OUT14 = -10+10 V OUT24 = 0.5+2.5 V OUT06 = 15 V OUT04 = 210 V OUT27 = 2.50 V OUT11 = 50 V OUT09 = 100 V	OUT21 ≘ -5+5 mA OUT22 ≘ -10+10 mA OUT23 ≘ -20+20 mA OUT25 ≘ 15 mA OUT02 ≘ 210 mA OUT02 ≘ 420 mA OUT28 ≘ 50 mA OUT29 ≘ 100 mA OUT07 ≘ 200 mA		YESPLUS ≘ FCC with 5 measuring points (a fee is charged)

Application example: level measurement and active analog input card

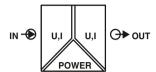


Application example: shunt measurement and Inline terminal with passive analog input channels within an Inline station



 $(Information\ on\ automation\ solutions\ from\ Phoenix\ Contact\ can\ be\ found\ in\ Catalog\ 8\ or\ at\ www.phoenixcontact.net/products)$

Analog IN / Analog OUT 3-way isolating amplifier

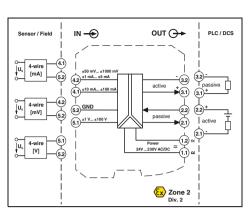


- Analog isolating amplifier for isolating, filtering, amplifying, and converting standard analog signals
- Configurable input and output signals, including bipolar current and voltage signals
- 3-way electrical isolation
- Over 1600 signal conversions can be set via DIP switches on the front
- Output active or passive
- Plug-in capable screw or spring-cage connection method
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Status indicator for supply voltage
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permissible

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

1) EMC: Class A product, see page 571



Input signal (configurable using the DIP switch)

Maximum input signal Input resistance

Output data

Output signal (configurable using the DIP switch)

Maximum output signal

Load R_B

General data Supply voltage U_R

Power dissipation

Electrical isolation

Maximum transmission error Temperature coefficient ZERO / SPAN adjustment

Input/output/power supply

Degree of protection Ambient temperature (operation)

Housing material

Dimensions W / H / D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance ATEX

IECEx UL, USA / Canada

Functional safety (SIL)

GL







Universal, more than 1600 signal combinations, wide-range power supply

Functional safety

Housing width 12.5 mm

Technical data

U input 0 ... 10 V, please indicate if different setting when ordering

±100 V ±100 mA Approx. 1 MΩ (±1 V DC ... ±100 V DC)

Approx. 10 Ω (±10 mA DC ... ±100 mA DC) U output I output

0 ... 20 mA, configurable via DIP switches 15 V 35 mA

 $\geq 1 \text{ k}\Omega (10 \text{ V})$ \leq 600 Ω (20 mA; active) (passive: ≤ (UB-2 V) / I_{outmax})

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 0.8 W (at 24 V DC / 20 mA) < 0.9 W (At 230 V AC / 20 mA)

 \leq 0.1% (Compared to the final value)

0.0075%/K +4% / +4%

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage,

surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

IP20 -20°C ... 70°C PA 66-FR 12.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24$ - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant ⟨E⟩ II 3 G Ex nA IIC T4 Gc Ex nA IIC T4 Gc

SIL 2

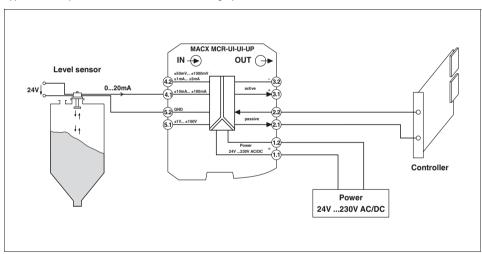
Description 3-way isolating amplifier, for electrical isolation of analog signals with long-range power supply Order configuration Screw connection Order configuration Spring-cage connection Standard configuration Screw connection Standard configuration Spring-cage connection

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-UI-UI-UP1)	2811459	1	
MACX MCR-UI-UI-UP-SP1)	2811585	1	
MACX MCR-UI-UI-UP-NC1)	2811297	1	
MACX MCR-UI-UI-UP-SP-NC1)	2811569	1	

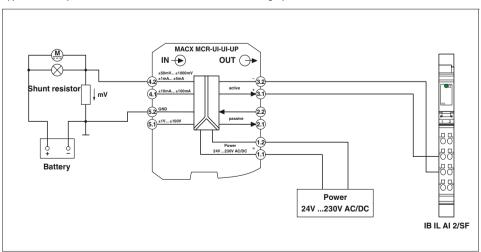
Order key for MACX MCR-UI-UI-... (standard configuration entered as an example)

Output Limit frequency Factory calibration certifi-Input Order No. cate (FCC) 2811459 OUT01 NONE IN40 ≘ 0...50 mV IN24 ≘ 0...60 mV IN70 ≘ 0...1.0 mA IN53 ≘ -50...+50 mV IN13 ≘ -60...+60 mV OUT15 \(\heta\) 0...5 mA OUT16 \(\heta\) 0...10 mA ≙ 30 Hz NONE IN71 = 0...1.5 mA 10K ≘ 10 kHz 2811459 ≘ YES ...-UI-UI-UP IN41 ≘ 0...75 mV IN54 ≘ -75...+75 mV IN72 ≘ 0...2.0 mA is charged) IN25 ≘ 0...100 mV IN43 ≘ 0...120 mV IN56 ≘ -120...+120 mV IN36 ≘ 0...5 mA OUT20 = -2.5...+2.5 V OUT21 ≘ -5...+5 mA YESPLUS FCC with OUT13 = -5...+5 V OUT14 = -10...+10 V OUT22 ≘ -10...+10 mA OUT23 ≘ -20...+20 mA 2811585 ≙ IN44 = 0...150 mV IN37 = 0...10 mA 5 measuring ...-UI-UI-UP-SP IN26 ≘ 0...200 mV IN15 ≘ -200...+200 mV IN74 ≘ 0...15 mA points (a fee is IN27 ≘ 0...300 mV IN28 ≘ 0...500 mV IN16 ≘ -300...+300 mV IN17 ≘ -500...+500 mV charged) OUT24 = 0.5...+2.5 V OUT25 ≘ 1...5 mA IN66 = 0...1000 mV IN29 = 0...1.0 V OUT26 \(\hat{a}\) 2...10 mA OUT02 \(\hat{a}\) 4...20 mA IN78 ≘ -1000...+1000 mV OUT06 ≘ 1...5 V IN18 = -1.0...+1.0 V IN63 = -1.5...+1.5 V OUT04 ≘ 2...10 V IN50 = 0...1.5 V IN30 = 0...2.0 V IN52 = 0...3.0 V IN19 = -2.0...+2.0 V IN65 = -3.0...+3.0 V OUT28 ≘ 5...0 mA OUT29 ≘ 10...0 mA OUT07 ≘ 20...0 mA IN84 ≘ -1.5...+1.5 mA OUT11 = 5...0 V IN05 = 0...5 V IN03 = 0...10 V IN21 = -5...+5 V IN22 = -10...+10 V IN85 ≘ -2.0...+2.0 mA IN86 ≘ -3.0...+3.0 mA OUT09 ≘ 10...0 V IN67 = 0...15 V IN79 ≘ -15...+15 V IN33 ≘ -5...+5 mA IN34 ≘ -10...+10 mA IN39 ≘ 0...30 V IN80 ≘ -30...+30 V IN87 ≘ -15...+15 mA IN81 ≘ -50...+50 V IN82 ≘ -100...+100 V IN35 ≘ -20...+20 mA IN88 ≘ -30...+30 mA IN69 = 0...100 V IN89 ≘ -50...+50 mA IN90 ≘ -100...+100 mA IN04 = 2...10 V IN92 ≘ 2...10 mA IN02 = 4...20 mA

Application example: level measurement and active analog input card

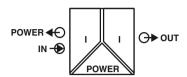


Application example: shunt measurement and Inline terminal with analog input channels within an Inline station



(Information on automation solutions from Phoenix Contact can be found in Catalog 8 or at www.phoenixcontact.net/products)

Analog IN / Analog OUT repeater power supplies



Repeater power supply and input isolating amplifier for the operation of 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources

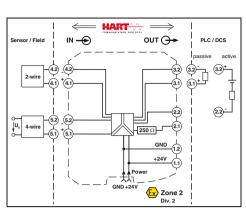
- Input 0/4...20 mA (feeding or non-feeding)
- 0/4...20 mA output (active or passive)
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- Terminal point with 250 Ω resistor to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal Transmitter supply voltage Voltage drop Output data Output signal

Load Output ripple General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Transmission error typical Maximum transmission error Under-/overload range

Electrical isolation

Functional safety (SIL)

Input/output/power supply

Ambient temperature range Status indication SMART communication Signal bandwidth Protocols supported Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance ATEX UL, USA / Canada









Repeater power supply and input isolating amplifier

Functional safety Housing width 12.5 mm

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA

> 16 V (at 20 mA)

< 3.5 V (in input isolating amplifier operation)

0 mA ... 20 mA (active)

4 mA ... 20 mA (active)

0 mA ... 20 mA (14 ... 26 V ext. source voltage) 4 mA ... 20 mA (14 ... 26 V ext. source voltage)

< 600 Ω

< 20 mV_{rms}

19.2 V DC ... 30 V DC

< 60 mA (at 24 V DC)

< 1.1 W (at 24 V DC / 20 mA)

< 0.01%/K

< 600 us (for 4 mA ... 20 mA step)

< 0.05% (of final value)

< 0.1% (of final value)

as per NF 43

2.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) Green LED (supply voltage)

Yes

as per HART specifications

HART PA 66-FR

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 II 3 G Ex nA IIC T4 Gc X

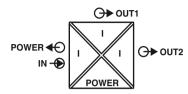
UL applied for

SIL 2 according to EN 61508

Description	
Repeater power supply, with HART®	protocol
	Screw connection Spring-cage conn.

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-SL-RPSSI-I¹) MACX MCR-SL-RPSSI-I-SP¹)	2865955 2924207	1 1	

Analog IN / Analog OUT repeater power supplies



Repeater power supply and input isolating amplifier for the operation of 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources

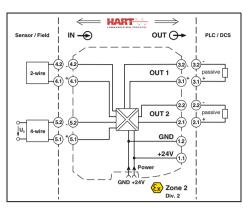
- Input 0/4...20 mA (feeding or non-feeding)
- Two electrically isolated 0/4 ... 20 mA (active) outputs
- Bidirectional transmission of digital HART communication signals (both outputs)
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- 4-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal

Voltage drop

Output data

Output ripple

General data

Supply voltage range

Current consumption

Temperature coefficient

Under-/overload range

Electrical isolation

Status indication

Protocols supported

Dimensions W / H / D

Housing material

Step response (10 - 90%)

Transmission error, typical

Maximum transmission error

Ambient temperature range

SMART communication (Per output)

Power dissipation

Load

Transmitter supply voltage

Output signal (Per output)

Sensor / Field IN	OUT O
2-wire 4.2 -4.2 -4.1 +4.1	0UT 1 passive
U _s 4-wire 5.1 +5.1	OUT 2 (2) (2) passive passive GND (12)
	+24V (1.1)
<u> </u>	Zone 2



Repeater power supply and input isolating amplifier, with two electrically isolated outputs

Functional safety

Housing width 12.5 mm

ı	ıe	CI	าท	ıca	data	1

4 mA ... 20 mA / 0 mA ... 20 mA

> 21.5 V (at 20 mA)

< 3.9 V (in input isolating amplifier operation)

0 mA ... 20 mA (active) 4 mA ... 20 mA (active) < 450 Ω (at 20 mA)

< 20 mV_{rms}

19.2 V DC ... 30 V DC (24 V DC (-20% ... +25%))

< 75 mA (at 24 V DC) < 1.45 W (at 24 V DC / 20 mA)

< 0.01%/K

< 1.3 ms (for 4 mA ... 20 mA step)

< 0.05% (of final value) < 0.1% (of final value)

as per NE 43

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2,

safe isolation as per EN 61010, EN 50178)

Output 1/output 2

Screw connection Spring-cage conn.

Input/output/power supply

1.5 kV AC (50 Hz. 1 min., test voltage) -20°C ... 60°C (Any mounting position) Green LED (PWR supply voltage)

Yes HART PA 66-FR

12.5 / 99 / 114.5 mm

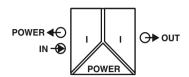
 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 SIL 2 according to EN 61508

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance Functional safety (SIL) Description Repeater power supply, with HART® protocol

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
MACX MCR-SL-RPSSI-2I1)	2924825	1					
MACX MCR-SL-RPSSI-2I-SP1)	2924838	1					

Analog IN / Analog OUT repeater power supplies



Repeater power supply and input isolating amplifier for the operation of 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources

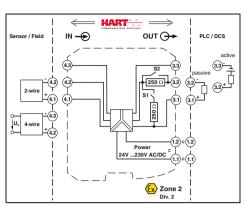
- Input 0/4...20 mA (feeding or non-feeding)
- Output 0/4...20 mA (active or passive), 0/1...5 V, can be switched via the DIP switch
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- -250Ω resistor that can be activated via DIP switches to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Test plugs for test sockets can be found on page 191

1) EMC: Class A product, see page 571



Input data Input signal Transmitter supply voltage Voltage drop

Output data

Output signal

Load Output ripple General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Transmission error typical Maximum transmission error Under-/overload range

Electrical isolation

Input/output/power supply

Ambient temperature range Status indication SMART communication Signal bandwidth Protocols supported Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance

ATFX UL. USA / Canada Functional safety (SIL)









Repeater power supply and input isolating amplifier, wide-range power supply

Functional safety Ex: 🕸

Housing width 17.5 mm

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA

> 16 V (at 20 mA)

< 3.5 V (in input isolating amplifier operation)

0 mA ... 20 mA (active) 4 mA ... 20 mA (active)

0 mA ... 20 mA (14 ... 26 V ext. source voltage) 4 mA ... 20 mA (14 ... 26 V ext. source voltage) 0 V ... 5 V (internal resistance, 250 Ω, 0.1%)

1 V ... 5 V (internal resistance, 250 Ω, 0.1%)

< 600 Ω (I output) < 20 mV_{rms}

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 75 mA (at 24 V DC)

< 1.8 W

< 0.01%/K

< 600 us (for 4 mA ... 20 mA step)

< 0.05% (of final value) < 0.1% (of final value)

as per NE 43

2.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) Green LED (supply voltage)

Yes

as per HART specifications

HART PA 66-FR

17.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

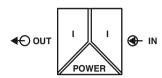
CE-compliant, additionally EN 61326 (E) II 3 G Ex nA IIC T4 Gc X UL applied for

SIL 2 according to EN 61508

Ordering data Order No. Туре MACX MCR-SL-RPSSI-I-UP1) 2865968 MACX MCR-SL-RPSSI-I-UP-SP1 2924210

ocol
Screw connection
Spring-cage conn.

Analog OUT output isolating amplifier



Output isolating amplifier for controlling I/P transducers, control valves, and displays

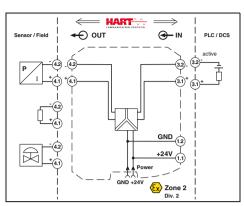
- 0/4 ... 20 mA input
- 0/4 ... 20 mA output
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- Line fault detection (LF)
- 3-way electrical isolation
- Power supply via DIN rail connector
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Functional safety

Housing width 12.5 mm

Input data Input signal Input voltage

Input impedance in the event of a cable break at the output

Output data Output signal Load Output ripple General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Maximum transmission error

Electrical isolation

Functional safety (SIL)

Input/output/power supply

Ambient temperature range Humidity SMART communication Signal bandwidth Protocols supported Housing material Inflammability class according to UL 94 Dimensions $\dot{W}/H/D$ Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance **ATEX**

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA 5.4 V (at 20 mA)

 $> 100 \text{ k}\Omega$ (If there is a line fault)

0 mA ... 20 mA / 4 mA ... 20 mA < 800 Ω (at 20 mA) < 20 mV_{rms}

19.2 V DC ... 30 V DC < 46 mA (at 24 V DC / 20 mA) < 1.1 W (at 24 V DC / 20 mA) < 0.01%/K < 140 µs < 0.1% (of final value)

1.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2. safe isolation as per EN 61010, EN 50178)

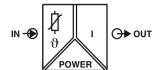
-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) as per HART specifications HART PA 66-FR

12.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 SIL 2 according to EN 61508

		Ordering data				
Description		Туре	Order No.	Pcs. / Pkt.		
Output isolating amplifier						
	Screw connection	MACX MCR-SL-IDSI-I1)	2865971	1		
	Spring-cage conn.	MACX MCR-SL-IDSI-I-SP1)	2924223	1		

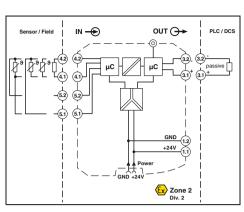
Temperature Temperature transducer



Programmable temperature transducer for operating resistance thermometers and resistance-type sensors. The measured values are converted into a linear 0 ... 20 mA or 4 ... 20 mA signal.

- Input for resistance thermometers and resistance-type sensors
- 0 ... 20 mA or 4 ... 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.
The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).
Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126
For information on the programming adapter, refer to page 119
Test plugs for test sockets can be found on page 191
Information on "Plug and play" connection using system cabling can be found from page 128
1) EMC: Class A product, see page 571



Input data Resistance thermometers Resistor Cable resistance Sensor input current Measuring range span Output data Output signal Load Behavior in the event of a sensor error Output ripple General data Supply voltage range Current consumption Power dissination Temperature coefficient

Transmission error, total

Step response (0 - 99%)

ZERO / SPAN adjustment Electrical isolation

Input/output/power supply

Ambient temperature range Humidity Housing material Inflammability class according to UL 94 Dimensions W / H / D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals Conformance

Functional safety (SIL)

Description	
Temperature transducer	
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

Programming adapter for configuring modules with S-PORT inter



For resistance thermometers and resistance-type sensors

(GL) Ex: (Ex)

Housing width 12.5 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor $0~\Omega \dots 2000~\Omega$ 50Ω per line (200 µA ... 1 mA) min. 50 K

0 mA ... 20 mA / 4 mA ... 20 mA ≤500 Ω As per NE 43 or can be freely defined < 50 μA_{PP}

19.2 V DC ... 30 V DC < 40 mA (24 V DC) < 1 W 0.01%/K Typ 800 ms (With SIL) max. 1200 ms (With SIL) Typ. 700 ms (Without SIL) max. 1100 ms (Without SIL)

0.05% x 100 [K] / measuring range span [K] + 0.05%

±5% / ±5%

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation) PA 66-FR V0 12.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 II 3 G Ex nA ic IIC T4 Gc X SIL 2 according to EN 61508

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
MACX MCR-SL-RTD-I') MACX MCR-SL-RTD-I-SP') MACX MCR-SL-RTD-I-NC') MACX MCR-SL-RTD-I-SP-NC')	2865065 2924317 2865078 2924320	1 1 1					

Accessories		
IFS-USB-PROG-ADAPTER ¹)	2811271	1

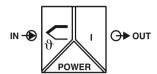
Notes:

Order key and temperature ranges for MACX-MCR-SL-RTD-I(-SP) temperature transducer

Order key for MACX-MCR-SL-RTD-I(-SP) temperature transducer (standard configuration entered as an example)

Order No.	Sensor type	Safety integrity level (SIL)	y level Connection technology		range: End	Measuring unit	Output range	Filter Oversampling	Filter Moving average value
2865065 2865065 ≘ MACX MCR- SL-RTD-I 2924317 ≘ MACX MCR- SL-RTD-I-SP	/ PT100 see below	/ ON ON ≘ active NONE ≘ not active ON only with output range = OUT02	3 2	see be- low	see be- low	/ C	/ OUT02 OUT01 OUT02 420 mA OUT02 additional control of the control of t	/ 10 1	1 1 1 1 = 1 value 2 = 2 values 3 = 3 values 4 = 4 values
	PT50	Resistor Pt 50 acc. to IEC 751 Pt 100 acc. to IEC 751 Pt 200 acc. to IEC 751 Pt 200 acc. to IEC 751 Pt 500 acc. to IEC 751 Pt 500 acc. to Sama RC21-4 Pt 500 acc. to Sama RC21-4 Ni 100 acc. to DIN 43760 Ni 500 acc. to DIN 43760 Cu 50 acc. to GOST 6651-2008 Cu 53 acc. to GOST 6651-2008 Alarm signal Sensor break/ underrange	4-1966 $\theta \ (\alpha = 0.00428)$ $\theta \ (\alpha = 0.00426)$	0 -200 -200 -200 -200 -200 -200 -60 -60 -50 -50	2000 850 850 850 850 600 600 250 250 200 180	Ω °C	25 Ω 50 K 50 K 50 K 50 K 50 K 50 K 50 K 50 K		
	/ 1035			SPLUS = FCC	FCC (a fee i	s charged) suring points (a	Temperature converge $T [^{\circ}F] = \frac{9}{5} T [^{\circ}C] + 35$	rsion guide for °C to °F.	:

Temperature Temperature transducer



Programmable temperature transducer for operating thermocouples and mV sources. The measured values are converted into a linear 0 ... 20 or 4 ... 20 mA signal.

- Input for thermocouples and mV sources
- 0 ... 20 mA or 4 ... 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

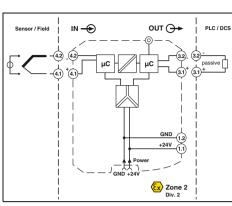
The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

For information on the programming adapter, refer to page 119

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data

Voltage

Output data

Output signal Load

Output ripple

General data

Supply voltage range

Current consumption

Temperature coefficient

Step response (0 - 99%)

Transmission error, total

ZERO / SPAN adjustment

Ambient temperature range

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Cold iunction errors

Electrical isolation

Humidity

Housing material

Conformance **ATEX**

Dimensions W / H / D

Conformance / approvals

Functional safety (SIL)

Power dissipation

Thermocouple sensors

Measuring range span

Behavior in the event of a sensor error



For thermocouples and mV sources

(GL) Ex: (Ex)

Housing width 12.5 mm

Technical data

E, J, K, N as per IEC / EN 60584, L as per DIN 43760

-20 mV ... 70 mV

(Min. 50 K for thermocouples, 3 mV for mV sources)

0 mA ... 20 mA / 4 mA ... 20 mA max 500 O As per NE 43 or can be freely defined

19.2 V DC ... 30 V DC

< 40 mA (24 V DC) < 1 W

0.01%/K

 $< 50 \, \mu A_{PP}$

Typ. 800 ms (With SIL) max 1200 ms (With SII.) Typ. 700 ms (Without SIL) max. 1100 ms (Without SIL)

 $0.05\% \times 200 \text{ [K]/Measuring range span [K]} + 0.05\%$

±1 K

Input/output/power supply

±5% / ±5%

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position)

5% ... 95% (no condensation)

PA 66-FR V0

12.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 / 0.2 \dots 2.5 \, \text{mm}^2 / 24 - 14$

CE-compliant, additionally EN 61326 II 3 G Ex nA ic IIC T4 Gc X SIL 2 according to EN 61508

Description Temperature transducer Order configuration Screw connection Standard configuration Screw connection

Programming adapter for configuring modules with

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
MACX MCR-SL-TC-I¹) MACX MCR-SL-TC-I-NC¹)	2924333 2924346	1					
Accessories							

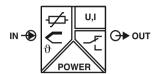
IFS-USB-PROG-ADAPTER1) 2811271

Order key and temperature ranges for MACX-MCR-SL-TC-I temperature transducer

Order key for MACX-MCR-SL-TC-I temperature transducer (standard configuration entered as an example)

Sensor type	Safety integrity level (SIL)	Cold junction compensation	Measuri Start	•	•	Meas unit	uring	Output range	Filter Oversampling			ılue
/ J	/ ON	/ 1	/ 0	/	1000	/	С	/ OUT02	/ 10	_/_	1	/
see below	ON ≘ active NONE ≘ not active ON only with output range = OUTO2	1 ≘ switched on 0 ≘ switched off (e.g., for mV voltage measurement)	see be low		see be- low	F =	°F	OUT01 ≘ 020 mA OUT02 ≘ 420 mA	1	3		
							Sr	mallest measuring range span				
V03 ≘	Voltage (mV)		-20		+70	mV		3 mV				
E ≘	acc. to IEC 584-1 (NiCr-CuN	li)	-250)	1000	°C		50 K				
J ≘	acc. to IEC 584-1 (Fe-CuNi)		-210)	1200			50 K				
K ≘	acc. to IEC 584-1 (NiCr-Ni)		-250)	1372			50 K				
N ≘	acc. to IEC 584-1 (NiCrSi-N	iSi)	-250)	1300							
L ≙	acc. to DIN 43760 (Fe-CuNi)	-200)	900	°C		50 K				
Alarm signal Overrange	Sensor brea underrange	k/ Facto	ory calibra			= FCC						
/ 10:	35 /	1215	NONE					Temperature conversion guide for °C to °F:				
1035 ≘ 3.5 mA 1035 ≘ 3.5 mA YE				YES				$T[^{\circ}F] = \frac{9}{5} T[^{\circ}C] + 32$				
	J see below V03	SIL See below	(SIL) Compensation	Start	Start Sta	(SIL) Compensation Start End J	Start	SIL	Signature Start Start	SIL Signature Signature	Site Site Start End Unit Oversampling Mail	SIL Compensation Start End Unit Oversampling Moving average value See below ON See below

Temperature Temperature transducer



Universal temperature transducer with freely configurable properties

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Relay switching output
- Configuration via software (FDT-DTM) or IFS-OP-UNIT operating and display unit
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in capable screw or spring-cage connection method
- Cold junction compensation with separate connector
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

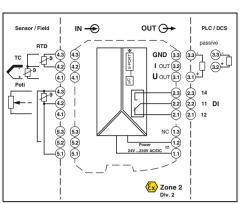
To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on

For information on the programming adapter, refer to page 119

1) EMC: Class A product, see page 571



Input data

Resistance thermometers

Thermocouple sensors

Resistor

Potentiometer Voltage

Output data Output signal

Maximum output signal

Load R_B

Behavior in the event of a sensor error

Switching output

Contact type

Contact material

Maximum switching voltage Maximum switching current

General data

Supply voltage range Power consumption

Temperature coefficien

Transmission error, total

Electrical isolation

Input/output/power supply

Input/output Input/power supply Input/switching output

Ambient temperature range Humidity

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

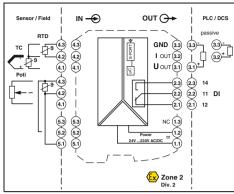
Conformance / approvals

Conformance ATEX

IECEx

Functional safety (SIL)

Programming adapter S-PORT interface











Universal, with switching output, wide-range power supply

Functional safety

Housing width 17.5 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor

B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG

 $0~\Omega ...~50~k\Omega$

 $0~\Omega \dots 50~k\Omega$

-1000 mV ... 1000 mV

U output I output

4 mA ... 20 mA (in the case of SIL; further free configuration without SIL)

±11 V 22 mA \leq 600 Ω (20 mA) ≥ 10 kΩ

According to NE 43 or freely configurable

Relay output

1 PDT

AgSnO₂, hard gold-plated

30 V AC (30 V DC)

0.5 A (30 V AC) / 1 A (30 V DC)

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 1.5 W

0.01%/K

< 0.1% (e.g., for Pt 100, 300 K span, 4 \dots 20 mA)

2.5 kV 1 (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2. safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

375 V (Peak value in accordance with EN 60079-11) -20°C ... 65°C

Typ. 5% ... 95% (no condensation)

PA 66-FR

V0 17.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

 $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

CE-compliant

II 3 G Ex nA nC ic IIC T4 Gc X

Ex nA nC ic IIC T4 Gc X

SIL 2, PL d

Description	
Temperature transducer	
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.
Order configuration	Screw connection
Order configuration	Spring-cage conn.

for configuring modules with

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MACX MCR-T-UI-UP') MACX MCR-T-UI-UP-SP') MACX MCR-T-UI-UP-C') MACX MCR-T-UI-UP-SP-C')	2811394 2811860 2811873 2811970	1 1 1			

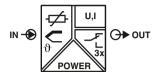
Accessories	;	
IFS-USB-PROG-ADAPTER ¹)	2811271	1

Order key for MACX-MCR-T-UI-UP(-SP)-C temperature transducer (standard configuration entered as an example)

Order No.	Safety integrity level (SIL)	Sensor type	Connection technology	Cold junction com- pensation	Measuring Start	g range: End	Meas unit	suring	Output ran	ge	Factory cali = FCC	bration certificate
2811873	ON	/ PT100	/ 4	0	/ -50	/ 150	/	С	/ OL	JT02	/	NONE
2811873 ≘ MACX MCR- T-UI-UP-C 2811970 ≘ MACX MCR- T-UI-UP-SP-C	ON ≘active NONE ≘ not active ON only with output range = OUT02	see below	2	0 ≘ off, e.g., with RTD, R, potenti- ometer, mV 1 ≘ on, e.g., with TC	see be- low	see below	O P	≘ °C ≘ °F ≘ Ω ≘ % ≘ mV	OUT01 ≘ OUT15 ≘ OUT25 ≘ OUT26 ≘ OUT02 ≘ OUT05 ≘ OUT03 ≘ OUT06 ≘ OUT04 ≘ OUT14 ≘ OUT14 ≘ OUT14 ≘	010 mA 020 mA 05 mA 15 mA 210 mA 420 mA 05 V 010 V 15 V 210 V -5+5 V -10+10 V		without FCC with FCC (a fee is charged) FCC with measuring points (a fee is charged)
									stmeasuring nge span		ig options car -CONF softwa	n be configured are:
Resistance thern			Pt 100 acc. to IEC 7		-200	850	°C		20 K			characteristic curve
Others can be sele ured in the softwar	ected or freely config-		Pt 200 acc. to IEC 7		-200	850	°C		20 K	with 30 int	erpolation poin	ts
ured in the softwar	re.		Pt 500 acc. to IEC 7: Pt 1000 acc. to IEC		-200 -200	850 850	0℃		20 K 20 K	- Output bel	navior in the ev	ent of a short circuit,
			Pt 100 acc. to Sama RC		-200	850	°C		20 K			e/underrange can be
			Pt 1000 acc. to Sama R		-200	850	°C		20 K			ccording to NE43 NE43 upscale)
				6651-2009 (α = 0.00385) Γ 6651-2009 (α = 0.00385)	-200 -200	850 850	0℃		20 K 20 K		_	
			Pt 100 acc. to JIS C		-200	850	°C		20 K	- Filter settir	ng (standard co	onfiguration: 1)
			Pt 1000 acc. to JIS 0		-200	850	°C		20 K		er failsafe (star	ndard configuration:
			Ni 100 acc. to DIN 4 Ni 1000 acc. to DIN		-60 -60	250 250	°C		20 K 20 K	ON)		
			Ni 1000 acc. to Sama		-60	180	°C		20 K	- Switching	behavior: swite	ching output ?
			Ni 1000 acc. to Sam		-60	180	°C		20 K		es, times, etc.)	(standard configura-
			Ni 1000 (Landis & G	• •	-50	160	°C		20 K	tion: OFF)		
			Cu 10 acc. to Sama Cu50 acc. to GOST 665		-70 -50	500 200	°C		100 K 100 K			
			Cu100 acc. to GOST 66		-50	200	°C		100 K			
			Cu53 acc. to GOST 665	i1-2009 (α = 0.00426)	-50	180	°C		100 K			
			KTY81-110 (Philips) KTY84-130 (Philips)		-55 -40	150 300	°C		20 K 20 K			
Thermocouples	(TC)	В ≙	acc. to IEC 584-1 (P	t30Rh-Pt6Rh)	500	1820	°C		50 K			
Others can be sele	ected in the software.		acc. to IEC 584-1 (N		-230	1000	°C		50 K			
			acc. to IEC 584-1 (F		-210	1200 1372	°C		50 K			
			acc. to IEC 584-1 (N acc. to IEC 584-1 (N		-250 -250	1300	°C		50 K			
		R ≘	acc. to IEC 584-1 (P	,	-50	1768	°C		50 K			
			acc. to IEC 584-1 (P	,	-50	1768	°C		50 K			
			acc. to IEC 584-1 (C acc. to DIN 43760 (F	,	-200 -200	400 900	°C		50 K			
			acc. to DIN 43760 (0		-200	600	°C		50 K			
			C ASTM JE988 (200		0	2315	°C		50 K			
			D ASTM JE988 (200 A-1 GOST 8.585-20		0	2315 2500	°C		50 K			
			A-2 GOST 8.585-20		0	1800	°C		50 K			
			A-3 GOST 8.585-20		0	1800	°C		50 K			
			M GOST 8.585-200 L GOST 8.585-2001		-200 -200	100 800	°C		50 K 50 K			
		20	2 000 1 0.000 200 1		200	000			0011			
	ce-type sensors (R)		0150 Ω resistor		0	150	Ω					
(2, 3, 4-conducto Others can be sele	ected in the software.		0600 Ω resistor 01200 Ω resistor		0	600 1200	Ω	10% of	the selected			
			06250 Ω resistor		0	6250	Ω		uring range			
			012500 Ω resistor		0	12500	Ω					
		RES12 ≙	050000 Ω resistor		0	50000	Ω					
Potentiometers		POT03 ≘	0150 Ω potentiom	eter	0	100	%					
(3-conductor)		POT05 ≘	0600 Ω potentiom	eter	0	100	%					
Others can be sele	ected in the software.		01200 Ω potention		0	100	%		the selected uring range			
			06250 Ω potention 012500 Ω potention		0	100	%	illeds	anny range			
			050000 Ω potentio		0	100	%					
Voltage signals ((mV) ected in the software.	V04 ≘	Voltage (mV)		-1000	+1000	mV	10%	of nominal span			

Temperature conversion guide for °C to °F:

Temperature Temperature transducer



Universal temperature transducer with freely configurable properties

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Three limit value relays, can be used in combination as a safe limit value relay
- Configuration via software (FDT-DTM) or IFS-OP-UNIT operating and display unit
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in capable screw or spring-cage connection method
- Cold junction compensation with separate connector
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

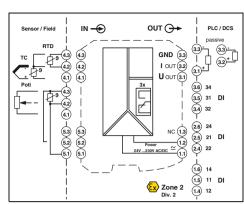
To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 118

For information on the programming adapter, refer to page 119

1) EMC: Class A product, see page 571



Input data

Resistance thermometers

Thermocouple sensors

Resistor

Potentiometer

Voltage Output data

Output signal

Maximum output signal

Load R_B

Behavior in the event of a sensor error

Switching output

Contact type

Contact material

Maximum switching voltage Maximum switching current

General data

Supply voltage range Power consumption

Temperature coefficien

Transmission error, total

Electrical isolation

Input/output/power supply

Input/output Input/power supply Input/switching output

Ambient temperature range Humidity

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance

ATEX

IECEx

Functional safety (SIL)

Description	
Temperature transducer	
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.
Order configuration	Screw connection
Order configuration	Spring-cage conn.

Programming adapter for configuring modules with S-PORT interface









Universal, with three limit value relays, wide-range power supply

Functional safety Ex: 🕸 🖺

Housing width 35 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor

B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG

 $0~\Omega ...~50~k\Omega$

 $0~\Omega \dots 50~k\Omega$

-1000 mV ... 1000 mV

U output I output

4 mA ... 20 mA (in the case of SIL; further free configuration without SIL)

±11 V 22 mA \leq 600 Ω (20 mA) $\geq 10 \text{ k}\Omega$

According to NE 43 or freely configurable

Relay output

3 PDTs

AgSnO₂, hard gold-plated 250 V AC (250 V DC)

2 A (250 V AC) / 2 A (28 V DC)

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 2.4 W

0.01%/K

< 0.1% (e.g., for Pt 100, 300 K span, 4 \dots 20 mA)

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage surge voltage category II; pollution degree 2. safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

-20°C ... 65°C

Typ. 5% ... 95% (no condensation)

PA 66-FR V0

35 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

 $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

CE-compliant

II 3 G Ex nA nC ic IIC T4 Gc X

Ex nA nC ic IIC T4 Gc X

SIL 2, PL d

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MACX MCR-T-UIREL-UP') MACX MCR-T-UIREL-UP-SP') MACX MCR-T-UIREL-UP-C') MACX MCR-T-UIREL-UP-SP-C')	2811378 2811828 2811514 2811831	1 1 1 1			

	,		
Acces	sories	;	
IFS-USB-PROG-ADAPTER ¹)		2811271	1

Order key for MACX-MCR-T-UIREL-UP(-SP)-C temperature transducer (standard configuration entered as an example)

2811514 /												
	ON /	PT100	/ 4	0	/ -50	/ 150	/	C /	OL	JT02	/	NONE
MACX MCR- T-UIREL-UP-C NON 2811831 ≘ MACX MCR- ON 0	N ≘ active NE ≘ not active only with output ge = OUT02	see below	2	0 ≘ off, e.g., with RTD, R, potentiometer, mV 1 ≘ on, e.g., with TC	see be- low	see below	O P	≘ °C ≘ °F ≘ Ω ≘ % ≘ mV	OUT01	010 mA 020 mA 05 mA 15 mA 210 mA 420 mA 05 V 010 V 15 V 210 V -5+5 V -10+10 V	YES	 ⊕ with FCC (a fee is charged) ⇒ FCC with 5 measuring points (a fee is charged)
									st measuring ge span		g options ca -CONF soft	an be configured ware:
Resistance thermome		PT100	Pt 100 acc. to IEC 75	51	-200	850	°C		20 K			r characteristic curve
Others can be selected	or freely config-		Pt 200 acc. to IEC 75		-200	850	°C		20 K	with 30 inte	erpolation po	ints
ured in the software.			Pt 500 acc. to IEC 75 Pt 1000 acc. to IEC 75		-200 -200	850 850	°C		20 K 20 K	- Output beh	navior in the e	event of a short circuit,
			Pt 100 acc. to Sama		-200	850	°C		20 K			ge/underrange can be
			Pt 1000 acc. to Same		-200	850	°C		20 K			according to NE43 : NE43 upscale)
				$651-2009 (\alpha = 0.00385)$ $6651-2009 (\alpha = 0.00385)$	-200 -200	850 850	°C		20 K 20 K	,	Ü	. ,
			Pt 1000 acc. to JIS C1		-200	850	°C		20 K	- Filter settir	ng (standard	configuration: 1)
		PT1000J	Pt 1000 acc. to JIS C	1604/1997	-200	850	°C		20 K	- Restart aft	er failsafe (st	andard configuration:
			Ni 100 acc. to DIN 4		-60	250	°C		20 K	ON)		
			Ni 1000 acc. to Din 4	43760/DIN IEC 60751 BC21-4-1966	-60 -60	250 180	0℃		20 K 20 K	- Switching	behavior: swi	itching output ?
			Ni 1000 acc. to Sam		-60	180	°C		20 K	(limit value) (standard configura-
			Ni 1000 (Landis & G	,	-50	160	°C		20 K	tion: OFF)		
			Cu 10 acc. to Sama Cu 50 acc. to GOST 66		-70 -50	500 200	0℃		100 K 100 K			
			Cu 100 acc. to GOST 6		-50	200	°C		100 K			
			Cu 53 acc. to GOST KTY81-110 (Philips)	6651-2009 (α = 1.426)	-50 -55	180 150	°C		100 K 20 K			
		KTY84 ≘	KTY84-130 (Philips)		-40	300	°C		20 K			
Thermocouples (TC)		B	acc. to IEC 584-1 (Pt	t30Rh-Pt6Rh)	500	1820	°C		50 K			
Others can be selected	in the software.		acc. to IEC 584-1 (N		-230	1000	°C		50 K			
			acc. to IEC 584-1 (Fe acc. to IEC 584-1 (N		-210 -250	1200 1372	0℃		50 K 50 K			
			acc. to IEC 584-1 (N		-250	1300	°C		50 K			
			acc. to IEC 584-1 (P	t13Rh-Pt)	-50	1768	°C		50 K			
			acc. to IEC 584-1 (Pracc. to IEC 584-1 (C		-50 -200	1768 400	°C		50 K			
			acc. to DIN 43760 (F		-200	900	000		50 K 50 K			
		U ≙	acc. to DIN 43760 (C		-200	600	°C		50 K			
			C ASTM JE988 (200		0	2315	°C		50 K			
			D ASTM JE988 (200 A-1 GOST 8.585-200		0	2315 2500	0℃		50 K 50 K			
		A2G ≘	A-2 GOST 8.585-20	01	0	1800	°C		50 K			
			A-3 GOST 8.585-20		-200	1800	°C ○C		50 K			
			M GOST 8.585-2001 L GOST 8.585-2001		-200	100 800	000		50 K 50 K			
Remote resistance-type (2, 3, 4-conductor)	pe sensors (R)		0150Ω resistor 0600Ω resistor		0	150 600	Ω					
Others can be selected	in the software.		01200 Ω resistor		0	1200	Ω		the selected			
			06250 Ω resistor		0	6250	Ω	measi	uring range			
			012500Ω resistor 050000Ω resistor		0	12500 50000	Ω					
Potentiometers			0150Ω potentiome		0	100	%					
(3-conductor) Others can be selected	in the software		0600Ω potentioms 01200Ω potention		0	100 100	%	10% of	the selected			
3 oui			01200 Ω potention 06250 Ω potention		0	100	%		uring range			
		POT10 ≘	012500Ω potentio	meter	0	100	%					
		POT12 ≙	050000 Ω potentio	meter	0	100	%					
Voltage signals (mV) Others can be selected	in the software.	V04	Voltage (mV)		-1000	+1000	mV		of nominal span			

Temperature conversion guide for °C to °F:

General data

Humidity Housing material

Ambient temperature range

Dimensions W / H / D

Conformance / approvals

Operating and display unit

Connection method

Conformance ATEX IFCEx

Description

Description

DIN rail

Accessories Operating and display unit

- Local display of actual values
- Copy function
- Easy guided operation
- Easy configuration without PC software
- Operating and display unit can be snapped directly onto compatible devices with a housing width of 35 mm
- DIN rail mounting possible for thinner devices in conjunction with cradle unit
- Backlighting
- Installation in zone 2 permissible

N	o	to	0	
1.4	v	rc	Э	٠

1) EMC: Class A product, see page 571





PC side

Measuring transducer side



Technical data -20°C ... 65°C (-4°F ... 149°F) 90% (at 25°C, no condensation) PA 6.6 35 / 99 / 20 mm S port (socket) S port (plug) CE-compliant Ex nA ic IIC T4 Gc X

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
IFS-OP-UNIT¹)	2811899	1			

Accessories **Cradle unit**

- For snapping onto the DIN rail
- For control cabinet mounting of the operating and display unit

1) EMC: Class A product, see page 571



Cradle for operating and display unit

Technical data

-20°C ... 65°C (-4°F ... 149°F) 90% (at 25°C, no condensation)

CE-compliant Ex nA ic IIC T4 Gc X

PA 6.6 35.2 / 29 / 99 mm S port (socket) S port (plug)

General data	
Ambient temperature range Humidity Housing material Dimensions W / H / D Connection method	IFS-OP-UNIT operator interface Measuring transducer side
Conformance / approvals	
Conformance ATEX IECEx	

Cradle unit, for snapping the operating and display unit onto the

Ordering data		
Туре	Order No.	Pcs. / Pkt.
IFS-OP-CRADLE¹)	2811886	1

Accessories Programming adapter

The IFS-USB-PROG-ADAPTER programming adapter is used for configuring Phoenix Contact INTERFACE modules with S-PORT interface.

The adapter is used with FDT/DTM software or ANALOG-CONF software. For programming MACX Analog and MINI Analog.

Notes:

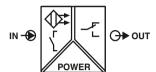
1) EMC: Class A product, see page 571



Applied for: cUL/UL

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
Programming adapter for configuring modules with S-PORT interface	IFS-USB-PROG-ADAPTER1)	2811271	1

Digital IN NAMUR isolation amplifiers



NAMUR isolation amplifier for operating proximity sensors and mechanical contacts

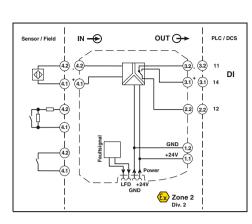
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output Contact type Contact material Maximum switching voltage

Maximum switching capacity Recommended minimum load Mechanical service life

Switching behavior Maximum switching frequency

General data Supply voltage range

Current consumption Power dissipation Electrical isolation

Input/output/supply, T-Connector

Ambient temperature range Humidity

Housing material

Inflammability class according to UL 94

Dimensions W / H / D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance

ATEX

Functional safety (SIL)

NAMUR isolation amplifier Screw connection Spring-cage conn.









Signal output: PDT relay

(1) Functional safety Ex: (Ex)

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output

1 PDT

AgSnO₂, hard gold-plated 250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)

500 VA 5 V / 10 mA 107 cycles Can be inverted via slide switch 20 Hz (without load)

19.2 V DC ... 30 V DC

21 mA (24 V DC) < 650 mW

300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) PA 66-FR

V0

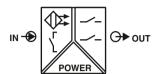
12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

CE-compliant, additionally EN 61326 II 3 G Ex nA nC IIC T4 Gc X SIL 2 according to EN 61508

CIL L docording to LIV 0 1000		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-NAM-R¹) MACX MCR-SL-NAM-R-SP¹)	2865997 2924252	1 1

Digital IN NAMUR isolation amplifiers



NAMUR isolation amplifier for operating proximity sensors and mechanical contacts

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Two relay signal outputs (N/O contact); output 2 can be used as an error message output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

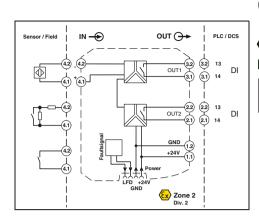
Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal No-load voltage Switching points Switching hysteresis Line error detection

Switching output Contact type Contact material Maximum switching voltage Maximum switching capacity Recommended minimum load Mechanical service life Switching behavior Maximum switching frequency

General data Supply voltage range Current consumption Power dissipation Electrical isolation

ATEX

Functional safety (SIL)

Input/supply, T connector

Output 1/output 2/input, power supply, T connector

Ambient temperature range Humidity Housing material Inflammability class according to UL 94 Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals Conformance

2 signal outputs: N/O contact relay

(I) Functional safety Ex: (Ex) Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA Break 0.05 mA < I_{IN} < 0.35 mA

Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output 2 N/O contacts AgSnO₂, hard gold-plated

250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A) 500 VA

5 V / 10 mA 107 cycles

Can be inverted via slide switch 20 Hz (without load)

19 2 V DC 30 V DC 30 mA (24 V DC) < 950 mW

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

2.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation)

PA 66-FR

12.5 / 99 / 114.5 mm

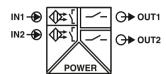
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 (II 3 G Ex nA nC IIC T4 Gc X SIL 2 according to EN 61508

Description	
NAMUR isolation amplifier	
	Screw connection
	Spring-cage conn.

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-NAM-2RO¹) MACX MCR-SL-NAM-2RO-SP¹)	2865010 2924265	1 1

Digital IN NAMUR isolation amplifiers



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

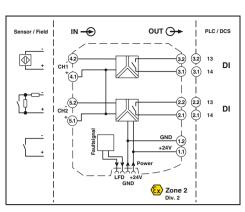
- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (N/O contact)
- Reversible direction of action (operating current or closed-circuit current behav-
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output Contact type

Contact material Maximum switching voltage

Maximum switching capacity Recommended minimum load

Mechanical service life Switching behavior

Maximum switching frequency

General data

Supply voltage range Current consumption Power dissipation Flectrical isolation

Input/supply, T connector

Spring-cage conn.

Output 1/output 2/input, power supply, T connector

Ambient temperature range Humidity

Housing material Inflammability class according to UL 94

Dimensions W / H / D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG) Conformance / approvals

Conformance

Functional safety (SIL)

Description NAMUR isolation amplifier Screw connection





2-channel, signal output: N/O contact relay

(1) Functional safety Ex: (Ex)

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA

Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

2 N/O contacts AgSnO₂, hard gold-plated 250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A) 500 VA 5 V / 10 mA

Relay output

107 cycles Can be inverted via slide switch

20 Hz (without load)

19 2 V DC 30 V DC 35 mA (24 V DC) < 1 W

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

2.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178)

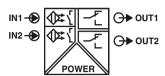
-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation) PA 66-FR 12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 II 3 G Ex nA nC IIC T4 Gc X SIL 2 according to EN 61508

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-2NAM-RO¹) MACX MCR-SL-2NAM-RO-SP¹)	2865049 2924294	1

Digital IN NAMUR isolation amplifiers



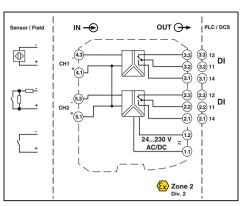
NAMUR isolation amplifier for operating proximity sensors and mechanical contacts

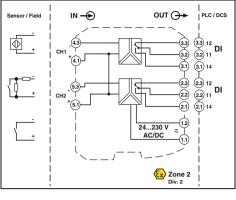
- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Wide-range power supply: 19.2 ... 253 V AC/DC
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:

Information on resistance circuits and marking material can be found on page 183

1) EMC: Class A product, see page 571





Input data Input signal

No-load voltage

Switching points Switching hysteresis

Switching output

Contact material

Maximum switching voltage

Maximum switching capacity

Recommended minimum load

Mechanical service life

Switching behavior Maximum switching frequency

Supply voltage range

Current consumption

Ambient temperature range

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Humidity

Housing material

Conformance ATEX

Dimensions W/H/D

Conformance / approvals

Functional safety (SIL)

Power dissipation

Electrical isolation

General data

Contact type

Line error detection

2-channel, signal output: PDT relay, wide-range power supply

Functional safety Ex: (Ex) Housing width 17.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking)

Approx. 0.2 mA

Break 0.05 mA < I_{IN} < 0.35 mA

Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output

AgSnO₂, hard gold-plated

250 V AC (2 A, 60 Hz) / 120 V DC (0.2 A) / 30 V DC (2 A) 500 VA

5 V / 10 mA 107 cycles

can be inverted using DIP switch

20 Hz (Load-dependent)

24 V 230 V AC/DC (-20% +10% 50 60 Hz)

< 80 mA; < 42 mA (24 V DC)

max. 1.3 W

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

Output 1/output 2/input, power supply

Input/power supply

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C

10% ... 95% (no condensation)

PA 66-FR V٥

17.5 / 99 / 114.5 mm

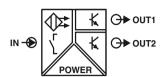
 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

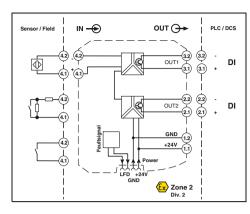
CE-compliant, additionally EN 61326 SIL 2 according to EN 61508

Description	
·	
NAMUR isolation amplifier	Screw connection
	Spring-cage conn.

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-2NAM-R-UP ¹) MACX MCR-SL-2NAM-R-UP-SP ¹)	2865052 2924304	1

Digital IN NAMUR isolation amplifiers





2 signal outputs: transistor (passive)

Technical data

(1) Functional safety Ex: (Ex)

Housing width 12.5 mm

NAMUR isolation amplifier for operating proximity sensors and mechanical contacts

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- 2 signal outputs: transistor (passive); up to 5 kHz
- Signal output 2 can also be used as a fault signaling output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with inhibiting of transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:
Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126
Information about resistance circuits is given on page 183
Information on "Plug and play" connection using system cabling can be found from page 128
1) EMC: Class A product, see page 571

Input data Input signal

No-load voltage Switching points Line error detection

Switching output Maximum switching voltage Maximum switching current Drop (ΔU) Switching behavior Maximum switching frequency

General data Supply voltage range Current consumption Power dissination Electrical isolation

Input/output/supply, T-Connector

Output 1/output 2

Screw connection Spring-cage conn.

Ambient temperature range Humidity Housing material Inflammability class according to UL 94 Dimensions W/H/D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG) Conformance / approvals

Conformance Functional safety (SIL)

NAMUR isolation amplifier

Description

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

2 transistor outputs, passive 30 V DC (per output) 50 mA (short-circuit resistant)

< 1.4 V can be inverted using DIP switch 5 kHz

19.2 V DC ... 30 V DC < 28 mA (24 V DC) 800 mW

300 V.... (Rated insulation voltage surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

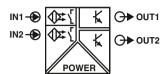
1 kV (50 Hz, 1 min., test voltage) 50 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) PA 66-FR V٥ 12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326 EV II 3 G Ex nA IIC T4 Gc X SIL 2 according to EN 61508

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-NAM-2T1) MACX MCR-SL-NAM-2T-SP1)	2865023 2924278	1

Digital IN NAMUR isolation amplifiers



NAMUR isolation amplifier for operating proximity sensors and mechanical contacts

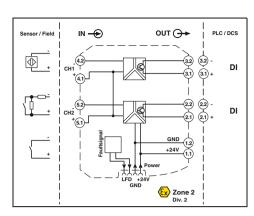
- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Signal output transistor (passive); up to 5 kHz
- Reversible direction of action (operating current or closed-circuit current behav-
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with inhibiting of transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 126

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 128

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Line error detection

Switching output Maximum switching voltage Maximum switching current Drop (ΔU) Switching behavior Maximum switching frequency

General data Supply voltage range Current consumption Power dissipation Electrical isolation

Input/output/supply, T-Connector

Ambient temperature range

Humidity

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance

Description

ATEX

Functional safety (SIL)

NAMUR isolation amplifier

2-channel, signal output transistor (passive)

(I) Functional safety Ex: (Ex)

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6)

Floating switch contacts Switch contacts with resistance circuit

8 V DC ±10%

> 2.1 mA (conductive) / < 1.2 mA (blocking)

Break 0.05 mA < $I_{\rm IN}$ < 0.35 mA Short-circuit 100 Ω < $R_{\rm Sensor}$ < 360 Ω Transistor output, passive

30 V DC (per output)

50 mA (short-circuit resistant)

< 1.4 V can be inverted using DIP switch

5 kHz

1000 mW

19.2 V DC ... 30 V DC < 34 mA (24 V DC)

300 V (Bated insulation voltage surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz. 1 min., test voltage)

Output 1/output 2 1 kV (50 Hz, 1 min., test voltage) 50 V_{rms} (Rated insulation voltage,

surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position)

10% ... 95% (no condensation) PA 66-FR

۷n

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant, additionally EN 61326

SIL 2 according to EN 61508

Screw connection Spring-cage conn.

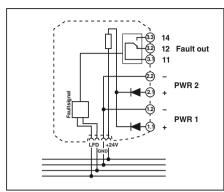
Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-2NAM-T1) MACX MCR-SL-2NAM-T-SP1)	2865036 2924281	1

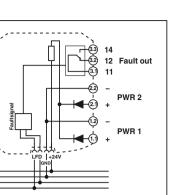
Accessories

Power and error message module

Power and error message module for feeding the 24 V supply voltage to the DIN rail connectors and signaling line faults and power supply failures.

- One-time or redundant supply, decoupled from diode, protected against polariza-
- Supply current up to 3.75 A
- Relay output (PDT) and flashing LED for error messages
- Error message in the event of a power supply failure or fuse fault
- Bus cable fault message for MACX MCR-...(2)NAM... devices connected via DIN rail connectors
- Replaceable fuse
- Installation in zone 2 permissible





Input data Input signal Redundant supply Polarization and surge protection Output data Maximum output signal Output voltage Switching output Contact type Contact material Maximum switching voltage General data Current consumption Ambient temperature range Humidity Fuse Status indication Housing material Inflammability class according to UL 94 Dimensions W / H / D

Conformance / approvals Conformance ATFX **IECE**x

UL, USA / Canada

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)



Ex: (Ex) // Applied for: cUL / UL Housing width 17.5 mm

Technical data

19.2 V DC ... 30 V DC yes, decoupled from diodes

c(UL) es (GL

3.75 A (Input voltage - max 0.8 V at 3.75 A) Relay 1 PDT Gold (Au) 50 V AC (2 A)

-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation) 5 A (replaceable), slow-blow 250 V AC 1 x red I FD (error) 2 x green LEDs (PWR1 and PWR2) Polyamide (PA 6.6) V0 17.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant (E) II 3 G Ex nA nC IIC T4 Gc X Ex nA nC IIC T4 Gc X UL 61010

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-PTB MACX MCR-PTB-SP	2865625 2924184	1

	Description
	Supply and error message module , including the relevant DIN rail connector ME 17,5 TBUS 1,5/5-ST-3,81 GN
	Screw connection

Accessories

ME 6,2 TBUS... T-Connector

DIN rail connector (5-pos.) for bridging the supply voltage of 12.5 mm wide MACX analog modules

- Reduces wiring costs
- System can be extended or module replaced even while process is active
- Inter-extendable



	Ordering data		
Description	Туре	Order No.	Pcs./ Pkt.
DIN rail connector (TBUS), for bridging the supply voltage, can be snapped onto 35 mm DIN rails as per EN 60715, with UL approval			
	ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	10

Accessories

Marking material for device marking

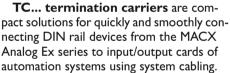
- For device marking inside the control cabinet and in the field
- Self-adhesive with high adhesive strengths
- Large temperature range



		Ordering dat	a	
Description	Color	Туре	Order No.	Pcs. / Pkt.
UniCard, with self-adhesive plastic labels				
10-part, lettering field size: 11 x 9 mm	white	UC-EMLP (11X9)	0819291	10
UniCard, with self-adhesive plastic labels, marked according to customer specifications For ordering details, see Catalog 5 or www.phoenixcontact.net/products				
10-part, lettering field size: 11 x 9 mm	white	UC-EMLP (11X9) CUS	0824547	1

Termination carrier for MACX Analog Ex isolating amplifiers





The termination carriers combine the advantages of modular DIN rail devices with those offered by plug and play rapid cabling solutions to provide a consistent solution for system technology.

Compact

- Saves up to 30% of space due to compact design

Robust and reliable

- Stable, vibration-resistant aluminum carrier device profile
- PCB is completely decoupled from modules
- PCB without active components
- Redundant supply and monitoring in separate DIN rail module

Easy maintenance

- Use of standard DIN rail devices
- Easy access to connection points
- Quick and safe module connection with plug-in and coded cable sets

Flexible

- Horizontal or vertical DIN rail mounting
- Profile section without pitch markings for I/O cards with specific number of chan-
- Can be specifically adapted for I/O cards of various automation systems with different system plug types



Select standard DIN rail device



Select module carrier



Select controller-specific front adapter and system cable



Solutions are also available for MINI Analog, MACX Analog Ex, and Safety

Termination carrier for MACX Analog Ex isolating amplifiers

The TC-D37SUB-ADIO16-EX-P-UNI

universal termination carrier is a compact solution which connects isolating amplifiers from the MACX Analog series to analog or binary input/output cards of automation sys-

The TC-D37SUB-AIO16-EX-PS-UNI

termination carrier design, when combined with the MACX MCR-S-MUX HART multiplexer, also enables communication between HART-capable field devices and a management system.

- Connection of up to 16 single-channel (Ex i-)isolating amplifiers
- Universal 1:1 signal routing to a 37-pos. D-SUB plug-in connector
- For system cables with D-SUB socket and open ends for universal connection
- Redundant supply and monitoring in separate DIN rail module

Contact us: specific termination carrier designs for I/O modules of various automation systems are available, planned or can be implemented according to your specifications

1) EMC: Class A product, see page 571



General data

Connection to the control system level

Number of positions

Maximum operating voltage Maximum permissible current

Rated insulation voltage

Surge voltage category

Pollution degree Rated surge voltage

Air and creepage distances

Degree of protection

Ambient temperature range

Shock

Vibration (operation)

Inflammability class according to UL 94

Dimensions W/H/D Power supply via power module

Input voltage range

Redundant supply

Polarization and surge protection

Fuse

Status indication

Switching output Contact material

Maximum switching voltage

Housing width 244 mm

Technical data

D-SUB pin strip

< 50 V DC (Per signal/channel)

1 A (Signal/channel)

50 V

0.5 kV

DIN EN 50178 (Basic insulation)

-40°C ... 80°C (Please observe module specifications)

15g, according to IEC 60068-2-27 2g, according to IEC 60068-2-6

244 / 170 / 160 mm

19.2 V DC ... 30 V DC

ves, decoupled from diodes Yes

5 A Slow-blow (can be exchanged)

1 x red LED (error) 2 x green LEDs (PWR1 and PWR2)

1 PDT

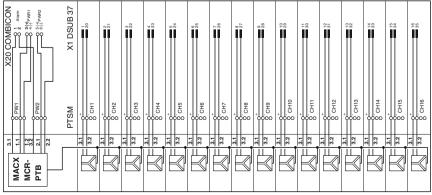
50 V DC (0.3 A) / 30 V DC (2 A) / 33 V AC (2 A)

Description
Universal termination carrier for 16 MACX MCR-EX isolators
- With connection for MACX MCR-S-MUX HART multiplexer

Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
TC-D37SUB-ADIO16-EX-P-UNI TC-D37SUB-AIO16-EX-PS-UNI ¹)	2924854 2902932	1

Supply and error message module
HART multiplexer, 32-channel

Accessories	•	
MACX MCR-PTB	2865625	1
MACX MCR-PTB-SP	2924184	1
MACX MCR-S-MUX	2865599	1



TC-D37SUB-ADIO16-EX-P-UNI and TC-D37SUB-AIO16-EX-PS-UNI connection scheme



Also for special applications

MCR Analog isolating amplifiers and digital displays - for special applications using signal processing.

Isolating amplifiers in the MCR Analog range can be used to record temperatures directly in the field, for example, or to convert digital signals into analog signals. You can monitor your process values using digital displays.

Choose the right MACX Analog isolating amplifier for your application:

Analog IN/Analog OUT

- Configurable signal multipliers to double standard analog signals
- Configurable loop-powered isolators and standard passive isolators for tempera-
- Programmable temperature transducers
- Configurable temperature transducers for Pt 100
- Temperature relay for Pt 100
- Programmable loop-powered temperature transducers.

Frequency

- Programmable frequency transducers for frequencies of up to 120 kHz

Limit value switches

- Limit value switches for standard analog signals

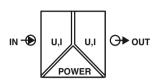
Digital displays

- Programmable digital displays for standard signals
- Setpoint adjuster

Your advantages:

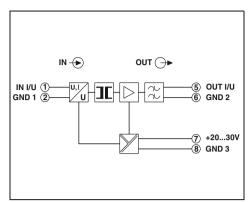
- High operational reliability in the event of disturbances, thanks to electrical isolation
- User-friendly wiring, thanks to plug-in connection terminal blocks
- Easy configuration via software, DIP switches or display keypad
- Digital displays can be programmed without software: via the keypad on the front
- The digital displays are easy to read, thanks to the large five-digit display

Analog IN / Analog OUT 3-way isolating amplifier



- Processing standard signals
- Fixed setting of input and output signals
- 3-way isolation

1) EMC: Class A product, see page 571



Input data Input signal Maximum input signal Input resistance Output data Output signal Maximum output signal Load R_B Linear transmission range (in reference to the output range end value) General data Supply voltage U_B

Current consumption Maximum transmission error Temperature coefficient Limit frequency (3 dB) Step response (10 - 90%) Test voltage, input/output/supply Ambient temperature (operation) Mounting Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Conformance / approvals Conformance



With fixed signal combinations

SN us 🖭 Housing width 12.5 mm

3	
Technical data	
U input	I input
0 10 V / -10 10 V	0 20 mA / 4 20 mA
30 V 100 kΩ	50 mA 50 Ω
U output	l output
0 10 V / -10 10 V	0 20 mA / 4 20 mA
15 V	30 mA
≥ 10 kΩ	≤ 500 Ω
0% 105% -110% 110%	-5% 105%
(Bipolar signals)	

20 V DC ... 30 V DC < 15 mA (without load) \leq 0.3% (of final value), typ. < 0.2% (of final value) < 0.015%/K

30 Hz 11 ms 1.5 kV (50 Hz, 1 min.) -25°C ... 60°C Any Polyamide PA non-reinforced

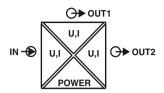
12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 14$

CE-compliant

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
MCR-C-U-I- 4-DC1)	2814537	5
MCR-C-I-U- 4-DC1)	2814511	5
MCR-C-U-U-DC1)	2814469	5
MCR-C-I-I-00-DC1)	2814508	5

Description	
MCR 3-way isolating amplifier, for	or electrical isolation of
analog signals,	
Input signal	Output signal
0 10 V	4 20 mA
4 20 mA	0 10 V
0 10 V, -10 10 V	0 10 V, -10 10 V
0 20 mA, 4 20 mA	0 20 mA, 4 20 mA

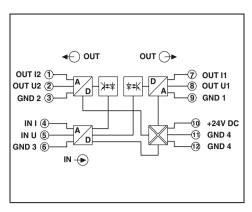
Analog IN/Analog OUT signal multiplier



- 4-way isolation
- Calibrated reversible input and output signals

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

1) EMC: Class A product, see page 571



Input data

Conformance / approvals

Conformance UL, USA / Canada

Input signal
Measuring range span
Maximum input signal
Input resistance
Output data
Output signal (configurable using the DIP switch)
Maximum output signal
Load R _B
General data
Supply voltage U _B
Current consumption
Maximum transmission error
Townseature and finish
Temperature coefficient
Test voltage, input/output/supply
Degree of protection
Ambient temperature (operation)
Housing material
Dimensions W / H / D
Screw connection solid / stranded / AWG

Description
MCR signal multiplier , for multiplication and electrical isolation of analog signals,
Order configuration
Standard configuration



With freely configurable input and two outputs



Housing width 17.5 mm

Housing width 17.5 mm						
Technic	cal data					
U input	l input					
0 V 12 V (freely selectable in 0.1 V steps)	0 mA 24 mA (freely selectable in 0.1 mA steps)					
min. 4 V	min. 8 mA					
30 V	50 mA					
200 kΩ	50 Ω					
U output	I output					
refer to the order key	refer to the order key					
15 V	35 mA					
≥ 10 kΩ	≤ 600 Ω					
20 V DC 30 V DC < 25 mA ≤ 0.15% (of final value), typ. 0.059	% (of final value)					

< 0.015%/K, typ. 0.0075%/K 1.5 kV (50 Hz, 1 min.) IP20 -25°C ... 55°C

Polyamide PA non-reinforced 17.5 / 99 / 114.5 mm

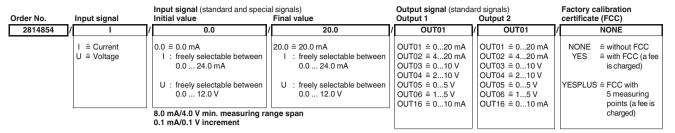
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant

Class I, Div. 2, Groups A, B, C, D or non-hazardous locations

Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
MCR-FL-C-UI-2UI-DCI¹) MCR-FL-C-UI-2UI-DCI-NC¹)	2814854 2814867	1

Order key for MCR-FL-C-UI-2UI-DCI (standard configuration entered as an example)



Ordering examples:		Input signal (standard and speci	Output signal (standa	Factory calibration certifi-		
		Initial value	Final value	Output 1	Output 2	cate (FCC)
2814854 /	I ,	5.3	/ 13.3	/ OUT01	/ OUT01	/ NONE
	I	I	I ≘ 13.3 mA	OUT01	OUT01	NONE

8.0 mA measuring range span, i.e., order is possible.

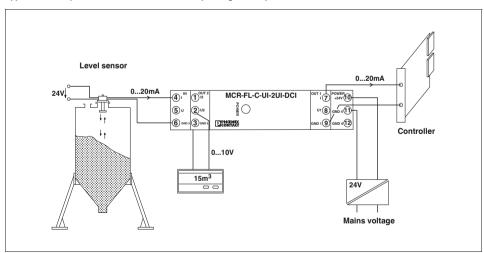
2814854 /	U	7.8	/ 11.8	/ OUT01 /	OUT03	NONE
	U	U ≘ 7.8 V	U	OUT01	OUT03	NONE

4.0 V measuring range span, i.e., order is possible.

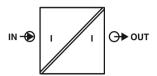
Combination table for input and output signals that can be set via DIP switches

		Output 1						Output 2						
Input	020 mA	420 mA	010 mA	010 V	05 V	15 V	210 V	020 mA	420 mA	010 mA	010 V	05 V	15 V	210 V
020 mA	Х	Х	х	Х	Х	х	х	Х	х	х	х	х	х	Х
420 mA	Х	Х	Х	Х	Х	х	Х	Х	Х	Х	Х	Х	х	Х
010 mA	Х	Х	Х	Х	Х	х	Х	Х	Х	Х	Х	Х	х	Х
210 mA	х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
010 V	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
210 V	Х	Х	Х	Х	Х	х	х	Х	Х	Х	Х	Х	Х	Х
05 V	Х	х	Х	Х	Х	х	х	Х	Х	Х	Х	Х	Х	Х
15 V	х	х	х	х	х	х	х	х	х	х	х	х	х	х

Application example: level measurement with subsequent signal multiplication

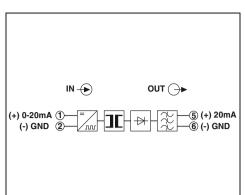


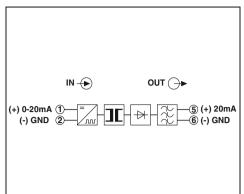
Analog IN / Analog OUT passive isolators



- Electrical isolation without additional auxiliary power supply
- Current signals 0(4)...20 mA
- Safe isolation

When using passive isolators, make sure that the current sourcing maximum current of 20 mA via the passive isolator with the voltage This means:





Input data Input signal

Voltage drop

Output data

Output signal Maximum output signal

General data

Load R_B

Response current

. Maximum input current

Maximum input voltage

Input voltage limitation

Maximum transmission error

Temperature coefficient

Test voltage input/output

Additional error per 100 Ω load

Protection against electric shock

-91us 🕑 Housing width 12.5 mm

0 ... 20 mA / 4 ... 20 mA 2.5 V (at I = 20 mA) < 50 µA 50 mA (100 mA overload) 30 V (30 V overload)

33 V 5% (with Zener diode) 0 ... 20 mA / 4 ... 20 mA < 50 mA

 \leq 1375 Ω (at I = 20 mA output signal)

< 5 mV (rms)

≤ 0.1% (of final value)

0.02% (of measured value / 100 Ω load)

 \leq 0.002%/K (of measured value / 100 Ω load)

4 kV (50 Hz, 1 min.)

Increased insulation according to DIN EN 61 010 part 1 and safe isolation according to VDE 0100 part 410 along the lines of VDE 0106 part 101 up to 300 V AC/DC for surge voltage category II and pollution degree 2 between all isolated distances.

BRIS STORY STATION TO

Was in

1-channel, with safe isolation

Technical data

-10°C ... 70°C Polyamide PA non-reinforced 12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant						
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MCR-SL-1CLP-I-I-00-4KV	2814841	1				

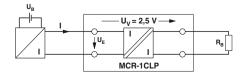
Notes:

voltage of the measuring transducer U_B is sufficient to drive the drop $U_V = 2.5 \text{ V}$ and the load R_B

 $U_B \ge U_E = 2.5 \text{ V} + 20 \text{ mA x R}_B$

Ambient temperature (operation) Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Conformance / approvals Conformance

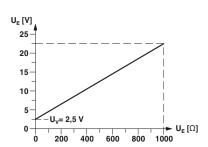
Description
MCR passive isolator, for electrical isolation of current signals without auxiliary power



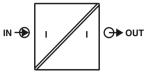
Input voltage in relation to load for $I_A = 20 \text{ mA}$

The diagram shows input voltage U_I in relation to load R_B taking into account voltage failure U...

If the load is known, the minimum voltage the sensor must supply in order to drive the maximum current of 20 mA via the passive isolator and the load can be read on the Y-axis.



Analog IN / Analog OUT passive isolators





- Electrical isolation without additional auxiliary power supply
- Current signals 0(4)...20 mA
- Alternatively 1-, 2- or 4-channel version

Notes:

When using passive isolators, make sure that the current sourcing voltage of the measuring transducer U_B is sufficient to drive the maximum current of 20 mA via the passive isolator with the voltage drop $U_V = 2.5 \text{ V}$ and the load R_B .

This means: $U_B \ge U_E = 2.5 \text{ V} + 20 \text{ mA x R}_B$

IN (OUT ()▶ ⑤ (+) 20mA (+) 0-20mA (1 (-) GND ②



1-, 2- or 4-channel options

Technical data



Input data Input signal Voltage drop Response current Maximum input current Maximum input voltage Input voltage limitation Output data Output signal Maximum output signal Load R_B

Ripple

General data

Additional error per 100 Ω load Temperature coefficient

Test voltage input/output Ambient temperature (operation)

Housing material

Dimensions H / D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

0 20 mA / 4 20 mA 2.5 V (at I = 20 mA) < 50 µA 50 mA (100 mA overload) 30 V (30 V overload) 33 V (with Zener diode)
0 20 mA / 4 20 mA < 50 mA \leq 1375 Ω (at I = 20 mA output signal) < 5 mV (rms)
0.02% (of measured value) ≤ 0.002%/K (of measured value / 100
510 V (50 Hz, 1 min.) -10°C 70°C Polyamide PA non-reinforced

measured value) K (of measured value / 100 Ω load)

PA non-reinforced

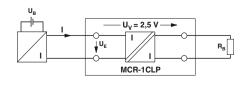
99 / 114.5 mm

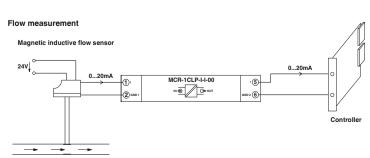
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant

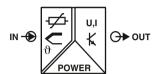
Ordering	Ordering data					
Туре	Order No.	Pcs. / Pkt.				
MCR-1CLP-I-I-00	2814016	1				
MCR-2CLP-I-I-00	2814029	1				
MCR-4CI P-I-I-00	2814045	1				







Temperature Temperature transducer

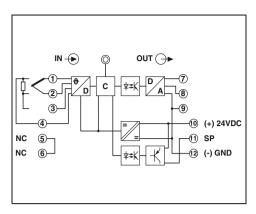


- For resistance thermometers and thermocouples
- Measure differential temperatures
- With transistor switching output
- Freely programmable via MCR/PI-CONF-WIN
- Option of inverse output signal ranges

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Further information about the configuration software can be found on page 149

1) EMC: Class A product, see page 571





Resistance thermometers

Thermocouple sensors

Voltage

Temperature range

Sensor input current

Output data

Output signal

Maximum output signal D/A resolution

Load R_B

Ripple

Output signal with open circuit

Measuring range overrange/underrange Switching output





For resistance thermometers, thermocouples, resistance-type sensors, and mV sources

.**91**0 gu Ex: • 🕪 "

Housing width 17.5 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor U, T, L, J, E, K, N, S, R, B, C, W, HK

0 Ω ... 8000 Ω (freely adjustable, min. measuring range 100 Ω)

-20 mV ... 2400 mV

(freely adjustable, minimum measuring range span of 10 mV) (Depending on sensor type used)

250 μA (resistance thermometer)

U output 0 ... 5 V / 0 ... 10 V 0 ... 20 mA / 4 ... 20 mA -5 ... 5 V / -10 ... 10 V ±12 V 24 mA ±12 bit ±12 bit ≤ 500 Ω ≥ 10 kΩ $< 20 \text{ mV}_{PP}$ -12 V ... 12 V 0 A ... 24 mA -12 V ... 12 V 0 A ... 24 mA

Transistor output, pnp

Can carry a load of 100 mA, switches supply voltage (not protected against short-circuit); locked in case of order-specific configuration, otherwise freely programmable through MCR/PI-CONF-WIN

General data

Supply voltage U_B Current consumption Maximum transmission error

Cold junction errors Temperature coefficient

Test voltage input/output Test voltage input/power supply Ambient temperature (operation)

Mounting Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG

Conformance / approvals Conformance UL, USA / Canada

GL

18 V DC ... 30 V DC

≤ 60 mA, typ. 40 mA

 \leq 0.1% (of maximum range, \pm 6 mV or \pm 12 μ A at output)

 \leq 3 K, typ. 1.5 K ≤ 0.01%/K, typ. 0.005%/K 1 kV (50 Hz, 1 min.) 1 kV (50 Hz. 1 min.) -20°C ... 65°C Any

Polyamide PA non-reinforced

17.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant

Class I, Div. 2, Groups A, B, C, D or non-hazardous locations Germanischer Lloyd

Description
MCR temperature measuring transducers, for resistance thermometers and thermocouple sensors, with electrical isolation of input/output and input/supply voltage
Order configuration Standard configuration Order configuration, without electrical isolation
Standard configuration, without electrical isolation

defination bloyd						
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MCR-T-UI-E ¹)	2814113	1				
MCR-T-UI-E-NC¹) MCR-T-UI¹)	2814126 2814090	1 1				
MCR-T-UI-NC¹)	2814100	1				

Order key for MCR-T-UI(-E)... (standard configuration entered as an example)

Sensor type Input characteristic curve Connection Measuring range: Measur-Output Output charac-**Factory calibration** End Order No. technology Start ing unit teristic curve certificate (FCC) OUT02 2814113 PT100 3 -200.0 +850.0 С NONE C ≙ °C See tables 2 2 -conductor for 0 mA for 20 mA N Normal NONE ≘ without FCC 2814113 ≘ under "Sen-(e.g., +850.0°C) F≙°F I ≘ Inverse ê with FCC (a fee (e.g., -200.0°C) OUT03 ≘ 0 10 V MCR-T-UI-F sor type" is charged) 2814090 ≘ P = % Cu10, Cu50, Cu53, OUT13 ≘ -5...+5 V YESPLUS ≘ FCC with thermocouple, resistor, potentiometer, MCR-T-UI KTY81-110 5 measuring thermocouple, points (a fee is resistor, voltage charged) notentiometer voltage

Resistance thermometers

Sensor type 1)	Standard (input charac- teristic curve)	Measuring range	Smallest measuring range span
PT	DIN/SAMA	-200°C 850°C	0.4 K
NI	DIN/SAMA	-60°C 180°C	0.4 K
Ni1000	Landis & Gyr	-50°C 160°C	0.4 K
CU10	SAMA	-70°C 500°C	0.4 K
CU50	_	-50°C 200°C	0.4 K
CU53	_	-50°C 180°C	0.4 K
KTY81	Philips	-55°C 150°C	0.4 K
KTY84	-	-40°C 300°C	0.4 K

Temperature ranges according to IEC 60751/EN 60751 and DIN 43760 SAMA RC 21-4-1966 with 2, 3 or 4-conductor circuit.

Other types or characteristic curves available on request.

Thermocouples

Sensor type	Thermocou- ple	Measuring range	Smallest measuring range span
U	Cu-CuNi	-200°C 600°C	> 1 K
T 2)	Cu-CuNi	-200°C 400°C	> 1 K
L	Fe-CuNi	-200°C 900°C	> 1 K
J 2)	Fe-CuNi	-210°C 1200°C	> 1 K
E 2)	NiCr-CuNi	-226°C 1000°C	> 1 K
K 2)	NiCr-Ni	-200°C 1372°C	> 1 K
N 2)	NiCrSi-NiSi	-200°C 1300°C	> 1 K
S 2)	Pt10Rh-Pt	-50°C 1768°C	> 4 K
R 2)	Pt13Rh-Pt	-50°C 1768°C	> 4 K
B 2)	Pt30Rh-Pt6Rh	500°C 1820°C	> 10 K
С		-18°C 2316°C	> 4 K
W		-18°C 2316°C	> 4 K
HK		-200°C 800°C	> 1 K

2) Thermocouples according to IEC 60584/EN 60584.

Other types or characteristic curves available on request.

Resistors, potentiometers, mV voltages

Sensor type	Input	Measuring range	Smallest measuring range span
RES	Resistor	$0~\Omega~~8000~\Omega$ (2-conductor)	2Ω
POT	Potentiometer (max. 8 kΩ)	0 100% (3-conductor)	0.2%
V01	Voltage	-20 mV+2400 mV	2 mV

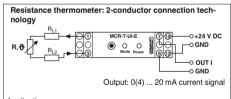
Temperature conversion guide for °C to °F:

$$T[^{\circ}F] = -T[^{\circ}C] + 32$$

Ordering examples with different input versions:

Resistance thermometer	2814113 / PT100 / D // 3 / -200.0 / +850.0 / C / OUT02 / N / NONE
	(Configuration for 3-conductor Pt 100 sensor; according to DIN from -200.0°C to +850.0°C with 4 20 mA output characteristic curve)
Thermocouple	2814113 / J / 0 / 0 / -346 / +2192 / F / OUT02 / I / NONE
	(Configuration for type J thermocouple from -346°F to +2192°F with 20 4 mA output characteristic curve)
Voltage	2814113 / V01 / 0 / 0 / -10 / 1200 / V / OUT03 / I / NONE
	(Configuration for voltage input from -10 mV to +1200 mV with 10 0 V output characteristic curve)
Resistor	2814113 / RES / 0 / 0 / 0 / 7500 / O / OUT05 / N / NONE
(2-conductor connection)	(Configuration for connecting a resistor varying between 0 Ω and 7500 Ω . The output signal is 0 5 V.)
Potentiometer	2814113 / POT / 0 / 0 / 10 / 90 / P / OUT02 / N / NONE
(3-conductor connection)	(Configuration for connecting a 3-conductor potentiometer, where 10 90% of the range is used. The output signal is 4 20 mA.)

Application examples:



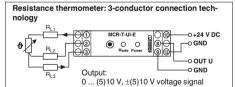
Application:

For short distances (< 10 m)

Please note:

 Cable resistances R_{1,1} and R_{1,2} are incorporated in the measurement result directly and falsify the result accordingly (example for Pt 100: $0.385~\Omega$ \cong 1 K).

Compensation of ±5% is possible.

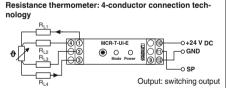


Application:

 For long distances between the Pt 100 sensor and the MCR module (R_{L1}, R_{L2}, R_{L3} \leq 25 Ω)

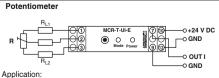
Please note:

To compensate the cable resistance, all cable resistances must have exactly the same values $(R_{L1} = R_{L2} = R_{L3})$



Application:

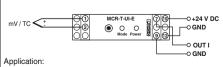
- For long distances between the Pt 100 sensor and the MCR module and different cable resistances (R_{L1} \neq R_{L2} \neq R_{L3} \neq R_{L4}) Please note:
- The cable resistance (R_{L2} + R_{L4}) must not exceed a value of 50 Ω.



For short distances and gradual changes.

Please note:

 Cable resistances R_{1,4} and R_{1,5} are incorporated in the measure. ment result directly and falsify the result accordingly. Compensation of ±5% is possible

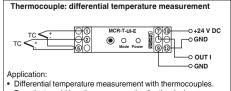


Thermocouple: absolute temperature measurement

Connecting a thermocouple or an mV signal.

Note:

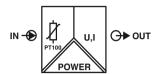
 Activate cold junction compensation for the device in the case of thermocouple measurements.



· Deactivate cold junction compensation for the device

¹⁾ Note: Pt sensors in increments of 10, 20, ...100 and 100, 200, ... 1000, 2000,

Temperature Temperature transducer

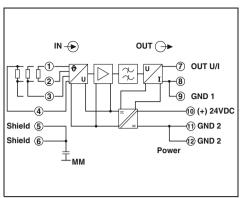


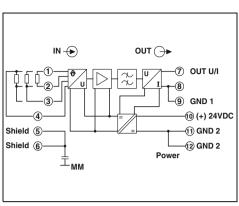
- Temperature range adjustable via DIP switch
- ZERO/SPAN adjustment
- Open circuit detection
- Alternatively with galvanically isolated supply voltage

Notes:

When ordering, you must use the order key to specify the desired configuration.

1) EMC: Class A product, see page 571







For Pt 100, either voltage or current output

P 20 LP 3

Housing width 17.5 mm

Input data
Resistance thermometers
Temperature range
Sensor input current
Output data
Output signal
Maximum output signal
Load R _B
Output signal with open circuit
General data
Supply voltage U _B
Current consumption
Maximum transmission error
Temperature coefficient
ZERO / SPAN adjustment
Step response (10 - 90%)
Test voltage power supply/signal
Ambient temperature (operation)
Housing material
Dimensions W/H/D
Screw connection solid / stranded / AWG
Conformance / approvals
Conformance
UL. USA / Canada

Technical data				
Pt 100 (IEC 60751/EN 60751): 2, 3, 4-conductor 0°C 300°C (0 100/150/200/300) / -50°C 250°C (-50 50/100/150/250) Approx. 1 mA				
U output		I output		
0 10 V 15 V ≥ 10 kΩ > 11 V		0 20 mA / 4 30 mA ≤ 500 Ω > 22 mA	. 20 mA	
U-DC	I-DC	- U	l	
35 mA ≤ 0.4% (of final ≤ 0.02%/K ±5% / ±5% 11 ms 750 V AC (50 H. -20°C 65°C Polyamide PA n 17.5 / 99 / 114.5	60 mA value) z, 1 min.) on-reinforced		20 30 V DC 45 mA	
CE-compliant UL 508 Recogn	ized			

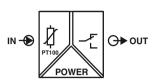
Description
MCR temperature measuring transducer, for Pt 100 temperature
sensors with 2, 3, 4-conductor technology with electrically isolated supply voltage
Output: 00.10 V
Output: 0(4)20 mA
Output: 010 V, without electrical isolation
Output: 0(4)20 mA, without electrical isolation

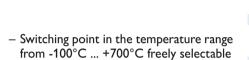
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MCR-PT100-U-DC¹) MCR-PT100-I-DC¹) MCR-PT100-U¹) MCR-PT100-I¹)	2810311 2810337 2810340 2810353	1 1 1	

Order key MCR-PT100-...(-DC) (standard configuration entered as example)

Order No.	Connection method	Temperature range	Output	Factory calibration certificate
2810337	/ 3	/ TR05	/ OUT02	/ NONE
2810311 ≘ MCR-PT100-U-DC 2810337 ≘ MCR-PT100-I-DC 2810340 ≘ MCR-PT100-U 2810353 ≘ MCR-PT100-I	2	TR01 ≘ -50+50°C TR02 ≘ -50+100°C TR03 ≘ -50+150°C TR04 ≘ -50+250°C TR05 ≘ 0100°C TR06 ≘ 0150°C TR07 ≘ 0200°C TR08 ≘ 0300°C	OUT01 OUT02 420 mA With the devices: 2810311 MCR-PT100-U-DC 2810340 MCR-PT100-U The output signal is 010 V. No details are necessary.	NONE

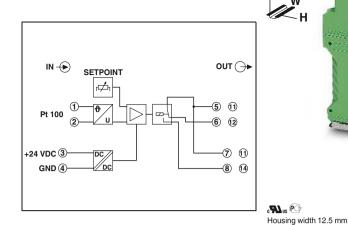
Temperature Temperature relay





- Changeover relay output
- Galvanically isolated
- Adjustable switch hysteresis

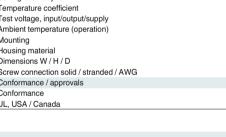
1) EMC: Class A product, see page 571



Input data Resistance thermometers Temperature range Sensor input current Switching output Contact type Contact material Maximum switching current Operate delay time Off delay time Switching hysteresis

Error/status indicator

General data Supply voltage U_B Current consumption Linearity error Setting accuracy Temperature coefficient Test voltage, input/output/supply Ambient temperature (operation) Mounting Housing material Dimensions W / H / D Screw connection solid / stranded / AWG Conformance / approvals Confor



Conformance
UL, USA / Canada
Description
MCR temperature relay, for Pt 100 in 2-conductor system



Technical data

Pt 100 (IEC 60751/EN 60751): 2-conductor -100°C ... 700°C Approx. 1 mA Relay output AgSnO, hard gold-plated 50 mA (for gold layer, 30 V AC/ 36 V DC)

2 A (in case of a destroyed gold layer, 250 V AC)

Approx. 6 ms Approx. 200 ms

Adjustable using DIP switches (0.5 K, 2 K, 3 K, 5 K)

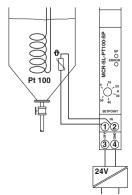
Red LED (short-circuit/wire break) / Yellow LED (relay active)

20 V DC ... 30 V DC < 30 mA < 0.1% < 1%, typ. < 0.5% < 0.01%/K, typ. 0.005%/K 1.5 kV (50 Hz, 1 min.) -20°C ... 65°C Polyamide PA non-reinforced

12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$

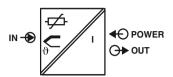
CE-compliant

UL 508 Recognized				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
MCR-SL-PT100-SP1)	2814948	1		



Application example - Temperature control of a heated medium 1 = mains voltage

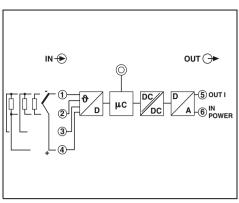
Temperature Temperature transducer



- Two-wire transmitter for resistance thermometers, thermocouples, resistance-type, and voltage sensors
- Freely programmable via MCR/PI-CONF-WIN

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond. connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. For this purpose, you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN configuration software, see page 149



Input data

Resistance thermometers

Thermocouple sensors

Resistor

Voltage

Output data Output signal

Load R_B

Output signal with short-circuit

Output signal with open circuit Measuring range overrange/underrange

Supply voltage U_B Current consumption

Transmission error

Resistance thermometers Thermocouple sensors Resistance-type sensors Voltage sensor

Step response (10 - 90%) Pickup delay

Test voltage input/output Degree of protection

Ambient temperature (operation) Mounting

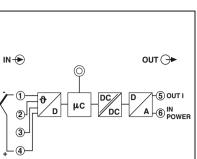
Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

UL, USA / Canada







Loop-powered, programmable

Housing width 12.5 mm

Technical data

Pt, Ni (100, 500, 1000);

minimum measurement range 10 K: 2, 3, 4-conductor

B, C, D, E, J, K, L, N, R, S, T, U;

minimum measurement range 50 K/500 K (Resistance-type sensor from 10 Ω to 400 Ω and from 10 Ω to 2000 Ω ;

minimum measurement range 10 $\Omega/100~\Omega)$

4 ... 20 mA / 20 ... 4 mA

(Max (V_{supply} -12 V) / 0.023 A (current output))

-10 mV ... 100 mV (min. measurement range 5 mV)

≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)

≤ 3.6 mA or ≥ 21 mA (adjustable)

≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)

12 V DC ... 35 V DC

< 3.5 mA

0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000) Type 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)

 $\pm 0.1 \Omega (10...400 \Omega), \pm 1.5 \Omega (10...2000 \Omega)$

 $\pm 20 \,\mu V \,(-10...100 \,mV)$

<2s

4 s

2 kV (50 Hz, 1 min.) IP20

-40°C ... 85°C

Anv

Polyamide PA non-reinforced

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

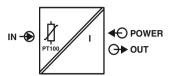
CE-compliant

Class I, Div. 2, Groups A, B, C, D

Ordering data Pcs / Order No. Pkt. MCR-FL-T-LP-I 2864561 1

Description	
MCR temperature measuring transducer, loop-powered	
for resistance thermometers, thermocouples, resistance-type, an voltage sensors	d

Temperature Temperature transducer

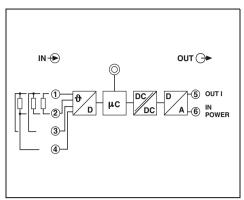


- Two-wire transmitter for Pt 100 resistance thermometers
- Freely programmable via MCR/PI-CONF-WIN

Notes:

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond. connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. For this purpose, you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN configuration software, see page 149



Input data

Output data

Resistance thermometers





Loop-powered, programmable



Housing width 12.5 mm

	data

Pt 100; minimum measurement range 10 K: 2, 3, 4-conductor

4 ... 20 mA / 20 ... 4 mA

(Max (V_{supply} -12 V) / 0.023 A (current output))

 \leq 3.6 mA or \geq 21 mA (adjustable)

 \leq 3.6 mA or \geq 21 mA (adjustable)

 \leq 20.5 mA / \geq 3.8 mA (linear increase/decrease)

12 V DC ... 35 V DC

< 3.5 mA

0.2 K <2s

4 s 2 kV (50 Hz, 1 min.)

IP20 -40°C ... 85°C

Any

Polyamide PA non-reinforced

12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 24$

CE-compliant

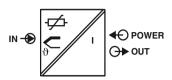
Class I, Div. 2, Groups A, B, C, D

Output signal Load R _B	
Output signal with short-circuit Output signal with open circuit	
Measuring range overrange/underrange	е
General data	
Supply voltage U _B Current consumption	
Transmission error	Resistance thermometers
Step response (10 - 90%)	
Pickup delay	
Test voltage input/output Degree of protection	
Ambient temperature (operation)	
Mounting	
Housing material	
Dimensions W / H / D	
Screw connection solid / stranded / AW	/G
Conformance / approvals	
Conformance	
UL, USA / Canada	

	Ordering data	
Description	Туре	Order No.
MCR temperature measuring transducer, loop-powered		
for Pt 100 resistance thermometer	MCR-SL-PT100-LP-I	2864558

Pcs. / Pkt.

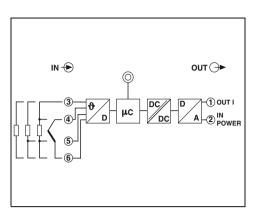
Temperature Temperature head transmitter



- Two-wire transmitter for resistance thermometers, thermocouples, resistance-type, and voltage sensors
- For mounting in the connecting head, form B
- Freely programmable via MCR/PI-CONF-WIN

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond. connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. For this purpose, you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN configuration software, see page 149







Loop-powered, programmable



Technical data

Pt, Ni (100, 500, 1000);

minimum measurement range 10 K: 2, 3, 4-conductor

B, C, D, E, J, K, L, N, R, S, T, U;

minimum measurement range 50 K/500 K

(Resistance-type sensor from 10 Ω to 400 Ω and from 10 Ω to 2000 Ω ; minimum measurement range 10 $\Omega/100~\Omega)$

-10 mV ... 75 mV (min. measurement range 5 mV)

4 ... 20 mA / 20 ... 4 mA

(Max (V_{supply} - 8 V) / 0.025 A (current output))

≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)

≤ 3.6 mA or ≥ 21 mA (adjustable)

≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)

Output signal with short-circuit

Output signal with open circuit

Measuring range overrange/underrange

Input data

Resistor

Voltage

Load R_B

Output data

Output signal

Resistance thermometers

Thermocouple sensors

Supply voltage U_B Current consumption

Transmission error

Resistance thermometers Thermocouple sensors Resistance-type sensors Voltage sensor

Step response (10 - 90%) Pickup delay

Test voltage input/output Degree of protection

Ambient temperature (operation)

Mountina

Housing material

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

UL, USA / Canada

8 V DC ... 35 V DC

< 3.5 mA

0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000) Type 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R) $\pm 0.1 \Omega (10...400 \Omega), \pm 1.5 \Omega (10...2000 \Omega)$

±20 μV (-10...100 mV)

<2s

6 s

2 kV (50 Hz, 1 min.)

IP00, IP66 (integrated in the connecting head)

-40°C ... 85°C

Anv

Polycarbonate, PC

0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15

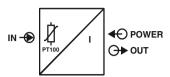
CE-compliant

Class I, Div. 2, Groups A, B, C, D

	Ø44 Ø33
7.0	50000

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
MCR temperature measuring transducer, loop-powered			
for resistance thermometers, thermocouples, resistance-type, and voltage sensors	MCR-FL-HT-T-I	2864529	1

Temperature Temperature head transmitter



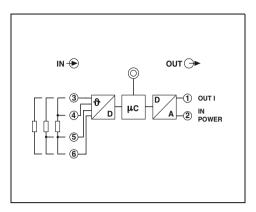


- Two-wire transmitter for Pt 100 resistance thermometers
- For mounting in the connecting head,
- Freely programmable via MCR/PI-CONF-WIN

Notes:

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond.connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. For this purpose, you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN configuration software, see page 149



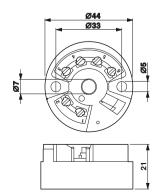


Loop-powered, programmable

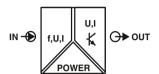


		i echnicai data
Input data		
Resistance thermometers		Pt 100 ; minimum measurement range 10 K : 2, 3, 4-conductor
Output data		
Output signal		4 20 mA / 20 4 mA
Load R _B		(Max (V _{supply} - 10 V) / 0.023 A (current output))
Output signal with short-circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Output signal with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Measuring range overrange/underrang	е	≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)
General data		
Supply voltage U _B		10 V DC 35 V DC
Current consumption		< 3.5 mA
Transmission error	Resistance thermometers	0.2 K
Step response (10 - 90%)		<2s
Pickup delay		4 s
Degree of protection		IP00, IP54 (integrated in the connecting head)
Ambient temperature (operation)		-40°C 85°C
Mounting		Any
Housing material		Polycarbonate, PC
Conformance / approvals		
Conformance		CE-compliant
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D

Ordering data		
Туре	Order No.	Po F
MCR-SL-HT-PT 100-I	2864516	
	Ordering	Ordering data Type Order No.



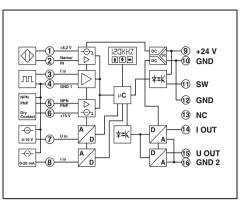
Frequency Frequency transducer



- Frequencies up to 120 kHz
- For NAMUR sensors, floating contacts, frequency generators, and NPN/PNP transistor outputs
- Analog and switching output
- 3-way isolation
- Programmable using membrane keypad or software
- Display of input or output signal

Further information about the configuration software can be found on page 149

1) EMC: Class A product, see page 571



Input data Frequency range Input sources

Transducer supply Signal level

Maximum input signal Signal form Pulse length Resolution Signal conversion time Input data Input signal

Maximum input signal Input resistance Resolution Output data Output signal Maximum output signal Load R_B Ripple

General data

Switching output

Supply voltage U_B Current consumption Maximum transmission error Temperature coefficient ZERO / SPAN adjustment Step response (10 - 90%) Test voltage, input/output/supply Ambient temperature (operation)

Status indication Operating elements

Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG

Conformance / approvals Conformance UL, USA / Canada GL

their inverse signals

Description MCR frequency measuring transducer, for conversion of frequencies into analog signals 0(4)...20 mA, 0...(5)10 V and





Programmable, for frequencies of up to 120 kHz

c¶us P⊕ (Bl Ex: (ŪL)us Housing width 45 mm

Technical data

Frequency input 0.1 Hz ... 120 kHz NPN/PNP transistor outputs NAMUR initiators Floating relay contact (dry contact) Frequency generator Approx. 15 V DC / max. 25 mA (constant) 2 V_{PP} (In case of rectangle 0.1 Hz ... 120 kHz) $2 V_{pp}$ (In case of sine 8 Hz ... 120 kHz) $13 V_{pp}$ (In case of sine 1 Hz ... 120 kHz) 30 V (incl. DC voltage)

Anv ≥ 1 µs > 12 bit < 32 ms

Isolating amplifier function

0 V ... 10 V (freely adjustable) 0 mA ... 20 mA (freely adjustable)

12 V 24 mA 95 kΩ 200 Ω 14 bit (full-scale) 14 bit (full-scale) U output I output 0...5V/0...10V 0 ... 20 mA 12 5 V 25 mA ≥ 500 Ω ≤ 500 Ω < 20 mV_{PP}

Transistor output, pnp

Switches supply voltage to terminal block SW, can carry a load of 100 mA, not protected against short-circuit

20 V DC ... 30 V DC

< 60 mA (without load, without switching output)

≤ 0.15% (of measured value), typ. 0.1%

0.015%/K, typ. 0.01%/K

±25% / ±25% < 25 ms

1.5 kV (50 Hz, 1 min.)

-20°C ... 65°C (for specified data)

LC display

Membrane keypad with 3 keys and LCD display

45 / 75 / 110 mm

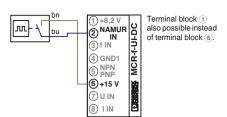
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Class I, Div. 2, Groups A, B, C, D or non-hazardous locations

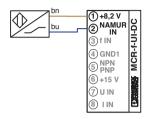
dermanischer Libyd				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
MCR-F-UI-DC1)	2814605	1		

Connection examples for common frequency transmitters

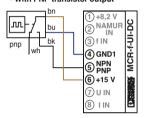
2-wire DC (mechanical contact)



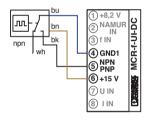
2-wire DC NAMUR sensor



4-wire DC · With PNP transistor output



With NPN transistor output



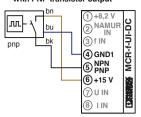
Application examples:

The MCR-F-UI-DC frequency transducer converts the pulse signal into an analog standard signal that provides information about the numbers of bottles in filling systems recorded in a defined time unit.

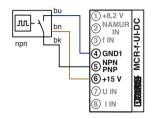
For speed measurements, it is possible to enter the measuring range in revolutions per minute (rpm) and to display the current measured value on the device.

The frequency measuring transducer has an automatic measuring range selection function (autorange) to ensure the best possible resolution. This permits response times to be reduced to a minimum and the measured value is optimally adapted to the input value.

3-wire DC With PNP transistor output

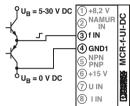


With NPN transistor output

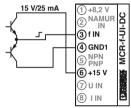


Incremental rotary transducer with push-pull:

Supply of the external signaling encoder



• Supply of the signaling encoder from the module

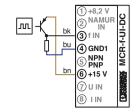


The external supply can be picked off by terminal blocks (9 +24VDC and 10 GND Any 3-way isolation

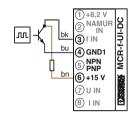
then no longer applies

3-wire DC

PNP transistor with pull-down resistance

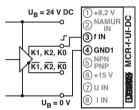


· NPN transistor with pull-up resistance

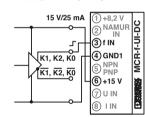


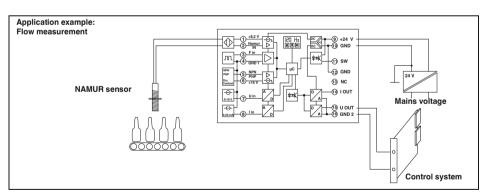
Incremental rotary transducer with HTL logic:

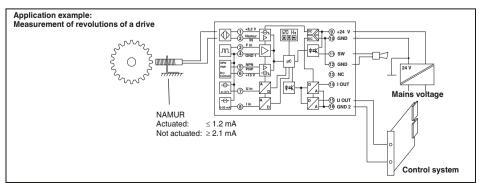
· Supply of the external signaling encoder



Supply of the signaling encoder from the module



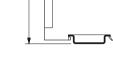


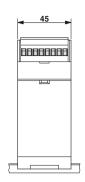


Programmable limit value switch











MCR-PSP-DC



(+)24 VDC (1) MM POWER (-) GND 0000 shield → IN 1(±) -(11) 12 цС -(12) U (±) 11 -(3) GND (±) U (-) OUT -(14) 22 -(15) U (+) ∆DE 21 (G) 24

- For thermocouple sensors, resistance thermometers, and linear resistors
- For current or voltage signals
- Four independently adjustable switching thresholds
- With or without electrical isolation of input signals
- Programming via membrane keypad or MCR-PICONF-WIN software
- Continuous measured value display

Further information about the configuration software can be found on page 149

1) EMC: Class A product, see page 571

Technical data Input data

Input sources

Contact type

Measuring rate Input resistance Current / voltage Discontinuous control resolution Switching output

Contact material Maximum switching voltage Maximum switching current Mechanical service life Response delay Status indication General data Supply voltage $U_{\rm B}$ Current consumption Maximum transmission error Temperature coefficient

Test voltage input/power supply Ambient temperature (operation) Status indication

Mounting Housing material Conformance / approvals UL, USA / Canada

Resistance thermometer 2, 3 or 4-conductor system (according to DIN 43760/DIN IEC 751 or SAMA RC 21-4-1966), e.g., PT sensors, Ni sensors, etc.

Thermocouple sensors (according to DIN IEC 584-1/DIN 43710):

B. E. J. K. L. N. R. S. T. U

Resistance: $0 \text{ k}\Omega \dots 8 \text{ k}\Omega$ (only 2-conductor connection)

Current: - 30 mA...+30 mA Voltage: - 30 V...+30 V

2 Hz 50 Ω / 200 kΩ

0.1°C / 0.01 V / 0.01 mA / 0.1 Ω

 $2\ x\ PDT\ contact,\ /\ 2\ switching\ points\ each,\ pick-up/drop-out\ (can\ be\ switched)$

AqNi 0,15 + HTV (hard gold-plated)

250 V AC 2 A AC 2 x 10⁷ cycles

0 s ... 2 s (adjustable) LED display

20 V DC ... 30 V DC < 60 mA 0.1% (of final value) ≤ 0.01%/K 1 kV AC (50 Hz, 1 min.)

-20°C ... 65°C 5-position 7-segment display and LEDs

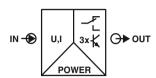
ABS

CE-compliant

Description
MCR threshold value switch, with two relay contacts
With electrically isolated input

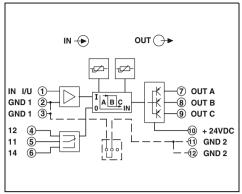
Туре	Order No.	Pcs. / Pkt.
MCR-PSP-DC1)	2811925	1
MCR-PSP1)	2811912	1

Limit values, threshold value switch



- 0 ... 10 V or 0 ... 20 mA input
- Relay/transistor output
- Limit indicator
- Adjustable hysteresis
- Monitoring of three signal statuses

1) EMC: Class A product, see page 571







For either standard voltage or standard current signals

c**911** us 🖭

Housing width 17.5 mm

	Technic	cal data
Input data	MCR-SWS-U1)	MCR-SWS-I1)
Input signal	0 10 V	0 20 mA / 4 20 mA
Maximum input signal	11 V	22 mA
Input resistance	≥ 100 kΩ	≤ 120 Ω
Limit value setting	Setting potentiometer, scaled 270	0° potentiometer
Setting range of the limit value	0 V 10 V	0 A 20 mA
Setting range for the hysteresis	0.1 V 10 V	0.2 mA 20 mA
	(setting accuracy: ±30 mV)	(setting accuracy: ±60 μA)
Internal hysteresis	±30 mV (around the lower/upper switching point)	$\pm 60~\mu A$ (around the lower/upper switching point)
Switching output	Transistor output, pnp	
Number of outputs	3	
Output voltage	20 V DC 30 V DC	
Continuous load current	100 mA	
Switching output	Relay output	
Contact type	1 PDT	
Contact material	AgNi 0,15 + HTV (hard gold-plate	ed)
Maximum switching voltage	250 V AC (30 V DC)	
Maximum switching current	2 A	
Mechanical service life	10 ⁷ cycles	
Error/status indicator		
General data		
Supply voltage U _B	20 V DC 30 V DC	
Current consumption	Typ. 60 mA	

≤ 0.02%/K

Polyamide PA non-reinforced

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 14$

17.5 / 99 / 114.5 mm

UL 508 Recognized

CE-compliant

< 25 ms -20°C ... 65°C

Description
MCR threshold value switch, with adjustable hysteresis and relay/transistor output
Input: 00.10 V
Input: 0(4) - 20 mA

Temperature coefficient

Dimensions W / H / D

Conformance / approvals

Mounting Housing material

Conformance UL, USA / Canada

Step response (10 - 90%)

Ambient temperature (operation)

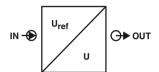
Screw connection solid / stranded / AWG

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MCR-SWS-U1)	2766465	1
MCR-SWS-I1)	2766478	1

Measurement and control technology

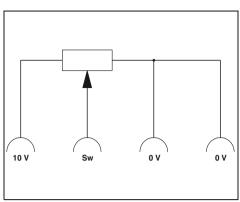
Special types of isolating amplifiers and digital displays

Setpoint value potentiometer



- For direct setpoint definition in combination with a constant voltage source

1) EMC: Class A product, see page 571



Input data Resistance value Linearity Load capacity General data

Ambient temperature (operation) Mounting Housing material Dimensions W / H / D

With spring-cage connection

Screw connection solid / stranded / AWG



Technical data EMG 30-SP-4K7LIN EMG 30-SP-10K LIN

4.7 kΩ ±20% 10 kΩ ±20% 5% (of final value) 5% (of final value)

1 W 0.5 W

0°C ... 40°C Polycarbonate fiber reinforced PC-F

30 / 75 / 68 mm 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14

Ordering data Туре EMG 30-SP- 4K7LIN EMG 30-SP-10K LIN

Е	EMG 30-SP-10K LIN	2942124	10
	Accessories	;	
	//INI MCR-SL-CVS-24-5-10-NC1) //INI MCR-SL-CVS-24-5-10-SP-NC1)	2902822 2902823	1

Pcs. / Pkt.

10

Order No.

2940252

Setpoint p	potentiometer, to set setpoints individually
Resistance	e value 4.7 kΩ
Resistance	value 10 kΩ

Accessories Configuration software package

The MCR/PI-CONF-WIN configuration software package is used to configure and visualize all parameters for the programmable MCR measuring transducers.

- Straightforward menu interface
- Rapid programming

The software runs under the following operating systems: Windows NT $^{\text{TM}}$, 2000 $^{\text{TM}}$, and XP $^{\text{TM}}$.



	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
MCR configuration software, for programming MCR-T, MCRI.P, MCR-F, MCR-F, and MCR-PSP modules, CD-ROM			
	MCR/PI-CONF-WIN	2814799	1
	Accessories		
Labels, for labeling MCR-T and MCR-S modules, four sheets DIN A4 marking labels (112 pieces.)	MCR-ET 38X35 WH	2814317	1

USB adapter cable Software adapter cable

The following adapter cables are available for programming:

- USB adapter cable
- Interface converter

The following modules are supported:

- MCR-T-UI(-E)...
- MCR-F-UI-DC
- MCR-PSP...
- MCR-FL-T-LP-I
- MCR-SL-PT100-LP-I
- MCR-FL-HT-T-I
- MCR-SL-HT-PT100-I

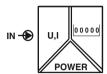


Data cable

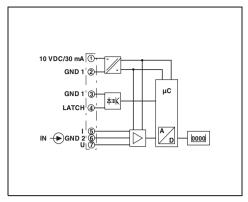
	Ordering data		
Description	Туре	Order No.	Pcs./ Pkt.
USB adapter cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	CM-KBL-RS232/USB	2881078	1
Software adapter cable (stereo jack plug/25-pos. D-SUB), 1.2 m long, for programming MCR-T, MCR-S, and MCR-F modules			
	MCR-TTL-RS232-E	2814388	1
Software adapter cable (6-pos./D-SUB 25-pos.), 1.5 m length, for programming MCR-PSP modules			
	MCR-TTL-RS232	2814391	1
Software adapter cable, 2.4 m length, with USB connection, for programming MCRLP and MCRHT modules			
	MCR-PAC-T-USB	2309000	1
	Accessories		
Adapter cable, stranded, 9-pos. D-SUB socket on 25-pos. D-SUB pin	PSM-KAD 9 SUB 25/BS	2761295	1

For additional information, visit www.phoenixcontact.net/products

Analog IN standard signals



- For 0 ... 10 V and 0(4) ... 20 mA standard analog signals
- Programmable
- 5 positions displayed
- 8 mm LED, 7-segment
- Galvanically isolated
- Min./max. value saving
- Freely programmable decimal point
- Latch/hold function for storing the display value
- Display 48 x 24 mm





For standard analog signals, programmable

.91us 🕑

Housing width 48 mm

		Tec	hnical data
Input data		U input	I input
Input signal		0 10 V	0 20 mA
Maximum input signal		30 V DC	50 mA
Input resistance		> 1 MΩ	(approx. 10 approx. 70
Resolution		1 mV	2 μΑ
Measuring rate		0.5 to 2 measurements/seco	nd
Input latch signal		Display stop	
Switching level	1 signal ("H")	4 V DC 30 V DC	
ŭ	0 signal ("L")	0 V DC 2 V DC	
Output data	5 \ ,		
Display		7-segment LED; 8 mm; red	
Number of the displayed positions		5	
Accuracy		< 0.1% ±1 digit (At an ambie	nt temperature of
General data			
Supply voltage U _B		10 V DC 30 V DC	
Current consumption		50 mA	
Data memory		EEPROM 1 mil. memory cyc	les or 10 years
Resolution A/D		14 bit	
System hum suppression		Digital filtering 50/60 Hz	
Test voltage input/power supply		500 V _{rms} (50/60 Hz, 1 min.)	

Number of the displayed positions Accuracy
General data
Supply voltage U _B
Current consumption
Data memory
Resolution A/D
System hum suppression
Test voltage input/power supply
Degree of protection
Ambient temperature (operation)
Housing material
Dimensions W / H / D
Control panel cutout
Screw connection solid / stranded / AWG
Conformance / approvals
Conformance
UL, USA / Canada

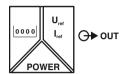
U input	I input
0 10 V	0 20 mA / 4 20 mA
30 V DC	50 mA
> 1 MΩ	(approx. 100Ω with 5 mA / approx. 70Ω with 20 mA)
1 mV	2 μΑ
0.5 to 2 measurements/second	
Display stop	
4 V DC 30 V DC	
0 V DC 2 V DC	
7-segment LED; 8 mm; red 5	
< 0.1% ±1 digit (At an ambient ten	nperature of 20°C)
10 V DC 30 V DC	
50 mA	10
EEPROM 1 mil. memory cycles of	r 10 years
14 bit	
Digital filtering 50/60 Hz	
500 V _{rms} (50/60 Hz, 1 min.)	
IP65 from the front	
-10°C 50°C	
Macrolon 2405	
48 / 24 / 68 mm	
22(+0.6)x45(+0.8) mm	
0.14 1.5 mm ² / 0.14 1.5 mm ²	/ 26 - 16
CE-compliant	
UL 508 Recognized	

	Ordering	data
Description	Туре	Order N
MCR digital display, for measurement and display of standard signals		
	MCR-SL-D-U-I	286401
	Accesso	ries
MCR DIN rail adapter for digital displays in a 24 x 48 mm housing	MCR-SL-D-RA	281008

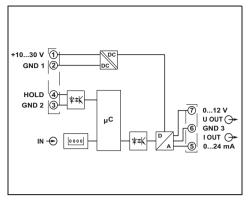




Analog OUT setpoint adjuster



- Manual setpoint definition with step width setting
- Manual setpoint definition via direct input
- Automatic setpoint definition with hold function and 20 support points
- Highly adjustable 0 ... 12 V or 0 ... 24 mA signal ranges
- Data backup in case of a power failure
- Display value parameterization
- Electrical isolation between output and supply





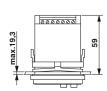
With manual and automatic ramp function

Housing width 48 mm

		Techr	nical data
Input data			
Display		7-segment, 8 mm, red	
Number of the displayed positions		4	
Switching level	1 signal ("H")	4 V DC 30 V DC	
	0 signal ("L")	0 V DC 2 V DC	
Output data		U output	I output
Output signal		0 12 V	0 24 mA
Length of step		10 mV	10 μΑ
Load R _B		≥ 2 kΩ	\leq 500 Ω (Up to 20 mA) \leq 400 Ω (> 20 mA)
Ripple		≤ 10 mV _{PP}	
General data			
Supply voltage U _B		10 V DC 30 V DC	
Power consumption		1 W (With 24 mA/12 V)	
Maximum transmission error		< 0.2% ((full-scale) at rated vol-	tage)
Test voltage output/power supply		500 V AC (50 Hz, 1 min.)	
Degree of protection		IP65 from the front	
Ambient temperature (operation)		-20°C 65°C	
Housing material		Macrolon 2405	
Dimensions W / H / D		48 / 24 / 68 mm	
Control panel cutout		45(+0.6)x22.2(+0.3) mm	
Screw connection solid / stranded / AWG		0.14 1.5 mm ² / 0.14 1.5 m	m ² / 26 - 16
Conformance / approvals			
Conformance		CE-compliant	
UL, USA / Canada		UL 508 Recognized	
		Orde	ring data

	Ordering d	ata	
Description	Туре	Order No.	Pcs. / Pkt.
MCR digital setpoint encoder, for presetting current and voltage signals			
	MCR-SL-D-SPA-UI	2710314	1
	Accessori	es	
MCR DIN rail adapter for digital displays in a 24 x 48 mm housing	MCR-SL-D-RA	2810081	1







Highly compact - leading technology

MACX Analog Ex - single- and two-channel signal isolating amplifiers for intrinsically safe circuits in the Ex area.

MACX Analog Ex isolating amplifiers ensure maximum system safety and explosion protection within a minimum amount of space. With a design width of just 12.5 mm, this comprehensive range for analog signal conditioning is approved according to ATEX and IECEx and consistently SIL-certified.

Maximum explosion protection for all Ex zones and gas groups

Many process technology systems have areas where potentially explosive atmospheres may occur. As such, measuring and control circuits are usually designed with intrinsic safety protection type Ex i.

MACX Analog Ex i isolating amplifiers and measuring transducers isolate intrinsically safe circuits from non-intrinsically safe circuits and safely limit the energy supplied to the Ex area. Furthermore, they handle extensive signal conditioning tasks.

All MACX Analog Ex isolating amplifiers are approved in accordance with the applicable ATEX and IECEx standards:

- [Ex ia] for intrinsically safe circuits up to Ex zone 0 and Ex zone 20
- Ex n for installing devices in Ex zone 2
- In addition, relevant national approvals

such as UL and GOST are available.

Choose the right MACX Analog Ex isolating amplifier for your application:

Analog IN

Measuring transducer repeater power supply and input isolating amplifier for the intrinsically safe operation of 2-wire transmitters, 4-conductor measuring transducers, and current sources.

Analog OUT

Output isolating amplifiers for the intrinsically safe operation of control valves, I/P converters, and displays.

Temperature

Configurable temperature transducers for the intrinsically safe operation of resistance thermometers, remote resistancetype sensors, thermocouples, and mV sources - with safe limit value relays as an option.

Digital IN

NAMUR isolating amplifiers for the intrinsically safe operation of proximity sensors and switches.

Digital OUT

Solenoid drivers for the intrinsically safe operation of solenoid valves and alarm transmitters.



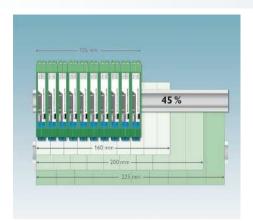
DIN rail connector-compatible The DIN rail connector enables the

modular bridging of the 24 V supply voltage.



Wide-range power supply

The modules featuring a wide-range power supply (...-UP) can be used in all power supply networks the world over without the need for additional power supply units.



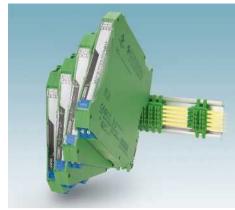
Significant space savings

- Housing width of just 12.5 mm for all single- and two-channel 24 V devices. Saves up to 45% of space, when compared to design widths up to 22.5 mm.



Easy-maintenance connection method:

- Plug-in connection terminal blocks with screw connection or fast push-in technology - coded, with integrated sockets.



Flexible power bridging and diagnostics

- Supply voltage bridging and the option of redundant, diode-decoupled supply and error indication.



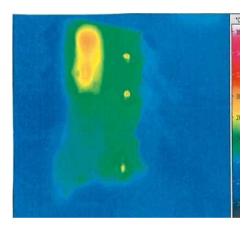
Easy configuration and monitoring

- Either via FDT/DTM or user-friendly stand-alone software - with integrated monitoring function.



Easy configuration

- Without software via DIP switches on the device front or with the operator interface and display unit.



Precise transmission, long service life

- Patented circuit concepts ensure precise transmission and minimal self-heating.



High operational reliability

- High operational reliability, thanks to safe 3-way electrical isolation.



Safe and reliable functions

Consistent SIL certification. This ensures the highest level of reliability and safety for your systems.



Fast and error-free signal connection

- Compact termination carriers connect MACX Analog Ex devices to the automation system - plug and play.

Facts about explosion protection

The chemical and petrochemical industries involve industrial processes which produce explosive atmospheres. They are caused, for example, by gases, fumes or vapors. Explosive atmospheres are also likely to occur in mills, silos, and sugar and fodder factories due to the dust present there.

Therefore, electrical devices in potentially explosive areas are subject to special directives.

Devices and protective systems in potentially explosive areas

European Parliament directive 94/9/EC of March 23, 1994 (ATEX manufacturer directive) is of particular importance within CENELEC (European Community and Western European EFTA states). It is designed to facilitate the harmonization of legal provisions in the member states of the European Union for devices and protective systems in terms of ensuring correct use in potentially explosive areas. Directive 94/9/EC must be applied to all explosionprotected devices and protective systems placed on the market in the European Union.

The scope of this directive also includes safety, monitoring, and control devices which are used outside of potentially explosive areas, but which are necessary for, or contribute towards, the safe operation of devices and protective systems with respect to explosion hazards.

The term **device** includes machines. equipment, stationary or mobile devices, control components, and system accessories. The directive also covers alarm and protection systems which are meant to be used, either individually or in combination, for the generation, transmission, storage, measurement, control, and conversion of energy as well as for processing materials and which have the potential to ignite and cause an explosion.

Protective systems are devices designed to stop an incipient explosion immediately and/or restrict the area affected by the explosion, and which are placed on the market separately as autonomous systems.



Components are defined as those parts that are necessary for ensuring the safe operation of devices and protective systems, but do not perform an autonomous function in themselves.

European directives are implemented in ordinances or laws at a national level.

Systems in potentially explosive areas

Directive 1999/92/EC (ATEX Operator Directive) was passed in Europe to regulate the operation of systems in potentially explosive areas.

Terminology	associated	with	the	Fv	area	

Explosive atmosphere

A mixture of combustible gases, steam, vapors or dust and air in atmospheric conditions that allow the entire mixture to combust once ig-

nited. Potentially explosive area

An area where the atmosphere has the potential to explode due to local or operational conditions ("Ex area").

Electrical equipment

The entire set of components, electric circuits or parts of electric circuits that are usually located within a single housing. Intrinsically safe electrical equipment

An electrical device in which all circuits are intrinsically safe. Note: these devices may be used directly in the Ex area. Associated equipment

Electrical devices that contain both intrinsically safe and non-intrinsically safe circuits and that are designed in such a way that the non-intrinsically safe circuits cannot influence the intrinsically safe ones.

Note: associated electrical equipment must not be used directly in potentially explosive areas without additional protection defined by a further protection type.

Classification into groups

The general stipulations of EN 60079-0 divide electrical devices for potentially explosive areas into three groups.

Group I:

Electrical devices for firedamp areas (mines) which are susceptible to pit gases (methane) and/or combustible dusts (coal dust).

Group II:

Electrical devices for operation in areas where explosive gas atmospheres are likely to occur, excluding mines susceptible to firedamp.

This also includes devices for the chemical, petrochemical, and pharmaceutical industries as well as for waste water treat-

Electrical devices are further divided into subcategories according to the properties of the explosive atmosphere.

In the case of the intrinsic safety protection type, classification is based on the minimum ignition energy of the gas or vapor.

Designation	Typical gas	Ignition energy/µJ Intrinsic safety
II A	Propane	> 180
II B	Ethylene	60 180
II C	Hydrogen	< 60
	•	

Group III:

Electrical devices for operation in areas where explosive dust atmospheres are likely to occur, excluding mines susceptible to firedamp.

This includes devices for areas associated with the food industry (mills, silos), for ex-

Electrical devices are further divided into subcategories according to the properties of the explosive atmosphere.

Designation	Dusts
III A	Combustible flyings
III B	Non-conductive dust
III C	Conductive dust

Classification into temperature classes

Simply dividing the various gases into explosion or gas groups according to their minimum ignition energy is not sufficient to describe the gases adequately with regard to their explosive properties.

A gas may explode either when the ignition energy is exceeded or where there is an excessively high temperature caused by a hot surface. This ignition temperature is, however, not usually linked to the ignition energy, i.e., a gas with a low ignition energy does not necessarily explode at a low temperature. Consequently, devices that are used directly in potentially explosive atmospheres are divided into temperature classes. Temperature classes define the maximum surface temperature even in the event of errors. Parallel to this, the gases are classified according to their different ignition temperatures.

Temperature class	Maximum permissible surface temperature of equipment	Ignition tempera- tures of combustible substances
	°C	°C
T 1	450	> 450
T 2	300	> 300 ≤ 450
T 3	200	> 200 ≤ 300
T 4	135	> 135 ≤ 200
T 5	100	> 100 ≤ 135
T 6	85	> 85 ≤ 100

The following table provides an overview of the ignition energies and ignition temperatures for certain gases:

Substance	T _{ign}	Tempera- ture class	E _{min}	Group
Ethoxyethane	170	T 4	190	II B
Ethylene	425	T 2	82	II B
Ammonia	630	T 1	14000	II A
Butane	365	T 2	250	II A
Methane	595	T 1	280	1
Propane	470	T 1	250	II A
Carbon disulfide	95	Т 6	9	II C
Hydrogen	560	T 1	16	II C

Zone classification

Potentially explosive areas are divided into zones according to the probability of their occurrence. The EN 60079-10-1 standard defines the zones containing explosive atmospheres as follows:

Zone 0:

Area in which an explosive atmosphere is present for continuous or long periods.

These conditions are usually present inside containers, pipelines, apparatus, and tanks.

Zone 1:

Area in which an explosive atmosphere is to be expected only occasionally during normal operation.

This includes the immediate area surrounding zone 0, as well as areas close to filling and emptying equipment.

Zone 2:

Area in which an explosive atmosphere is not expected during normal operation; however, if it does occur, then it does so only rarely and for a short period.

Zone 2 includes areas that are used exclusively for storage, areas around pipe connections that can be disconnected, and generally the immediate area surrounding zone 1.

Areas that are potentially explosive as a result of combustible dusts are divided into the following zones according to EN 60079-10-2 (formerly: EN 61241-10):

Zone 20:

Area in which an explosive atmosphere is present for continuous, frequent or long periods in the form of an airborne cloud of combustible dust.

Zone 21:

Area in which an explosive atmosphere in the form of an airborne cloud of combustible dust is to be expected only occasionally during normal operation.

Zone 22:

Area in which an explosive atmosphere in the form of an airborne cloud of combustible dust is not expected during normal operation. However, if it does occur, then it does so only for a short period.

Categories

The ATEX Directive assigns devices for use in potentially explosive areas to categories. In IEC 60079-0, "Equipment Protection Level (EPL)" is the term used instead of "category".

In the same way that there are different zones, there are also different device categories. These consist of categories M1 and M2 for Group I and categories 1, 2, and 3 for Group II. The categories for **equipment** group II are described in more detail below:

Category 1:

Devices constructed to guarantee a very high degree of safety.

Devices in this category must guarantee the required degree of safety even in the unlikely event of a device failure and therefore be provided with measures to protect against explosion, so that:

- In the event of one integrated protection measure failing, a second, independent protection measure is able to guarantee the necessary safety.
- In the event of two independent errors, the necessary safety is guaranteed.

Category 2:

Devices constructed to guarantee a very high degree of safety.

The explosion protection measures associated with this category guarantee the required degree of safety, even in the case of frequent device failures or common error states.

Category 3:

Devices constructed to guarantee a standard degree of safety.

Devices in this category guarantee an adequate degree of safety in normal opera-

The table below shows which categories are assigned to which zones:

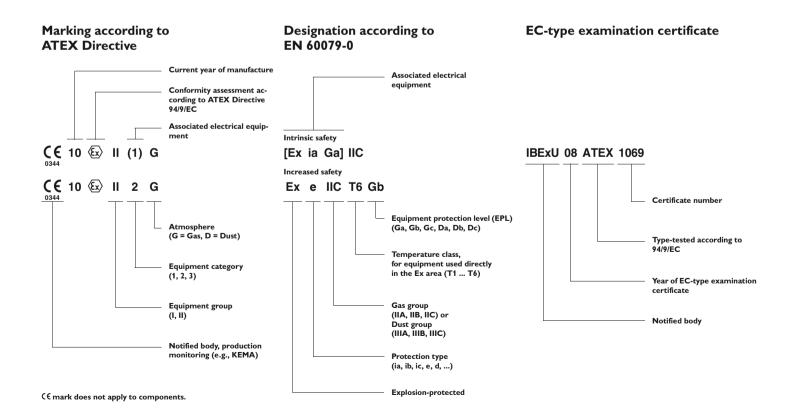
Category	For Zone	Also possible
1	0 20	1 and 2 21 and 22
2	1 21	2 22
3	2 22	

Measurement and control technology

Ex i isolating amplifiers with SIL functional safety - MACX Analog Ex

Protection types

Protection principle		Protection type		Area of application (selection)	Standard
	Isolation	Oil immersion Sand filling	o q	Transformers, relays, startup controls, switching devices Transformers, relays, capacitors	EN 60079-6 EN 60079-5
		Molded encapsulation	m*	Coils of relays and motors, electronics, solenoid valves, connection systems	EN 60079-18
P ₁ > P _A	Exclusion	Pressurized enclosure	Р	Control cabinets, motors, measuring and analysis devices, computers	EN 60079-2
*	Special mechanical design	Flameproof enclosure	d	Motors, switching devices, power electronics	EN 60079-1
	Clearance from electrically conductive parts	Increased safety	e	Terminal blocks, housing, lights, motors	EN 60079-7
R L		Intrinsic safety		Electronics, measurement and control	EN 60079-11
	Energy limitation	Intrinsically safe systems	i*	Electronic systems	EN 60079-25
		Intrinsically safe fieldbus systems		Fieldbus systems	EN 60079-27
Improved industrial qua nA: non-sparking nC: sparking equipment nR: restricted breathing nL: energy-limited nP: simplified pressurize	housing	Protection type "n"	n**	Motors, housing, lights, electronics	EN 60079-15
	* ia, ma: application in zone 0, 1, 2	/ ib, mb: application in zone 1, 2 / ic, mc:	application	on in zone 2 only ** Application in zone 2 only	



Solenoid drivers for controlling solenoid valves

In order to control intrinsically safe Ex i solenoid valves, you have to have an intrinsically safe control circuit. This is provided by the solenoid drivers that are available from Phoenix Contact.

The following must be taken into account when dimensioning your intrinsically safe control circuit:

- Valve
- Cable with corresponding resistance
- Solenoid driver

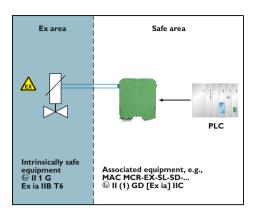
As a result, it may be the case that not all valves are compatible with the solenoid drivers.

Below is an extract from a table showing possible combinations of valves and solenoid drivers.

A complete and updated list (along with details of the technical data of suitable valves, the maximum cable lengths, and the maximum cable resistances of the individual combinations) can be found on the Internet

www.phoenixcontact.net/products

Example circuit



Valves overview INTERFACE Ex solenoid driver

Manufacturer	acturer Type designation		esignation Ex certificate Condition		MACX MCR-EX- SL-SD-21-25-LP	MACX MCR-EX- SL-SD-21-40-LP	MACX MCR-EX- SL-SD-24-48-LP	MACX MCR-EX SL-SD-21-60-LP	
ASCO	Coil	195	LCIE 08 ATEX 6083			1	1		
	Coil	302 (12 V)	INERIS 03 ATEX 0249X				1	1	
	Coil	302 (24 V)	INERIS 03 ATEX 0249X					1	
Bürkert	Coil	AC 10, standard	PTB 01 ATEX 2101			1	1		
	Coil	AC 10, high-resistance	PTB 01 ATEX 2101			1	1		
	Coil	AC 21, standard	PTB 01 ATEX 2175	700 mW / 65°C		1	1		
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	700 mW / 65°C		1	1		
	Coil	AC 21, standard	PTB 01 ATEX 2175	900 mW / 45°C		1	1		
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	900 mW / 45°C		1	1		
	Coil	AC 21, standard	PTB 01 ATEX 2175	900 mW / 60°C		1	1		
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	900 mW / 60°C		,	1		
	Coil	G1 642735, standard		600 mW / 50°C		1	· · · · · ·		
	Coil	G1 642735, high-resistance		600 mW / 50°C		4			
	Coil	G1 642735, standard	PTB 01 ATEX 2173	800 mW / 40°C		V	,		
						V	V		
	Coil	G1 642735, high-resistance	PTB 01 ATEX 2173	800 mW / 40°C		V	V		
	Coil	G1 642735, standard	PTB 01 ATEX 2173	1000 mW / 40°C		V	V		
	Coil	G1 642735, high-resistance	PTB 01 ATEX 2173	1000 mW / 40°C		✓	√		
FESTO	Coil	MFHIA-SA-EX GBXE022AIAD03	PTB 03 ATEX 2097				1	V	
	Coil	(J)MFHBIA-SA-EX GBXE022AIAD03	PTB 03 ATEX 2097				/		
Norgren Herion	Coil	2050	PTB 07 ATEX 2019			✓.	√	√	
	Coil	2051	PTB 07 ATEX 2019			✓	✓	✓	
	Coil	2052	PTB 07 ATEX 2019			✓	✓	✓	
	Coil	2053	PTB 07 ATEX 2019				✓	✓	
	Coil	2085	PTB 06 ATEX 2001 U		✓				
	Coil	2086	PTB 06 ATEX 2001 U		✓	✓	✓	√	
	Coil	3039	PTB 03 ATEX 2134				✓		
	Coil	2003	PTB 04 ATEX 2010				✓		
Hörbiger	Piezo	P8 38x RF-Nx-SPN65	DMT 01 ATEX E026X	30 V type	1	1			
	Piezo	P20 381RF-NG-CPN61	DMT 01 ATEX E025X	30 V type	✓	✓			
Parker	Coil VZ07	488650.01	LCIE 02 ATEX 6024X			1	1		
	Coil VZ33	494035.10	LCIE 02 ATEX 6024X			1	1		
	Coil VZ08	488660.01	LCIE 02 ATEX 6024X			1	1		
	Coil VZ09	488670.01	LCIE 02 ATEX 6024X			1	1		
	Coil VZ95	482160.01	LCIE 02 ATEX 6024X	EEx ia IIB T6		1	1	1	
	Coil VZ23	482870.01	LCIE 02 ATEX 6024X			1	1	·	
Samson	Coil	3701-11 (6 V)	PTB 02 ATEX 2178		1	•	•		
	Coil	3701-12 (12 V)	PTB 02 ATEX 2178		*/	1	1		
	Coil	3701-13 (24 V)	PTB 02 ATEX 2178		,	*/	1		
	Coil	3963-11 (6 V)	PTB 01 ATEX 2085		/	V			
	Coil	3963-12 (12 V)	PTB 01 ATEX 2085		4	,	,		
	Coil				V	1	V		
		3963-13 (24 V)	PTB 01 ATEX 2085		1	✓	✓		
	Coil	3964-11 (6 V)	PTB 02 ATEX 2047		V ,	,	,		
	Coil	3964-12 (12 V)	PTB 02 ATEX 2047		✓,	/	V		
	Coil	3964-13 (24 V)	PTB 02 ATEX 2047		/	/	/		
	Coil	3965-11 (6 V)	PTB 05 ATEX 2044X		V				
	Coil	3965-12 (12 V)	PTB 05 ATEX 2044X		/	/	/		
	Coil	3965-13 (24 V)	PTB 05 ATEX 2044X			/	/		
	Coil	3967-11 (6 V)	PTB 06 ATEX 2027		✓.				
	Coil	3967-12 (12 V)	PTB 06 ATEX 2027		✓	✓	1		
	Coil	3967-13 (24 V)	PTB 06 ATEX 2027						
Seitz	Pilot valve	PV 12F73 Ci oH	PTB 99 ATEX 2146		1	1	1		
	Pilot valve	PV 12F73 Xi oH	PTB 00 ATEX 2030		1	1	1		
	Pilot valve	PV 12F73 Xi oH-2	PTB 00 ATEX 2030		1	1	1		
	Solenoid	11 G 52	PTB 01 ATEX 2020			_	1		

Safety-related function for the Ex

The term SIL (safety integrity level) is becoming more and more significant in the field of process technology. It defines the reguirements that a device or a system is expected to fulfill so that the failure probability can be specified. The aim is to achieve maximum possible operational reliability. If a device or system fails, a defined state is attained. Standard-based inspections are carried out to determine statistical probability.

Application of SIL on the basis of EN 61508 and EN 61511

The SIL standard is used for a wide range of industries within the process industry, including the chemical industry, refineries, oil and gas production, paper manufacturing, and conventional power generation. In addition to functional safety requirements, systems in potentially explosive areas are also subject to Ex standards EN 60079-0 ff.

EN 61508: "Functional safety of electrical/electronic/programmable electronic safety-related systems"

This standard describes the requirements that the manufacturer has to bear in mind when producing devices or systems.

EN 61511: "Functional safety - Safety instrumented systems for the process industry sector"

Standard EN 61511 describes the requirements for achieving systems with functional safety.

Compliance with the standard is determined by operators, owners, and planners on the basis of safety plans and national regulations. In addition, the standard also describes the requirements for using a device in an application on the basis of its proven effectiveness (proven in use).



SIL marking on devices

The products in the MACX range from Phoenix Contact, which have been developed in accordance with EN 61508, are marked with the designation SIL 2 or SIL 3. This indicates clearly that the devices may be suitable for safety instrumented functions (SIF).

To determine whether they can actually

be used, you need to calculate the sum of the probability failure values for all the devices in the signal circuit. The values required for this can be found in the safety manual accompanying any SIL product.

Overview of terms from SIL standards EN 61508 and EN 61511

SIL	Safety integrity level	E/E/PES	Electrical/electronic/programmable electronic systems
	One of four discrete levels for the specification of requirements for the safety integrity of safety instrumented functions, which are assigned to the EIE/PE safety instrumented systems, where SIL 4 is the highest and SIL		This term is used for all electrical devices or systems which can be used to execute a safety instrumented function. It includes simple electrical devices and all types of programmable logic controllers (PLCs).
	1 the lowest level.	PFH	Probability of dangerous failure per hour
EUC	Equipment under control Equipment, machines, devices or systems used in pro-		Describes the probability of a dangerous failure occurring per hour.
	duction, materials processing or transport.	SFF	Safe failure fraction
MTBF	Mean Time Between Failures The expected mean time between failures.	311	Describes the proportion of harmless failures. This is the ratio of the rate of safe failures plus the rate of diagnosed or detected faults in relation to the total failure rate of
PFD	Probability of failure on demand		the system.
	The probability of a failure on demand. Describes the probability of a safety instrumented system failing to perform its function when required.	SIF	Safety instrumented function Describes the safety instrumented functions of a system.
PFDavg	Average probability of failure on demand The average probability of the function failing on de- mand.	SIS	Safety instrumented system An SIS (safety instrumented system) consists of one or more safety instrumented functions. An SIL requirements applicable for each of these safety instrumented functions.

SIL inspection

The complete signal path must be taken into account during the SIL inspection. The example shows how in a typical safety application the calculation is based on average failure probabilities of individual devices.

Table 2 of standard EN 61508-1 describes the relationship between the average failure probability and the attainable SIL. Here, the level required determines the overall budget for the sum of all PFD values.

A system with a single-channel structure with a low demand rate is used as an example; for SIL 2 the average PFD value is between 10^{-3} and $< 10^{-2}$.

Safety integrity level SIL	Operating mode with a low demand rate (average probability of the specified function failing on demand)
4	$\geq 10^{-5}$ to < 10^{-4}
3	$\geq 10^{-4} \text{ to} < 10^{-3}$
2	\geq 10 ⁻³ to < 10 ⁻²
1	$\geq 10^{-2} \text{ to} < 10^{-1}$

Safety integrity level: failure limit values for a safety function which is operated in an operating mode with a low demand ra

The INTERFACE Analog and INTERFACE Ex product ranges include products that meet the requirements for explosion protection as well as functional safety.

Example:

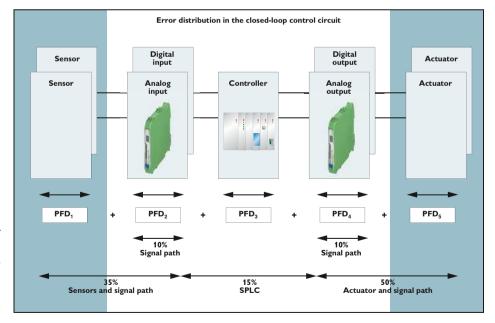
A sensor and actuator are assembled in the field and are exposed to chemical and physical loads (process medium, pressure, temperature, vibration, etc.). Accordingly, these components have a high risk of failure:

- The sensor accounts for 25% of the overall PFD
- The actuator accounts for 40% of the overall PFD

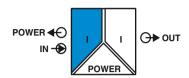
Neither the failsafe controller nor the interface modules come into contact with the process medium and both are usually located in a protected control cabinet:

- The failsafe controller accounts for 15% of the overall PFD
- Each of the interface modules accounts for 10% of the overall PFD

Typically, the values form the basis for a calculation.



Analog IN Repeater power supply, Ex i



Repeater power supply and input isolating amplifier for the operation of intrinsically safe (Ex-i) 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources installed in Ex areas.

- 0/4 ... 20 mA input, [Ex ia] (powered or not powered)
- 0/4...20 mA output (active or passive)
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- Terminal point with 250 Ω resistor to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

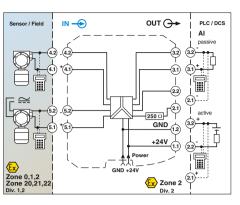
Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data
Input signal
Transmitter supply voltage
Voltage drop
Output data
Output signal

Load
Output ripple
General data
Supply voltage range
Current consumption
Power dissipation
Temperature coefficient
Step response (10 - 90%)
Transmission error, typical
Maximum transmission error
Under-Joverland range

Ambient temperature range

Electrical isolation

Input/output/power supply

Input/output

Humidity
Status indication
SMART communication
Signal bandwidth
Protocols supported
Housing material
Inflammability class according to UL 94
Dimensions W / H / D
Screw connection solid / stranded / AWG
Spring-cage connection (solid/stranded/AWG)
Safety data as per ATEX
Maximum voltage U_o

Maximum current I_o
Maximum power P_o
Maximum voltage U_m
Conformance / approvals
Conformance

IECEx UL, USA / Canada Functional safety (SIL)

ATEX

Descripti









Repeater power supply and input isolating amplifier

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA

> 16 V (at 20 mA)

< 3.5 V (in input isolating amplifier operation)

0 mA ... 20 mA (active) 4 mA ... 20 mA (active)

0 mA ... 20 mA (14 ... 26 V ext. source voltage) 4 mA ... 20 mA (14 ... 26 V ext. source voltage)

4 mA ... 20 mA (14 ... 26 V ext. source voltage < 600 Ω

< 20 mV $_{\rm rms}$

19.2 V DC ... 30 V DC

< 60 mA (at 24 V DC)

< 1.1 W (at 24 V DC / 20 mA)

< 0.01%/K

< 600 μ s (for 4 mA ... 20 mA step)

< 0.05% (of final value) < 0.1% (of final value)

as per NE 43

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11)

375 V (Peak value in accordance with EN 60079-11) -20°C ... 60°C (Any mounting position)

10% ... 95% (no condensation) Green LED (supply voltage) Yes

as per HART specifications HART

PA 66-FR V0

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

25.2 V 93 mA 587 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326

II (1) G [Ex ia Ga] IIC/IIB

II (1) D [Ex ia Da] IIIC

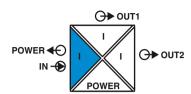
II (1) D (Ex ia Da] IIIC

[Ex ia Ga] IIC/IIB; [Ex ia Da] IIIC; Ex nA [ia Ga] IIC/IIB T4 Gc

Class I Div 2; IS for Class I, II, III Div 1 SIL 2 according to EN 61508

	Ordering dat	а	
tion	Туре	Order No.	Pcs Pk
er power supply, smart, intrinsically safe input			
Screw connection Spring-cage conn.	MACX MCR-EX-SL-RPSSI-I ¹) MACX MCR-EX-SL-RPSSI-I-SP ¹)	2865340 2924016	

Analog IN Repeater power supply, Ex i



Repeater power supply and input isolating amplifier for the operation of intrinsically safe (Ex-i) 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources installed in Ex areas

- 0/4 ... 20 mA input, [Ex ia] (powered or not powered)
- Two electrically isolated 0/4 ... 20 mA (active) outputs
- Bidirectional transmission of digital HART communication signals (both outputs)
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- 4-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

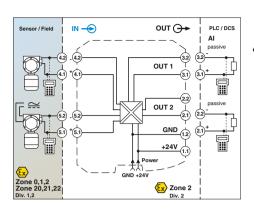
Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Input signal Transmitter supply voltage Voltage drop Output data Output signal (Per output) Load Output ripple < 20 mV_{rms} General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Transmission error, typical Maximum transmission error Under-/overload range Electrical isolation Input/output/power supply

> Input/output Input/power supply Output 1/output 2

Ambient temperature range Status indication SMART communication (Per output) Protocols supported Housing material Dimensions W / H / D Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX Maximum voltage U_o Maximum current I Maximum power P Maximum voltage U_m Conformance / approvals Conformance

ATEX IECEx

Functional safety (SIL)



Repeater power supply and input isolating amplifier, with two electrically isolated outputs

Housing width 12.5 mm

					ta	

4 mA ... 20 mA / 0 mA ... 20 mA

> 16 V (at 20 mA)

< 3.9 V (in input isolating amplifier operation)

4 mA ... 20 mA (active) < 450 Ω (at 20 mA)

19.2 V DC ... 30 V DC (24 V DC (-20% ... +25%))

< 75 mA (24 V DC/ 20 mA) < 1.45 W (24 V DC/ 20 mA)

< 0.01%/K

< 1.3 ms (for 4 mA ... 20 mA step)

< 0.05% (of final value) < 0.1% (of final value)

as per NE 43

2.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 1.5 kV AC (50 Hz. 1 min., test voltage)

-20°C ... 60°C (Any mounting position) Green LED (PWR supply voltage) Yes

HART PA 66-FR

12.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 14$ $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

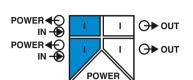
25 2 V 93 mA 587 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326

[Ex ia Ga] IIC/IIB; [Ex ia Da] IIIC; Ex nA [ia Ga] IIC/IIB T4 Gc SIL 2 according to EN 61508

		Ordering date	ta	
Description		Туре	Order No.	Pcs. / Pkt.
Repeater power supply, smart, intrinsical	y safe input			
	Screw connection Spring-cage conn.	MACX MCR-EX-SL-RPSSI-2I ¹) MACX MCR-EX-SL-RPSSI-2I-SP ¹)	2865366 2924236	1 1

Analog IN Repeater power supply, Ex i



Repeater power supply for the operation of intrinsically safe (Ex i) 2-conductor measuring transducers installed in the Ex area.

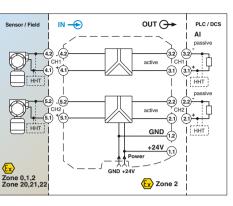
- 2-channel
- 4 ... 20 mA input, [Ex ia] (powered)
- 4 ... 20 mA output (active)
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- Safe 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found from page 182

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 184



2-channel repeater power supply

Technical data

Housing width 12.5 mm

Input data Input signal

Transmitter supply voltage

Underload/overload signal range

Output data

Output signal

Load

Underload/overload signal range

General data

Supply voltage range Current consumption

Power dissipation

Temperature coefficient

Step response (10 - 90%)

Transmission error, typical Maximum transmission error

Flectrical isolation

Input/output/power supply

Input/output Input/power supply Output 1/output 2

Ambient temperature range Status indication SMART communication Signal bandwidth Protocols supported Housing material Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX

Maximum voltage U_o

Maximum current Io Maximum power P

Maximum voltage U_m

Conformance / approvals

Conformance

ATEX

IFCEx

De Re

Functional safety (SIL)

Per channel
mA 20 mA
· 16 V (at 20 mA)
) mA 24 mA
Per channel
· mA 20 mA (active) 50 Ω (at 20 mA) I mA 24 mA
9.2 V DC 30 V DC (24 V DC (-20% +25%))

< 100 mA (24 V / 20 mA)

< 1.4 W (at 24 V DC / 20 mA)

< 0.01%/K

4

0

< 1.3 ms (for 4 mA ... 20 mA step)

< 0.05% (of final value)

< 0.1% (of final value)

2.5 kV (50 Hz, 1 min., test voltage) $300 \text{ V}_{\text{rms}}$ (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

1.5 kV (50 Hz, 1 min., test voltage) -20°C ... 60°C (Any mounting position)

Green LED (supply voltage)

Yes

as per HART specifications HART

PA 66-FR

12.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 14$

 $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

25.2 V 93 mA 587 mW

253 V AC (125 V DC)

CE-compliant, additionally EN 61326

(x) II (1) G [Ex ia Ga] IIC

(x) II (1) D [Ex ia Da] IIIC

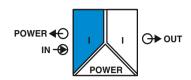
(I) G Ex nA [ia Ga] IIC T4 Gc

[Ex ia Ga] IIC/IIB; [Ex ia Da] IIIC; Ex nA IIC T4 Gc

SIL 2, PL d

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MACX MCR-EX-SL-RPSS-2I-2I MACX MCR-EX-SL-RPSS-2I-2I-SP	2865382 2924676	1 1			
	Type MACX MCR-EX-SL-RPSS-2I-2I	Type Order No. MACX MCR-EX-SL-RPSS-2I-2I 2865382			

Analog IN Repeater power supply with wide range power supply, Ex i

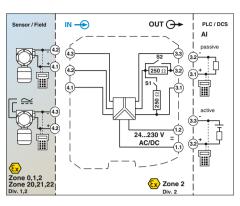


Repeater power supply and input isolating amplifier for the operation of intrinsically safe (Ex-i) 2-conductor measuring transducers, 4-conductor measuring transducers, and mA current sources installed in Ex areas

- 0/4 ... 20 mA input, [Ex ia] (powered or not powered)
- Output 0/4...20 mA (active or passive), 0/1...5 V, can be switched via the DIP switch
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- -250Ω resistor that can be activated via DIP switches to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information on marking material can be found on page 127 Test plugs for test sockets can be found on page 191

1) EMC: Class A product, see page 571



Input data Input signal Transmitter supply voltage Voltage drop Output signal (configurable using the DIP switch)

Load Output ripple General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Transmission error, typical Maximum transmission error Under-/overload range

Electrical isolation

Input/output/power supply

Input/output Input/power supply

Ambient temperature range Humidity Status indication SMART communication Signal bandwidth Protocols supported Housing material Inflammability class according to UL 94 Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX Maximum voltage U_o Maximum current I. Maximum power P Maximum voltage U_m Conformance / approvals

Conformance ATEX

IFCFx UL. USA / Canada Functional safety (SIL)







Repeater power supply and input isolating amplifier, wide-range power supply

Functional safety
Ex: 🐼 🐿 🖆 // Applied for: GL Housing width 17.5 mm

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA

> 16 V (at 20 mA)

< 3.5 V (in input isolating amplifier operation)

0 mA ... 20 mA (active) 4 mA ... 20 mA (active)

0 mA ... 20 mA (14 ... 26 V ext. source voltage) 4 mA ... 20 mA (14 ... 26 V ext. source voltage) 0 V ... 5 V (internal resistance, 250 Ω, 0.1%) 1 V ... 5 V (internal resistance, 250 Ω, 0.1%) $< 600 \Omega$ (I output)

< 20 mV_{rms}

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 80 mA (at 24 V DC) < 1.6 W

< 0.01%/K

< 600 µs (for 4 mA ... 20 mA step) < 0.05% (of final value) < 0.1% (of final value)

as per NE 43

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage)

as per HART specifications HART

PA 66-FR V٥

17.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24$ - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

25.2 V 93 mA 587 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326

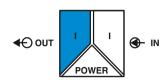
II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC/IIB T4 Gc [Ex ia Ga] IIC/IIB; [Ex ia Da] IIIC; Ex nA [ia Ga] IIC/IIB T4 Gc $\,$

Class I Div 2: IS for Class I. II. III Div 1

SIL 2 according to EN 61508

	Ordering data		
	Туре	Order No.	Pcs. / Pkt.
safe input			
Screw connection Spring-cage conn.	MACX MCR-EX-SL-RPSSI-I-UP1) MACX MCR-EX-SL-RPSSI-I-UP-SP1)	2865793 2924029	1
		Type safe input Screw connection MACX MCR-EX-SL-RPSSI-I-UP¹)	Type Order No. Safe input Screw connection MACX MCR-EX-SL-RPSSI-I-UP¹) 2865793

Analog OUT Output isolating amplifier, Ex-i



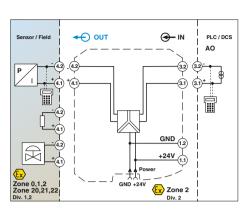
Output isolating amplifier for controlling intrinsically safe (Ex-i) I/P converters, control valves, and indicators installed in Ex areas.

- 0/4...20 mA input
- 0/4...20 mA output, [Ex ia] IIC
- Bidirectional transmission of digital HART communication signals
- Plug-in capable screw or spring-cage connection method, with integrated sockets for HART communicators
- Line fault detection (LF)
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Test plugs for test sockets can be found on page 191

Information on "Plug and play" connection using system cabling can be found from page 184



Input signal Input voltage Input impedance in the event of a cable break at the output Output data Output signal Load Output ripple General data Supply voltage range Current consumption Power dissipation Temperature coefficient Step response (10 - 90%) Maximum transmission error

Input data

Electrical isolation

Input/output/power supply

Output/input Output/power supply

Humidity Status indication SMART communication Signal bandwidth Protocols supported Housing material Inflammability class according to UL 94 Dimensions W / H / D Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG) Safety data as per ATEX Maximum voltage U_o

Ambient temperature range

Maximum current Io Maximum power P Maximum voltage U_m Conformance / approvals

Conformance ATEX

IECEx UL, USA / Canada Functional safety (SIL)



Functional safety Housing width 12.5 mm

Technical data

0 mA ... 20 mA / 4 mA ... 20 mA 5.4 V (at 20 mA) $> 100 \text{ k}\Omega$ (If there is a line fault)

0 mA ... 20 mA / 4 mA ... 20 mA

< 800 Ω (at 20 mA) < 20 mV_{rms}

19.2 V DC ... 30 V DC < 46 mA (at 24 V DC / 20 mA) < 1.1 W (at 24 V DC / 20 mA) < 0.01%/K

< 140 us < 0.1% (of final value)

1.5 kV (50 Hz. 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) -20°C ... 60°C (Any mounting position)

10% ... 95% (no condensation) Green LED (supply voltage) Yes

as per HART specifications HART PA 66-FR

V0 12.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 14$ $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$

27 7 V 92 mA 633 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326

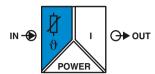
(x) II (1) G [Ex ia Ga] IIC

(x) II (1) D [Ex ia Da] IIIC (I) G Ex nA [ia Ga] IIC T4 Gc [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA [ia Ga] IIC T4 Gc Class I Div 2; IS for Class I, II, III Div 1 SIL 2 according to EN 61508

Description	
Output isolating amplifier, smart, out	tput intrinsically safe
	Screw connection Spring-cage conn.
	-pg rage ra

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
MACX MCR-EX-SL-IDSI-I	2865405	1			
MACX MCR-EX-SL-IDSI-I-SP	2924032	1			

Temperature transducer, Ex i



Programmable temperature transducer for intrinsically safe operation of resistance thermometers and resistance-type sensors installed in Ex areas. The measured values are converted into a linear 0 ... 20 mA or 4 ... 20 mA signal.

- Input for resistance thermometers and resistance-type sensors, [Ex ia]
- 0 ... 20 mA or 4 ... 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key, see page 167

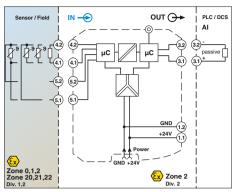
The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

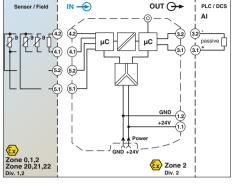
Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

For information on the programming adapter, refer to page 119

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571





Input data

Resistor

Cable resistance

Output data Output signal

Output ripple

General data

Supply voltage range

Current consumption

Step response (0 - 99%)

Transmission error, total ZERO / SPAN adjustment

Ambient temperature range

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Electrical isolation

Humidity

Status indication

Housing material

Dimensions W/H/D

Safety data as per ATEX

Power dissination Temperature coefficient

Load

Sensor input current

Measuring range span

Behavior in the event of a sensor error

Resistance thermometers

For resistance thermometers and resistance-type sensors

(UL) us (GL) Ex: (Ex) .(II) ...

Housing width 12.5 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor 0 Ω ... 2000 Ω 50 Ω per line (200 µA ... 1 mA) min. 50 K

0 mA ... 20 mA / 4 mA ... 20 mA max. 500 Ω As per NE 43 or can be freely defined < 50 uApr

19.2 V DC ... 30 V DC (24 V DC (-20% ... +25%))

< 40 mA (24 V DC) < 1 W 0.01%/K

Typ. 800 ms (With SIL) max. 1200 ms (With SIL) Typ. 700 ms (Without SIL) max 1100 ms (Without SII)

0.05% x 100 [K] / measuring range span [K] + 0.05%

+5% / +5%

Input/output/power supply

Input/output

Input/power supply

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

-20°C ... 60°C (Any mounting position)

5% ... 95% (no condensation) Green LED (supply voltage, PWR) Red LED, flashing (line, sensor error, ERR)
Red LED (module error, ERR) PA 66-FR

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

6 V 6.3 mA 9.4 mW

IFS-USB-PR

CE-compliant, additionally EN 61326

🖎 II (1) G [Ex ia Ga] IIC

(1) G [EX 18 GB] IIIC (2) II (1) D [Ex 18 DB] IIIC (2) II 3(1) G Ex nA ic [ia GB] IIC T4 Gc X

[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA ic [ia Ga] IIC T4 Gc

Class I Div 2; IS for Class I, II, III Div 1 SIL 2 TÜV Rheinland 968/EZ374.00/09

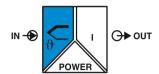
Maximum voltage U _o	
Maximum current I _o	
Maximum power P _o	
Conformance / approvals	
Conformance	
ATEX	
IECEx	
UL, USA / Canada	
Functional safety (SIL)	
Tunctional safety (SIE)	
Description	
·	
Temperature measuring transducers for	
resistance thermometers, intrinsically safe in	•
Order configuration	Screw connection
Order configuration	Spring-cage conn.
Standard configuration	Screw connection
Standard configuration	Spring-cage conn.

Programming adapter for configuring modules with

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MACX MCR-EX-SL-RTD-I') MACX MCR-EX-SL-RTD-I-SP') MACX MCR-EX-SL-RTD-I-NC') MACX MCR-EX-SL-RTD-I-SP-NC')	2865939 2924142 2865573 2924168	1 1 1				

-EX-SL-R D-I-SP-NC ')	2924100	1
Accessories	;	
ROG-ADAPTER1)	2811271	1

Temperature transducer, Ex i



Programmable temperature transducer for intrinsically safe operation of thermocouples and mV sources installed in Ex areas. The measured values are converted into a linear 0 ... 20 mA or 4 ... 20 mA signal.

- Input for thermocouples and mV sources,
- 0 ... 20 mA or 4 ... 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

To order a product with an order configuration, please enter the desired configuration by referring to the order key, see page 167

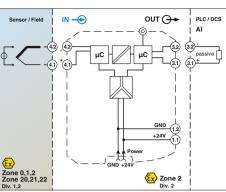
The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

For information on the programming adapter, refer to page 119

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Thermocouple sensors

Voltage

Measuring range span

Output data Output signal Load

Behavior in the event of a sensor error Output ripple

General data Supply voltage range Current consumption Power dissipation Temperature coefficient

Step response (0 - 99%)

Transmission error, total Cold junction errors

ZERO / SPAN adjustment Electrical isolation

Input/output/power supply

Input/output Input/power supply

Humidity Status indication

Ambient temperature range

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Safety data as per ATEX Maximum voltage U Maximum current I.

Maximum power P. Maximum voltage U...

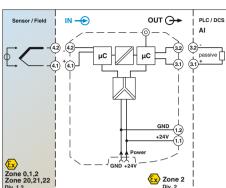
Conformance / approvals Conformance

ATEX

IECEx

UL. USA / Canada Functional safety (SIL)

S-PORT interface





For thermocouples and mV sources

c(UL) es (GL Ex: (1), (1), (2) Housing width 12.5 mm

Technical data

E, J, K, N as per IEC / EN 60584, L as per DIN 43760

-20 mV ... 70 mV

(Min. 50 K for thermocouples, 3 mV for mV sources)

0 mA ... 20 mA / 4 mA ... 20 mA max 500 O As per NE 43 or can be freely defined

< 50 μA_{PP} 19 2 V DC 30 V DC

< 40 mA (24 V DC)

< 1 W

0.01%/K

Typ. 800 ms (With SIL) max 1200 ms (With SII.) Typ. 700 ms (Without SIL) max. 1100 ms (Without SIL)

 $0.05\% \times 200 \text{ [K]/Measuring range span [K]} + 0.05\%$

±1 K ±5% / ±5%

2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation) Green LED (supply voltage, PWR) Red LED, flashing (line, sensor error, ERR)

Red LED (module error, ERR)

PA 66-FR

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

6 V 4.7 mA 7 mW 253 V AC (125 V DC)

(1) D [Ex ia Da] IIIC (2) II (1) D [Ex ia Da] IIIC (3) II 3(1) G Ex nA ic [ia Ga] IIC T4 Gc X

[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA ic [ia Ga] IIC T4 Gc Class I Div 2: IS for Class I. II. III Div 1

SIL 2 TÜV Rheinland 968/EZ374.00/09

		Ordering dat	a
escription		Туре	(
emperature measuring transducers trinsically safe input	s for thermocouples,		
rder configuration	Screw connection	MACX MCR-EX-SL-TC-I1)	
tandard configuration	Screw connection	MACX MCR-EX-SL-TC-I-NC1)	

,		
Accessories		
IFS-USB-PROG-ADAPTER¹)	2811271	1

Order No.

2865942 2865586

Description	
Temperature measuring transduce intrinsically safe input	ers for thermocouples,
Order configuration	Screw connection
Standard configuration	Screw connection

Programming adapter for configuring modules with

Order key and temperature ranges for MACX-MCR-EX-SL-RTD-I(-SP) temperature transducer

Order key for MACX-MCR-EX-SL-RTD-I(-SP) temperature transducer (standard configuration entered as an example)

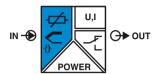
Order No.	Sensor type	Safety integrity level Connection (SIL) technology		Measuring Start	range: End		leasu nit	uring Output range	Filter Oversampling	Filter Moving average value
2865939	/ PT100	/ ON / 3		/ 0	/ 100]/[(C / OUT02	/ 10	/ 1 /
2865939 ≘ MACX MCR-EX- SL-RTD-I 2924142 ≘ MACX MCR-EX- SL-RTD-I-SP	see below	ON = active NONE = not active ON only with output range = OUT02 2 = 2-cond 3 = 3-cond 4 = 4-cond	uctor	see be- low	see be- low		C ≘ F ≘ O ≘	°F	1	1
	RES01 ≘	Resistor		0	2000		Ω	25 Ω		
	PT50	Pt 50 acc. to IEC 751		-200	850		°C	50 K		
	PT100	Pt 100 acc. to IEC 751		-200	850		°C	50 K		
	PT200	Pt 200 acc. to IEC 751		-200	850		°C	50 K		
	PT500	Pt 500 acc. to IEC 751		-200	850		°C	50 K		
	PT100S ≘	Pt 100 acc. to Sama RC21-4-1966		-200	600		°C	50 K		
	PT500S	Pt 500 acc. to Sama RC21-4-1966		-200	600	1 1	°C	50 K		
		Ni 100 acc. to DIN 43760		-60	250		°C	50 K		
		Ni 500 acc. to DIN 43760		-60	250		°C	50 K		
		CU50 acc. to GOST 6651 (α = 1.428)		-50	200	1 1	°C	50 K		
	CU53 ≙	CU53 acc. to GOST 6651 (α = 1.426)		-50	180	٠	°C	50 K		
	Alarm signal Short circuit/ overrange	Alarm signal Sensor break/ underrange	Fac	ctory calibrat		te =	FCC			
•••	/ 103	5 / I215	/		NONE			Temperature conve	ersion guide for °C to °F	:
	1035			NONE					32	
	Alarm signals c ware.	an also be configured individually using soft-								

Order key and temperature ranges for MACX-MCR-EX-SL-TC-I temperature transducer

Order key for MACX-MCR-EX-SL-TC-I temperature transducer (standard configuration entered as an example)

Order No.	Sensor type	Safety integrity level (SIL)	Cold junction com- pensation	Measuring Start	range: End	Meas unit	uring	Output range	Filter Oversampling	Filter Moving average va	lue
2924942 MACX MCR-EX- SL-TC-I	see below	/ ON ON ≘active NONE ≘ not active ON only with output range = OUT02	1 1 \(\heta \) switched on 0 \(\heta \) switched off (e.g., for mV voltage measurement)	see be- low	see be- low	C =	C ≘ °C ≘ °F ≘ mV	OUT01 = 020 mA OUT02 = 420 mA	/ 10 1	/ 1 1	/
]			Sr	nallest measuring range span			
	V03 ≘	Voltage (mV)		-20	+70	mV		3 mV			
	E ≙	acc. to IEC 584-1 (NiCr-Cu	Ni)	-250	1000	°C		50 K			
	J ≘	acc. to IEC 584-1 (Fe-CuN)	-210	1200	°C		50 K			
	K ≘	acc. to IEC 584-1 (NiCr-Ni)		-250	1372	°C		50 K			
	N ≘	acc. to IEC 584-1 (NiCrSi-N	liSi)	-250	1300	°C		50 K			
	L ≘	acc. to DIN 43760 (Fe-CuN	i)	-200	900	°C		50 K			
	Alarm signal Overrange	Alarm sigr Sensor bre underrange	ory calibration		= FCC	:					
	/ 10:	35 /	l215 /		NONE			Temperature conver	sion guide for °C to °F:		
	1		mA Yi 5 mA YESI	PLUS = FCC	CC (a fee is			$T[^{\circ}F] = \int_{5}^{9} T[^{\circ}C] + 32$			
	ware.	and the second s	, somg som								

Temperature transducer, Ex i



Universal temperature transducer with freely configurable properties for intrinsically safe operation of resistance thermometers, thermocouples, resistance-type sensors, and potentiometers installed in Ex areas

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources, [Ex ia]
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Relay switching output
- Configuration via software (FDT-DTM) or IFS-OP-UNIT operating and display unit
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in capable screw or spring-cage connection method
- Cold junction compensation with separate connector
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

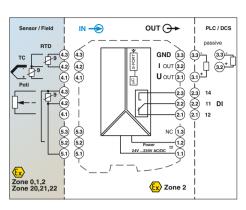
To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on

For information on the programming adapter, refer to page 119

1) EMC: Class A product, see page 571



Input data

Resistance thermometers

Thermocouple sensors

Resistor

Potentiometer

Voltage Output data

Output signal

Maximum output signal

Load R_B

Behavior in the event of a sensor error

Switching output

Contact type

Contact material

Maximum switching voltage Maximum switching current

General data

Supply voltage range Power consumption

Temperature coefficien

Transmission error, total

Electrical isolation

Input/output/power supply Input/output Input/power supply Input/switching output Output/power supply

Ambient temperature range

Humidity

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX

Maximum voltage U

Maximum current I. Maximum power P.

Conformance / approvals

Conformance

ATEX

Functional safety (SIL)

Description Temperature transducer, intrinsically safe input Standard configuration Screw connection Standard configuration Spring-cage conn. Order configuration Screw connection Order configuration Spring-cage conn.

Programming adapter for configuring modules with S-PORT interface









Universal, with switching output, wide-range power supply

Functional safety Ex: 🕸 🖺

Housing width 17.5 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor

B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG

 $0~\Omega ...~50~k\Omega$

 $0~\Omega \dots 50~k\Omega$

-1000 mV ... 1000 mV

U output I output

4 mA ... 20 mA (in the case of SIL; further free configuration without SIL)

±11 V 22 mA \leq 600 Ω (20 mA) ≥ 10 kΩ

According to NE 43 or freely configurable

Switching output

1 PDT

AgSnO₂, hard gold-plated

30 V AC (30 V DC)

0.5 A (30 V AC) / 1 A (30 V DC)

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 1.5 W

0.01%/K

< 0.1% (e.g., for Pt 100, 300 K span, 4 \dots 20 mA)

2.5 kV (50 Hz, 1 min., test voltage)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

375 V (Peak value in accordance with EN 60079-11)

300 V_{rms} (Rated insulation voltage,

surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 65°C

Typ. 5% ... 95% (no condensation)

PA 66-FR ۷n

17.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

6 V 7.4 mA

11 mW

CE-compliant (Ex) II (1) G [Ex ia Ga] IIC (Ex) II (1) D [Ex ia Da] IIIC

II 3 G Ex nA nC ic IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC ic IIC T4 Gc

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MACX MCR-EX-T-UI-UP1)	2865654	1				
MACX MCR-EX-T-UI-UP-SP1)	2924689	1				
MACX MCR-EX-T-UI-UP-C1)	2811763	1				
MACX MCR-EX-T-UI-UP-SP-C1)	2924692	1				

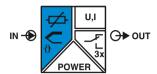
Accessories							
IFS-USB-PROG-ADAPTER ¹)	2811271	1					

Order key for MACX-MCR-EX-T-UI-UP(-SP)-C temperature transducer (standard configuration entered as an example)

Order No.	Safety integrity level (SIL)	Sensor type	Connection technology	Cold junction compensation	Measuring Start	g range: End	Meas unit	suring Output r	ange	Factory calibration certificate = FCC
2811763	/ ON	/ PT100	/ 4	/ 0	/ -50	/ 150	/	C /	OUT02	/ NONE
2811763 ≘ MACX MCR-EX- T-UI-UP-C	ON ≘ active NONE ≘ not active	see below	2	0 ≘ off, e.g., with RTD, R, potenti- ometer, mV	see be- low	see be- low	F	≙ °F OUT16	â 05 mAâ 010 mAâ 020 mA	NONE ≘ without FCC
2924692 ≘ MACX MCR-EX-	ON only with output		3 ≘ 3-conductor	1				ê % OUT15 ê mV OUT25 OUT26	â 05 mAâ 15 mAâ 210 mA	YES ≘ with FCC (a fee is charged)
T-UI-UP-SP-C	range = OUT02		4 ≜ 4-conductor					OUT05 OUT03 OUT06 OUT04 OUT13 OUT14 Others of		YESPLUS ≜ FCC with 5 measuring points (a fee is charged)
								Smallestmeasuri range span		ng options can be configured S-CONF software:
Resistance them		PT100	Pt 100 acc. to IEC 7	51	-200	850	°C	20 K		nfigurable user characteristic curve
Others can be seld ured in the softwar	ected or freely config-		Pt 200 acc. to IEC 7		-200	850	°C	20 K	with 30 int	erpolation points
ured in the softwar	16.		Pt 500 acc. to IEC 7 Pt 1000 acc. to IEC		-200 -200	850 850	℃	20 K 20 K		havior in the event of a short circuit,
		PT100S ≘	Pt 100 acc. to Sama	RC21-4-1966	-200	850	°C	20 K		eak or overrange/underrange can be figured or set according to NE43
			Pt 1000 acc. to Sam	a RC21-4-1966 651-2009 (α = 0.00385)	-200	850 850	0℃	20 K 20 K		configuration: NE43 upscale)
				$6651-2009 (\alpha = 0.00385)$	-200 -200	850	°C	20 K	- Filter setti	ng (standard configuration: 1)
			Pt 100 acc. to JIS C		-200	850	°C	20 K		,
			Pt 1000 acc. to JIS (Ni 100 acc. to DIN 4		-200 -60	850 250	°C	20 K 20 K	- Restart af	ter failsafe (standard configuration:
				43760/DIN IEC 60751	-60	250	°C	20 K	,	
			Ni 100 acc. to Sama		-60	180	°C	20 K		behavior: switching output ? es, times, etc.) (standard configura-
			Ni 1000 acc. to Sam Ni 1000 (Landis & G		-60 -50	180 160	0℃	20 K 20 K	tion: OFF)	
			Cu 10 acc. to Sama	• •	-70	500	°C	100 K		
			Cu 50 acc. to GOST 6		-50	200	°C	100 K		
				$6651-20091 \ (\alpha = 0.00428)$ $651-2009 \ (\alpha = 0.00426)$	-50 -50	200 180	00 0	100 K 100 K		
		KTY81 ≘	KTY81-110 (Philips) KTY84-130 (Philips)	·	-55 -40	150 300	°C	20 K 20 K		
Thermocouples		В ≘	acc. to IEC 584-1 (F	t30Rh-Pt6Rh)	500	1820	°C	50 K		
Others can be sele	ected in the software.		acc. to IEC 584-1 (N	,	-230	1000 1200	°C	50 K		
			acc. to IEC 584-1 (F acc. to IEC 584-1 (N		-210 -250	1372	°C	50 K 50 K		
			acc. to IEC 584-1 (N	,	-250	1300	°C	50 K		
			acc. to IEC 584-1 (F acc. to IEC 584-1 (F		-50 -50	1768 1768	0℃	50 K 50 K		
			acc. to IEC 584-1 (C	,	-200	400	°C	50 K		
			acc. to DIN 43760 (I		-200	900	°C	50 K		
			acc. to DIN 43760 (0 C ASTM JE988 (200		-200 0	600 2315	°C	50 K 50 K		
		DA ≘	D ASTM JE988 (200	02)	0	2315	°C	50 K		
			A-1 GOST 8.585-20 A-2 GOST 8.585-20		0	2500 1800	°C	50 K 50 K		
			A-3 GOST 8.585-20		0	1800	°C	50 K		
			M GOST 8.585-200		-200	100	°C	50 K		
		LG ≘	L GOST 8.585-2001		-200	800	°C	50 K		
	ce-type sensors (R)		0150Ω resistor		0	150	Ω			
(2, 3, 4-conducto Others can be sele	or) ected in the software.		0600 Ω resistor		0	600	Ω	10% of the select	he	
2	a Johnaro.		01200 Ω resistor 06250 Ω resistor		0	1200 6250	Ω	measuring rang		
			012500Ω resistor		0	12500	Ω			
		RES12 ≘	050000 Ω resistor		0	50000	Ω			
Potentiometers			0150Ω potentiom		0	100	%			
(3-conductor) Others can be sele	ected in the software.		0600 Ω potentiom		0	100	%	10% of the select	ad	
Juliera cari de Sele	colou iii iiie suitwaie.		01200 Ω potention 06250 Ω potention		0	100 100	%	measuring rang		
		POT10 ≘	012500 Ω potentio	ometer	0	100	%			
		POT12 ≘	050000 Ω potention	ometer	0	100	%			
Voltage signals (Others can be sele	(mV) ected in the software.	V04 ≘	Voltage (mV)		-1000	+1000	mV	10% of nomina span		
		1								

Temperature conversion guide for °C to °F:

Temperature transducer, Ex i



Universal temperature transducer with freely configurable properties for intrinsically safe operation of resistance thermometers, thermocouples, resistance-type sensors, and potentiometers installed in Ex areas

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources, [Ex ia]
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Three limit value relays, can be used in combination as a safe limit value relay
- Configuration via software (FDT-DTM) or IFS-OP-UNIT operating and display unit
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in capable screw or spring-cage connection method
- Cold junction compensation with separate connector
- Wide-range power supply: 19.2 ... 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

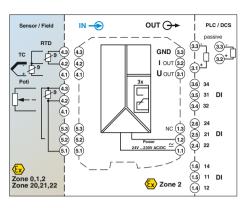
To order a product with an order configuration, enter the required configuration by referring to the adjacent order key

The configuration software can be downloaded from the Internet (www.phoenixcontact.net/products)

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on

For information on the programming adapter, refer to page 119

1) EMC: Class A product, see page 571



Input data

Resistance thermometers

Thermocouple sensors

Resistor

Potentiometer Voltage

Output data Output signal

Maximum output signal

Load R_B

Behavior in the event of a sensor error

Switching output

Contact type

Contact material

Maximum switching voltage Maximum switching current

General data

Supply voltage range Power consumption

Temperature coefficien

Transmission error, total

Electrical isolation

Input/output/power supply Input/output Input/power supply Input/switching output Output/power supply

Ambient temperature range

Humidity

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX

Maximum voltage U

Maximum current I.

Maximum power P.

Conformance / approvals Conformance

ATEX

Functional safety (SIL)

Description Temperature transducer, intrinsically safe input Standard configuration Screw connection Standard configuration Spring-cage conn. Order configuration Screw connection Order configuration Spring-cage conn.

Programming adapter for configuring modules with S-PORT interface









Universal, with three limit value relays, wide-range power supply

Functional safety Ex: 🕸 🖺

Housing width 35 mm

Technical data

Pt, Ni, Cu sensors: 2, 3, 4-conductor

B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG

 $0~\Omega ...~50~k\Omega$

 $0~\Omega \dots 50~k\Omega$

-1000 mV ... 1000 mV

U output I output

4 mA ... 20 mA (in the case of SIL; further free configuration without SIL)

±11 V 22 mA \leq 600 Ω (20 mA)

≥ 10 kΩ According to NE 43 or freely configurable

Relay output

3 PDTs

AgSnO₂, hard gold-plated

250 V AC (250 V DC)

2 A (250 V AC) / 2 A (28 V DC)

24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)

< 2.4 W

0.01%/K

< 0.1% (e.g., for Pt 100, 300 K span, 4 \dots 20 mA)

2.5 kV (50 Hz, 1 min., test voltage)

375 V (Peak value in accordance with EN 60079-11)

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11)

300 V_{rms} (Rated insulation voltage,

surge voltage category II; pollution degree 2,

safe isolation as per EN 61010. EN 50178)

-20°C ... 65°C

Typ. 5% ... 95% (no condensation)

PA 66-FR ۷n

35 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

6 V

7.4 mA

11 mW

CE-compliant

(Ex) II (1) G [Ex ia Ga] IIC (Ex) II (1) D [Ex ia Da] IIIC

II 3 G Ex nA nC ic IIC T4 Gc X

[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC ic IIC T4 Gc

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MACX MCR-EX-T-UIREL-UP1) MACX MCR-EX-T-UIREL-UP-SP1) MACX MCR-EX-T-UIREL-UP-C1) MACX MCR-EX-T-UIREL-UP-SP-C1)	2865751 2924799 2865722 2924809	1 1 1 1				

Accessories	,	
IFS-USB-PROG-ADAPTER1)	2811271	1

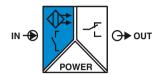
Order key for MACX-MCR-EX-T-UIREL-UP(-SP)-C temperature transducer (standard configuration entered as an example)

Order No.	Safety integrity level (SIL)		Connection technology	Cold junction compensation	Measuring Start		Meas unit	suring	Output ran	ge	Factory calibration certificate = FCC
2865722	/ ON	/ PT100	/ 4	/ 0	/ -50	/ 150	/	С	/ OU	T02	/ NONE
2865722 ≘ MACX MCR-EX-	ON ≘ active	see below	2 = 2-conductor	0 ≘ off, e.g., with RTD, R, potenti-	see be- low	see be-		≙ °C ≙ °F	OUT15		NONE ≘ without FCC
T-UIREL-UP-C 2924809 ≘	NONE ≘ not active		3 ≘ 3-conductor	ometer, mV			Р :	≙ Ω ≙ % ≙ mV	OUT01 ≘ OUT15 ≘ OUT25 ≘	05 mA	YES ≘ with FCC (a fee is charged)
MACX MCR-EX- T-UIREL-UP-SP-C	ON only with output range = OUT02		4 ≘ 4-conductor	1					OUT26 ≘ OUT02 ≘ OUT05 ≘	210 mA 420 mA	YESPLUS ≘ FCC with
									OUT03 ≘ OUT06 ≘	010 V	5 measuring points (a fee is charged)
									OUT04 ≘ OUT13 ≘		
									Others can configured ware	be freely	
									est measuring nge span		g options can be configured -CONF software:
	(272)	DT400	D: 100		000	0.50		Iai	- '		
Resistance then Others can be sel	mometers (RTD) ected or freely config-		Pt 100 acc. to IEC 7 Pt 200 acc. to IEC 7		-200 -200	850 850	0℃		20 K 20 K		figurable user characteristic curve erpolation points
ured in the softwa			Pt 500 acc. to IEC 7		-200	850	°C		20 K		
			Pt 1000 acc. to IEC		-200	850	°C		20 K		navior in the event of a short circuit, ak or overrange/underrange can be
			Pt 100 acc. to Same Pt 1000 acc. to Same		-200 -200	850 850	°C		20 K 20 K		igured or set according to NE43
				$6651-2009 (\alpha = 0.00385)$	-200	850	00		20 K	(standard	configuration: NE43 upscale)
		PT1000G ≘	Pt 1000 acc. to GOS	T 6651-2009 (α = 0.00385)	-200	850	°C		20 K	- Filter settin	ng (standard configuration: 1)
			Pt 100 acc. to JIS C		-200	850	°C		20 K		,
			Pt 1000 acc. to JIS (3760/DIN IEC 60751	-200 -60	850 250	°C		20 K 20 K	 Restart att ON) 	er failsafe (standard configuration:
		NI1000		43760/DIN IEC 60751	-60	250	°C		20 K	,	
			Ni 100 acc. to Sama		-60	180	0℃		20 K		behavior: switching output ? s, times, etc.) (standard configura-
			Ni 1000 acc. to Sam Ni 1000 (Landis & G		-60 -50	180 160			20 K 20 K	tion: OFF)	o, times, etc., (standard comigard
			Cu 10 acc. to Sama		-70	500	°C		100 K		
				651-2009 (α = 0.00428)	-50	200	°C		100 K		
				6651-2009 (α = 0.00428) 651-2009 (α = 0.00426)	-50 -50	200 180	°C °C		100 K 100 K		
			KTY81-110 (Philips		-55	150	°C		20 K		
		KTY84 ≘	KTY84-130 (Philips		-40	300	°C		20 K		
Others can be sel	(TC) ected in the software.		acc. to IEC 584-1 (F acc. to IEC 584-1 (N		500 -230	1820 1000	0℃		50 K 50 K		
Others can be ser	colod in the contware.		acc. to IEC 584-1 (F	,	-210	1200	00		50 K		
			acc. to IEC 584-1 (N		-250	1372	°C		50 K		
			acc. to IEC 584-1 (Nacc. to IEC 584-1 (F		-250 -50	1300 1768	0℃		50 K 50 K		
			acc. to IEC 584-1 (F	,	-50	1768	°C		50 K		
			acc. to IEC 584 (Cu	,	-200	400	°C		50 K		
			acc. to DIN 43760 (l acc. to DIN 43760 (l		-200 -200	900 600	0℃		50 K 50 K		
			C ASTM JE988 (20)		0	2315	°C		50 K		
			D ASTM JE988 (20		0	2315	°C		50 K		
			A-1 GOST 8.585-20 A-2 GOST 8.585-20		0	2500 1800	0℃		50 K 50 K		
			A-3 GOST 8.585-20		0	1800	°C		50 K		
			M GOST 8.585-200		-200	100	°C		50 K		
		LG ≘	L GOST 8.585-200		-200	800	°C		50 K		
	ce-type sensors (R)		0150Ω resistor		0	150	Ω				
(2, 3, 4-conducto	or) ected in the software.		0600 Ω resistor		0	600	Ω	10% of	f the selected		
Others can be ser	colod in the software.		01200Ω resistor 06250Ω resistor		0	1200 6250	Ω		suring range		
		RES10 ≘	012500Ω resistor		0	12500	Ω				
		RES12 ≘	050000 Ω resistor		0	50000	Ω				
Potentiometers		POT03 ≘	0150 Ω potentiom	eter	0	100	%				
(3-conductor)	noted in the setting	POT05 ≘	0600Ω potentiom	eter	0	100	%	4001	(a)		
Otners can be sel	ected in the software.		01200 Ω potention 06250 Ω potention		0	100 100	%		f the selected suring range		
			012500 Ω potention		0	100	%		J		
			050000 Ω potention		0	100	%				
Voltage signals	(mV)	V04	Voltage (mV)		-1000	+1000	mV	10%	of nominal		
	ected in the software.	-	. J		1000	. 1000		1070	span		
		1									

Temperature conversion guide for °C to °F:

T [°F] = 9 T [°C] + 32

Digital IN NAMUR isolating amplifier, Ex i



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

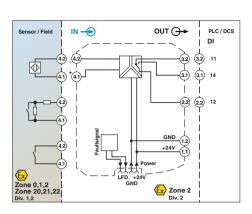
Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output

Contact type Contact material

Maximum switching voltage

Maximum switching capacity

Recommended minimum load Mechanical service life

Switching behavior

Maximum switching frequency

General data

Supply voltage range

Current consumption

Power dissipation Number of channels

Electrical isolation

Input/output Input/power supply Input/output/supply, T-Connector

> Screw connection Spring-cage conn.

Ambient temperature range Humidity

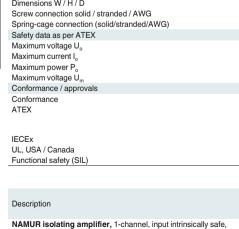
Housing material

Status indication

Inflammability class according to UL 94

Dimensions W / H / D

output: PDT contact











Signal output: PDT relay

Functional safety Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output

1 PDT AgSnO₂, hard gold-plated

250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)

500 VA 5 V / 10 mA 107 cycles

Can be inverted via slide switch

20 Hz (without load)

19 2 V DC 30 V DC 21 mA (24 V DC) < 650 mW

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, basic insulation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) PA 66-FR V٥ 12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9.6 V 10 mA 25 mW 253 V AC (125 V DC)

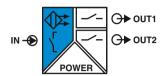
CE-compliant, additionally EN 61326 (I) (1) G [Ex ia Ga] IIC (I) D [Ex ia Da] IIIC II 3 G Ex nA nC IIC T4 Gc X

[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC IIC T4 Gc Class I Div 2: IS for Class I, II, III Div 1

SIL 2 according to EN 61508

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
MACX MCR-EX-SL-NAM-R1)	2865434	1		
MACX MCR-EX-SL-NAM-R-SP1)	2924045	1		

Digital IN NAMUR isolating amplifier, Ex i



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Two relay signal outputs (N/O contact); output 2 can be used as an error message
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

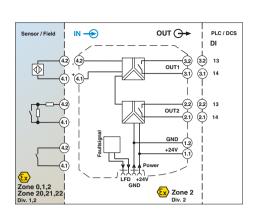
Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output Contact type Contact material Maximum switching voltage Maximum switching capacity Recommended minimum load Mechanical service life Switching behavior Maximum switching frequency

General data Supply voltage range Current consumption Power dissipation Number of channels Electrical isolation

> Input/output Input/power supply Input/supply, T connector

Output 1/output 2/input, power supply, T connector

Ambient temperature range Humidity Status indication

Housing material Inflammability class according to UL 94 Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX Maximum voltage U Maximum current I. Maximum power P. Maximum voltage U. Conformance / approvals

Conformance ATFX

IECEx UL, USA / Canada Functional safety (SIL)



2 signal outputs: N/O contact relay

Ex: (1) Functional safety Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA Break 0.05 mA < I_{IN} < 0.35 mA

Short-circuit 100 Ω < R_{Sensor} < 360 Ω Relay output

2 N/O contacts AgSnO₃, hard gold-plated 250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A) 500 VA 5 V / 10 mA 107 cycles Can be inverted via slide switch 20 Hz (without load)

19 2 V DC 30 V DC 30 mA (24 V DC) < 950 mW

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2. basic insulation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category III: pollution degree 2. safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage) -20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) PA 66-FR

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16 9.6 V 10 mA 25 mW 253 V AC (125 V DC)

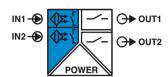
12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant, additionally EN 61326 II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC IIC T4 Gc Class I Div 2; IS for Class I, II, III Div 1 SIL 2 according to EN 61508

	Ordering dat	a	
	Туре	Order No.	Pcs. / Pkt.
e,			
ection	MACX MCR-EX-SL-NAM-2RO1)	2865450	1
conn.	MACX MCR-EX-SL-NAM-2RO-SP1)	2924061	1

Digital IN NAMUR isolating amplifier, Ex i



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

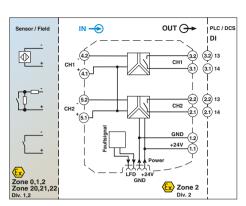
- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (N/O contact)
- Reversible direction of action (operating current or closed-circuit current behav-
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output

Contact type Contact material

Maximum switching voltage

Maximum switching capacity

Recommended minimum load Mechanical service life

Switching behavior

Maximum switching frequency

General data

Supply voltage range Current consumption

Power dissipation

Number of channels

Electrical isolation

Input/power supply Input/supply, T connector

Input/output

Output 1/output 2/input, power supply, T connector

Ambient temperature range

Humidity

Status indication

Housing material

Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX

Maximum voltage U Maximum current I.

Maximum power P.

Maximum voltage U.,

Conformance / approvals

Conformance ATFX

IECEx

UL, USA / Canada Functional safety (SIL)











2-channel, signal output: N/O contact relay

Functional safety

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) < 0.2 mA Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output

2 N/O contacts AgSnO₂, hard gold-plated

250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)

500 VA 5 V / 10 mA

107 cycles Can be inverted via slide switch

20 Hz (without load)

19 2 V DC 30 V DC 35 mA (24 V DC) < 1 W 2

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2.

basic insulation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage,

surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation)

Green LED (supply voltage) LED vellow (switching state) Red LED (line errors)

PA 66-FR V0

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9.6 V 10.3 mA 25 mW

253 V AC (125 V DC)

CE-compliant, additionally EN 61326 (x) II (1) G [Ex ia Ga] IIC (x) II (1) D [Ex ia Da] IIIC (x) II 3 G Ex nA nC IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC IIC T4 Gc Class I Div 2; IS for Class I, II, III Div 1

SIL 2 according to EN 61508 Ordering data

Туре	Order No.	Pcs./ Pkt.
MACX MCR-EX-SL-2NAM-RO¹) MACX MCR-EX-SL-2NAM-RO-SP¹)	2865476 2924087	1 1

Digital IN NAMUR isolating amplifier, Ex i

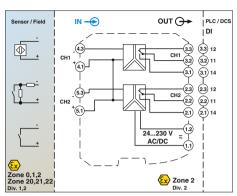


NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with de-excitation of output relay
- Wide-range power supply: 19.2 ... 253 V AC/DC
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information on resistance circuits and marking material can be found on page 183

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Switching hysteresis Line error detection

Switching output Contact type Contact material Maximum switching voltage Maximum switching capacity Recommended minimum load Mechanical service life Switching behavior Max. switching frequency General data Supply voltage range

Current consumption Power dissipation Electrical isolation

Input/output Input/power supply

Output 1/output 2/input, power supply

Ambient temperature range Humidity

Housing material

Inflammability class according to UL 94 Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX Maximum voltage U Maximum current I. Maximum power P. Maximum voltage U_m

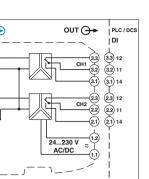
Conformance / approvals

Conformance ATEX

IECEx

De N οι

Functional safety (SIL)











2-channel, signal output: PDT relay, wide-range power supply

Functional safety Ex: 🖾 🖷 // Applied for: cUL / UL

Housing width 17.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit 8 V DC ±10%

> 2.1 mA (conductive) / < 1.2 mA (blocking)

Approx. 0.2 mA

Break 0.05 mA < I_m < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Relay output

AgSnO₃, hard gold-plated

250 V AC (2 A, 60 Hz) / 120 V DC (0.2 A) / 30 V DC (2 A)

500 VA 5 V / 10 mA 107 cycles

can be inverted using DIP switch 20 Hz (Load-dependent)

24 V 230 V AC/DC (-20% +10% 50 60 Hz)

< 80 mA; < 42 mA (24 V DC)

max. 1.3 W

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2,

safe isolation as per EN 61010, EN 50178) 2.5 kV AC (50 Hz, 1 min., test voltage)

300 V_{rms} (Rated insulation voltage, surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C

10% ... 95% (no condensation)

PA 66-FR V0

17 5 / 99 / 114 5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9.6 V 10.3 mA 25 mW

253 V AC/DC (Supply terminals) 250 V AC (Output terminals) 120 V DC (Output terminals)

CE-compliant, additionally EN 61326

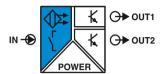
(1) D [Ex ia Da] IIIC (Ex) II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc X

[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA nC [ia Ga] IIC T4 Gc $\,$

SIL 2 according to EN 61508

, (- ,						
		Ordering data				
Description		Туре	Order No.	Pcs. / Pkt.		
IAMUR isolating amplifier, 2-chann utput: Changeover contact	el, input intrinsically safe,					
	Screw connection	MACX MCR-EX-SL-2NAM-R-UP1)	2865984	1		
	Spring-cage conn.	MACX MCR-EX-SL-2NAM-R-UP-SP1)	2924249	1		

Digital IN NAMUR isolating amplifier, Ex i



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

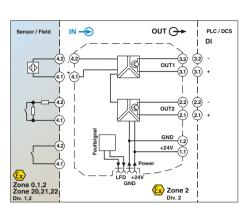
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- 2 signal outputs: transistor (passive); up to 5 kHz
- Signal output 2 can also be used as a fault signaling output
- Reversible direction of action (operating current or closed-circuit current behav-
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with inhibiting of transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 182

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling can be found from page 184

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Line error detection

Switching output Maximum switching voltage Maximum switching current Drop (ΔU) Switching behavior

Maximum switching frequency General data Supply voltage range Current consumption

Power dissination Number of channels Flectrical isolation

Input/output Input/supply, T-Connector Input/output/supply, T-Connector

Output 1/output 2

Ambient temperature range Status indication

Housing material Inflammability class according to UL 94 Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

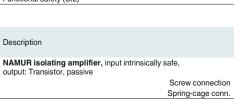
Safety data as per ATEX Maximum voltage U Maximum current Io

Maximum power P. Maximum voltage Un Conformance / approvals

Conformance ATFX

IECEx

UL, USA / Canada Functional safety (SIL











2 signal outputs: transistor (passive)

Functional safety Ex: •••••

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC +10% > 2.1 mA (conductive) / < 1.2 mA (blocking) Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω 2 transistor outputs, passive 30 V DC (per output) 50 mA (short-circuit resistant) < 1.4 V can be inverted using DIP switch

19.2 V DC ... 30 V DC < 28 mA (24 V DC) 800 mW

5 kHz

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

50 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 1 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED vellow (switching state) Red LED (line errors) PA 66-FR V0 12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9 6 V 10 mA 25 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326 (Ex) II (1) G [Ex ia Ga] IIC (Ex) II (1) D [Ex ia Da] IIIC (Ex) II 3 G Ex nA IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA IIC T4 Gc Class I Div 2; IS for Class I, II, III Div 1

SIL 2 according to EN 61508		
Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
MACX MCR-EX-SL-NAM-2T ¹) MACX MCR-EX-SL-NAM-2T-SP ¹)	2865463 2924074	1

Digital IN NAMUR isolating amplifier, Ex i



NAMUR isolating amplifier for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Signal output transistor (passive); up to
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD), can be activated/deactivated, error message signaled by red flashing LED with inhibiting of transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permitted

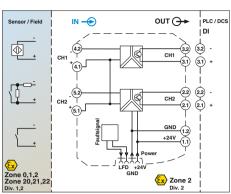
Notes:

found from page 182

Information about resistance circuits is given on page 183

Information on "Plug and play" connection using system cabling

1) EMC: Class A product, see page 571



Input data Input signal

No-load voltage Switching points Line error detection

Switching output Maximum switching voltage Maximum switching current Drop (ΔU) Switching behavior Maximum switching frequency

General data Supply voltage range Current consumption Power dissination Number of channels Electrical isolation

> Input/output Input/supply, T-Connector Input/output/supply, T-Connector

> > Output 1/output 2

Ambient temperature range Humidity Status indication

Housing material Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Safety data as per ATEX

Maximum voltage U_o Maximum current I,

Maximum power P.

Maximum voltage U, Conformance / approvals

Conformance

ATEX

IECEx

Description

UL, USA / Canada Functional safety (SIL

output: Transistor, passive









2-channel, signal output transistor (passive)

்**டு**ு **(i**) Functional safety Ex: •••••

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) Break 0.05 mA < $I_{\rm IN}$ < 0.35 mA Short-circuit 100 Ω < $R_{\rm Sensor}$ < 360 Ω

Transistor output, passive 30 V DC (per output) 50 mA (short-circuit resistant)

< 1.4 V

can be inverted using DIP switch 5 kHz

19.2 V DC ... 30 V DC < 34 mA (24 V DC) 1000 mW

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

2.5 kV (50 Hz, 1 min., test voltage)

50 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 1 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) PA 66-FR V0

12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9 6 V 10.3 mA 25 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326 🔯 II (1) G [Ex ia Ga] IIC (Ex) || (1) G || Ex || a Gaj || C (Ex) || (1) D || Ex || a Da] || || C (Ex) || 3 G Ex || A || C T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA IIC T4 Gc Class I Div 2; IS for Class I, II, III Div 1

SIL 2 according to EN 61508

	Ordering dat	а	
	Туре	Order No.	Pcs. / Pkt.
on in.	MACX MCR-EX-SL-2NAM-T1) MACX MCR-EX-SL-2NAM-T-SP1)	2865489 2924090	1 1

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be

can be found from page 184

Screw connection Spring-cage con

NAMUR isolating amplifier, 2-channel, input intrinsically safe

Input data Input signal

No-load voltage

Switching points

Line error detection Switching output

Switching voltage

Switching frequency

Impedance 0-signal

Impedance 1-signal

Switching behavior

Power dissipation

Electrical isolation

Ambient temperature range

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG)

Impedance fault

General data Supply voltage range

Current draw

Humidity

Status indication

Housing material

Dimensions W / H / D

Safety data as per ATEX

Maximum voltage U. Maximum current I

Maximum power P.

Conformance **ATEX**

Maximum voltage U.

Conformance / approvals

Functional safety (SIL)

Digital IN NAMUR isolating amplifier, Ex i



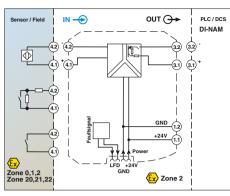
NAMUR isolation amplifiers for the intrinsically safe operation of proximity sensors or mechanical contacts installed in the

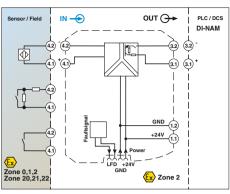
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Signal output with resistive behavior (transistor)
- Signal output with line fault transparency: line error message directly via output to PLC or PCS. The output responds in accordance with EN 60947-5-6.
- Up to 5 kHz
- Direction of operation can be selected
- Line fault detection can be activated/deactivated
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or spring-cage connection technology
- Safe 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permissible

Notes:

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found

Information about resistance circuits is given on page 183













With line fault transparency

Housing width 12.5 mm

Technical data

NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit 8 V DC ±10% > 2.1 mA (conductive) / < 1.2 mA (blocking) Break 0.05 mA < I_{IN} < 0.35 mA Short-circuit 100 Ω < R_{Sensor} < 360 Ω

Resistive (transistor, passive)

Typ. 8.2 V DC ±10% (according to EN 60947-5-6)

≤ 5 kHz (Ohmic load) $11 k\Omega \pm 5\%$ 1.4 kΩ ±5% > 100 kΩ

Input/output

Input/supply, T-Connector

Input/output/supply, T-Connector

can be inverted using DIP switch

12 V DC ... 24 V DC -20 % ... +25 % 25 mA (24 V DC) < 0.6 W

375 V (Peak value in accordance with EN 60079-11) 375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) 2.5 kV (50 Hz, 1 min., test voltage)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) PA 66-FR V0 12.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

9 6 V 10 mA 25 mW 253 V AC (125 V DC)

CE-compliant, additionally EN 61326

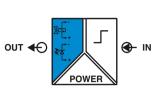
(x) II (1) G [Ex ia Ga] IIC
(x) II (1) D [Ex ia Da] IIIC (E) II 3G Ex nA IIC T4 Gc X

Yes SIL 2

Description
NAMUR isolation amplifier , intrinsically safe input, output with line fault transparency
Screw connection
Spring-cage conn

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-EX-SL-NAM-NAM	2866006	1	
MACX MCR-EX-SL-NAM-NAM-SP	2924883	1	

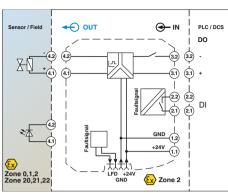
Digital OUT Solenoid driver, Ex i



Solenoid driver for the intrinsically safe control of Ex i solenoid valves, alarm transmitters or indicators installed in the

- Input: logic (low/high signal)
- Output: 48 mA current limitation at 9.5 V,
- Line fault detection (can be activated/deactivated)
 - Directly via signal channel
 - Or via switching output
- Transparent for test pulses
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or spring-cage connection technology
- Safe 3-way electrical isolation
- Up to SIL 2 according to EN 61508
- Installation in zone 2 permissible

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found



Input data

Input current

Output data Output voltage

Current limitation

No-load voltage

Internal resistance

Response time t_A

Switch contact

Current draw

Short-circuit-proof General data

Power dissipation

Electrical isolation

Supply voltage range

Line error detection

Error message output

Switching level 0 signal ("L")

Switching level 1 signal ("H")

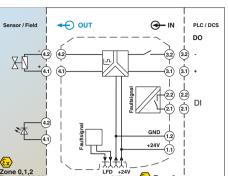
Transparent for test pulses

Immunity to short-circuiting

Maximum switching voltage

Maximum switching current

Input impedance in the event of a line fault at the output











Current limitation 48 mA, with line fault detection

Housing width 12.5 mm

Technical data

0 V DC ... 5 V DC (Open) 15 V DC ... 30 V DC

< 12 mA

 $3 \text{ M}\Omega$ (High resistance (Mega Ω))

≥ 9.5 V DC (At 48 mA)

> 48 mA (With cable error detection)

> 23 V DC

≥ 269 Ω (Internal resistance R_i)

< 30 ms

< 50 Ω (short circuit on the line)

 $> 10 \text{ k}\Omega$ (line break)

N/C contact 30 V DC 50 mA

19.2 V DC ... 30 V DC (24 V DC (-20% ... +25%))

< 90 mA < 1.5 W

375 V (Peak value in accordance with EN 60079-11) 2.5 kV (50 Hz, 1 min., test voltage)

300 V.... (Rated insulation voltage surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Green LED (supply voltage) LED yellow (switching state)

Red LED (line errors) IP20

PA 66-FR V0

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

25.3 V 94 mA 595 mW 253 V

CE-compliant, additionally EN 61326

(x) || (1) G [Ex ia Ga] ||C (x) || (1) D [Ex ia Da] ||IC (x) || 3(1) G Ex nA [ia Ga] ||C T4 Gc X

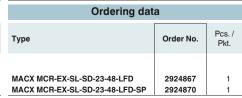
Yes

SIL 3 (applied for)

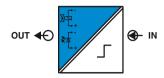
Ambient temperature range	
Humidity	
Status indication	
Degree of protection	
Housing material Inflammability class according to UL 94	
Dimensions W / H / D	
Screw connection solid / stranded / AWG	
Spring-cage connection (solid/stranded/AWG)	
Safety data as per ATEX	
Maximum voltage U _o	
Maximum current I _o	
Maximum power P _o Maximum voltage U _m	
Conformance / approvals	
Conformance	
ATEX	
IECEx	
Functional safety (SIL)	
i unononai sarety (OIL)	-
Description	

Input/output, supply, error message output

Description		Туре
Solenoid driver , logic input, intrinsically safe out letection	tput, line fault	
	Screw connection	MACX MCR-E
\$	Spring-cage conn.	MACX MCR-I



Digital OUT Solenoid driver, Ex i



Solenoid drivers for controlling intrinsically safe solenoid valves, alarm transmitters, and indicators installed in Ex areas.

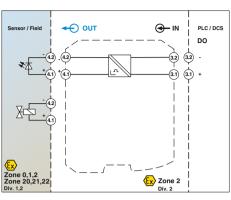
- 20 ... 30 V DC input
- Output [Ex ia]
- Various output characteristic curves compatible with the commercial solenoid valves
- Loop-powered: The required power is supplied via the control signal on the input side.
- Mechanically compatible with DIN rail connector
- Galvanic 2-way isolation
- Up to SIL 3 as per EN 61508
- Installation in zone 2 permitted

Notes:

A list of suitable valves and notes for calculating a valve circuit are available from the download center at www.phoenixcontact.net/products

Information on marking material can be found on page 127

Information on "Plug and play" connection using system cabling can be found from page 184



Input data Input signal Input current Output data Output voltage Current limitation No-load voltage Internal resistance Immunity to short-circuiting Response time t_A General data Power dissipation Temperature coefficient Electrical isolation

Output/input

Ambient temperature range Humidity Status indication

Degree of protection

Housing material Inflammability class according to UL 94

Dimensions W/H/D

Screw connection solid / stranded / AWG

Spring-cage connection (solid/stranded/AWG) Safety data as per ATEX

Maximum voltage U

Maximum current I

Maximum power P

Maximum voltage U,,

Conformance / approvals

Conformance

ATEX

IECEx

UL, USA / Canada Functional safety (SIL)



Current limitation 25 mA

Ex: (Ex) (III) III Housing width 12.5 mm

Technical data

20 V DC ... 30 V DC

10 mA DC ... 70 mA DC (45 mA for $U_e = 24 \text{ V DC}$)

5.5 V DC (At 25 mA)

25 mA

21.9 V DC

641 Ω (Internal resistance R_i)

Yes

20 ms

< 1 W 0.01%/K

375 V (Peak value in accordance with EN 60079-11)

2.5 kV (50 Hz, 1 min., test voltage)

300 V_{rms} (Rated insulation voltage,

surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

-20°C ... 60°C (Any mounting position)

10% ... 95% (no condensation)

Yellow LED (switching state / status, lights up when output circuit is

IP20

PA 66-FR V0

12.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

39 mA

245 mW

253 V AC (125 V DC)

CE-compliant, additionally EN 61326 (I) G [Ex ia Ga] IIC/IIB/IIA (E) II (1) D [Ex ia Ga] IIIC (E) II 3 G Ex nA IIC T4 Gc X

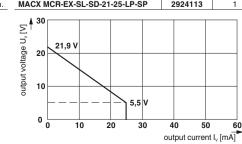
[Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA IIC T4 Gc X

Class I Div 2; IS for Class I, II, III Div 1

SIL 3

Description	
Solenoid driver, loop-powered, output intrinsica	ally safe
	•
	Screw connection
	Spring-cage conn.

Ordering dat	a	
Туре	Order No.	Pcs. / Pkt.
MACX MCR-EX-SL-SD-21-25-LP	2865492	1
MACX MCR-EX-SL-SD-21-25-LP-SP	2924113	1











Current limitation 40 mA







Current limitation 48 mA







< 1.4 W

0.01%/K

188 mA

1.18 W

Pcs /

Pkt.

Order No.



Current limitation 58 mA, [Ex ia] IIB

- Functional safety

Ex: 🐼 🕪 🖺
Housing width 12.5 mm
Т

Technical data 20 V DC ... 30 V DC 10 mA \dots 95 mA (65 mA for U_e = 24 V DC) 10 V DC (At 40 mA) 40 mA 21.9 V DC 287 Ω (Internal resistance R_i) Yes 20 ms < 1.2 W 0.01%/K

375 V (Peak value in accordance with EN 60079-11) 2.5 kV (50 Hz, 1 min., test voltage) 300 V_{ms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) -20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Yellow LED (switching state / status, lights up when output circuit is active) IP20 PA 66-FR V0 12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 24 - 16$ 25.1 V

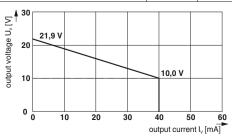
550 mW 253 V AC (125 V DC) CE-compliant, additionally EN 61326 (Ex) II (1) G [Ex ia Ga] IIC/IIB/IIA (Ex) II (1) D [Ex ia Da] IIIC (Ex) II 3 G Ex nA IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA IIC T4 Gc X

Class I Div 2; IS for Class I, II, III Div 1

87 mA

SIL 3

Ordering dat	Ordering data		
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-EX-SL-SD-21-40-LP MACX MCR-EX-SL-SD-21-40-LP-SP	2865764 2924139	1 1	
MACX MCH-EX-SL-SD-21-40-LP-SP	2924139	1	



Ex: (Ex) (I) = Housing width 12.5 mm

riodaling width 12.5 min
Technical data
20 V DC 30 V DC
10 mA 95 mA (75 mA for U_e = 24 V DC)
10.5 V DC (At 48 mA) 48 mA 24 V DC 276 Ω (Internal resistance R _i) Yes 30 ms
4.400
<1.4 W 0.01%/K
375 V (Peak value in accordance with EN 60079-11)

375 V (Peak value in accordance with EN 60079-11) 2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178) -20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Yellow LED (switching state / status, lights up when output circuit is active) IP20 PA 66-FR V0 12.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

253 V AC (125 V DC) CE-compliant, additionally EN 61326 (EX) II (1) G [Ex ia Ga] IIC/IIB/IIA (EX) II (1) D [Ex ia Da] IIIC (EX) II 3 G Ex nA IIC T4 Gc X [Ex ia Ga] IIC; [Ex ia Da] IIIC; Ex nA IIC T4 Gc X Class I Div 2; IS for Class I, II, III Div 1 SIL 3 **Ordering data**

10

20

101 mA

697 mW

Туре

MAC	ΧM	CR-EX-S	L-SD-24	-48-LP	2	865609		1
MAC	ΧM	ICR-EX-S	L-SD-24	-48-LP-S	P 2	924126		1
	30 20	24 V						
output voltage U _v [V] -	10			<u></u>			10,5 V	
no	.0							

Functional safety Housing width 12.5 mm

20 V DC 30 V DC
10 mA 105 mA (95 mA for U _e = 24 V DC)
12.9 V DC (At 58 mA)
58 mA
21.9 V DC
133 Ω (Internal resistance R _i)
Yes
30 ms

Technical data

375 V (Peak value in accordance with EN 60079-11) 2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage, surge voltage category II; pollution degree 2, safe isolation as per EN 61010, EN 50178)

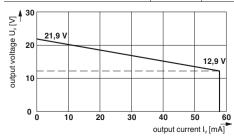
-20°C ... 60°C (Any mounting position) 10% ... 95% (no condensation) Yellow LED (switching state / status, lights up when output circuit is active) IP20 PA 66-FR V0

12.5 / 99 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$ 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

253 V AC (125 V DC) CE-compliant, additionally EN 61326 (x) II (1) G [Ex ia Ga] IIB/IIA (x) II (1) D [Ex ia Da] IIIC (x) II 3 G Ex nA IIC T4 Gc X

[Ex ia Ga] IIB; [Ex ia Da] IIIC; Ex nA IIC T4 Gc X Class I Div 2; IS for Class I, II, III Div 1 SIL 3

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-EX-SL-SD-21-60-LP MACX MCR-EX-SL-SD-21-60-LP-SP	2865515 2924100	1
4 30		



40

50

output current I_v [mA]

30

Accessories

Power and error message module

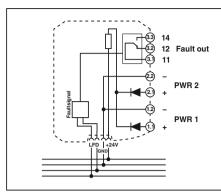
Power and error message module for feeding the 24 V supply voltage to the DIN rail connectors and signaling line faults and power supply failures.

- One-time or redundant supply, decoupled from diode, protected against polariza-
- Supply current up to 3.75 A
- Relay output (PDT) and flashing LED for error messages
- Error message in the event of a power supply failure or fuse fault
- Bus cable fault message for MACX MCR-...(2)NAM... devices connected via DIN rail connectors
- Replaceable fuse
- Installation in zone 2 permissible

ME 6,2 TBUS... T-Connector

DIN rail connector (5-pos.) for bridging the supply voltage of 12.5 mm wide MACX analog Ex modules.

- Reduces wiring costs
- System can be extended or module replaced even while process is active
- Inter-extendable



Input data	
Input signal	
Redundant supply	
Polarization and surge protection	
Output data	
Maximum output signal	
Output voltage	
Switching output	
Contact type	
Contact material	
Maximum switching voltage	
General data	
Current consumption	
Ambient temperature range	

Humidity Fuse Status indication Housing material

Inflammability class according to UL 94 Dimensions W / H / D Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Conformance ATFX

14 (3) 12 Fault out (3) 11 PWR 2 PWR 1
LFD +24V

IECEx UL, USA / Canada Description Supply and error message module, including the relevant DIN rail connector ME 17,5 TBUS 1,5/5-ST-3,81 GN Screw connection Spring-cage conn.

DIN rail connector (TBUS), for bridging the supply voltage, can be snapped onto 35 mm DIN rails as per EN 60715, with UL approval



Power and error message module

eUL) es (GL Ex: (Ex) // Applied for: cUL / UL Housing width 17.5 mm

	Tecl	nnica	data
--	------	-------	------

19.2 V DC ... 30 V DC yes, decoupled from diodes

3.75 A (Input voltage - max. 0.8 V at 3.75 A) Relay 1 PDT Gold (Au) 50 V AC (2 A)

-20°C ... 60°C (Any mounting position) 5% ... 95% (no condensation) 5 A (replaceable), slow-blow 250 V AC 1 x red I FD (error) 2 x green LEDs (PWR1 and PWR2) Polyamide (PA 6.6) V0 17.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16

CE-compliant II 3 G Ex nA nC IIC T4 Gc X Ex nA nC IIC T4 Gc X UI 61010

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-PTB	2865625	1
MACX MCR-PTB-SP	2924184	1

Accessories	,	
ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	10

Accessories

Marking material for device marking

- For device marking inside the control cabinet and in the field
- Self-adhesive with high adhesive strengths
- Large temperature range



		Ordering data		
Description	Color	Туре	Order No.	Pcs. / Pkt.
UniCard, with self-adhesive plastic labels		HC FMLD (44VO)	0819291	10
10-part, lettering field size: 11 x 9 mm UniCard, with self-adhesive plastic labels, marked according to customer specifications For ordering details, see Catalog 5 or www.phoenixcontact.net/products	white	UC-EMLP (11X9)	0619291	10
10-part, lettering field size: 11 x 9 mm	white	UC-EMLP (11X9) CUS	0824547	1

Accessories

Resistance circuit

Double-level terminal block with resistance circuit according to NAMUR for line fault detection in the case of mechanical contacts

Important:

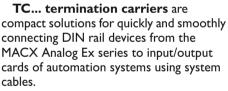
- For intrinsically safe circuits, only in combination with D-UKK 3/5 cover



		Ordering data		
Description	Color	Туре	Order No.	Pcs. / Pkt.
Double-level terminal block, with preassembled resistors				
With screw connection		UKK 5-2R/NAMUR	2941662	50
Cover, width 2.5 mm				
	gray	D-UKK 3/5	2770024	50
	blue	D-UKK 3/5 BU	2770105	50

Termination carrier for **MACX** Analog Ex-isolating amplifiers





The termination carriers combine the advantages of modular DIN rail devices with those offered by plug and play rapid cabling solutions to provide a consistent solution for system technology.

Compact

- Saves up to 30% of space due to compact design

Robust and reliable

- Stable, vibration-resistant aluminum carrier device profile
- PCB is completely decoupled from modules
- PCB without active components
- Redundant supply and monitoring in separate DIN rail module

Easy maintenance

- Use of standard DIN rail devices
- Easy access to connection points
- Quick and safe module connection with plug-in and coded cable sets

Flexible

- Horizontal or vertical DIN rail mounting
- Profile section without pitch markings for I/O cards with specific number of chan-
- Can be specifically adapted for I/O cards of various automation systems with different system plug types



Select standard DIN rail device



Select module carrier



Select controller-specific front adapter and system cable



Solutions are also available for MINI Analog, MACX Analog Ex, and Safety

Termination carrier for MACX Analog Ex-isolating amplifiers

The TC-D37SUB-ADIO16-EX-P-UNI

universal termination carrier is a compact solution which connects isolating amplifiers from the MACX Analog Ex series to analog or binary input/output cards of automation systems.

The **TC-D37SUB-AIO16-EX-PS-UNI** termination carrier design, when combined with the MACX MCR-S-MUX HART multiplexer, also enables communication between HART-capable field devices and a management system.

- Connection of up to 16 single-channel (Ex i-)isolating amplifiers
- Universal 1:1 signal routing to a 37-pos. D-SUB plug-in connector
- For system cables with D-SUB socket and open ends for universal connection
- Redundant supply and monitoring in separate DIN rail module

Notes:

Contact us: specific termination carrier designs for I/O modules of various automation systems are available, planned or can be implemented according to your specifications.

1) EMC: Class A product, see page 571



Connection to the control system level Number of positions

Maximum operating voltage
Maximum permissible current

Rated insulation voltage Surge voltage category Pollution degree

General data

Rated surge voltage Air and creepage distances Degree of protection Ambient temperature range

Shock

Vibration (operation)

Inflammability class according to UL 94

Dimensions W / H / D

Power supply via power module Input voltage range

Redundant supply

Polarization and surge protection

Fuse

HART n

Status indication

Switching output Contact material

Maximum switching voltage

Housing width 244 mm

Technical data

D-SUB pin strip

37

< 50 V DC (Per signal/channel)

1 A (Signal/channel)

50 V

2

0.5 kV

DIN EN 50178 (Basic insulation)

IP20

-40°C ... 80°C (Please observe module specifications)

15g, according to IEC 60068-2-27 2g, according to IEC 60068-2-6

VU

244 / 170 / 160 mm

19.2 V DC ... 30 V DC ves, decoupled from diodes

Yes

5 A Slow-blow (can be exchanged)

1 x red LED (error)

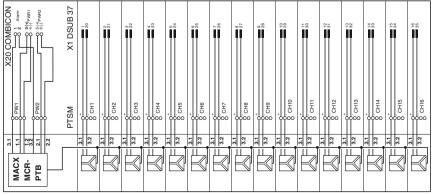
2 x green LEDs (PWR1 and PWR2) 1 PDT

Au

50 V DC (0.3 A) / 30 V DC (2 A) / 33 V AC (2 A)

	Ordering dat	а
Description	Туре	(
Universal termination carrier for 16 MACX MCR-EX isolators		
- With connection for MACX MCR-S-MUX HART multiplexer	TC-D37SUB-ADIO16-EX-P-UNI TC-D37SUB-AIO16-EX-PS-UNI¹)	
	Accessories	}
Supply and error message module	MACX MCR-PTB	

	Accessories	•	
y and error message module	MACX MCR-PTB	2865625	1
	MACX MCR-PTB-SP	2924184	1
multiplexer, 32-channel	MACX MCR-S-MUX	2865599	1



TC-D37SUB-ADIO16-EX-P-UNI and TC-D37SUB-AIO16-EX-PS-UNI connection scheme

Pcs /

Pkt.

Order No.

2924854 2902932

Multiplexers for HART signals

Multiplexers for HART signals

Multiplexer for digital connection of HART-capable field devices (such as measuring transducers or control valves) to a PC or management system.

- Supports online configuration and diagnostics for the connected HART-capable field devices
- Constant documentation of process variables and states
- 32 HART channels per multiplexer
- Up to 128 HART multiplexers at one PC interface
- Communication via software tool (e.g., HART OPC Server) using RS-485 interface
- Electrical isolation between auxiliary energy, RS-485 bus and the HART channels
- HART field devices are accessed at the same time that the measurement signal is transmitted without affecting measured value processing
- HART field devices connected via universal HART connection boards: direct connection if processing non-Ex signals, with separate Ex i signal isolator connected upstream if processing Ex signals
- Power supplied via HART connection board

Notes:

1) EMC: Class A product, see page 571





Housing width 35.2 mm

Technical data

16 or 32; adjustable using a switch

Flat-ribbon cable, 14-pos. (inclusive)

HART Field Communication Protocol Rev. 6.0 (downward compatible up to Rev 4.0); FSK Physical Layer Specification (Rev. 8.1)

Two vellow "Tx" and "Rx" "HART" LEDs

Red "ERR" LED (flashes in case of an error in the HART bus)

D-SUB-9 socket

RS-485

Compatible with OPC HART server, PDM, PRM, and FDT/DTM

0...127; using a rotary switch at the front

9600 / 19200 / 38400 / 57600 [bps]; via rotary switch at the front

≤ 1200 m

Two yellow "Tx" and "Rx" "RS-485" LEDs

18 V ... 31.2 V 24 V DC 55 mA

1.35 W

Green "PWR" LED

Yes (no faulty devices / output states)

350 V AC

100 V DC (Capacitive)

350 V AC 350 V AC

Processor error: The "PWR" LED flashes;

error in the HART communication: the "ERR" LED flashes

-20°C ... 60°C

< 95% (no condensation)

35.2 / 99 / 114.5 mm

CE-compliant

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MACX MCR-S-MUX	2865599	1	

MACX MCR-5-MUX	2000099	ı
Accessories		
TC-D37SUB-AIO16-EX-PS-UNI¹)	2902932	1
TC-D37SUB-AIO16-M-PS-UNI ¹)	2902934	1
MACX MCR-S-MUX-TB	2308124	1
PSM-ME-RS232/RS485-P1)	2744416	1
PSM-ME-RS485/RS485-P1)	2744429	1

Field devices interface (HART) Channels

Connection method

Signal

HART specification

Data transmission display

Display error

RS-485 interface Connection method

Signal

Data flow control/protocols

Number of HART multiplexers per bus segment

Address setting

Transmission length Display

General data

Supply voltage range Nominal supply voltage Current consumption

Power consumption Operating voltage display

Undervoltage monitoring

Galvanic isolation of HART signal/RS-485 Galvanic isolation of HART signals between each other

Galvanic isolation of HART signal/supply

Galvanic isolation of RS-485/supply

Error monitoring

Ambient temperature range

Humidity

Dimensions W / H / D Conformance / approvals

Conformance

Description HART multiplexer, 32-channel including two 14-wire flat-ribbon cables

Universal termination carrier for 16 MACX MCR-EX isolators - With connection for MACX MCR-S-MUX HART multiplexer

Universal termination carrier for 16 MINI MCR isolators - With connection for MACX MCR-S-MUX HART multiplexer

HART connection board

Interface converter, for conversion from RS-232 (V.24) to RS-485, with electrical isolation, rail-mountable, changeover of data direction self-controlling or through RTS/CTS

Repeater, for electrical isolation and increased range

027g

Loop-powered, programmable

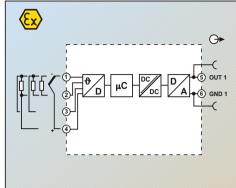
Programmable loop-powered temperature measuring transducer,

- 1-channel
- Loop-powered
- Input for resistance thermometers. thermocouples, and linear mV signals, Ex ia IIC
- Output 4...20 mA/20...4 mA
- Can be installed in zone 1
- Galvanic 2-way isolation
- HART-capable (MCR-FL-TS-LP-I-EX)
- Configuration using software

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond. connection.

To configure the MCR-FL-TS-LPI-EX HART-capable device (2864587), you need a HART modem.

To configure the MCR-FL-T-LP-EX device (2864574), you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN software, see page 190



Block diagram MCR-FL-TS-LP-I-EX



Resistance thermometers

Thermocouple sensors

Resistor

Voltage

Configuration

Measuring output

Output signal range Maximum output signal

Load

Line monitorina

Short-circuit current

Output current with open circuit

Output current, measuring range overrange/underrange

General data

Supply voltage range Current consumption Step response (10 - 90%)

Transmission error

Thermocouple sensors

Resistance thermometers Resistance-type sensors Voltage sensor

Test voltage input/output Switch on delay time

Standards/regulations

Housing material Inflammability class according to UL 94

Dimensions W / H / D

Connection method Screw connection solid / stranded / AWG

Safety data as per ATEX

Maximum voltage Ui

Maximum current I, Maximum power Pi

Maximum voltage U_o

Maximum current Io

Maximum power Po

Gas group

- max. external inductivity Lo - max. external capacity Co

Maximum ambient temperature

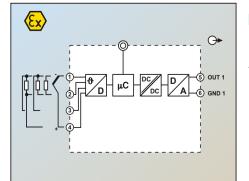
Conformance / approvals Conformance

ATEX UL, USA / Canada

Functional safety (SIL)

Description

HART-compatible



Block diagram MCR-FL-T-LP-I-EX



Ex: Ex oll os

Pt, Ni (100, 500, 1000); min. measurement range 10 K B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K

10 Ω ... 400 Ω (min. measurement range 10 $\Omega)$ $10~\Omega$... $2000~\Omega$ (min. measurement range $100~\Omega$)

-10 mV ... 100 mV (min. measurement range 5 mV) Yes, programmable

4 mA ... 20 mA / 20 mA ... 4 mA

≤ 23 mA

NF 43

 \leq 520 Ω (At $\rm U_{V}$ = 24 V; $\rm U_{supply}$ - 12 V / 0.023 A)

 \leq 3.6 mA or \geq 21 mA (adjustable, not for thermocouples)

≤ 3.6 mA or ≥ 21 mA (adjustable)

3.8 mA ... 20.5 mA

12 V DC ... 30 V DC

< 3.5 mA

0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)

Type 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)

 $\pm 0.1 \Omega (10...400 \Omega), \pm 1.5 \Omega (10...2000 \Omega)$

±20 µV (-10...100 mV) 2 kV AC (50 Hz, 1 min.)

4 s

NAMUR recommendation NF 21

Polyamide PA non-reinforced

V0

[mH]

12.5 / 99 / 114.5 mm

Plug-in screw connection

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

MCR-FL-T-LP-I-EX MCR-FL-TS-LP-I-EX 30 V 30 V 100 mA 100 mA 750 mW 750 mW 5 V DC 4.4 V DC 5.9 mA 9.6 mA

7.2 mW 10.6 mW IΙΑ IIВ II C IJΑ IIΒ II C 100 100 100 100 100 100 10 10 12 12 2.4 T4 = 85°C, T5 = 70°C, T4 = 85°C, T5 = 65°C,

T6 = 55°C T6 = 50°C

CE-compliant (x) II 2(1) G Ex ia IIC T6

SIL 2 according to EN 61508

CE-compliant

Il 2(1) G Ex ia IIC T4...T6 cULus

Ordering dat	a	
Туре	Order No.	Pcs. / Pkt.
MCR-FL-TS-LP-I-EX	2864587	1
MCR-FL-T-LP-I-EX	2864574	1

MCR temperature transducer, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors

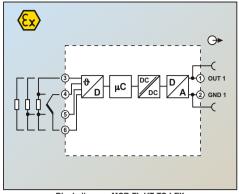
Programmable loop-powered temperature measuring transducers with connection heads, Ex i

- 1-channel
- Loop-powered
- Input for resistance thermometers, thermocouples, and linear mV signals, Ex ia IIC
- Output 4...20 mA/20...4 mA
- Can be installed in zone 0
- Galvanic 2-way isolation
- HART-compatible

Notes:

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-conductor connection

To configure the MCR-FL-TS-LPI-EX HART-capable device, you need a HART modem.



Block diagram MCR-FL-HT-TS-I-EX





Loop-powered, programmable



Measuring input

Resistance thermometers

Thermocouple sensors

Resistor

Voltage

Configuration

Measuring output

Output signal range Maximum output signal

Load

Line monitoring

Short-circuit current

Output current with open circuit

Output current, measuring range overrange/underrange

General data

Supply voltage range Current consumption

Step response (10 - 90%)

Transmission error Resistance thermometers

Thermocouple sensors Resistance-type sensors Voltage sensor

Test voltage input/output Switch on delay time

Degree of protection

Mounting position Connection

Standards/regulations

Housing material

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Safety data as per ATEX

Maximum voltage Ui Maximum current Ii

Maximum power P

Maximum voltage Uo

Maximum current Io

Maximum power P

Gas group

- max. external inductivity Lo

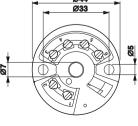
- max. external capacity Co Maximum ambient temperature

Conformance / approvals

Conformance ATEX

UL, USA / Canada

Functional safety (SIL)



Description

MCR temperature measuring transducer, smart, for resistance thermometers, thermocouples, resistance-type sensors,

and voltage sensors

Technical data

Pt, Ni (100, 500, 1000); min. measurement range 10 K B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K

10 Ω ... 400 Ω (min. measurement range 10 $\Omega)$

10 Ω ... 2000 Ω (min. measurement range 100 Ω)

-10 mV ... 75 mV (min. measurement range 5 mV)

Yes, programmable

4 mA ... 20 mA / 20 mA ... 4 mA

≤ 23 mA

 $\leq 630~\Omega$ (At UV = 24 V; U_{supply} - 10 V / 0.023 A)

NF 43

 \leq 3.6 mA or \geq 21 mA (adjustable, not for thermocouples)

≤ 3.6 mA or ≥ 21 mA (adjustable)

3.8 mA ... 20.5 mA (linear increase/decrease)

12 V DC ... 30 V DC

< 3.5 mA

<2s

0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)

Type 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)

 $\pm 0.1 \Omega (10...400 \Omega), \pm 1.5 \Omega (10...2000 \Omega)$

±20 uV (-10...75 mV) 2 kV AC (50 Hz, 1 min.)

IP00, IP66 (integrated in the connecting head) Connecting head according to DIN 43729 form B

Installation in connection head according to DIN 43729 form B

NAMUR recommendation NE 21

Polycarbonate, PC

V٥

0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15

30 V 100 mA

750 mW

5 V DC

5.4 mA

6.6 mW

IJΑ IIΒ

[mH]

100 100 100

9.9

Category 1: T4 = 60°C, T5 = 50°C, T6 = 40°C Category 2: T4 = 85°C, T5 = 70°C, T6 = 55°C

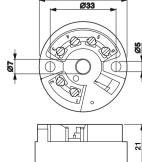
II C

CE-compliant
 II 1 G and II 2 G Ex ia IIC T6/T5/T4

cULus

SIL 2 according to EN 61508

OIL E dood ding to EIV 0 1000			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MCR-FL-HT-TS-I-EX	2864545	1	



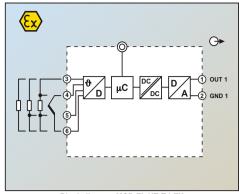
Programmable loop-powered temperature measuring transducers with connection heads, Ex i

- 1-channel
- Loop-powered
- Input for resistance thermometers. thermocouples, and linear mV signals, Ex ia IIC
- Output 4...20 mA/20...4 mA
- Can be installed in zone 0
- Galvanic 2-way isolation
- Configuration using software

Notes:

The devices are supplied with the standard configuration: Pt 100 sensor, measuring range 0 ... 100°C, 3-cond. connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. For this purpose, you need the MCR-PAC-T-USB programming adapter and the MCR/PI-CONF-WIN configuration software, see page 190









Technical data

B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K

Pt, Ni (100, 500, 1000); min. measurement range 10 K

10 Ω ... 400 Ω (min. measurement range 10 $\Omega)$ $10~\Omega$... $2000~\Omega$ (min. measurement range $100~\Omega$) -10 mV ... 100 mV (min. measurement range 5 mV)



Measuring input

Resistance thermometers

Thermocouple sensors

Resistor

Voltage

Configuration

Measuring output

Output signal range Maximum output signal

Load

Line monitorina

Short-circuit current

Output current with open circuit

Output current, measuring range overrange/underrange

Yes, programmable

4 mA ... 20 mA / 20 mA ... 4 mA ≤ 25 mA

 \leq 720 Ω (For U $_{V}$ = 24 V; U $_{supply}$ - 8 V / 0.025 A) NF 43

 \leq 3.6 mA or \geq 21 mA (adjustable, not for thermocouples)

≤ 3.6 mA or ≥ 21 mA (adjustable) 3.8 mA ... 20.5 mA (linear increase/decrease)

General data

Supply voltage range Current consumption

Step response (10 - 90%)

Transmission error

Test voltage input/output Switch on delay time

Degree of protection

Standards/regulations

Safety data as per ATEX Maximum voltage Ui

Maximum current Ii

Maximum power Pi

Maximum voltage U_o

Maximum current Io

Maximum power Po

Gas group

Inflammability class according to UL 94

Screw connection solid / stranded / AWG

Mounting position Connection

Housing material

Resistance thermometers Thermocouple sensors Resistance-type sensors

Voltage sensor

< 3.5 mA

0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000) Type 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)

 $\pm 0.1 \Omega (10...400 \Omega), \pm 1.5 \Omega (10...2000 \Omega)$

±20 µV (-10...100 mV)

2 kV AC (50 Hz, 1 min.)

8 V DC ... 30 V DC

6 s

IP00, IP66 (integrated in the connecting head)

Connecting head according to DIN 43729 form B Installation in connection head according to DIN 43729 form B

NAMUR recommendation NE 21

Polycarbonate, PC

٧n

0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15

30 V

100 mA

750 mW

8.2 V DC

4.6 mA

9.35 mW

[mH]

IJΒ II C

8.5 4.5

0.974

Category 1: T4 = 60°C, T5 = 50°C, T6 = 40°C

Category 2: T4 = 85°C, T5 = 70°C, T6 = 55°C

Conformance / approvals

- max. external inductivity Lo

- max. external capacity Co

Maximum ambient temperature

rmance

SA / Canada

CE-compliant

cULus

6 0 0	Confor ATEX UL, US
	Descri
	MCR t resista and vo

Description
MCR temperature measuring transducer, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
MCR-FL-HT-T-I-EX	2864532	1

Accessories

Configuration software package The MCR/PI-CONF-WIN configuration software package is used to configure and visualize all parameters for the programmable loop-powered temperature transducers.

- For temperature transducers MCR-FL-T(S)-LP-I-EX and MCR-FL-HT-T(S)-I-EX
- Galvanically isolated
- Configuration possible during operation
- Straightforward menu interface
- Rapid programming

The computer and the measuring transducer communicate with one another via a software adapter cable and a serial interface.

	es

The software runs under the following operating systems: Windows NT^{TM} , 2000^{TM} , and XP^{TM} .



	Ordering data	а	
Description	Туре	Order No.	Pcs. / Pkt.
MCR configuration software, for programming MCR-T, MCRLP, MCRHT, MCR-S, MCR-F, and MCR-PSP modules, CD-ROM			
	MCR/PI-CONF-WIN	2814799	1

Accessories

USB adapter cable Software adapter cable

For connecting the programmable MCR-/PI modules to the USB interface of a computer, the USB adapter cable CM-KBL-RS232/USB can be used together with the relevant adapter cables. Programming with the MCR/PI-CONF-WIN software is possible under the operating systems Windows 98™, Windows 2000™ and Windows XP™.

The following modules are supported:

- MCR-FL-T-LP-I-EX
- MCR-FL-HT-T-I-EX



Description	Туре
USB adapter cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	СМ-К
Software adapter cable , 2.4 m length, with USB connection, for programming MCRLP and MCRHT modules	
	MCR-
Adapter cable, stranded, 9-pos. D-SUB socket on 25-pos. D-SUB	PSM-

Ordering dat	a	
Туре	Order No.	Pcs. / Pkt.
CM-KBL-RS232/USB	2881078	1
MCR-PAC-T-USB	2309000	1
Accessories	3	
PSM-KAD 9 SUB 25/BS	2761295	1

Accessories

Shield fast connection

- For connecting cable shielding to cable terminal points
- Can be connected to PLUGTRAB PT
- Easy assembly



	Ord	lering data
Description	Туре	Order No. Pcs. / Pkt.
Shield fast connection		
For Ø 3-6 mm	SSA 3-6	2839295 10
For Ø 5-10 mm	SSA 5-10	2839512 10

Accessories

Test plug



F		
ре	Order No.	Pcs. / Pkt.
PS-MT PS-IH RD PS-IH WH PS-IH BU PS-IH YE PS-IH GN PS-IH GY	0201744 0201676 0201663 0201689 0201692 0201702 0201728	10 10 10 10 10 10 10
PS PS PS PS	S-MT S-IH RD S-IH WH S-IH BU S-IH YE S-IH GN	S-MT 0201744 S-IH RD 0201676 S-IH WH 0201663 S-IH BU 0201689 S-IH YE 0201692 S-IH GN 0201702 S-IH GY 0201728



Monitoring

Energy and power measuring technology

EMpro energy meters measure, analyze, and communicate important electrical system parameters.

PSK DL data logger kits monitor and log operating states.

PSK meters record compressed air consumption.

Current transformers

PACT current transformers convert currents up to 4000 A into secondary currents of 1 and 5 A.

Current and voltage measuring technology

MCR current and voltage transducers convert currents and voltages into standard analog signals.

Solar and PV system monitoring

The SOLARCHECK modular monitoring system is used for string monitoring in photovoltaic systems.

Residual current monitoring

RCM devices provide residual current monitoring in grounded power supply systems. They detect residual currents at an early stage before they result in forced shutdown.

Components for E-Mobility

EV Charge Control is the charging controller used to charge electric vehicles on the AC mains according to IEC 61851-1.

Electronic monitoring relays

EMD monitoring relays detect and indicate deviations in important system parameters at an early stage.

Electronic timer relays

ETD timer relays are used for straightforward time control functions.

Special function modules

EMG special function modules enable simple components such as diodes to be used in an industrial context. These products feature professional housing and connection technology.

Product range overview	
Product overview	194
Energy and	404
power measuring technology	196 200
EMpro energy meters Extension modules	202
Complete packages for data logging	206
Compressed air meters	208
Current transformers	210
Selection guide	212
PACT current transformers	213
Accessories	223
Current and	226
voltage measuring technology Current transducers	229
Voltage transducers	236
Accessories	237
Solar and	
PV system monitoring	238
SOLARCHECK PV string monitoring	240
Residual current monitoring	242
Residual current monitoring - RCM	244
Components for E-Mobility	246
EV Charge Control charging controller	247
Monitoring relays, timer relays, special function modules	248
EMD electronic monitoring relays	250
ETD electronic timer relays	258
EMG special function modules	262

Product overview

Energy and power measuring technology

Page 200



EMpro energy meters for front-panel installation



Page 201

EMpro energy meters for DIN rail mounting



Special function and communication modules



Page 205

DIN rail adapters

Page 202



PACT winding current transformers Page 222



Mounting accessories, shock protection Page 223



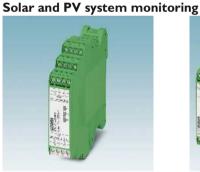
distorted currents up to 600 A Page 229



MCR current transducers for AC/DC and distorted currents up to 55 A, programmable Page 230

Accessories Configuration software and USB adapter cable

Page 149



SOLARCHECK PV string monitoring Communication module Page 240



SOLARCHECK PV string monitoring Current measuring modules Page 241



SOLARCHECK PV string monitoring Voltage measuring modules Page 241

Monitoring relays



EMD-BL Compact monitoring relays





Multifunctional monitoring relays

Page 252

Timer relays



ETD-BL Ultra-narrow timer relays Page 258



ETD Multifunctional timer relays

Page 260

Product overview



Complete packages for data logging Page 206



Compressed air meters

Page 208

Current transformers



PACT bus-bar current transformers Page 212

Can be calibrated Page 224



PACT plug-in current transformers

Page 214 Can be calibrated Page 224



MCR current transducers for AC currents, sinusoidal up to 12 A Passive, up to 5 A Page 232 Page 234



MCR current transducers for AC currents, sinusoidal and distorted, up to 200 A
Page 233



MCR current protectors for AC currents, sinusoidal up to 16 A Page 235



MCR voltage transducers for DC voltages up to 660 V For AC voltages up to 444 V

Page 236 Page 236

Residual current monitoring



RCM type B+ for DC residual currents and pulsating DC and AC residual currents Page 244



RCM type A for pulsating DC and AC residual currents Page 245

Components for E-Mobility



EV Charge Control Charging controller

Page 247



EV Charge Lock Release Mains failure plug release

Page 247

Special function modules



EMG Diode modules, lamp testing modules, display modules Page 262

Lightning current measuring system



Lightning current measuring system See Catalog 6

HMIs



HMIs See Catalog 8

Signal towers



Signal towers See Catalog 8



Energy costs at a glance

Within industry, energy is viewed as a variable cost factor. As a result, lower energy costs are becoming increasingly important in terms of providing companies with a major competitive advantage in the areas of production, process, and industrial engineering.

Alongside energy consumption, the quality of the energy supplied, the reliability of supply, and effective system utilization also play an important role in ensuring profitability. This calls for continuous measurement and analysis of all sources of energy.

Advantages of energy data acquisition

Continuously recorded energy flow provides the basis for a target-oriented energy management system.

Access comprehensive information regarding the characteristic electrical data of your machinery and benefit from the advantages of this:

- Reduce your energy costs by identifying potential energy savings.
- Optimize your system capacity: through intelligent switching of system parts, uniform network load, and reduced harmonics.
- Reduce peak loads using forward-looking trend calculation and load management.
- Safeguard your production processes and minimize downtimes by continuously monitoring important system parameters.

Measurement - monitoring - communication

Efficient energy management – networkcapable EMpro energy meters can be used to acquire and monitor the characteristic electrical data of your machines and sys-

They can be freely extended with communication modules and special function modules, enabling your energy meters to keep pace with your growing requirements. Future-proof planning and investment is therefore ensured.



The communication expert

The EMpro MA600 is capable of performing all measurement tasks associated with power supply applications up to 700 V AC from straightforward current and power measurement and detection of harmonics to spectral analysis and trend calculation.

- Flexible network connection
- Can be extended with plug-in communication modules and special function modules
- Remote access via web server



The universal solution on the front panel

The EMpro MA400 is capable of all standard measurement tasks in the main distribution up to 500 V AC.

- Plug-in RS-485 extension module for integration in JBUS and MODBUS systems



The compact starter for use in the sub-distribution

The EMpro MA200 energy meter is ideal for simple measurement tasks where onsite analysis of the measured values is suffi-

The highly communicative device for use on DIN rails

The EMpro MA250 performs simple measuring tasks in small control cabinets directly on the machine.

- With built-in RS-485 interface for integration in JBUS and MODBUS systems



Data logger kits

PSK DL data logger kits monitor the operating state of your plant and inform you of any change in state by SMS.

The complete package is available in two

- PSK DL BASIC with all basic functions
- PSK DL FLEX allows programming directly in SQL and supports modular expansion. Sends e-mails via GPRS or DSL.



Sensors and meters

Use of resources at a glance - determine all relevant states using sensors and meters.

- Detailed procurement measurement, thanks to precise sensor and meter tech-
- Intelligent sensor communication, thanks to IO-Link technology



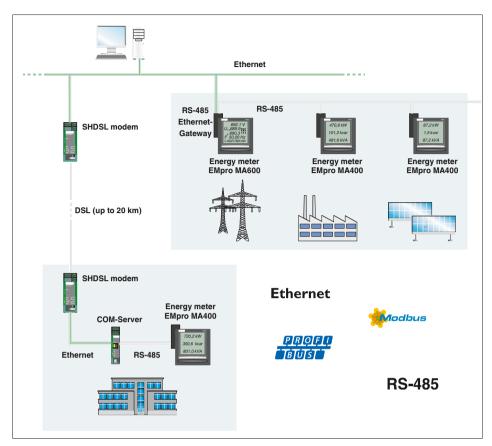
Inline power measurement terminal

The Inline power measurement terminal enables analysis of AC networks.

- For measuring current, voltage, and power, as well as identifying distortion and harmonics

The power measurement terminal can be found in Catalog 8, control technology, I/O systems, and network structure.

Energy meters



Measurement - monitoring - communication

In order to achieve efficient energy management, all energy data that has been determined is acquired and analyzed centrally in the control center.

For data transmission, integrate the EMpro measuring devices flexibly into your network structures.

The network components from Phoenix Contact offer interference-free and highperformance communication of energy data, even in harsh industrial environments:

- Copper-based and fiber optic data transmission
- Ethernet and modem communication
- Industrial wireless transmission



Direct access to measured values

Analyze your system parameters quickly on site. At the touch of a button, you can access precisely those measured values that are of relevance.

You can also use the user-friendly web server function to request measured values directly from the control center.



Planning reliability and investment security

EMpro extension modules, special function modules, and communication modules enable you to remain flexible and extend your EMpro measuring devices at any time:

- Digital inputs and outputs
- Pulse outputs
- Analog outputs
- Communication interfaces
- Measured data memory
- Temperature measurement



Remote access to multiple meters with just one IP address

The web server that has been integrated into the Ethernet communication modules allows you to conveniently configure key parameters online. It also allows remote access to key electrical characteristics such as current, voltage, power, energy, and harmonics.

You can easily select the right device for your application by referring to the table be-

Product type	The compact starter	The highly communicative device for use on DIN rails	The universal solution on the front panel	The communication expert
	EEM-MA200	EEM-MA250 with RS-485	EEM-MA400	EEM-MA600 EEM-MA600-24DC
Mounting				
DIN rail	•	•		-
Front panel	-	-	•	•
Measurement				
Currents				
Ι1, Ι2, Ι3, Σ3	•	•		•
I1, I2, I3, IN (calculation)			•	•
Maximum values	•	•	•	•
Average values	-		•	•
Supports current measurement without an external transformer	-			•
Voltages				
U12, U23, U31, V1, V2, V3	•	•	•	•
Maximum values				•
Average values				•
Voltage measurement via voltage transducer				
	•	•	•	
Voltage measurement, direct, up to 500 V	•	•	•	
Voltage measurement, direct, up to 700 V	•	•	•	
Frequency	•	•	•	·
Power				
ΣP, ΣQ, ΣS (±)	•	•	•	•
P, Q, S per phase (±)			•	•
Maximum values P, Q, S	•	•	•	•
Average values P, Q, S			•	•
Trend power				•
Power factor				
ΣPF	•	•	•	•
PF per phase			•	•
			•	<u> </u>
THD (Total Harmonic Distortion)			•	•
	Up to 51st harmonic	Up to 51st harmonic	Up to 51st harmonic	Up to 63rd harmonic
THD (Total Harmonic Distortion)	Up to 51st harmonic	Up to 51st harmonic		
THD (Total Harmonic Distortion) 11, 12, 13, U12, U23, U31, V1, V2, V3	Up to 51st harmonic	Up to 51st harmonic		
THD (Total Harmonic Distortion) 11, 12, 13, U12, U23, U31, V1, V2, V3 Temperature				
THD (Total Harmonic Distortion) 11, 12, 13, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal)				
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering	•	•	Up to 51st harmonic	Up to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+)	•	•	Up to 51st harmonic	Up to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±)	•	•	Up to 51st harmonic	Up to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours	•	•	Up to 51st harmonic	Up to 63rd harmonic • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis	•	•	Up to 51st harmonic	Up to 63rd harmonic • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value)	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) linputs One configurable input for tariff switch-over Special function modules (optional)	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional)	•	•	Up to 51st harmonic	Up to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os	•	•	Up to 51st harmonic	Up to 63rd harmonic • • •
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value	•	•	Up to 51st harmonic	Up to 63rd harmonic Output
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs	•	•	Up to 51st harmonic	Up to 63rd harmonic Output
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Two analog outputs	•	•	Up to 51st harmonic	Up to 63rd harmonic Output to 63rd harmonic Up to 63rd harmonic Output to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Two analog outputs Two analog outputs Temperature measurement	•	•	Up to 51st harmonic	Up to 63rd harmonic Output O
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Two analog outputs Temperature measurement Communication modules (optional)	•	•	Up to 51st harmonic • •	Up to 63rd harmonic Output of 63rd harmonic Up to 63rd harmonic Output of 63rd harmonic Output of 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Temperature measurement Communication modules (optional) JBUS/Modbus RTU (RS-485)	•	•	Up to 51st harmonic	Up to 63rd harmonic Output O
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Two analog outputs Temperature measurement Communication modules (optional) JBUS/Modbus RTU (RS-485) PROFIBUS DP	•	•	Up to 51st harmonic • •	Up to 63rd harmonic Output of 63rd harmonic Up to 63rd harmonic Output of 63rd harmonic Output of 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Temperature measurement Communication modules (optional) JBUS/Modbus RTU (RS-485)	•	•	Up to 51st harmonic • •	Up to 63rd harmonic Output O
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Two analog outputs Temperature measurement Communication modules (optional) JBUS/Modbus RTU (RS-485) PROFIBUS DP	•	•	Up to 51st harmonic • •	Up to 63rd harmonic Up to 63rd harmonic Up to 63rd harmonic
THD (Total Harmonic Distortion) I1, I2, I3, U12, U23, U31, V1, V2, V3 Temperature Temperature measurement (internal) Metering Active and reactive energy (kWh+, kvarh+) Active and reactive energy (kWh±, kvarh±) Two-tariff meter Operating hours Analysis Harmonics analysis Outputs One configurable pulse output (kWh+, kvarh+) or alarm (threshold value) Inputs One configurable input for tariff switch-over Special function modules (optional) Memory Two digital I/Os One pulse output or one threshold value Two pulse outputs Temperature measurement Communication modules (optional) JBUS/Modbus RTU (RS-485) PROFIBUS DP PROFIBUS (D-SUB)	•	•	Up to 51st harmonic • •	Up to 63rd harmonic Output O

Key

11, 12, 13 Conductor currents IN Neutral conductor current U12, U23, U31 Phase conductor voltages V1, V2, V3 Conductor voltages to N

Real power Q Reactive power

S Apparent power Power factor

Total harmonic distortion

Energy meters

EMpro energy meters are capable of acquiring, monitoring, and displaying all electrical system and machine parameters local-

EEM-MA600

- Can be extended with special function and communication modules
- Remote access via web server, integrated into Ethernet communication module
- Acquisition of individual harmonic components up to 63rd order
- Trend calculation for active and reactive power

EEM-MA400

- Can be extended with a pulse module
- Can be extended with RS-485 communication module (JBUS/MODBUS)

Input data

. Measuring principle

Input voltage range

Overload capacity

Operate threshold

Ener

Energ

Acquisition of harmonics Measured value

Voltage measuring input V1, V2, V3

Current measuring input I1, I2, I3

Input current range (Via external transformers)

- Acquisition of total harmonic content up to harmonic of 51st order

EEM-MA250

- Two-tariff measurement via pulse input
- Pulse output
- RS-485 interface (JBUS/MODBUS)

EEM-MA200

- Two-tariff measurement via pulse input
- Pulse output

1) EMC: Class A product, see page 571



Measuring voltage of up to 700 V AC, extendable

.(JL),

Housing width 96 mm

- · · · · · · · · · · · · · · · · · · ·	
•	Technical data
Frue r.m.s. value measi up to 63rd harmonic AC sine (50/60 Hz)	urement
18 V AC 700 V AC (F 11 V AC 404 V AC (F	Phase/Phase) Phase/neutral conductor)
	a external voltage transducers) 10, 115, 120, 173, 190 V AC)
0.2%	

9999 A (primary) (1 A and 5 A, secondary) 6 A (Permanent) 10 mA

0 MW ... 8000 MW / 0 Mvar ... 8000 Mvar / 0 MVA ... 8000 MVA

0.5% Class 0.5S Class 2

(Via extension module)

Via extension module

Via extension module

LCD display, backlighting approximately

20 VA (With maximum number of extension modules) IP52 (front), IP30 (back) -10°C ... 55°C (14°F to 131°F) 96 / 96 / 82 mm 96 / 96 / 80 mm

 $0.5 \dots 2.5 \text{ mm}^2 / 0.5 \dots 2.5 \text{ mm}^2 / 20 - 14$ $0.5 \dots 6 \text{ mm}^2 / 0.5 \dots 6 \text{ mm}^2 / 20 - 8$

CE-compliant UI 61010-1

Accuracy
Power measurement
Measuring range
Accuracy
Active energy (IEC 62053-22)
Reactive power (IEC 62053-23)
Digital input
Voltage input signal
Switching output
Output description
Maximum switching voltage
Current carrying capacity
Serial port
Output description
Serial transmission speed
Display
Туре
Measuring rate
General data
Supply voltage
Nominal power consumption
Degree of protection
Ambient temperature range
Dimensions W / H / D
Dimensions W / H / D With extension module
Connection cross section (solid / stranded / AWG)
Voltage and other connections
Current connection
Conformance / approvals
Conformance
UL, USA / Canada
Description
Energy meter, for installation in front panel

50,77 Gariada	02010101		
	Ordering data		
cription	Туре	Order No.	Pcs. / Pkt.
rgy meter, for installation in front panel	EEM-MA600 ¹)	2901366	1
rgy meter, for front-panel installation, 24 V DC			
rgy meter, for mounting on a DIN rail			



Measuring voltage of up to 700 V AC, supply voltage 24 V DC

Technical data



Measuring voltage of up to 500 V AC, can be extended with RS-485 interface



Measuring voltage of up to 500 V AC, with DIN rail mounting, also with RS-485 interface

Housing width 96 mm

True r.m.s. value measurement up to 63rd harmonic AC sine (50/60 Hz)

18 V AC ... 700 V AC (Phase/Phase) 11 V AC ... 404 V AC (Phase/neutral conductor) 500 kV AC (Primary, via external voltage transducers) (Secondary, 60, 100, 110, 115, 120, 173, 190 V AC)

9999 A (primary) (1 A and 5 A, secondary) 6 A (Permanent) 10 mA 0.2%

0 MW ... 8000 MW / 0 Mvar ... 8000 Mvar / 0 MVA ... 8000 MVA

0.5% Class 0.5S Class 2

(Via extension module)

Via extension module

Via extension module

LCD display, backlighting approximately

CE-compliant

20 VA (With maximum number of extension modules) IP52 (front), IP30 (back) -10°C ... 55°C (14°F to 131°F) 96 / 96 / 82 mm 96 / 96 / 80 mm $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.5 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$ 0.5 ... 6 mm² / 0.5 ... 6 mm² / 20 - 8

Ordering data Pcs./ Order No. Type Pkt EEM-MA600-24DC 2902352

.(JJ), Housing width 96 mm

N

Technical data True r.m.s. value measurement up to 51st harmonic AC sine (50/60 Hz) 50 V AC ... 500 V AC (Phase/Phase)

28 V AC ... 289 V AC (Phase/neutral conductor)

0.2% 9999 A (primary) 5 A (secondary) 6 A (Permanent) 5 mA 0.2%

0 MW ... 11 MW / 0 Mvar ... 11 Mvar / 0 MVA ... 11 MVA

0.5% Class 0.5S Class 2

Via extension module

LCD display, backlighting approximately

10 VA (With maximum number of extension modules) IP52 (front), IP30 (back)

-10°C ... 55°C (14°F to 131°F) 96 / 96 / 82 mm 96 / 96 / 80 mm

 $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.5 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$ $0.5 \dots 6 \text{ mm}^2 / 0.5 \dots 6 \text{ mm}^2 / 20 - 8$

CE-compliant UL 61010-1

Housing width 72 mm Technical data

True r.m.s. value measurement up to 51st harmonic AC sine (50/60 Hz)

.(U).

50 V AC ... 519 V AC (Phase/Phase) 28 V AC ... 300 V AC (Phase/neutral conductor)

9999 A (primary) 5 A (secondary) 6 A (Permanent) 5 mA

0 kW ... 9999 kW / 0 kvar ... 9999 kvar / 0 kVA ... 9999 kVA

0.5% Class 0.5S Class 2

230 V AC ±10% (Tariff switchover: e.g., day/nighttime tariff)

30 V DC 27 mA EEM-MA2501) Modbus RTU/JBUS RS-485 2,4 ... 38.4 kbps

Transistor output, active

LCD display, backlighting

approximately

EEM-MA2001) None

5 VA IP51 (front), IP20 (back)

-10°C ... 55°C (14°F to 131°F) 72 / 90 / 64 mm

 $0.5 \dots 2.5 \text{ mm}^2 / 0.5 \dots 2.5 \text{ mm}^2 / 20 - 14$ 0.5 ... 4 mm² / 0.5 ... 4 mm² / 20 - 10

CE-compliant UL 61010-1

Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs./ Pkt.
EEM-MA4001)	2901364	1			
			EEM-MA250¹) EEM-MA200¹)	2901363 2901362	1

Extension modules

Plug-in special function module for the EEM-MA600 energy meter

EEM-2DIO-MA600

- Two digital inputs and outputs
- Configurable threshold values

EEM-2AO-MA600

- Two 0 ... 20 mA/4 ... 20 mA analog outputs, configurable

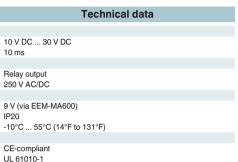


Digital input
Voltage input signal Input pulse length
Output
Output description
Maximum switching voltage
General data
Supply voltage
Degree of protection
Ambient temperature range
Conformance / approvals
Conformance
UL, USA / Canada

Description	
Description	
Special function module (for EEM-MA600)	
With two digital I/Os	
With two analog outputs	



Two digital inputs and outputs



OE 01010-1				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
EEM-2DIO-MA600¹)	2901371	1		



Two analog outputs

Technical data
-
Current output
9 V (via EEM-MA600) IP20 -10°C 55°C (14°F to 131°F)
CE-compliant UL 61010-1

Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
EEM-2AO-MA600¹)	2901475	1

Extension modules

Plug-in special function module for the EEM-MA600 energy meter

EEM-MEMO-MA600

- Stores the last ten alarms together with the time and date
- Stores the real and reactive power, e.g., for 45 days with a 15-minute synchronization pulse

Notes:	
1) FMC: Class A product, see page !	57



Memory module

	Technical data
Digital input	
Voltage input signal	10 V DC 30 V DC
General data	
Supply voltage	9 V (via EEM-MA600)
Memory size	512 kByte
Degree of protection	IP20
Ambient temperature range	-10°C 55°C (14°F to 131°F)
Conformance / approvals	
Conformance	CE-compliant CE-compliant
UL, USA / Canada	UL 61010-1

Ordering data		
Гуре	Order No.	Pcs. / Pkt.
FEM-MEMO-MA6001)	2901370	1
•	pe M-MEMO-MA600¹)	

Extension modules

Communication modules

EEM-RS485-MA...

- JBUS/Modbus RTU (RS-485)

EEM-PB...-MA600

- PROFIBUS DP, with transmission speeds of 1.5 or 12 Mbps



1) EMC: Class A product, see page 571



RS-485



PROFIBUS

Serial port
Output description
Serial transmission speed
General data
Supply voltage
Degree of protection
Ambient temperature range
Conformance / approvals
Conformance
UL, USA / Canada

UL, USA / Canada	
Description	
Communication module (for EEM-MA400)	
JBUS/Modbus RTU (RS-485)	
Communication module (for EEM-MA600)	
JBUS/Modbus RTU (RS-485)	
PROFIBUS DP (1.5 Mbps)	
` ' '	
PROFIBUS DP (12 Mbps)	

Technical data		
Modbus RTU/JBUS RS-485 2.4 38.4 kbps		
9 V (via EEM-MA400) IP20 -10°C 55°C (14°F to 131°F)		
CE-compliant UL 61010-1		
Ordering data		

UL 61010-1				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
EEM-RS485-MA4001)	2901365	1		
EEM-RS485-MA6001)	2901367	1		

Techni	ical data
EEM-PB-MA6001)	EEM-PB12-MA6001)
PROFIBUS DP RS-485	PROFIBUS DP RS-485
9.6 kbps 1.5 Mbps	9.6 kbps 12 Mbps
9 V (via EEM-MA600) IP20	
-10°C 55°C (14°F to 131°F)	
CE-compliant	

UL 61010-1		
Ordering data		
Туре	Order No.	Pcs./ Pkt.
EEM-PB-MA6001)	2901368	1
EEM-PB12-MA6001)	2901418	1

Communication modules

EEM-ETH-MA600

E

Communication module (for EEM-MA600)

Ethernet

RS-485/Ethernet gateway

Ethernet Integrated web server	
EM-ETH-RS485-MA600 Ethernet/RS-485 gateway MODBUS RTU master for up to 246 slaves Integrated web server	
lotes:	Ethernet

(MODBUS TCP) Technical data

Modbus TCP Ethernet (RJ45)

-10°C ... 55°C (14°F to 131°F)

10/100 Mbps 9 V (via EEM-MA600)

CE-compliant

IP20



Ethernet/RS-485 gateway (MODBUS TCP/MODBUS RTU)

1) EMC: Class A product, see page 571	
Serial port	
Output description	
Serial transmission speed	
General data	
Supply voltage	
Degree of protection	
Ambient temperature range	
Conformance / approvals	
Conformance	
UL, USA / Canada	
Description	

Ordering data		
Туре	Order No.	Pcs. / Pkt.
EEM-ETH-MA600¹)	2901373	1

Technical data
Modbus TCP Ethernet (RJ45) 10/100 Mbps
9 V (via EEM-MA600) IP20
-10°C 55°C (14°F to 131°F)
CE-compliant UL 61010-1
Ordering data

Ordering data		
Туре	Order No.	Pcs. / Pkt.
EEM-ETH-RS485-MA6001)	2901374	1

Extension module

Plug-in special function module for the EEM-MA600 energy meter

EEM-TEMP-MA600

- Temperature recording for up to three PT 100 temperature sensors
- Temperature measuring range -20°C...+150°C
- Internal temperature recording of the ambient temperature -10°C...+55°C





Temperature module

	Technical data		
Input data			
Description of the input	Pt 100 input: 2, 3, 4-conductor		
Temperature range	-20°C 150°C (Connected sensors) -10°C 55°C (in the immediate vicinity)		
Transmission error	0.5 K/m (2-conductor) 0.25 K/m (3-conductor) 0 K/m (4-conductor)		
Basic accuracy	±1 K		
General data			
Supply voltage	9 V (via EEM-MA600)		
Degree of protection	IP20		
Ambient temperature range	-10°C 55°C (14°F to 131°F)		
Conformance / approvals			
Conformance	CE-compliant CE-compliant		
	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
Special function module (for EEM-MA600)			

N

EEM-TEMP-MA6001)

Extension modules

Plug-in special function modules for the EEM-MA400 and EEM-MA600 energy meters.

EEM-IMP-MA400

- One configurable pulse output
- One configurable threshold value

EEM-IMP-MA600

- Two configurable pulse outputs



Pulse module



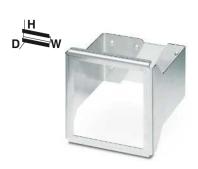
2901949

Pulse module

	Technic	al data		Technica	al data	
Digital input						
Voltage input signal Input pulse length	-			-		
Output						
Output description Maximum switching voltage	Relay output 100 V DC			Relay output 100 V DC		
General data						
Supply voltage Degree of protection Ambient temperature range	9 V (via EEM-MA400) IP20 -10°C 55°C (14°F to 131°F)			9 V (via EEM-MA600) IP20 -10°C 55°C (14°F to 131°F)		
Conformance / approvals	-10 0 33 0 (141 10 1011)			-10 0 33 0 (14 1 10 101 1)		
Conformance	CE-compliant			CE-compliant		
	Orderin	Ordering data		Ordering data		
Description	Туре	Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs. / Pkt.
Special function module (for EEM-MA600)						
With two digital I/Os	EEM-IMP-MA400	2904314	1			
With two analog outputs				EEM-IMP-MA600	2904313	1

Measuring instrument bracket

- For mounting the EEM-MA600 or EEM-MA400 energy meters on a 35 mm DIN rail according to EN 60715



For mounting on DIN rails

	Technical data
General data	
Vibration resistance	57 Hz 150 Hz (2 g)
Weight	265 g
DIN rail clip material	Aluminum, natural anodized
Fixing sheet material	Stainless steel VA
Dimensions W / H / D	116 / 112 / 115 mm
	Ordering data

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
DIN rail adapter for EEM-MA600 and EEM-MA400 energy meters			
	EEM-MKT-DRA	2902078	1

Complete packages for data logging

BASIC data logger kit

Optimize your use of energy and resources. Data loggers from Phoenix Contact can be used to monitor and log the supply of water, compressed air, and electricity to your system. This enables efficient cost control. No additional software or operator panels are needed to parameterize data loggers - simply use a web browser on your

The BASIC data logger kit features:

- Low installation and energy costs, thanks to parameterization via web interface without programming knowledge
- Comprehensive solution complete package available under one order num-
- Flexible communication, thanks to the integrated GSM/GPRS modem and Ethernet interface
- Maximum system availability, thanks to limit value monitoring
- Standardized data routing, thanks to SQL interface
- Process information sent to the user via e-mail or SMS
- Set digital outputs on the data logger via
- Integrated FTP and web server



Technical data

See www.phoenixcontact.net/products

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
PSK DL BASIC	2700726	1

Complete packages for data logging

FLEX data logger kit

The PSK DL FLEX data logger kit is the extended version of the PSK DL BASIC basic package. A maximum of three digital input terminals and four analog input terminals from the Inline I/O system can also be connected to the FLEX kit. The mounted terminals are automatically detected and started up. The PSK DL FLEX can be used to send digital and analog status information via SMS or e-mail or via mobile phone networks or Ethernet. In addition, the PSK DL FLEX can write the information directly to an SQL database that is provided.

In addition to all the properties of the **BASIC** version, the **FLEX** extended solution kit also offers the following:

- Direct SQL connection via SQL interface
- Process information via e-mail and SMS
- Flexible extension with additional I/O modules

Notes:

1) EMC: Class A product, see page 571



Technical data

See www.phoenixcontact.net/products

	Ordering data	а	
Description	Туре	Order No.	Pcs. / Pkt.
Extendable parameterizable data logger kit with Ethernet interface and GSM/GPRS modem, including power supply unit with 8 digital outputs, 24 digital inputs, and 8 analog inputs, plus accessories and patch cable			
	PSK DL FLEX	2700727	1
	Accessories	•	
Inline digital input terminal, complete with accessories (connector and labeling field)			
- 2 inputs	IB IL 24 DI 2-PAC1)	2861221	1

Inline digital input terminal, complete with accessories (connector and labeling field)			
- 2 inputs	IB IL 24 DI 2-PAC1)	2861221	1
- 4 inputs	IB IL 24 DI 4-PAC1)	2861234	1
- 8 inputs	IB IL 24 DI 8-PAC1)	2861247	1
- 16 inputs	IB IL 24 DI 16-PAC1)	2861250	1
- S0 counter	IB IL DI 8/S0-PAC1)	2897020	1
Inline analog input terminal, complete with accessories (connector and labeling field)			
- 2 inputs	IB IL AI 2/SF-PAC1)	2861302	1
- 8 inputs	IB IL AI 8/SF-PAC1)	2861412	1
- 8 inputs, initiator with supply outputs	IB IL AI 8/IS-PAC1)	2861661	1

Sensors and meters Compressed air meters

Use meters from Phoenix Contact to monitor the use of compressed air, an expensive production resource. By using compressed air efficiently, you can decrease compressor usage and therefore reduce energy costs. The calorimetric measuring procedure records even the smallest consumption rates. You can therefore detect wear or leaks based on the amount of air consumed.

Use compressed air meters to acquire the following values:

- The current volumetric flow according to ISO 2533 and DIN 1343
- The total volume used
- The temperature of the compressed air in the monitored operating processes

The compressed air meters impress thanks to their:

- Detailed reference measurement with flow rate, total volume, and temperature
- Intelligent sensor communication, thanks to IO-Link technology
- Measuring range from 0.06 Nm3/h to 700.0 Nm3/h
- Flexible use, thanks to IP65 protection: resistant to dust and splash water

IO-Link



Compressed air counter up to 75 Nm³/h

.(JL),

Technic	cal data
PSK AFS6050IOL	PSK AFS6000IOL
0 Nm ³ /h	. 75 Nm³/h
0 Nm³/h	. 90 Nm³/h
(±1.5% of the m	neasured value)
< 0.1 s ((dAP = 0))
±15% of the measured value	Depending on the air quality:
+1.5% of the measuring range fi-	
nal value	+0.3% of the measuring range

nal value; ±6% of the measured value +0.6% of the measuring range final value

Temperature monitoring		
Measuring range	0°C 60°	°C
Display area	-12°C 72	2°C
Response time	30 s (Q > 0.1 l	Nm³/h)
Resolution	0.5°C	
Accuracy	±2.5°C (Q > 0.1	Nm ³ /h)
Supply for module electronics		
Connection method	M12 plug-in co	nnector
No. of pos.	4	
Supply voltage range	19 V DC 30	VDC
Current draw	< 100 mA	
Digital outputs		
Pulse value	0.0010 m ³ 100	00000 m ³
Pulse length	min. 0.04 s	
Delay time	0.5 s (Operational readiness)	
Analog outputs		
Type of protection	Short-circuit protection, polar	
Current output signal	4 mA 20	*****
Load/output load current output	≤ 500 Ω	2
General data		
Weight	581 g	961 g
Width	45 mm	
Height	111 mm	300 mm
Depth	79.5 mm	76.8 mm
Degree of protection	IP65	
Protection class	III	
Ambient temperature (operation)	0°C 60°	
Ambient temperature (storage/transport)	-20°C 85	5°C
Vibration resistance according to IEC 60068-2-6	5 g (55 200	00 Hz)
	Oudovino	1.1.

	Ordering data				
Туре		Order No.	Pcs. / Pkt.		
PSK A	FS6050IOL	2700704	1		
PSK A	FS6000IOL	2700707	1		

Flow monitoring Measuring range Display area Repeatability

Response time Measured value error

Res Res Acc Sur Col No. Sur Cui Digi Pul Pul Del

Description Compressed air meter: G1/2 process connection, measuring range up to 75 Nm³/h Compressed air meter: G1/2 process connection, measuring range up to 75 Nm3/h Compressed air meter: R1/4 process connection, measuring range up to 15 Nm3/h Compressed air meter: R1 process connection, measuring range up to 225 Nm³/h Compressed air meter: R2 process connection, measuring range up to 700 Nm³/h



Short-circuit protection, polarity reversal protection

4 mA ... 20 mA

 $\leq 500~\Omega$

887 g

45 mm

193.3 mm

74.5 mm

IP65

IO-Link

N



IO-Link



Compressed air counter up to 225 Nm³/h

Compressed air counter up to 700 Nm³/h

Short-circuit protection, polarity reversal protection

4 mA ... 20 mA

 $\leq 500~\Omega$

4.332 kg

133 mm

475 mm

IP65



r((()) 12	,®;;	· (%)·:
Technical data	Technical data	Technical data
0 Nm³/h 15 Nm³/h $0 \text{ Nm³/h} 18 \text{ Nm³/h} \\ (\pm 1.5\% \text{ of the measured value}) \\ < 0.1 \text{ s ((dAP = 0))} \\ \text{Depending on the air quality: } \pm 3\% \text{ of the measured value } + 0.3\% \text{ of the measuring range final value; } \pm 6\% \text{ of the measured value } + 0.6\% \\ \text{of the measuring range final value}$	$\begin{array}{l} 0\ Nm^3/h\\ 225\ Nm^3/h\\ 0\ Nm^9/h\\ 270\ Nm^9/h\\ (\pm 1.5\%\ of\ the\ measured\ value)\\ <0.1\ s\ ((dAP=0))\\ Depending\ on\ the\ air\ quality:\ \pm 3\%\ of\ the\ measured\ value\ +0.3\%\ of\ the\ measuring\ range\ final\ value;\ \pm 6\%\ of\ the\ measured\ value\ +0.6\%\ of\ the\ measuring\ range\ final\ value\\ \end{array}$	$2\ Nm^3/h \dots 700\ Nm^3/h$ $0\ Nm^3/h \dots 840\ Nm^3/h$ $(\pm 1.5\%$ of the measured value) $<0.1\ s$ ((dAP = 0)) Depending on the air quality: $\pm 3\%$ of the measured value +0.3% of the measuring range final value; $\pm 6\%$ of the measured value +0.6% of the measuring range final value
0°C 60°C -12°C 72°C 30 s (Q > 0.1 Nm³/h) 0.5°C ±2.5°C (Q > 0.1 Nm³/h)	0°C 60°C -12°C 72°C 30 s (Q > 0.1 Nm ⁹ /h) 0.5°C ±2.5°C (Q > 0.1 Nm ³ /h)	0°C 60°C -12°C 72°C 30 s (Q > 0.1 Nm³/h) 0.5°C ±2.5°C (Q > 0.1 Nm³/h)
M12 plug-in connector	M12 plug-in connector	M12 plug-in connector
4 19 V DC 30 V DC < 100 mA	4 19 V DC 30 V DC <100 mA	4 19 V DC 30 V DC < 100 mA
0.0010 m ³ 1000000 m ³ min. 0.2 s 0.5 s (Operational readiness)	0.0030 m ³ 3000000 m ³ min. 0.02 s 1 s (Operational readiness)	0.0100 m ³ 4000000 m ³ min. 0.043 s 0.5 s (Operational readiness)

Short-circuit protection, polarity reversal protection

4 mA ... 20 mA

≤ 500 Ω

2.053 kg

45 mm

475 mm

88.5 mm

IP65

0°C 60°C -20°C 85°C 5 g (55 2000 Hz)				0°C 60°C -20°C 85°C 5 g (55 2000 Hz)				0°C 60°C -20°C 85°C 5 g (55 2000 Hz)			
	Ordering dat	а			Ordering data	a			Ordering data		
Туре		Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs. / Pkt.
PSK AFS5000IOL		2700705	1								
				PSK AFS8000IOL		2700708	1				
								PSK AFS2000IOL		2700709	1



Extremely versatile

PACT current transformers offer a complete product range for converting alternating currents up to 4000 A into secondary currents of 1 A and 5 A. Depending on requirements, bus-bar, plug-in, and winding current transformers are available. PACT current transformers are available in different transformation ratios, accuracy classes, and rated powers - in 3000 versions, for your current measurement requirements.

Also available for higher accuracy classes

For standard applications, such as in machine building or system manufacturing, Phoenix Contact offers current transformers with accuracy classes 0.5 and 1 in a version that cannot be calibrated.

For higher accuracy or for billing purposes in energy supply, type-tested transformers that can be calibrated as well as calibrated transformers are available - with classes 0.2/0.2S/0.5 and 0.5S.



Fast and secure installation

The current transformer quick-action mechanism offers the following advantages:

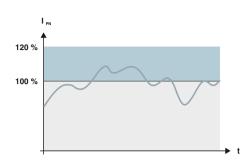
- Tool-free mounting
- Considerable reduction in installation
- Easy handling and secure fastening by pressing with finger
- Current transformers align themselves no need for subsequent alignment



Variable and space-saving mounting

In addition to the vertical and horizontal mounting position, the optional accessories offer further installation options such as mounting on the DIN rail or on the control cabinet panel.

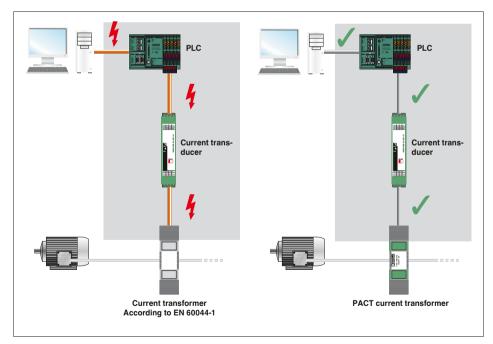
All PACT current transformers are just 30 mm wide. This saves space - for example flat mounting when measuring branch out-



Safe detection of current peaks

PACT current transformers can be used to safely detect current peaks greater than the rated nominal current strength - without resulting in any damage: the transformers are designed for a continuous thermal nominal current that is 120% of the primary rated current strength.

Example: a PACT transformer with a specified rated power of 10 VA does indeed deliver 14.4 VA on a continual basis.



Safe isolation

PACT current transformers are manufactured in accordance with EN 50178. This is relevant for electronic equipment for use in power installations.

EN 50178 differs considerably from EN 60044, the usual standard for transformers, with regard to safety.

Your advantages:

- PACT current transformers offer safe isolation, thanks to greater air and creepage distances
- PACT current transformers ensure that there is no sparkover on the secondary side of the transformer and human life is protected inside and outside the control cabinet
- Up to 1000 V (L-N) operating voltage possible
- Routine testing with 12 kV (1.2/50 µs)
- Surge voltage category 3 is met

Selection guide

- Complete range consisting of winding, bus-bar, and plug-in current transformers
- Popular types available from stock; alternatively, order key can be used for custom dimensioning
- Versions available to support official calibration

Selection

- Select your converter in accordance with the dimensions of the copper rail
- Specify the four electrical characteristics of the converter:
 - 1. The primary rated current $\textbf{strength}~\textbf{I}_{\textbf{pn}}$ - the maximum amperage occurring in the path to be measured

- 2. The secondary rated current I_{sn} supplied to the downstream measuring devices
- **3. Class** accuracy for adherence to the specified tolerances
- 4. Rated power S_n [VA] takes account of all the loads occurring in the measuring circuit



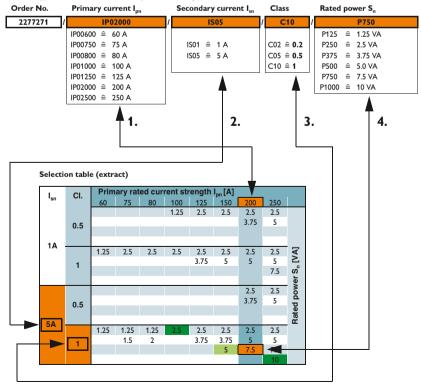
	Technical data
Input data	
Thermal rated short-time current	$I_{th} = 60 * I_{n}$
Rated surge current	$I_{dvn} = 2.5 * I_{th}$
Rated frequency	50 Hz 60 Hz
Surge current limitation factor	FS 5
General data	
Rated insulation voltage	1 kV
Test voltage	3 kV (50 Hz, 1 min.)
Impulse withstand voltage	12 kV (1.2 / 50 μs)
Insulating material class	E
Connection capacity of secondary terminals	2 x (2.5 x 4) mm
Ambient temperature (operation)	-25°C 40°C
Standards/regulations	IEC 60044-1, EN 50178
Housing material	Polyamide PA fiberglass reinforced

Calculation guide

Determination of the secondary side rated power S All the occurring loads must be added: - Calculate the power requirement of the copper cable (forward and Take into account the power requirement of the connected devices (measuring devices) S_n total = S_n copper cable + S_n measuring device + S_n reserve Power requirement of copper cables with a different diameter Rated power in VA/m section in mm² (consider the forward and return line) Secondary current I_{sn} Secondary current I_{sn} 1.5 0.2917 0.0117 0.1094 0.0044 0.0729 0.0029 S_n copper cable = cable length x 2 x rated powe S_n copper cable = 10 m x 2 x 0.1750 VA/m = 3.50 VA S measuring device = 2 VA S_n reserve < 0.5 x (S_n copper cable + S_n measuring device) S reserve = 2 VA S_n total = S_n copper cable + S_n measuring device + S_n reserve S_n total = 3.5 VA + 2 VA + 2 VA = 7.5 VA

Order key - example for PACT MCR-V2-3015-60

Preferred types that can be ordered directly are marked in green in the selection table



Current transformers

PACT MCR-V1-21-44

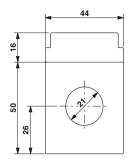
- Primary rated current I_{pn} : 0...(50...500) A
- Round conductor dimensions: Ø 21 mm

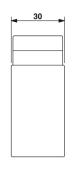
Notes:

Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy.

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 224

The relevant installation accessories can be found on page 223







Bus-bar curr. transf., official calibration as an option

		Ordering data		
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.
Preferred versions available from stock (marked in green in the selection table) Primary rated current I _{on} :				
- 50 A	1.25 VA	PACT MCR-V1-21-44- 50-5A-1	2277019	1
- 75 A	2.5 VA	PACT MCR-V1-21-44- 75-5A-1	2277611	1
- 100 A	2.5 VA	PACT MCR-V1-21-44-100-5A-1	2277022	1
- 125 A	3.75 VA	PACT MCR-V1-21-44-125-5A-1	2277763	1
- 150 A	5 VA	PACT MCR-V1-21-44-150-5A-1	2277035	1
- 200 A	5 VA	PACT MCR-V1-21-44-200-5A-1	2277776	1
- 250 A	5 VA	PACT MCR-V1-21-44-250-5A-1	2277048	1
- 300 A	10 VA	PACT MCR-V1-21-44-300-5A-1	2277789	1
- 400 A	5 VA	PACT MCR-V1-21-44-400-5A-1	2277051	1
- 500 A	10 VA	PACT MCR-V1-21-44-500-5A-1	2277792	1
Current transformers, pay attention to the following determining the desired current transformer type	g order key for			
		PACT MCR-V1-21-44	2277268	1

Add **order key** from the selection table (ordering example marked in orange) Order No. Primary current Ipn Secondary current I_{sn} Class Rated power S, 2277268 IP05000 C05 P1000 Selection table PACT MCR-V1-21-44 (Order No.: 2277268) Primary rated current amperage I_{pn} [A]
50 60 75 80 100 CI. 500 150 300 400 2.5 2.5 2.5 2.5 2.5 C05 3.75 7.5 IS01 2.5 2.5 power S_n [VA] C10 10 2.5 1.25 1.25 1.25 2.5 2.5 2.5 2.5 C05 2.0 3.75 Rated **≙ 0.5** 10 7.5 7.5 7.5 IS05 2.5 2.5 2.5 2.5 2.5 2.5 C10 3.75 10 7.5 7.5 10

Current transformers

PACT MCR-V2-3015-60

- Primary rated current I_{DD}: 0...(50...750) A

- Round conductor dimensions: Ø 28 mm

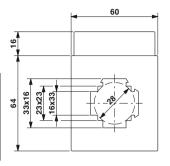
- Rail dimensions: 30x15 mm; 20x20 mm

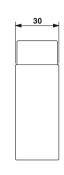
Notes:

Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 224

The relevant installation accessories can be found on page 223







Plug-in curr. transformer, official calibration as an option

		Ordering data		
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.
Preferred versions available from stock				
(marked in green in the selection table)				
Primary rated current I _{pn} : - 60 A	1.25 VA	PACT MCR-V2-3015- 60- 60-5A-1	2277815	1
- 75 A	1.25 VA 1.25 VA	PACT MCR-V2-3015- 60- 60-5A-1	2277818	1
- 75 A	1.25 VA 1.5 VA	PACT MCR-V2-3015- 60- 75-5A-1	2276502	1
- 80 A	1.25 VA	PACT MCR-V2-3015-60-75-5A-1	2276302	1
- 100 A	2.5 VA	PACT MCR-V2-3015- 60- 100-5A-1	2277064	1
- 125 A	3.75 VA	PACT MCR-V2-3015- 60- 125-5A-1	2277624	1
- 150 A	3.75 VA	PACT MCR-V2-3015- 60- 150-5A-1	2277844	1
- 150 A	5 VA	PACT MCR-V2-3015- 60- 150-5A-1	2277077	1
- 200 A	5 VA	PACT MCR-V2-3015- 60- 200-5A-1	2277637	1
- 200 A	7.5 VA	PACT MCR-V2-3015- 60- 200-5A-1	2277857	1
- 250 A	5 VA	PACT MCR-V2- 3015- 60-250-5A-1	2276544	1
- 250 A	7.5 VA	PACT MCR-V2-3015- 60- 250-5A-1	2277860	1
- 250 A	10 VA	PACT MCR-V2-3015- 60- 250-5A-1	2277080	1
- 300 A	7.5 VA	PACT MCR-V2-3015- 60- 300-5A-1	2277640	1
- 400 A	10 VA	PACT MCR-V2-3015- 60- 400-5A-1	2277093	1
- 500 A	10 VA	PACT MCR-V2-3015- 60- 500-5A-1	2277653	1
- 600 A	10 VA	PACT MCR-V2-3015- 60- 600-5A-1	2277103	1
- 750 A	10 VA	PACT MCR-V2-3015- 60- 750-5A-1	2277666	1
Current transformers, pay attention to the fo determining the desired current transformer ty				
		PACT MCR-V2- 3015- 60	2277271	1
		Accessories		
Quick-action mechanism; width of the holding	ng latch 16 mm			
Fixing pin length 40 mm		PACT-FAST-MNT-W16-L40	2276638	1
Quick-action mechanism; width of the holding	ng latch 16 mm			
Fixing pin length 65 mm		PACT-FAST-MNT-W16-L65	2276641	1

Add **order key** from the selection table (ordering example marked in orange) Order No. Primary current I_{pn} Secondary current I_{sn} Class Rated power S_n 2277271 IP07500 C05 P1500 Selection table PACT MCR-V2-3015-60 (Order No.: 2277271) Primary rated current amperage I_{pn} [A]
50 60 75 80 100 CI. 400 500 600 150 200 750 2.5 2.5 2.5 2.5 2.5 2.5 C05 3.75 10 10 10 **≙ 0.5** 10 IS01 **≙1A** 2.5 2.5 2.5 Rated power S_n [VA] 5 C10 3.75 5 5 10 15 2.5 2.5 2.5 2.5 2.5 2.5 2.5 5 C05 3.75 **≙ 0.5** 7.5 10 10 10 IS05 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C10 3.75 10 15

PACT MCR-V2-4012-70

- Primary rated current I_{pn} : 0...(75...1000) A
- Round conductor dimensions: Ø 33 mm
- Rail dimensions:

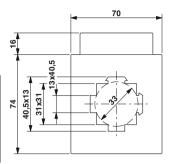
40x12 mm; 2x 30x10 mm

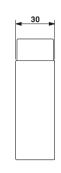
Notes:

Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy.

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 224

The relevant installation accessories can be found on page 223







Plug-in curr. transformer, official calibration as an option

		Ordering dat	a	
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.
Preferred versions available from stock (marked in green in the selection table) Primary rated current I _{nn} :				
- 250 A	5 VA	PACT MCR-V2-4012- 70- 250-5A-1	2277116	1
- 300 A	7.5 VA	PACT MCR-V2-4012- 70- 300-5A-1	2277679	1
- 400 A	7.5 VA	PACT MCR-V2-4012- 70- 400-5A-1	2277129	1
- 500 A	10 VA	PACT MCR-V2-4012- 70- 500-5A-1	2277682	1
- 600 A	10 VA	PACT MCR-V2-4012- 70- 600-5A-1	2277132	1
- 750 A	10 VA	PACT MCR-V2-4012- 70- 750-5A-1	2277695	1
- 800 A	10 VA	PACT MCR-V2-4012- 70- 800-5A-1	2277145	1
- 1000 A	10 VA	PACT MCR-V2-4012- 70-1000-5A-1	2277158	1
Current transformers, pay attention to the follow determining the desired current transformer type	ring order key for			
		PACT MCR-V2- 4012- 70	2277284	1
		Accessories	3	
Quick-action mechanism; width of the holding la	atch 13 mm			
Fixing pin length 40 mm		PACT-FAST-MNT-W13-L40	2276612	1
Quick-action mechanism; width of the holding la	atch 13 mm			
Fixing pin length 65 mm		PACT-FAST-MNT-W13-L65	2276625	1

Add order key from the selection table (ordering example marked in orange) Order No. Primary current Ipn Secondary current I_{sn} Class Rated power S, 2277284 IP010000 C10 P250 Selection table PACT MCR-V2-4012-70 (Order No.: 2277284) Primary rated current strength I_{pn} [A]

75 80 100 125 150 CI. 80 100 125 750 300 400 500 600 800 1000 2.5 2.5 2.5 2.5 2.5 2.5 1.25 2.5 C05 3.75 10 **≙ 0.5** 10 10 10 10 IS01 ≘1 A 2.5 2.5 2.5 C10 5 10 ທ້ 10 10 10 10 10 powe 2.5 1.25 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C05 3.75 **≙ 0.5** 10 10 10 10 7.5 IS05 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C10 7.5 10 10

215

Current transformers

PACT MCR-V2-5012-85

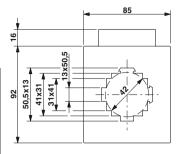
- Primary rated current I_{DD}: 0...(100...1500) A
- Round conductor dimensions: Ø 42 mm
- Rail dimensions: 50x12 mm; 2x 40x10 mm

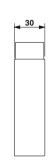
Notes:

Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 224

The relevant installation accessories can be found on page 223







Plug-in curr. transformer, official calibration as an option

		Ordering da	ta	
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.
Preferred versions available from	stock			
(marked in green in the selection tab	ole)			
Primary rated current I _{pn} :				
- 150 A	3.75 VA	PACT MCR-V2-5012- 85- 150-5A-1	2276117	1
- 200 A	5 VA	PACT MCR-V2-5012- 85- 200-5A-1	2276120	1
- 250 A	7.5 VA	PACT MCR-V2-5012- 85- 250-5A-1	2276133	1
- 300 A	10 VA	PACT MCR-V2-5012- 85- 300-5A-1	2276146	1
- 400 A	10 VA	PACT MCR-V2-5012- 85- 400-5A-1	2277161	1
- 500 A	15 VA	PACT MCR-V2-5012- 85- 500-5A-1	2276159	1
- 600 A	10 VA	PACT MCR-V2-5012- 85- 600-5A-1	2277174	1
- 600 A	15 VA	PACT MCR-V2-5012- 85- 600-5A-1	2276162	1
- 750 A	10 VA	PACT MCR-V2-5012- 85- 750-5A-1	2276175	1
- 800 A	10 VA	PACT MCR-V2-5012- 85- 800-5A-1	2277187	1
- 1000 A	10 VA	PACT MCR-V2-5012- 85-1000-5A-1	2276463	1
- 1000 A	15 VA	PACT MCR-V2-5012- 85-1000-5A-1	2277190	1
- 1250 A	15 VA	PACT MCR-V2-5012- 85-1250-5A-1	2277200	1
- 1500 A	15 VA	PACT MCR-V2-5012- 85-1500-5A-1	2276188	1
Current transformers, pay attention determining the desired current transformers.				
		PACT MCR-V2- 5012- 85	2277297	1
		Accessorie	s	
Quick-action mechanism; width of	the holding latch 13 mm			
Fixing pin length 40 mm		PACT-FAST-MNT-W13-L40	2276612	1
Quick-action mechanism; width of	the holding latch 13 mm			
Fixing pin length 65 mm		PACT-FAST-MNT-W13-L65	2276625	1

Add **order key** from the selection table (ordering example marked in orange) Order No. Primary current I_{pn} Secondary current I_{sn} Class Rated power S_n 2277297 IP02500 C10 P750 Selection table PACT MCR-V2-5012-85 (Order No.: 2277297) Primary rated current amperage $I_{pn}[A]$ CI. 150 500 600 750 800 1000 1500 200 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C05 10 10 10 7.5 10 10 10 10 10 IS01 15 2.5 2.5 2.5 5 Rated power S, [VA] C10 3.75 5 **7.5** 5 5 10 5 10 7.5 10 10 10 15 15 10 20 20 15 20 20 30 2.5 2.5 1.25 2.5 2.5 2.5 2.5 2.5 2.5 C05 5 5 10 5 **≙ 0.5** 10 10 10 7.5 20 10 10 **IS**05 15 2.5 2.5 2.5 2.5 2.5 C10 7.5 15 15

PACT MCR-V2-6015-85

- Primary rated current I_{pn} : 0...(200...1600) A
- Round conductor dimensions: Ø 52 mm
- Rail dimensions:

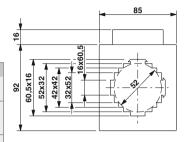
60x15 mm; 2x 50x10 mm; 40x40 mm

Notes:

Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy.

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 224

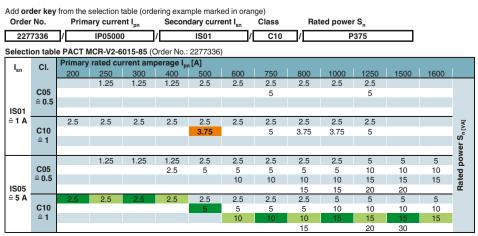
The relevant installation accessories can be found on page 223





Plug-in curr. transformer, official calibration as an option

		Ordering data						
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.				
Preferred versions available from stor (marked in green in the selection table) Primary rated current I _{nn} :	k							
- 200 A	2.5 VA	PACT MCR-V2-6015- 85- 200-5A-1	2277873	1				
- 250 A	2.5 VA	PACT MCR-V2-6015- 85- 250-5A-1	2277886	1				
- 300 A	2.5 VA	PACT MCR-V2-6015- 85- 300-5A-1	2277899	1				
- 400 A	2.5 VA	PACT MCR-V2-6015- 85- 400-5A-1	2277909	1				
- 500 A	5 VA	PACT MCR-V2-6015- 85- 500-5A-1	2277912	1				
- 600 A	10 VA	PACT MCR-V2-6015- 85- 600-5A-1	2277925	1				
- 750 A	10 VA	PACT MCR-V2-6015- 85- 750-5A-1	2277938	1				
- 800 A	10 VA	PACT MCR-V2-6015- 85- 800-5A-1	2277941	1				
- 1000 A	15 VA	PACT MCR-V2-6015- 85-1000-5A-1	2277954	1				
- 1250 A	15 VA	PACT MCR-V2-6015- 85-1250-5A-1	2277967	1				
- 1500 A	15 VA	PACT MCR-V2-6015- 85-1500-5A-1	2277970	1				
- 1600 A	15 VA	PACT MCR-V2-6015- 85-1600-5A-1	2277983	1				
Current transformers , pay attention to determining the desired current transformers.		DAGE MODIVO COAS OF	0077000					
		PACT MCR-V2- 6015- 85	2277336	1				
		Accessories	S					
Quick-action mechanism; width of the	e holding latch 16 mm							
Fixing pin length 40 mm		PACT-FAST-MNT-W16-L40	2276638	1				
Quick-action mechanism; width of the	holding latch 16 mm							
Fixing pin length 65 mm		PACT-FAST-MNT-W16-L65	2276641	1				



Current transformers

PACT MCR-V2-6315-95

- Primary rated current I_{DD}: 0...(200...2500) A
- Round conductor dimensions: Ø 53 mm
- Rail dimensions: 63x15 mm 2x 50x10 mm 40x40 mm

PACT MCR-V2-6040-96

- Primary rated current In: 0...(200...2000) A
- Round conductor dimensions: Ø 61 mm
- Rail dimensions: 60x40 mm; 50x50 mm



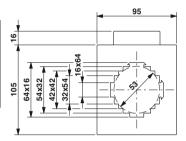
Plug-in curr. transformer, official calibration as an option

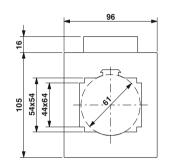


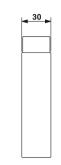
Plug-in curr. transformer, official calibration as an option

Notes: Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy. Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 225

The relevant installation accessories can be found on page 223







		Ordering date	a		ta		
Description	Rated power S_n	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Preferred versions available from stock (marked in green in the selection table) Primary rated current I _{nn} :							
- 600 A	10 VA				PACT MCR-V2-6040- 96- 600-5A-1	2276191	1
- 750 A	10 VA				PACT MCR-V2-6040- 96- 750-5A-1	2276201	1
- 800 A	10 VA	PACT MCR-V2-6315- 95- 800-5A-1	2277213	1	PACT MCR-V2-6040- 96- 800-5A-1	2276214	1
- 1000 A	10 VA	PACT MCR-V2-6315- 95-1000-5A-1	2277226	1	PACT MCR-V2-6040- 96-1000-5A-1	2277705	1
- 1250 A	10 VA	PACT MCR-V2-6315- 95-1250-5A-1	2277239	1			
- 1250 A	15 VA				PACT MCR-V2-6040- 96-1250-5A-1	2276227	1
- 1500 A	10 VA	PACT MCR-V2-6315- 95-1500-5A-1	2277242	1	PACT MCR-V2-6040- 96-1500-5A-1	2277718	1
- 1600 A	10 VA	PACT MCR-V2-6315- 95-1600-5A-1	2277255	1			
- 1600 A	15 VA				PACT MCR-V2-6040- 96-1600-5A-1	2276230	1
- 2000 A	15 VA				PACT MCR-V2-6040- 96-2000-5A-1	2276243	1
Current transformers, pay attention to the foll determining the desired current transformer type							
		PACT MCR-V2- 6315- 95	2277307	1	PACT MCR-V2- 6040- 96	2277349	1
		Accessories	3		Accessorie	S	
Quick-action mechanism; width of the holding	g latch 16 mm						
Fixing pin length 40 mm		PACT-FAST-MNT-W16-L40	2276638	1	PACT-FAST-MNT-W16-L40	2276638	1
Quick-action mechanism; width of the holding	g latch 16 mm						
Fixing pin length 65 mm		PACT-FAST-MNT-W16-L65	2276641	1	PACT-FAST-MNT-W16-L65	2276641	1

Add **order key** from the selection table (ordering example marked in orange) Order No. Primary current Ipn Secondary current I_{sn} Class Rated power S_n 2277307 IP25000 P500

Selection	Selection table PACT MCR-V2-6315-95 (Order No.: 2277307)															
I _{sn}	CI.	Prim	ary ra	ated c	urren	t amp	erage	I _{pn} [A	١]							
*sn	0	200	250	300	400	500	600	750	800	1000	1250	1500	1600	2000	2500	
		2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	5		
	C05			5	5	5	5	10	10	10	10	10	10	10		
IS01	≙ 0.5				7.5	10	10	15	15			15	15	15		
1301 ≙ 1 A														20		
- ' ^		2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	10		n [VA]
	C10	3.75	5	5	5	5	5	10	10	10	10	10	10	15		
	≙ 1			7.5	10	10	10	15	15			15	15	20		ຶ້
							15		20							power
		2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	5	5	8
	C05		3.75	5	5	5	5	10	10	10	10	10	10	10	10	
	≙ 0.5			7.5	10	10	10	15	15	15	15	15	15	15	15	Rated
IS05						15	15	20	20	30	20	30	30	30	30	œ
≘ 5 A		2.5	2.5	2.5	2.5	5	5	5	5	10	5	5	10	10	10	
	C10	3.75	5	5	5	10	10	10	10	15	10	10	15	15	15	
	≙1			10	10	15	15	15	15	30	15	15	30	30	30	
					15	20	20	30	30		30	30				

Select	Selection table PACT MCR-V2-6040-96 (Order No.: 2277349)														
1	CI.	Prim	ary ra	ated c	urren	t amp	erage	I _{pn} [A	١]						
Isn	OI.	200	250	300	400	500	600	750	800	1000	1250	1500	1600	2000	
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			
	C05				5	5	5	5	5	5	5				
	≙ 0.5					7.5		7.5	7.5	10	10				
IS01															
≘ 1 A		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			₹
	C10	3.75	5	5	5	5	5	5	5	5	5	5			, L
	≙ 1				7.5	7.5		7.5	7.5	10	10				50
															power S _{n [vA]}
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	õ
	C05				5	5	5	5	5	5	5	5	5	10	Ø
	≙ 0.5					7.5	7.5	10	10	7.5	10	10	10	15	Rated
IS05													15		œ
≘ 5 A		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	2.5	5	5	
	C10	3.75	3.75	5	5	5	5	5	5	5	10	5	10	10	
	≙ 1				7.5	7.5	10	10	10	10	15	10	15	15	
									15						

Current transformers

PACT MCR-V2-8015-105

- Primary rated current I_{pp}: 0...(400...2500) A

- Round conductor dimensions: Ø 61 mm

- Rail dimensions:

80x15 mm; 2x 60x10 mm; 3x 50x10 mm

PACT MCR-V2-8020-105

- Primary rated current I_{DD}: 0...(500...2000) A

- Round conductor dimensions: Ø 70 mm

- Rail dimensions:

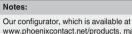
2x 80x10 mm; 60x60 mm



Plug-in curr. transformer, official calibration as an option



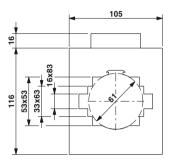
Plug-in curr. transformer, official calibration as an option

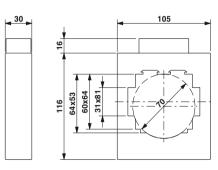


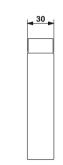
www.phoenixcontact.net/products, makes ordering easy.

Current transformers that support official calibration: To specify the type of current transformer you require, please use the order key on page 225

The relevant installation accessories can be found on page 223







S _n
7.5 VA
10 VA
10 VA
10 VA
15 VA
10 VA
15 VA
10 VA
15 VA
15 VA
10 VA
20 VA
20 VA

Ordering dat	а	Ordering data					
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.		
PACT MCR-V2-8015-105- 400-5A-1	2276256	1					
PACT MCR-V2-8015-105- 500-5A-1	2276269	1					
PACT MCR-V2-8015-105- 600-5A-1	2276272	1					
PACT MCR-V2-8015-105- 750-5A-1	2276285	1					
PACT MCR-V2-8015-105- 800-5A-1	2276298	1					
PACT MCR-V2-8015-105-1000-5A-1	2277721	1	PACT MCR-V2-8020-105-1000-5A-1	2277747	1		
PACT MCR-V2-8015-105-1000-5A-1	2276308	1					
PACT MCR-V2-8015-105-1250-5A-1	2276311	1					
PACT MCR-V2-8015-105-1500-5A-1	2277734	1	PACT MCR-V2-8020-105-1500-5A-1	2277750	1		
PACT MCR-V2-8015-105-1600-5A-1	2276324	1					
			PACT MCR-V2-8020-105-2000-5A-1	2276382	1		
PACT MCR-V2-8015-105-2000-5A-1	2276337	1					
PACT MCR-V2-8015-105-2500-5A-1	2276340	1					
D107 H0D V0 0045 405			D. OT 110D Vo. 2000 105				
PACT MCR-V2- 8015-105	2277352	1	PACT MCR-V2- 8020-105	2277365	1		

Add **order key** from the selection table (ordering example marked in orange)

Order No. Primary current Ipn Secondary current I_{sr} Class Rated power S_n 2277352 IP25000 C10 P3000

Selecti	Selection table PACT MCR-V2-8015-105 (Order No.: 2277352)												
	CI.	Prima	ry rate	d curre	nt amp	erage I	_{pn} [A]						
sn	Oi.	400	500	600	750	800	1000	1250	1500	1600	2000	2500	
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5		
	C05		5	5	5	5	5	5	5	5	10		
IS01	≙ 0.5			10		10	7.5	10	10	10	15		
1301 1 A									15	15	20		_
- 1 7		2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	10		[VA]
	C10	5	5	5	5	5	5	5	10	10	15		_
	≙ 1	7.5	10	10	10	10	10	10	15	15	20		ທ [ື]
							15	15	20	20	25		power
		2.5	2.5	2.5	2.5	2.5	5	2.5	2.5	2.5	2.5	5	õ
	C05	5	5	5	5	5	10	5	5	5	5	10	0
	≙ 0.5			10	10	10	15	10	10	10	10	15	Rated
IS05					15	15	20			15	15	20	_ æ
≘ 5 A		2.5	2.5	2.5	2.5	5	5	2.5	2.5	5	5	10	
	C10	5	5	5	5	10	10	5	5	10	10	15	
	≙ 1	7.5	10	10	10	15	15	10	10	15	15	20	
l		l			15		20		15		20	30	

	CI.	Prima	rimary rated current amperage I _{pn} [A]												
I _{sn}	Ci.	500	600	750	800	1000	1250	1500	1600	2000					
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5						
	C05		5	5	5	5		5	5						
IS01	≙ 0.5					10									
≙1A															
- 1 7		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		₹				
	C10	5	5	5	5	5	5	5	5						
	≙ 1		7.5	7.5	7.5	10					50				
						15					. š				
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	power S _{n [vA]}				
	C05	5	5	5	5	5	5	5	5	5					
	≙ 0.5		7.5	7.5	7.5	10	10	10	10	10	Rated				
IS05									15		œ				
≘ 5 A		2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5					
	C10	5	5	5	5	5	5	5	10	10					
	≙ 1		7.5	7.5	10	10	10	10	15						
								15							

Current transformers

PACT MCR-V2-10020-129

- Primary rated current I_{DD}: 0...(400...4000) A

- Round conductor dimensions: Ø 85 mm

- Rail dimensions:

2x 100x10 mm; 80x64 mm

PACT MCR-V2-10036-129

- Primary rated current I_{DD}: 0...(400...4000) A

- Rail dimensions:

3x 100x12 mm



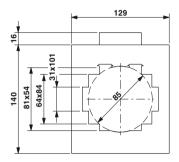
Plug-in curr. transformer, official calibration as an option

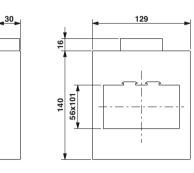


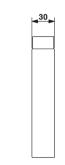
Plug-in curr. transformer, official calibration as an option



The relevant installation accessories can be found on page 223







Description	Rated power S_n
Preferred versions available from stock (marked in green in the selection table) Primary rated current I _{on} :	
- 2500 A	15 VA
- 3000 A	15 VA
Current transformers, pay attention to the determining the desired current transformers.	

Ordering data									
Туре	Order No.	Pcs. / Pkt.							
PACT MCR-V2-10020-129-2500-5A	2276395	1							
PACT MCR-V2-10020-129	2277378	1							

Ordering data									
Туре	Order No.	Pcs. / Pkt.							
PACT MCR-V2-10036-129-3000-5A	2276405	1							
PACT MCR-V2-10036-129	2277381	1							

Add order key from the selection table (ordering example marked in orange)									
Order No.	Primary current I _{pn}	Secondary current I _{sn}	Class	Rated power S _n					
2277378 /	IP40000	/ IS05	/ C05 /	P2500					

Selection table PACT MCR-V2-10020-129 (Order No.: 2277378)															
1	CI.	Prima	ary rat	ted cu	rrent a	amper	age I _{pr}	,[A]							
sn	0	400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
			2.5	5	5	5	5	5	5	5	5	5	5		
	C05 ≘ 0.5		5	10	10	10	10	10	10	10	10	10	10		
								15	15	15	15	15	15		
IS01												20	20		
1 A	C10 ≘ 1	2.5	2.5	5	5	5	5	5	5	5	5	5	5		[VA]
		5	5	10	10	10	10	10	10	10	10	10	10		2
								15	15	15	15	15	15		ທັ
												25	30		ē
			2.5	2.5	5	5	5	5	5	5	5	5	5	5	power
	C05		5	5	10	10	10	10	10	10	10	10	10	10	
	≙ 0.5							15	15	15	15	15	15	15	Rated
IS05											20	20	25	25	Ba
≙ 5 A		2.5	2.5	5	5	5	5	5	5	5	5	5	5	5	
	C10 ≙ 1	5	5	10	10	10	10	10	10	10	10	10	10	10	
							15	15	15	15	15	15	15	15	
										20	25	30	30	30	

	Selection table PACT MCR-V2-10036-129 (Order No.: 2277381)															
	_	CI.	Prima	ary rat	ted cu	rrent a	mper	age I _{pr}	[A]							
	I _{sn}	OI.	400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
				2.5	5	5	5	5	5	5	5	5	5	5		
L		C05		5	10	10	10	10	10	10	10	10	10	10		
L		≙ 0.5							15	15	15	15	15	15		
ı	IS01												20	20		_
L	≙ 1 A	C10	2.5	2.5	5	5	5	5	5	5	5	5	5	5		[VA]
L			5	5	10	10	10	10	10	10	10	10	10	10		_
L		≙1							15	15	15	15	15	15		ທຶ
ı													25	30		power
L				2.5	2.5	5	5	5	5	5	5	5	5	5	5	ŏ
ı		C05		5	5	10	10	10	10	10	10	10	10	10	10	
ı		≙ 0.5							15	15	15	15	15	15	15	Rated
ı	IS05											20	20	25	25	æ
	≙ 5 A		2.5	2.5	5	5	5	5	5	5	5	5	5	5	5	
ı		C10	5	5	10	10	10	10	10	10	10	10	10	10	10	
L		≙ 1						15	15	15	15	15	15	15	15	
	I										20	25	30	30	30	

Current transformers

PACT MCR-V2-12020-159

- Primary rated current I_{pp}: 0...(400...4000) A
- Round conductor dimensions: Ø 96 mm
- Rail dimensions: 2x 120x10 mm: 3x 100x10 mm: 80x80 mm

PACT MCR-V2-12040-159

- Primary rated current I_{nn}: 0...(400...4000) A
- Rail dimensions: 4x 120x10 mm

IS05 ≘ 5 A

C10

10 15

20

15

15 15

20

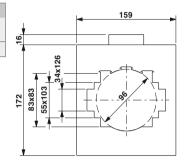


Plug-in current transformer

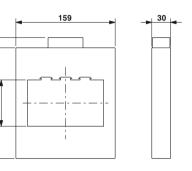


Plug-in current transformer

Notes: Our configurator, which is available at www.phoenixcontact.net/products, makes ordering easy. The relevant installation accessories can be found on page 223







Description	Rated power S_n
Preferred versions available from stock (marked in green in the selection table) Primary rated current I _{pn} : - 4000 A	15 VA
Current transformers, pay attention to the follo determining the desired current transformer type	

Ordering data										
Туре	Order No.	Pcs. / Pkt.								
PACT MCR-V2-12020-159	2277394	1								

Ordering data									
Туре	Order No.	Pcs. / Pkt.							
PACT MCR-V2-12040-159-4000-5A	2276418	1							
PACT MCR-V2-12040-159	2277404	1							

Add order key from the selection table (ordering example marked in orange) Order No. Primary current Ipn Secondary current I_{sn} Class Rated power 2277404 IP08000 P250 Selection table PACT MCR-V2-12020-159 (Order No.: 2277394) Primary rated current amperage I_{pn} [A] 400 | 500 | 600 | 750 | 800 | 1000 | 1250 | 1500 | 1600 | 2000 | 2500 | 3000 | 4000 2.5 2.5 2.5 2.5 2.5 5 C05 10 10 10 10 10 10 15 **≙** 0.5 15 15 15 15 15 30 IS01 45 10 5 C10 ທ້ 10 15 10 15 10 15 15 15 15 15 30 20 20 45 Rated power 2.5 2.5 2.5 2.5 10 10 C05 **≙ 0.5** 10 10 10 10 10 15 15 30 15 15 15 30 30

15 15 30

30 30 45 15 15 30 30 30

30

		_													
Sele	Selection table PACT MCR-V2-12040-159 (Order No.: 2277404)														
	CI. Primary rated current amperage I _{pn} [A]														
sn	Ci.	400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
		2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	10	
	C05	5	5	5	5	5	5	10	10	10	10	10	10	15	
IS01	≙ 0.5						10	15	15	15	15	15	15	30	
≘ 1A															_
- 14	C10 ≘ 1	2.5	5	5	2.5	2.5	5	5	5	5	5	5	10	10	[VA]
		5	10	10	5	5	10	10	10	10	10	10	15	15	
		10	15	15		10	15	15	15	15	15	15	30	30	S
															power
		2.5	2.5	2.5	2.5	2.5	5	5	10	5	5	5	10	10	ó
	C05	5	5	5	5	5	10	10	15	10	10	10	15	15	5
	≙ 0.5				10	10	15	15	30	15	15	15	30	30	Rated
IS05															č
≘ 5 A		2.5	5	5	5	5	5	5	10	5	5	10	10	10	
	C10	5	10	10	10	10	10	10	15	10	10	15	15	15	
	≙ 1	10	15	15	15	15	15	15	30	15	15	30	30	30	
1		1													

Current transformers

PACT MCR-V3-60

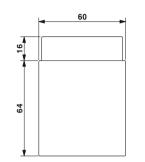
- Primary rated current I_{pn}: 0...(1...40) A
- Current-carrying copper lines connected directly to the screw terminal blocks on the primary side

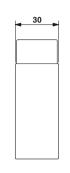
Notes:

Our configurator, which is available at

www.phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 223







Winding current transformer

Description
Current transformers, pay attention to the following order key for determining the desired current transformer type

Ordering data									
Туре	Order No.	Pcs. / Pkt.							
PACT MCR-V3-60	2277417	1							

Add order key from the selection table (ordering example marked in orange) Rated power S_n Order No. Primary current I_{pn} Secondary current I_{sn} Class 2277417 IP00025 C10 P250 Selection table PACT MCR-V3-60 (Order No.: 2277417) Primary rated current strength I_{pn} [A] CI. 10 20 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C05 **≙ 0.5** IS01 ≘1 A 2.5 Z C10 ဟ် Rated power 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C05 5 **≙ 0.5** IS05 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C10

Quick-action mechanism for **PACT** current transformers

- No tools necessary for mounting
- Extremely easy handling, thanks to secure fastening by pressing with finger
- Set consisting of two fixing pins and a holding latch

Notes:

The 16 mm wide quick-action mechanism can also be used for larger current transformers if the length of the fixing pins is sufficient.



for: ...-V2-4012-70..., ...-V2-5012-85...

Technical data



for: ...-V2-3015-60..., ...-V2-6015-85..., ...-V2-6315-95... **Technical data**

General data							
Material	PA 6			PA 6			
Ambient temperature (operation)	-25°C 120°C			-25°C 120°C			
	Ordering dat	a	Ordering data				
Description	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
Quick-action mechanism; width of the holding latch 13 mm							
Fixing pin length 65 mm	PACT-FAST-MNT-W13-L65	2276625	1				
Fixing pin length 40 mm	PACT-FAST-MNT-W13-L40	2276612	1				
Quick-action mechanism; width of the holding latch 16 mm							
Fixing pin length 65 mm				PACT-FAST-MNT-W16-L65	2276641	1	
Fixing pin length 40 mm				PACT-FAST-MNT-W16-L40	2276638	1	

Accessories

- Copper sleeves
- DIN rail adapter
- Secondary terminal cover
- Insulating caps



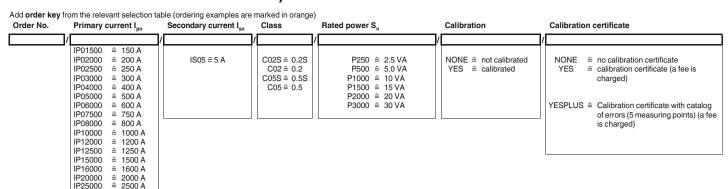
Copper sleeves DIN rail adapter Ordering data



Secondary terminal cover **Insulating caps** Ordering data

		Ordering da	.a	Ordering data					
Description		Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.		
Copper sleeves, for establishing a conductive conthe horizontal assembly of PACT analog current transize of the copper sleeve depends on the diameter of the current transformer.	nsformers. The								
- for PACT MCR-V1-21-44	Ø 21/8 mm	PACT MCR-CB-21- 8	2277569	1					
- for PACT MCR-V1-21-44	Ø 21/12 mm	PACT MCR-CB-21-12	2277556	1					
- for PACT MCR-V2-3015-60	Ø 28/12 mm	PACT MCR-CB-28-12	2277543	1					
- for PACT MCR-V2-5012-85	Ø 42/12 mm	PACT MCR-CB-42-12	2277530	1					
DIN rail adapter									
		PACT MCR-RA	2277598	12					
Secondary terminal cover, for increasing the clea creepage distances	rances and								
	Length: 60 mm				PACT MCR-ETC-60	2277572	9		
	Length: 75 mm				PACT MCR-ETC-75	2277585	9		
Insulating caps , for protection against unintended mounting screws of the primary rail	contact with								
					PACT MCR-ICAP	2277608	18		

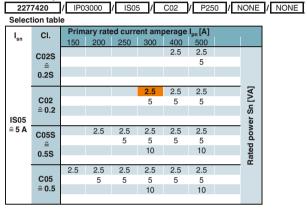
Calibratable current transformers - order key and selection tables



PACT MCR-V1C-21-44 (Order No.: 2277420)

You will find information about the product on page 213.

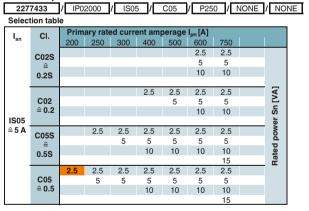
Add order key from the selection table



PACT MCR-V2C-3015-60 (Order No.: 2277433)

You will find information about the product on page 214.

Add order key from the selection table



PACT MCR-V2C-5012-85 (Order No.: 2277459)

You will find information about the product on page 216. Add **order key** from the selection table

2277459 / IP10000 / IS05 / C05 / P1500 / NONE / NONE

Selection table														
-	CI.	Prim	Primary rated current amperage I _{pn} [A]											
I _{sn}	0	200	250	300	400	500	600	750	800	1000	1200			
	C02S						2.5	2.5	2.5	5	5			
	≙						5	5	5	10	10			
	0.28							10	10	15	15			
										20	30	_		
					2.5	2.5	2.5	2.5	2.5	5	5	in [VA]		
	C02				5	5	5	5	5	10	10	_		
	≙ 0.2						10	10	10	15	15	Ø		
IS05										30	30	power		
≘ 5 A	C05S	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	ŏ		
	≙			5	5	5	10	10	10	10	10			
	0.5S				10	10				15	15	Rated		
	0.00									30	30	Ва		
		2.5	2.5	2.5	2.5	2.5	5	5	5	5	5			
	C05		5	5	5	5	10	10	10	10	10			
	≙ 0.5				10	10				15	15			
										30	30			

PACT MCR-V2C-4012-70 (Order No.: 2277446)

You will find information about the product on page 215.

Add order key from the selection table

227	2277446 / IP06000 / IS05 / C02 / P1000 / NONE / NONE						1E				
Selec	tion tabl	е									
I _{sn}	CI. Primary rated current amperage I _{pn} [A]										
*sn	· · · ·	200	250	300	400	500	600	750	800	1000	
	C02S						2.5	2.5	2.5	5	
	≙						5	5	5	10	
	0.28							10	10		
	0.20										
					2.5	2.5	2.5	5	2.5	5	₹
	C02				5	5	5	10	5	10	Sn [VA]
	≙ 0.2					10	10		10		
IS05											ē
≘ 5 A	C05S		2.5	2.5	2.5	2.5	5	5	2.5	5	power
	≙			5	5	5	10	10	5	10	<u>م</u>
	0.58				10	10			10		Ę
	0.00										Rated
1		2.5	2.5	2.5	2.5	2.5	5	5	2.5	5	
	C05		5	5	5	5	10	10	5	10	
1	≙ 0.5				10	10			10		

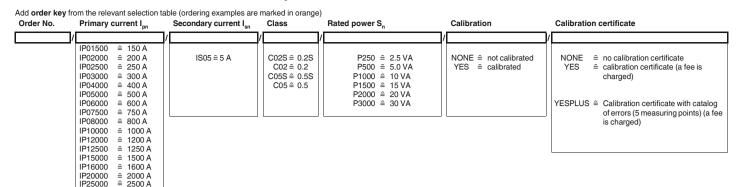
PACT MCR-V2C-6015-85 (Order No.: 2277462)

You will find information about the product on page 217.

Add **order key** from the selection table 2277462 / IP02500 / IS05 / C05 / P250 / NONE / NONE

Selection table Primary rated current amperage Ipn [A] CI. 1000 1200 250 300 400 500 600 750 800 2.5 2.5 2.5 2.5 C02S 5 5 10 10 0.25 2.5 2.5 2.5 2.5 5 5 Sn 10 10 IS05 15 ≘ 5 A 2.5 2.5 2.5 2.5 2.5 2.5 2.5 C05S 5 Rated 10 10 0.58 25 2.5 2.5 25 2.5 C05 5 5 5 10 10 10 10

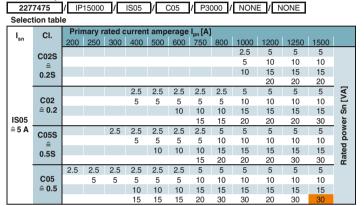
Calibratable current transformers - order key and selection tables



PACT MCR-V2C-6315-95 (Order No.: 2277475)

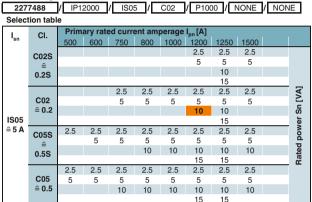
You will find information about the product on page 218.

Add **order key** from the selection table



PACT MCR-V2C-6040-96 (Order No.: 2277488)

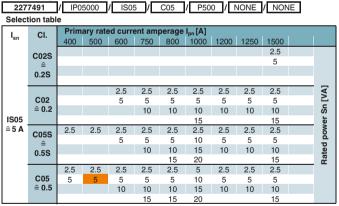
You will find information about the product on page 218. Add **order key** from the selection table



PACT MCR-V2C-8015-105 (Order No.: 2277491)

You will find information about the product on page 219.

Add **order key** from the selection table

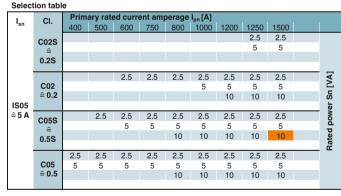


PACT MCR-V2C-8020-105 (Order No.: 2277501)

You will find information about the product on page 219.

Add **order key** from the selection table

2277501 / IP15000 / IS05 / C05S / P1000 / NONE / NONE



PACT MCR-V2C-10020-129 (Order No.: 2277514)

You will find information about the product on page 220.

Add order key from the selection table

2277514 / IP08000 / IS05 / C05 / P1500 / NONE / NONE

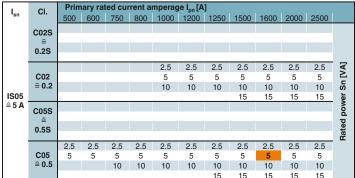
Select	Selection table												
I _{sn}	CI.	Primary rated current amperage I _{pn} [A]											
*sn	.	500	600	750	800	1000	1200	1250	1500	1600	2000	2500	
	C02S								2.5	2.5	2.5	2.5	
	≙								5	5	5	5	
	0.28											10	
													_
						2.5	2.5	2.5	2.5	2.5	2.5	2.5	[VA]
	C02					5	5	5	5	5	5	5	
	≙ 0.2					10	10	10	10	10	10	10	Sn
IS05								15	15	15	15	15	power
≘ 5 A	C05S	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	õ
	≙	5	5	5	5	5	5	5	5	5	5	5	0
	0.58				10	10	10	10	10	10	10	10	Rated
							15	15	15	15	15	15	æ
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	C05	5	5	5	5	5	5	5	5	5	5	5	
	≙ 0.5			10	10	10	10	10	10	10	10	10	
					15	15	15	15	15	15	15	15	

PACT MCR-V2C-10036-129 (Order No.: 2277527)

You will find information about the product on page 220.

Add **order key** from the selection table

2277527 / P16000 / IS05 / C05 / P500 / NONE / NONE Selection table





With flexible power supply - current transducers up to 12 A AC

Active current transducers convert sinusoidal alternating currents up to 12 A. The integrated wide-range power supply unit enables use in various different countries.

With hinged Rogowski sensor - current transducers up to 200 A AC

The AC current transducers measure sinusoidal and non-sinusoidal alternating currents up to 200 A. The hinged Rogowski sensor ensures very easy installation, as cables that are to be measured do not have to be isolated. This enables mounting to be carried out without interruptions.

Limit value monitoring with the current protector

At the current protector, a desired amperage is specified at which a PDT contact switches a load on or off.

Flexible signal conditioning - current transducers up to 55 A AC/DC

Current transducers up to 55 A offer an infinitely adjustable measuring range. This range is mapped over the entire output signal range. This ensures extremely accurate resolution of measured values. Basic configuration can be performed quickly via the DIP switches. Additional useful device functions can be set via the software.

For high currents - current transducers up to 600 A AC/DC

The universal current transducers are the ideal solution for measuring high currents with any waveform up to 600 A AC/DC. The product range offers various different devices in graded measuring ranges with current or voltage output.

Voltage transducers, AC and DC

Voltage transducers convert AC and DC voltages into standard analog signals.



For sinusoidal alternating currents up to 12 A

- 3-way electrical isolation
- Wide-range version from 19.2 ... 253 V AC/DC
- Voltage bridging with DIN rail connector
- Input/output can be configured via DIP
- Suitable for potentially explosive areas, thanks to ATEX approval for Ex zone 2



For sinusoidal and non-sinusoidal alternating currents up to 200 A

- Distorted alternating currents up to 6000 Hz can be also acquired, thanks to true r.m.s. value measurement (RMS)
- Uninterrupted installation and lossless current measurement thanks to hinged Rogowski sensor
- Measuring range selection with slide switch



Limit value monitoring

The current protector converts sinusoidal alternating currents to binary switching signals.

- Switching point can be freely selected in the measuring range of 0 ... 16 A AC
- Changeover relay output
- Adjustable switch hysteresis
- 3-way isolation
- Settable operating current/quiescent current behavior



With flexible measuring ranges for all waveforms up to 55 A

- Lossless true r.m.s. value measurement without shunt via Hall sensor (TRMS)
- Optimum mapping of the measuring range up to 55 A, thanks to software-programmable upper and lower limits
- Limit value alarm in the event of threshold value overrange or underrange up to 55 A - via relay or transistor output



For high currents - current transducers up to 600 A AC/DC

- Lossless true r.m.s. value measurement without shunt via Hall sensor (TRMS)
- Compact dimensions also enable distributed use
- Variable mounting on DIN rail and mounting plate
- COMBICON plug-in connection terminal blocks
- 3-way isolation
- For a conductor diameter of up to 32 mm



Voltage transducers, AC and DC

- For DC voltages from 0 ... ±660 V DC and AC voltages from 0 ... 444 V AC
- Bidirectional output signals
- Adjustable voltage ranges
- ZERO/SPAN adjustment ±20%
- 3-way isolation

Current acquisition

If purely ohmic loads (incandescent lamps, heaters, etc.) are operated on a conventional 230 V network, no distortions are produced on the power grid.

As non-linear loads increase as a result of phase angle-controlled regulation modules, pure sinusoidal waves gradually take on a trapezoidal waveform.

The majority of current and voltage transducers are calibrated for sinusoidal alternating currents, which means that they can only indicate the r.m.s. value of an alternating current by mean-value genera-

True r.m.s. measuring transducers do not rely on specific form factors and accept all waveforms.

r.m.s. value acquisition according to the transformer principle (RMS)

According to Faraday's law of induction, a magnetic flux which changes over time produces an induced voltage at the terminals of a coil. A circuit arrangement consisting of two electrically isolated but magnetically coupled circuits is known as a transformer. This is one of the simplest and most commonly used methods of current transfer.

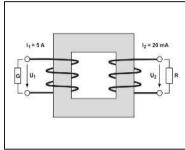
True r.m.s. value acquisition according to the Rogowski principle (TRMS)

The Rogowski measuring principle is used to measure sinusoidal and non-sinusoidal alternating currents. A non-ferrous induction coil (air-core coil), known as the Rogowski coil, measures the magnetic voltage along a closed circumference around a live conductor.

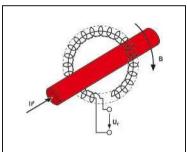
The output signal of the Rogowski coil is then conditioned so as to obtain an exact replica of the primary current.

True r.m.s. value acquisition with a Hall sensor (TRMS)

The magnetic flux generated by the primary current I_D is condensed in the magnetic circuit and measured in the air gap using a Hall sensor. The output signal of the Hall sensor is then conditioned so as to obtain an exact replica of the primary



r.m.s. value acquisition according to the trans-former principle (RMS)



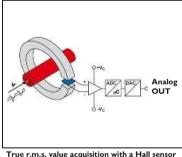
True r.m.s. value acquisition according to the Rogowski principle (TRMS)

Arithmetic average value The arithmetic average value is used to

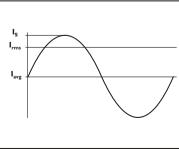
measure direct currents or filter a DC component out from a pulsating current. Applying the arithmetic average value to a symmetrical alternating current would result in a measured value of "0".

The arithmetic average value enables direct currents to be made available at the output in the form of standard analog signals. The polarity can be evaluated by means of a bipolar output signal.

For a 230 V/50 Hz power grid, this results in the following with regard to the voltage levels:



True r.m.s. value acquisition with a Hall sensor (TRMS)



Arithmetic average value

For a sinusoidal AC current this means:

$$I_{rm} = \frac{I_s}{\sqrt{2}}$$
 $U_r = \frac{U_s}{\sqrt{2}}$

Mean-value generation

(root mean square value)

The r.m.s. value of an alternating current

corresponds to the steady-state value that

results from the instantaneous values of this

current. This steady-state value generates

as a direct current of identical magnitude.

the same thermal work in an ohmic resistor

The term "true r.m.s. value" simply means

that distorted, direct, and pulsating currents can be acquired. Here, the measuring trans-

ducer is compatible with any waveform.

r.m.s. value

AC/DC current transducers and distorted currents

The MCR-SL-CUC-... current transducers measure DC, AC, and distorted currents of 0 ... 600 A.

- Universal current measurement, no shunt required
- Compact dimensions also enable distributed use
- Variable mounting on DIN rail and mounting plate
- Simple connection method thanks to COMBICON plug-in connection terminal blocks
- 3-way isolation

UL, USA / Canada



For DC, AC, and distorted currents of 0 ... 300 A, voltage output

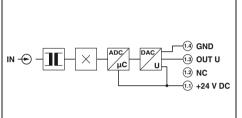


For DC, AC, and distorted currents of 0 ... 600 A, current output

,(U),



Housing width 90 mm



Housing width 90 mm 1.4 GND 1.3 NC 12 OUT I 1.1) +24 V DC

Technical data

Input data
Frequency range
Curve type
Connection method
Output data
Output signal
Maximum output signal
Load R _B
General data
Supply voltage U _B
Maximum transmission error
Temperature coefficient
Cton reconnec (10, 000())
Step response (10 - 90%) Safe isolation
Rated insulation voltage
•
Surge voltage category / pollution degree Degree of protection
• .
Ambient temperature range Dimensions W / H / D
Spring-cage connection (solid/stranded/AWG) Conformance / approvals
Conformance Conformance
Conformance

	Technical data
20 Hz 6000 Hz (0 Hz AC, DC or distorted cur Cable design: 32 mm d	rrents
0 10 V	
≥ 10 kΩ	
20 V DC 30 V DC <±1% (of final value) typ. 0.02%/K (0 60°C	C) 0.04%/K (-40 65°C)
150 ms acc. to EN 61010 300 V AC III / 2	
IP20 -40°C 65°C 90 / 33.8 / 85 mm	
0.25 2.5 mm ² /0.2	2.5 mm ² / 24 - 12

Ordering data	
CE-compliant JL/C-UL listed UL 508	
0.25 2.5 mm ² / 0.2 2.5 mm ² / 24 - 12	
90 / 33.8 / 85 MM	

20 Hz 6000 Hz (0 Hz)
AC, DC or distorted currents
Cable design: 32 mm diameter
4 00 4
4 20 mA < 25 mA
< 300 Ω
V 000 12
20 V DC 30 V DC
<±1% (of final value)
typ. 0.02%/K (0 60°C) 0.04%/K (-40 65°C)
450
150 ms
acc. to EN 61010 300 V AC
300 V AC
IP20
-40°C 65°C
90 / 33.8 / 85 mm
0.25 2.5 mm ² / 0.2 2.5 mm ² / 24 - 12
OLO III EIG IIII 7 ET 1E
CE-compliant CE-compliant

Description	Overload ca- pacity
Universal current transducer	
Input current range: 0 100 A	6 x I _{IN}
Input current range: 0 200 A	3 x I _{IN}
Input current range: 0 300 A	3.33 x I _{IN}
Input current range: 0 400 A	2.5 x I _{IN}
Universal current transducer without UL appr	oval
Input current range: 0 500 A	3.6 x I _{IN}
Input current range: 0 600 A	3 x I _{IN}

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MCR-SL-CUC-100-U MCR-SL-CUC-200-U MCR-SL-CUC-300-U	2308108 2308205 2308302	1 1 1 1				

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
MCR-SL-CUC-100-I MCR-SL-CUC-200-I MCR-SL-CUC-300-I MCR-SL-CUC-400-I	2308027 2308030 2308043 2308072	1 1 1				
MCR-SL-CUC-500-I MCR-SL-CUC-600-I	2308085 2308098	1 1				

UL/C-UL listed UL 508

AC/DC current transducers and distorted currents

The MCR-S-...-UI(-SW)-DCI current transducers measure direct, alternating and distorted currents.

- Device can be set via DIP switches or MCR/PI-CONF-WIN configuration soft-
- True r.m.s. value measurement
- 3-way isolation
- With optional relay and transistor output



Input data Input current

Curve type

Operate threshold

Frequency range

Overload capacity

Connection method

Surge strength

Output data

Load R_B Switching output Relay output

To order a configurable product, enter the required configuration by referring to the adjacent order key.

Further information about the configuration software can be found on page 237

1) EMC: Class A product, see page 571



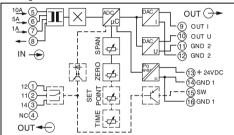
For DC, AC, and distorted currents 0 ... 11 A



For DC, AC, and distorted currents 0 ... 55 A

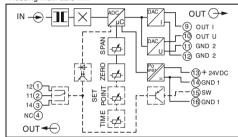
EX: • • •

Housing width 22.5 mm



D 20 1820 Ex:

Housing width 22.5 mm



Technical data

0 A ... 11 A (AC/DC)

2% (of measuring range nominal value 1/5/10 A)

15 Hz ... 400 Hz

2 x I_N(continuous)

I output 0 ... 5 V / 1 ... 5 V / 0 ... 10 V 0 ... 20 mA / 4 ... 20 mA

> 10 kO

< 500 O

19 V ... 29 V (supply voltage - 1 V)

80 mA (Not short-circuit proof)

Contact material

Output voltage

Max. switching current

Continuous load current

Setting range of the threshold value Response delay

Output signal (normal and inverse)

Status indication General data Supply voltage U_B

Transistor output pnp

Current consumption

Maximum transmission error

Temperature coefficient

Step response (10 - 90%) Safe isolation

Rated insulation voltage

Surge voltage category / pollution degree

Test voltage input/output

Test voltage input/power supply Test voltage output/power supply

Degree of protection Ambient temperature range Dimensions W / H / D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

UL. USA / Canada

AC, DC or distorted currents

20 x I_N (1 s)

Screw connection

U output

2 ... 10 V / -5 ... 5 V / -10 ... 10 V

1 PDT / AgSnO, hard gold-plated

50 mA (for gold layer, 30 V AC/ 36 V DC) 2 A (in case of a destroyed gold layer, 250 V AC)

1% ... 110%

0.1 s ... 20 s

Yellow LED

20 V DC ... 30 V DC

< 50 mA (without load)

< 0.5% (of nominal range value under nominal conditions)

typ. < 0.025%/K

330 ms (with AC) 40 ms (with DC) as per EN 50178, EN 61010

300 V AC (to ground)

III / 2

4 kV (50 Hz. 1 min.)

4 kV (50 Hz, 1 min.) 500 V (50 Hz, 1 min.)

IP20

-20°C ... 60°C

22.5 / 99 / 114.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant

Class I, Zone 2, AEx nC IIC T6, Ex nC IIC T6

Т	ec	hı	nic	ca	l d	a	ta

0 A ... 55 A (AC/DC)

0.8% (of measuring range nominal value 50 A)

15 Hz ... 400 Hz

AC, DC or distorted currents

Depending on through connected conductor

Depending on through connected conductor

Through connection, diameter 10.5 mm I output

U output 0 ... 5 V / 1 ... 5 V / 0 ... 10 V

0 ... 20 mA / 4 ... 20 mA

2 ... 10 V / -5 ... 5 V / -10 ... 10 V

> 10 kΩ < 500 O

1 PDT / AgSnO, hard gold-plated

50 mA (for gold layer, 30 V AC/ 36 V DC) 2 A (in case of a destroyed gold layer, 250 V AC)

19 V ... 29 V (supply voltage - 1 V) 80 mA (Not short-circuit proof)

1% ... 110% 0.1 s ... 20 s

Yellow LED

20 V DC ... 30 V DC

< 50 mA (without load)

< 0.5% (of nominal range value under nominal conditions) typ. < 0.025%/K

330 ms (with AC) 40 ms (with DC)

as per EN 50178, EN 61010

300 V AC (to ground)

III/2

4 kV (50 Hz. 1 min.) 4 kV (50 Hz 1 min)

500 V (50 Hz, 1 min.) IP20

-20°C ... 60°C 22.5 / 99 / 114.5 mm

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

CE-compliant

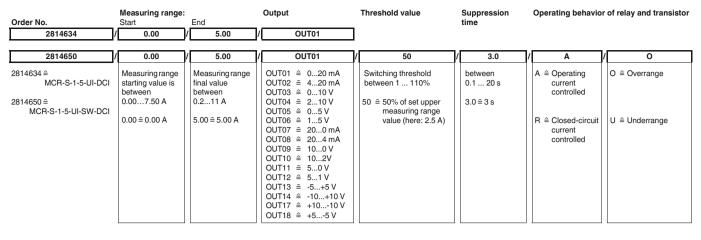
Class I, Zone 2, AEx nC IIC T6, Ex nC IIC T6

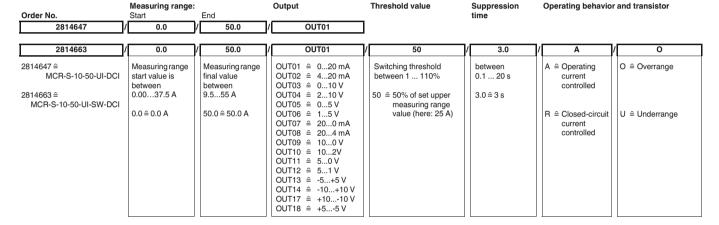
CE, COTT Canada
Description
MCR current measuring transducer for measuring AC, DC, and distorted currents with relay and transistor switching output
Configurable product
Standard product
Configurable product, without switching output
Standard product, without switching output
230 PHOENIX CONTACT

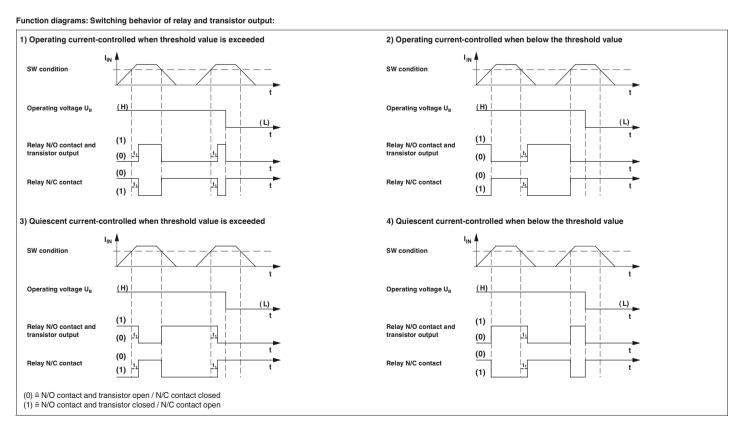
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
MCR-S-1-5-UI-SW-DCI ¹) MCR-S-1-5-UI-SW-DCI-NC ¹) MCR-S-1-5-UI-DCI ¹) MCR-S-1-5-UI-DCI-NC ¹)	2814650 2814731 2814634 2814715	1 1 1 1

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MCR-S-10-50-UI-SW-DCI1)	2814663	1
MCR-S10-50-UI-SW-DCI-NC1)	2814744	1
MCR-S-10-50-UI-DCI1)	2814647	1
MCR-S10-50-UI-DCI-NC1)	2814728	1

Order key for the current transducers (standard configuration entered as example)







AC current transducers, sinusoidal

The MCR-SL-CAC-... current transducers measure sinusoidal alternating currents within the range 0 ... 1/5/12 A.

- Wide-range version from 19.2 ... 253 V AC/DC
- 3-way isolation
- Input/output can be configured using the DIP switch





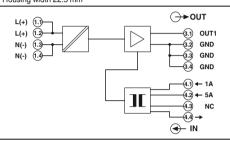
For sinusoidal alternating currents 0 ... 1 A/0 ... 5 A



For sinusoidal alternating currents 0 ... 5 A/0 ... 12 A

Ex: Ex

Housing width 22.5 mm



Technical data

MACX MCR-SL-CAC- 5-I-UP1)

19.2 V AC/DC ... 253 V AC/DC

(at U_B=24 V DC, I_{OUT}=20 mA)

under nominal conditions)

max. 300 ms Typ. 200 ms

 \leq 0.5% (of nominal range value

< 30 mA

< 0.02%/K

IP20

acc. to EN 61010

4 kV (50 Hz, 1 min.)

2 kV (50 Hz, 1 min.)

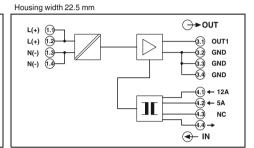
22.5 / 104 / 114.5 mm

-20°C ... 65°C (-4°F ... 149°F)

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² /

2707437

50



Technical data

Input data Input current (configurable) Nominal frequency

Frequency range Curve type Overload capacity Surge strength Connection method Output data Output signal (configurable)

Maximum output signal Load R_B Ripple General data Supply voltage U_B

Current consumption

Maximum transmission error

Temperature coefficient

Step response (10 - 90%) Safe isolation Rated insulation voltage Surge voltage category Input/output Pollution degree Test voltage input/output Test voltage output/power supply Degree of protection Ambient temperature range Dimensions W / H / D Screw connection solid / stranded / AWG

Conformance / approvals Conformance ATEX

UL, USA / Canada

Description MCR current measuring transducers for sinusoidal alternating Supply voltage 19.2 ... 30 V DC Supply voltage 19.2 ... 253 V AC/DC

DIN rail connector, for bridging the supply voltage (19.2...30 V DC), can be snapped on to 35 mm DIN rails as per EN 60715

0 A AC ... 1 A AC (configurable) / 0 A AC ... 5 A AC (configurable) 50 Hz 45 Hz ... 65 Hz Sine 2 x I_{N (}continuous) 20 x I_N (1 s) Screw terminal block

0 ... 20 mA / 4 ... 20 mA 25 mA < 500 Ω (at 20 mA) $< 10 \text{ mV}_{PP}$ (for 500 Ω at 20 mA) MACX MCR-SL-CAC- 5-I1) 19.2 V DC ... 30 V DC

< 32 mA (at U_B=24 V DC, I_{OUT}=20 mA) ≤ 0.5% (of nominal range value under nominal conditions)

< 0.02%/K max. 300 ms Typ. 200 ms acc. to EN 61010

4 kV (50 Hz, 1 min.) 1.5 kV (50 Hz, 1 min.)

IP20 -20°C ... 65°C (-4°F ... 149°F) 22.5 / 104 / 114.5 mm $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, /$

ME 22,5 TBUS 1,5/5-ST-3,81 GN

CE-compliant II 3 G Ex nA II T4 X UL 508 Recognized

0 A AC ... 5 A AC (configurable) / 0 A AC ... 12 A AC (configurable) 50 Hz 45 Hz ... 65 Hz Sine 1 x I_N (continuous)

0 ... 20 mA / 4 ... 20 mA 25 mA < 500 Ω (at 20 mA) $< 10 \text{ mV}_{PP} \text{ (for 500 } \Omega \text{ at 20 mA)}$ MACX MCR-SL-CAC-12-I-UP1) 19.2 V AC/DC ... 253 V AC/DC

< 33 mA (at 24 V DC) ≤ 0.5% (of nominal range value under nominal conditions)

8 x I_N (1 s)

Screw terminal block

< 0.02%/K < 300 ms acc. to EN 61010 300 V AC (to ground)

4 kV (50 Hz, 1 min.) 2 kV (50 Hz, 1 min.) IP20

-20°C ... 65°C (-4°F ... 149°F) 22.5 / 104 / 114.5 mm $0.2 \dots 2.5 \text{ mm}^2 / 0.2 \dots 2.5 \text{ mm}^2 /$

CE-compliant

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-CAC- 5-I1)	2810612	1
MACX MCR-SL-CAC- 5-I-UP1)	2810625	1
Accessories		

Ordering data		
Туре	Order No.	Pcs. / Pkt.
MACX MCR-SL-CAC-12-I-UP1)	2810638	1
Accessories	}	

AC current transducers, sinusoidal and distorted

The MCR-SL-S-...00-... current transducers measure sinusoidal and non-sinusoidal alternating currents within the range 0 ... 200 A.

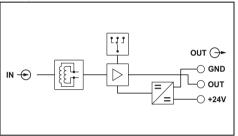
- True/r.m.s. value measurement from 30...6000 Hz
- Measuring range selection with slide switch
- Loop-powered
- Can be retrofitted with the open-up Rogowski coil



For sinusoidal and non-sinusoidal alternating currents, 0 ... 200 A, voltage output



Housing width 55 mm

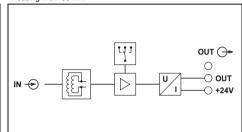




For sinusoidal and non-sinusoidal alternating currents, 0 ... 200 A, current output (loop-powered)



Housing width 55 mm



Input data
Input current (configurable)
Operate threshold
Frequency range
Curve type
Overload capacity
Surge strength
Connection method
Output data
Output signal
Maximum output signal
Load R _B
General data
Supply voltage U _B
Current consumption
Maximum transmission error
Cable position error
Temperature coefficient
Step response (10 - 90%)
Safe isolation
Rated insulation voltage
Surge voltage category / pollution degree
Test voltage input/output
Degree of protection
Ambient temperature range
Dimensions W / H / D
Screw connection solid / stranded / AWG

Technic	cal data	
S-100-U 0 A 100 A (050/75/100 A) 1% (of final value) 30 Hz 6000 Hz Sinusoidal and non-sinusoidal Depending on laid conductor Depending on through connected Clamp-on cable design, diameter	l conductor	
0 5 V / 0 10 V $((0 V 10 V) 14 V, (0 V 5 V) 7^{V}$ ≥ 10 kΩ	V)	
20 V DC 30 V DC < 30 mA < 1% (of final value) < 0.63% < 0.035%/K < 340 ms As per IEC 61010-1 and IEC 6132 300 V AC (to ground) III / 2 5 kV (50 Hz, 1 min.) IP20 -20°C 60°C 55 / 85 / 70.5 mm 0.2 2.5 mm² / 0.2 2.5 mm² / 2		
CE-compliant cULus		
Ordering data		
	Pcs. /	

Techni	ical data
S-100-I-LP	S-200-I-LP
O A 100 A (050/75/100 A) 1% (of final value) 30 Hz 6000 Hz Sinusoidal and non-sinusoidal Depending on laid conductor Depending on through connecte Clamp-on cable design, diamete	
4 00 4	
4 20 mA < 25 mA ((U _B - 12 V) x 350 / 12 A)	
20 V DC 30 V DC	
< 1% (of final value) < 0.63% < 0.025%/K < 340 ms As per IEC 61010-1 and IEC 613 300 V AC (to ground) III / 2 5 kV (50 Hz, 1 min.) IP20 -20°C 60°C 55 / 85 / 70.5 mm 0.2 2.5 mm² / 0.2 2.5 mm² /	
CE-compliant	
cULus	

Description
MCR current measuring transducers for sinusoidal and non-sinusoidal alternating currents Input current range: 050/75/100 A Input current range: 00.100/150/200 A

Conformance / approvals Conformance UL, USA / Canada

			_
Ordering dat	a		
Туре	Order No.	Pcs. / Pkt.	Т
MCR-SL-S-100-U	2813457	1	N
MCR-SL-S-200-U	2813460	1	N
	•		

•		
Туре	Order No.	Pcs. / Pkt.
MCR-SL-S-100-I-LP MCR-SL-S-200-I-LP	2813486 2813499	1

Ordering data

Passive AC current transducers, sinusoidal

The MCR-SLP-1-5-UI-0 passive current transducer measures sinusoidal alternating currents within the range 0 ... 1 A/0 ... 5 Å.

- Loop-powered
- Measuring ranges 1 A and 5 A AC, reconnectable

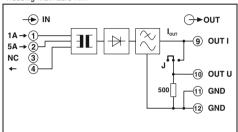
1) EMC: Class A product, see page 571



For sinusoidal alternating currents 0 ... 1 A/0 ... 5 A



Housing width 22.5 mm



Input data
Input current
Frequency range
Curve type
Overload capacity
Surge strength
Permissible output range
Connection method
Output data
Output signal
Maximum output signal
Load R _B

Ripple
General data
Maximum transmission error
Temperature coefficient
Step response (10 - 90%)
Safe isolation
Rated insulation voltage
Surge voltage category / pollution degree
Test voltage input/output
Degree of protection
Ambient temperature range
Dimensions W / H / D
Screw connection solid / stranded / AWG
Conformance / approvals
Conformance

Techn	ical data
1 A input	5 A input
0 A AC 5 A AC	0 A AC 0.005 A AC
45 Hz 60 Hz	45 Hz 60 Hz
Sine	Sine
2 x I _N (5 min. at 60°C ambient temperature)	-
50 A (1 s)	100 A (1 s)
1.2 x I _N	1.2 x I _N
Screw connection	Screw connection
U output	I output
0 10 V	0 20 mA
20 V	30 mA
> 100 kΩ	< 750 Ω
	$<$ 250 Ω (when current and voltage outputs are used simultaneously)
< 50 mV _{pp}	< 50 mV _{pp}

< 0.5% (of final value)
< 0.015%/K
< 200 ms
as per EN 50178, EN 61010
300 V AC (to ground)
III/2
4 kV (50 Hz, 1 min.)
IP20
-25°C 60°C
22.5 / 99 / 114.5 mm
0.2 2.5 mm ² / 0.2 2.5 mm ² / 24 - 14

CE.	con	anli	ant	

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
MCR-SLP-1-5-UI-01)	2814359	1		

Description
MCR passive current measuring transducers for sinusoidal alternating currents

AC current protectors, sinusoidal

The MCR-SL-S-16-SP-24 current protector converts sinusoidal 50 Hz/60 Hz alternating currents into binary switching signals.

- Switching point can be freely selected in the measuring range of 0...16 A AC
- Changeover relay output
- Adjustable switch hysteresis
- 3-way isolation
- Settable operating current/quiescent current behavior

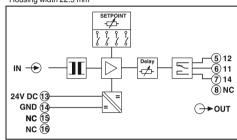
1) EMC: Class A product, see page 571



For sinusoidal alternating currents, 0 ... 16 A AC

. SLus 🕝

Housing width 22.5 mm



Technical data

Input data Input current Frequency range Curve type Overload capacity Connection method Switching output Contact type Contact material Maximum switching current Switching hysteresis

Response delay

Operating and closed circuit current behavior

Relay status display General data Supply voltage $U_{\rm B}$ Current consumption Setting accuracy Temperature coefficient Step response (10 - 90%) Safe isolation

Rated insulation voltage

Surge voltage category / pollution degree Test voltage input/output Test voltage input/power supply Degree of protection Ambient temperature range Dimensions W/H/D

Screw connection solid / stranded / AWG

Conformance / approvals Conformance

Description

MCR current protector for sinusoidal alternating currents

0 A AC ... 16 A AC 45 Hz ... 65 Hz Sine

2 x I_{N (}continuous)

Through connection, diameter 4.2 mm

Relay output 1 PDT

AgSnO, hard gold-plated 50 mA (for gold layer, 30 V AC/ 36 V DC)

2 A (in case of a destroyed gold layer, 250 V AC) Adjustable using a DIP switch (0.5%, 5%, 10%, 15%)

Typ. 0.1 s ... 10 s (Adjustable using a potentiometer)

Adjustable using a DIP switch Yellow LED (relay active)

20 V DC ... 30 V DC < 30 mA < 0.5% < 0.02%/K 40 ms

as per EN 50178, EN 61010-1 300 V AC (to ground)

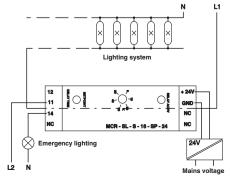
III/24 kV (50 Hz, 1 min.) 4 kV (50 Hz, 1 min.) IP20

-20°C ... 65°C 22.5 / 99 / 114.5 mm

 $0.2 \dots 2.5 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 14$

CE-compliant

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MCR-SL-S- 16-SP- 241)	2864464	1	



Lighting system with emergency lighting

Voltage transducers

The MCR-VDC-UI-B-DC voltage transducer measures DC voltages within the range 0 ... ±660 V DC.

The MCR-VAC-UI-O-DC voltage transducer measures sinusoidal AC voltages from 0 ... 444 V AC.

- Bidirectional output signals
- Adjustable voltage ranges
- ZERO/SPAN adjustment ±20%
- 3-way isolation



For DC voltages 0 ... ±660 V DC



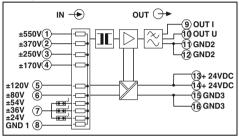
For sinusoidal AC voltages 0...444 V AC

Notes:

1) EMC: Class A product, see page 571

P 20 LP 3 Housing width 22.5 mm

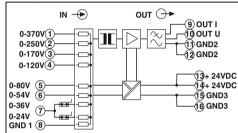
-550 V DC ... 550 V DC



Technical data

550 kΩ

.91us 🕑 Housing width 22.5 mm



Input data	
Input voltage range / resistor	
ZERO / SPAN adjustment	
Frequency range	
Output data	
Output signal	
Maximum output signal	
Load R _B	
Ripple General data	
Supply voltage U _B	
Current consumption	
Maximum transmission error	
Temperature coefficient	
Limit frequency (3 dB)	
Step response (10 - 90%)	
Safe isolation	
Rated insulation voltage	
Surge voltage category / pollution degree	
Test voltage input/output	
Degree of protection	
Ambient temperature range	
Dimensions W / H / D	
Screw connection solid / stranded / AWG	
Conformance / approvals	
Conformance	

-370 V DC 370 V DC -250 V DC 250 V DC -170 V DC 170 V DC -120 V DC 120 V DC -80 V DC 54 V DC -54 V DC 54 V DC -36 V DC 36 V DC -24 V DC 24 V DC ±20% / ±20%	370 kΩ 250 kΩ 170 kΩ 120 kΩ 80 kΩ 54 kΩ 36 kΩ 24 kΩ
U output	I output
-10 10 V \pm 15 V > 10 kΩ < 50 mV _{PP}	-20 20 mA ±30 mA < 500 Ω < 50 mV _{PP}
18.5 V DC 30.2 V DC < 50 mA < 1% (of final value) < 0.015%/K 40 Hz 12 ms acc. to EN 50178 - II / 2 1.5 kV (50 Hz, 1 min.) IP20 -25°C 50°C 22.5 / 99 / 114.5 mm	
0.2 2.5 mm ² / 0.2 2.5 mm ² / 2	24 - 14
OF as multisent	
CF-compliant	

Technical data		
0 V 370 V AC 0 V 250 V AC 0 V 170 V AC 0 V 120 V AC 0 V 80 V AC 0 V 54 V AC 0 V 36 V AC 0 V 36 V AC	370 kΩ 250 kΩ 170 kΩ 120 kΩ 80 kΩ 54 kΩ 36 kΩ 24 kΩ	
±20% / ±20% 45 Hz 400 Hz		
U output	I output	
0 10 V 15 V > 10 kΩ < 50 mV _{PP}	0 20 mA / 4 20 mA 30 mA < 500 Ω < 50 mV _{PP}	
	. т. т. т. т.	
18.5 V DC 30.2 V DC < 45 mA < 1.5% (of final value) - 250 ms		
acc. to EN 50178 300 V DC		
3.3 kV (50 Hz, 1 min.) IP20 -25°C 60°C		
22.5 / 99 / 114.5 mm		

CE-compliant

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Conformance	CE-compliant		
	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
MCR voltage measuring transducer, for DC voltages from 0±20 V DC to 0±660 V DC	MCR-VDC-UI-B-DC¹)	2811116	1
MCR voltage transducer, for sinusoidal AC voltages from 020 V AC to 0440 V AC			

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
MCR-VAC-UI-O-DC1)	2811103	1	

Accessories Configuration software package

The MCR/PI-CONF-WIN configuration software package is used to configure and visualize all parameters for the programmable MCR measuring transducers.

- Straightforward menu interface
- Rapid programming

The software runs under the following operating systems: Windows NT $^{\text{TM}}$, 2000 $^{\text{TM}}$, and XP $^{\text{TM}}$.



For MCR-S-... current transducer

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
MCR configuration software, for programming MCR-T, MCRLP, MCRHT, MCR-S, MCR-F, and MCR-PSP modules, CD-ROM			
	MCR/PI-CONF-WIN	2814799	1
	Accessories		
Labels, for labeling MCR-T and MCR-S modules, four sheets DIN A4 marking labels (112 pieces)	MCR-ET 38X35 WH	2814317	1

USB adapter cable Software adapter cable

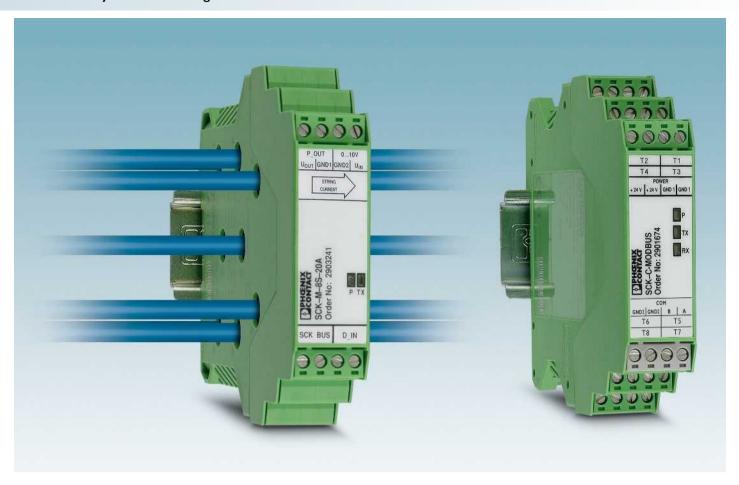
The following adapter cables are available for programming the MCR-S... current transducers:

- USB adapter cable
- Software adapter cable



For MCR-S-... current transducer

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
USB adapter cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	CM-KBL-RS232/USB	2881078	1
Software adapter cable (stereo jack plug/25-pos. D-SUB), 1.2 m long, for programming MCR-T, MCR-S, and MCR-F modules			
	MCR-TTL-RS232-E	2814388	1
	Accessories	•	
Adapter cable, stranded, 9-pos. D-SUB socket on 25-pos. D-SUB pin	PSM-KAD 9 SUB 25/BS	2761295	1



Utilize solar electricity efficiently

Detect errors - increase efficiency: photovoltaic systems should achieve maximum energy yield within the shortest possible

SOLARCHECK provides reliable information regarding the performance of your photovoltaic system. It can be used to detect faults, which may be caused by damaged panels, defective contacts or damage in the cabling. This allows you to implement countermeasures quickly, thereby increasing the efficiency of your system.

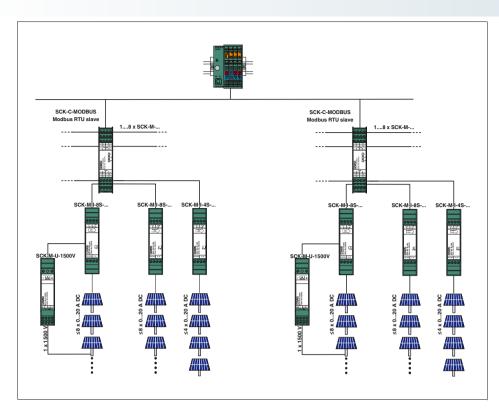
Current topic: reliable monitoring

Whether a small roof-top system on a family home or a megawatt outdoor system: for reliable operation, the photovoltaic market requires monitoring systems where status information is continuously available and visualization is easy. Phoenix Contact offers a comprehensive portfolio of hardware and software products specifically designed for this purpose.

Energy of the future

From installation to monitoring - in the "Components and systems for photovoltaics" brochure you will find further innovative solutions for your photovoltaic system, such as:

- Connection technology
- Surge protection
- Hardware and software solutions
- Generator connection boxes
- Tools and marking

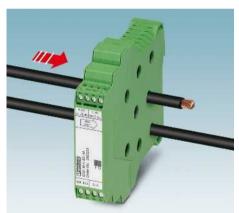


Easy integration in monitoring sys-

The modular Solarcheck monitoring system consists of various measuring modules for current and voltage measurement and an associated communication module.

The communication module collects the measured values from the current measuring modules and forwards them to a higherlevel controller. You can acquire up to eight or four string currents with one current measuring module each. A maximum of eight current measuring modules of any type can be connected to one communication module. The 2-conductor communication cable is also used to supply the measuring modules with power. This means that no additional power supply unit is required in the field.

The voltage measuring module is usually connected to and also supplied via the analog input provided on the 8-channel current measuring modules.



1500 V DC

Contact-free current measurement

Contact-free measurement using Hall sensors offers many advantages:

- Safe isolation is already ensured by the cable insulation.
- No contact resistance due to additional contact points.
- The current is forwarded safely as the line circuit is not directly accessed.

Space-saving installation without an additional power supply unit

With a width of just 22.5 mm, the narrow measuring module bundles the cables in a confined space.

- The 2-conductor communication cable is also used to supply the measuring modules.
- This means that one communication module supplies up to eight measuring modules - without an additional power supply unit.

Flexible expansion

Optional extension of voltage measurement up to 1500 V DC.

- Also suitable for grounded systems.
- Suitable for PV systems with extra high system voltages.
- Flexible use, even outside the Solarcheck system.

PV string monitoring Solarcheck

The modular Solarcheck monitoring system consists of various devices for current and voltage measurement and an associated communication module.

Communication module:

- For connecting and collecting measured values from up to eight measuring mod-
- Provision of data for transfer to higherlevel controllers

Current measuring modules:

- 8-channel current measurement up to 20 A DC
- Detection of reverse currents up to -1 A
- 4-channel extension modules for 20 A DC
- Internal temperature monitoring
- Digital input for monitoring, e.g., the remote indication contacts of surge protection modules
- Supply via the communication module

Voltage measuring module

- Voltage measurement up to 1500 V DC in any grounded PV system
- Connection and supply is usually via the analog input provided (0 ... 10 V) on the 8-channel Solarcheck current measuring module
- Output of the voltage measured value as a 2 ... 10 V analog signal
- As an option, can also be removed from the Solarcheck group and used separately

1) EMC: Class A product, see page 571





Communication module RS-485 (Modbus RTU)



INPUT SCK-MODBUS Ов - GND2 -() GND2 T5 - ← +24 V ○ +24 V GND1

Supply	
Supply voltage	
Own current consumption	
Measuring input	
Current measuring range	
Maximum transmission error	

Supply voltage
Own current consumption
Measuring input
Current measuring range
Maximum transmission error
Temperature coefficient
Reverse current detection
Number of measuring channels
Voltage measuring range
Connection method
Digital input
Controlled by external floating contact
Analog input
Input voltage range
Analog output
Output voltage range
SCK-C-MODBUS data interface
Cable length (for 0.15 mm²)
Communication protocol
Serial port
Serial transmission speed
Cable length Communication protocol
General data
Degree of protection
Ambient temperature range
Dimensions W / H / D
Screw connection solid / stranded / AWG
Conformance / approvals
Conformance

Conformance
Description
Communication module
Current measuring module, 8-channel
Current measuring module, 4-channel for extension
Valtaga magazina madula
Voltage measuring module

	\Box
Technical data	

24 V DC -10% +25%
40. 4
12 mA
-
•
-
-
-
-
•
-
-
RS-485
9.6/14.4/19.2/38.4 kbps
•

≤ 1200 m Modbus RTU IP20 -20°C ... 70°C 22.5 / 102 / 106 mm 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

CE-compliant		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
SCK-C-MODBUS ¹)	2901674	1



Current measuring module, 20 A DC, 8-channel



Housing width 22.5 mm

45 mA

-1 A ... 0 A 4

max. 300 m Proprietary

IP20 -20°C ... 70°C

2903241



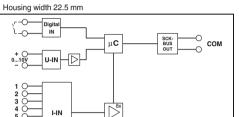
Extension module, 4-channel Current measurement 20 A DC

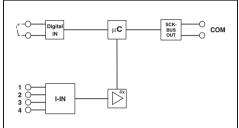


N



Voltage measuring module, 0...1500 V DC



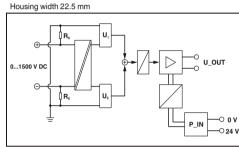


Technical data

0 A ... 20 A ±1% (From the measuring range final value)

Through connection, 9.5 mm diameter

0.02%/K (From T > 25°C)



Technical dat	a	
-		
45 mA		
0 A 20 A		
±1% (From the measuring range final valu 0.02%/K (From T > 25°C) -1 A 0 A 8	e)	
Through connection, 9.5 mm diameter		
Floating switch contacts		
Tioding switch contacts		
0 V 10 V		
-		
max. 300 m Proprietary		
-		
-		
IP20 -20°C 70°C 22.5 / 102 / 128.5 mm 0.14 1.5 mm² / 0.14 1.5 mm² / 26 - 16	i	
CE-compliant		
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.

SCK-M-I-8S-20A

22.5 / 102 / 128.5 mm		
0.14 1.5 mm ² / 0.14	1.5 mm² / 26 - 16	
CE-compliant		
Ordering data		
Туре	Order No. Pcs. / Pkt.	
SCK-M-I-4S-20A	2903242 1	

	P_IN 010
Technical data	a
24 V DC -10% +25% (or via SCK-M-I-8S	i)
35 mA	
1% (After additional adjustment) < 0.03%/K	
1	
0 V DC 1500 V DC	

-
•
2 V 10 V
max. 0.5 m
-
-
-
•

Screw connection

IP20
-20°C 70°C
22.5 / 102 / 128.5 mm
0.14 1.5 mm ² / 0.14 1.5 mm ² / 26 - 16
CE-compliant CE-compliant

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
SCK-M-U-1500V	2903591	1	

Monitoring

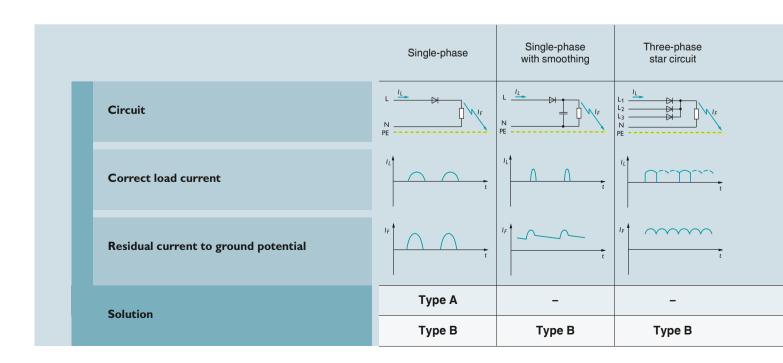
Residual current monitoring

Detect errors before they actually occur

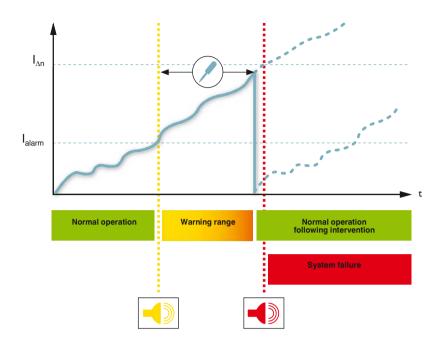


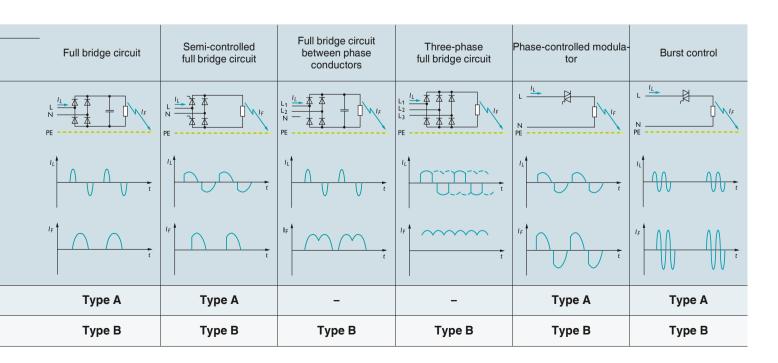
RCM devices provide residual current monitoring in grounded power supply systems. They detect residual currents at an early stage, such as those that occur as a result of insulation errors. They can therefore be used to prevent forced system shutdown. Plans can be made to remove errors outside of operating hours. RCM devices also act as a form of fire prevention.

Increasing use is being made of equipment such as frequency inverters. In the event of an error, residual currents with a frequency of up to 50 kHz can be generated. Type B+ RCM devices from Phoenix Contact are already able to detect residual currents with frequencies up to 100 kHz. This far exceeds present-day requirements of 20 kHz for type B+ devices.



Residual currents can increase continually due to gradual processes. This can be attributed to humidity or conductive dirt on live parts, for example. Residual current circuit breakers trip at different rated residual currents $I_{\Delta n}$, depending on their type. Additionally installed residual current monitoring devices prevent sudden system downtimes thanks to early warnings. The continuous supply of information about gradually increasing residual currents allows timely intervention. Unplanned system failures can be avoided.





Residual current monitoring

Residual current monitoring - RCM

- Adjustable residual response current of 30 mA to 3 A
- Adjustable pre-alarm threshold and delay time
- Actual differential current can be read via LED display
- Remote signaling for main and pre-alarm

Cables for type B+ converter connection (RJ45, 4-pair, 1:1 line) can be found in the accessories section by entering the order number (RCM/converter) at: www.phoenixcontact.net/products

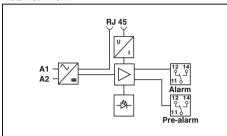


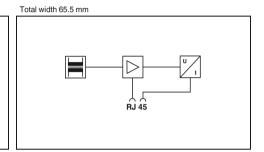
RCM type B+ for smooth and pulsating DC and AC residual currents up to 100 kHz



Converter for RCM type B+

Total width 71.6 mm





Electrical data
Nominal voltage range
Nominal frequency f _N
Rated current In
Max. required back-up fuse
DOM 1 .

Rated response differential current I_{dvn} Differential current acquisition characteristic

Response differential current $I_{\Delta n}$ Discrimination threshold main alarm

Discrimination threshold pre-alarm

Response time for 2 x I_{An}

Thermal permanent differential current I_{cth}

Thermal rated short-time differential current \mathbf{I}_{th}

Rated surge voltage resistance $\mathbf{U}_{\mathrm{imp}}$

General data

Connection data solid / stranded / AWG

Maximum permissible outside diameter of cables Housing material

Ambient temperature (operation)

Degree of protection Test standards

Test standards

Pollution degree

Surge voltage category

Mounting

Mounting type

Remote indication contact

Connection data solid / stranded / AWG

Max. operating voltage Max. operating current

Technical data		
85 V AC 264 V AC		
50 Hz (60 Hz) - 16 A (B)		
3 A		
Type B+ (DC up to 100 kHz) 30, 100, 300, 1000, 3000 mA (adjustable)		
80% 100% (of the set response differential current $I_{\Delta n}$) 10% 90% (of the main alarm threshold, adjustable)		
0.1 s 1 s (adjustable)		
•		
4 kV		
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12 - polycarbonate -25°C 65°C IP20		
DIN EN 62020 / DIN EN 60664 / DIN VDE 0664-110 - 2 III		

Туре	Order No.	Pcs./	
Ordering data			
0.2 4 mm ² / 0.2 2.5 mm ² / - 230 V AC 5 A (cos phi > 0.9)			
DIN rail: 35 mm PDT contact			
2 III	0004-110		
	0664-110		
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12			
- 4 kV			
0.1 s 1 s (adjustable) -			
$10\% \dots 90\%$ (of the main alarm threshold, a	adjustable)		
30, 100, 300, 1000, 3000 mA (adjustable) 80% 100% (of the set response different	tial current I _{∆n})		
3 A Type B+ (DC up to 100 kHz)			

Technical data				
SCT-35	SCT-70	SCT-105		
- - 125 A	- - 200 A	- - 300 A		
3 A Type B+ (DC up to 100 kHz) 0.03 A 3 A	3 A Type B+ (DC up to 100 kHz) 0.03 A 3 A	3 A Type B+ (DC up to 100 kHz) 0.1 A 3 A -		
-	-	-		
- 150 A (50 Hz/20 kHz) 3 kA for 1 s (50 Hz/20 kHz) 8 kV	- 150 A (50 Hz/20 kHz) 3 kA for 1 s (50 Hz/20 kHz) 8 kV	- 150 A (50 Hz/20 kHz) 3 kA for 1 s (50 Hz/20 kHz) 8 kV		
23.00 mm	46.00 mm polycar -20°C .	65°C		
DIN EN 62020 / VDE 0663 / DIN EN 60044-1 / VDE 0414 / DIN V VDE V 0664-110				
2 IV	2 IV	2 IV		
Screw mount-	C	Caraconatina		
ing	Screw mount- ing	Screw mounting		

Description
Evaluation unit
Current transformer
20 mm Ø
30 mm Ø
35 mm Ø
70 mm Ø
105 mm Ø
140 mm Ø
210 mm Ø

5 A (cos phi > 0.9)		
Ordering data		
Туре	Order No.	Pcs./ Pkt.
RCM-B/50/85-264V	2806210	1

-		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
RCM-B-SCT- 35 RCM-B-SCT- 70 RCM-B-SCT-105	2806223 2806236 2806249	1 1 1

Residual current monitoring



RCM type A for pulsating DC and AC residual currents with 50/60 Hz

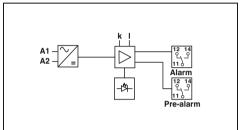


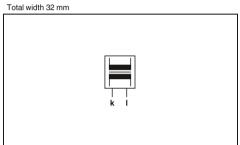
Converter for RCM type A



Converter for RCM type A

Total width 71.6 mm

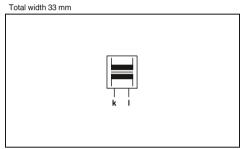




Technical data

...SCT-35

...SCT-30



Technical data	
	SCT-20
85 V AC 264 V AC 50 Hz (60 Hz)	-
-	50 A
16 A (B)	
3 A Type A (50 / 60 Hz) 30, 1000, 3000 mA (adjustable) 80% 100% (of the set response differential current $I_{\Delta n}$)	3 A Type A (50 / 60 Hz) 0.03 A 3
$10\% \dots 90\%$ (of the main alarm threshold, adjustable)	-
0.1 s 1 s (adjustable)	-
-	1.5 x l _n
-	10 x I _n (for
4 kV	8 kV
0.2 4 mm² / 0.2 2.5 mm² / 24 - 12	13.00 mm
polycarbonate -25°C 65°C IP20	
DIN EN 62020 / DIN EN 60664	
2 III	2 IV
DIN rail: 35 mm	DIN rail: 35 mm
PDT contact	
0.2 4 mm² / 0.2 2.5 mm² / - 230 V AC	
5 A (cos phi > 0.9)	

-	-	-	-	
-	-	-	-	
50 A	100 A	125 A	200 A	
-	-	-	-	
0.4	0.4	0.4	0.4	
3 A	3 A	3 A	3 A	
Type A (50 / 60 Hz)				
0.03 A 3 A	0.03 A 3 A	0.03 A 3 A		
0.03 A 3 A				
-	-	-	-	
-	-	-	-	
-	-	-	_	
1.5 x l _n	1.5 x l _n	1.5 x l _n	1.5 x I _n	
10 x I _n (for 1 s)				
8 kV	8 kV	8 kV	8 kV	
_		2	_	
	.2 4 mm ² / 0.2 .			
13.00 mm	20.00 mm	23.00 mm	46.00 mm	
		rbonate		
-20°C 65°C				
IP20 (terminal blocks)				
DINE	N 62020 / VDE 0		44-1 /	
_		0414	_	
2	2	2	2	
IV	IV	IV	IV	
DIN rail: 35	DIN rail: 35	Screw mount-	Screw mount-	
mm	mm	ing	ing	
		-		
		-		
		-		
Ordering data				

		l echnical data		
	SCT-70	SCT-105	SCT-140	SCT-210
	-	-	-	-
	200 A	250 A	350 A	400 A
A	3 A Type A (50 / 60 Hz) 0.03 A 3 A	3 A Type A (50 / 60 Hz) 0.03 A 3 A	3 A Type A (50 / 60 Hz) 0.03 A 3 A	3 A Type A (50 / 60 Hz) 0.03 A 3 A
	-	-	-	-
	1.5 x I _n	1.5 x l _n	1.5 x I _n	1.5 x l _n
s)	10 x I _n (for 1 s)	10 x I _n (for 1 s)	10 x I _n (for 1 s)	10 x I _n (for 1 s)
	8 kV	8 kV	8 kV	8 kV
				2
24 - 1	46.00 mm	70.00 mm	93.00 mm polyca -20°C	2.5 mm² / 24 - 12 140.00 mm rbonate 65°C inal blocks)
600	144-1 /	DIN E	EN 62020 / VDE 0	0663 / DIN EN 60044-1 /
	2 IV	2 IV	2 IV	2 IV
nt-	Screw mount- ing	Screw mount- ing	Screw mount- ing	Screw mounting
				-
				-
				_

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RCM-A/50/85-264V	2806016	1	

Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
RCM-A-SCT- 20 RCM-A-SCT- 30 RCM-A-SCT- 35 RCM-A-SCT- 70	2806045 2806058 2806061 2806074	1 1 1 1			
			RCM-A-SCT-105	2806087	1
			RCM-A-SCT-140 RCM-A-SCT-210	2806090 2806100	1 1

Components for E-Mobility



EV Charge Control charging controller

EV Charge Control is the charging controller used to charge electric vehicles on the AC mains according to IEC 61851-1. The control and monitoring functions that are defined here for charging mode 3 serve as the basis for the equipment.

- Control Pilot evaluation and control
- Monitoring of the PE protective ground connection
- Evaluation of the proximity
- Control of the charge contactor and locking actuators

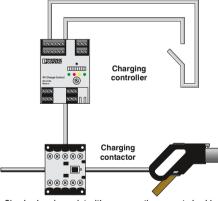
Plug-in charging systems

For information on plug-in charging systems, see Catalog 2, connection technology for field devices.

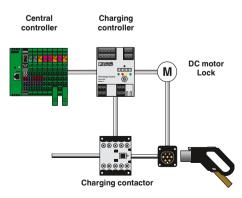
Additional functions:

All necessary control functions are integrated in a single device. No additional controller is required.

- Easy configuration directly at the device or via the integrated web server
- Adjustable charging current limitation of 6 ... 80 A
- Parameterizable automatic rejection of charging cables with low current carrying capacity
- Automatic or manual locking as well as selection of DC motor or magnetic locking actuators
- Optional locking confirmation and external enabling as a switching requirement
- Integration into your charging infrastructure via Ethernet interface (Modbus/TCP)
- Charging process enabling, status requests, and dynamic load management via remote access
- 4 digital inputs and 4 digital outputs
- Two digital outputs configurable via web server
- 4 relay outputs



Simple charging point with permanently connected cable



EV Charge Control charging controller in conjunction with a central controller

Components for E-Mobility

EV Charge Control charging control-

EV Charge Control

- Charging controller for charging electric vehicles on AC mains according to IEC 61851-1.

EV Charge Lock Release

- Optional extension module for plug release in the event of mains failure.

Notes:

For information on plug-in charging systems, see Catalog 2, connection technology for field devices.



Charging controller



Mains power failure plug enable

	Housing width 71.6 mm	Housing width 35.6 mm
	Technical data	Technical data
Input		
Description of the input Nominal input voltage U _N Input current Input ranges	Digital input 24 V 8 mA (24 V) -3 V 5 V (Off) 15 V 30 V (On)	Signal input 12 V Approx. 5 mA (at 12 V) -3 V 3 V (Off) -30 V10 V (Locking ON) 10 V30 V (Unlocking ON)
Switching output		
Output description Maximum switching voltage	Relay output C _{1,2} and V _{1,2} 250 V AC	Relay output Approx. 11.5 V (Operating/capacitor voltage minus the diode voltage of ~ 0.5 V)
Maximum switching current	6 A	4 A
Switching output		
Output description Maximum switching voltage Maximum switching current	Relay output R _{1.3} and R _{2.4} 30 V AC/DC 6 A	
Switching output		
Output description Maximum output voltage Maximum output current	Digital output 30 V 0.6 A	:
Ethernet interface	Dus. L.	
Connection method Transmission speed Transmission length	RJ45 socket 10/100 Mbps 100 m (with shielded, twisted-pair data cable)	
General data		
Supply voltage		12 V DC ±5%
Supply voltage range	110 V AC 240 V AC (nominal voltage range) 95 V AC 264 V AC	•
Maximum current consumption	40 mA	-
Own current consumption	•	4 A (4 mA in idle state)
Frequency range	45 Hz 65 Hz	-
Degree of protection	IP20	IP20
Ambient temperature range	-25°C 60°C	-25°C 60°C
Dimensions W / H / D	71.6 / 61 / 90 mm	35.6 / 61 / 90 mm
Screw connection solid / stranded / AWG	0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12	0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12
Conformance / approvals	CF samueliant	CE compliant
Conformance	CE-compliant CE-compliant	CE-compliant CE-compliant
	Ordering data	Ordering data

	Ordering data		Ordering data			
Description	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
EV Charge Control charging controller						
	EM-CP-PP-ETH	2902802	1			
Mains failure plug release EV Charge Lock Release						
				EM-EV-CLR-12V	2903246	1

Monitoring relays, timer relays, special function modules



For high system availability

EMD monitoring relays can be used to detect deviations in important system parameters at an early stage. These can be indicated or system parts can be shut down selectively. EMD monitoring relays ensure error-free and cost-effective operation of your system. They are an inexpensive solution for numerous monitoring functions.

- Surge voltage and undervoltage
- Overcurrent and undercurrent
- Phase failure, phase sequence, and phase asymmetry
- Power factor and real power
- Motor winding temperature
- Levels

For system monitoring, choose from two product ranges: compact or multifunctional monitoring relays.

Perfect timing

ETD timer relays ensure optimum time sequences.

The modules are the cost-effective alternative to a PLC: with easy configuration and fast wiring.

Choose from two product ranges for your ideal time control application:

- Ultra-narrow timer relays each with one time range and one function
- Multifunctional timer relays with selectable time ranges and functions

Professionally packaged components

Special function modules with professional housing and connection technology can be used to integrate electronic components in your system. They can be used to perform a variety of tasks:

- Diode modules provide protection against polarity reversal. In addition, they decouple messages in fault reporting sys-
- Lamp testing modules decouple signals in isolation in the field of fault reporting technology.
- Display modules simplify troubleshooting and provide help for monitoring process-

Monitoring relays, timer relays, special function modules



Compact monitoring relays

Ideal for simple monitoring tasks - from series production to building installation.

- Compact installation housing
- Quick and tool-free wiring with push-in technology
- Parameters can be adjusted easily using rotary switches
- Clear diagnostics, thanks to color status **LED**



Multifunctional monitoring relays

- Parameters can be adjusted easily using rotary switches
- Fast error detection, thanks to fine tuning and short response times
- Worldwide use, thanks to wide-range power supply unit or plug-in transformer
- Space saving with two PDT outputs in 22.5 mm wide housing
- Electrically isolated measuring and supply circuits
- Clear diagnostics, thanks to color status **LEDs**



Ultra-narrow timer relays

The space-saving and inexpensive solution for simple time control applications.

- Each with one time range and one func-
- Design width of just 6.2 mm saves up to 70% space compared to conventional timer relays
- Precise time setting using the illuminated thumbwheel
- Fast wiring through the use of plug-in bridges



Multifunctional timer relays

For universal use thanks to wide range of functions.

- Just three versions for all conventional time control applications.
- Two floating PDT outputs on a design width of just 22.5 mm
- Supply voltage via wide-range power supply unit
- Optimum setting of times ranging from milliseconds to several days



Special function modules

Special function modules transform components such as diodes into a shock-proof and dust-proof electronics module.

- Easy installation, thanks to electronics housing with IP20 protection that can be installed in a control cabinet
- Fast mounting on DIN rails, thanks to the foot catch
- User-friendly wiring, thanks to practical connection technology

Monitoring relays, timer relays, special function modules

Single-phase current and voltage monitoring

Single-phase current monitoring The EMD-BL-C-10 monitors AC currents from 0 ... 10 A.

- Adjustable response delay
- 0 ... 5 A or 0 ... 10 A measuring range
- Adjustable via rotary switch on the front

Single-phase voltage monitoring The EMD-BL-V-230 monitors DC and AC voltages.

- 24 V AC/DC or 230 V AC
- Separately adjustable response delay
- Adjustable monitoring range
- Adjustable via potentiometer on the front





Current monitoring, 1-phase Overcurrent, undercurrent, window

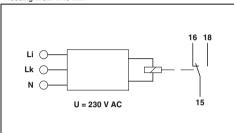




Voltage monitoring, 1-phase Undervoltage, window

Housing width 17.5 mm

Overcurrent, undercurrent, window



Technical data

Housing width 17.5 mm 24 V DC 24 V AC 15

Functions
Input
Input ranges
Input ranges
Input resistance
Min. setting range
Max. setting range
Setting range for response delay
Basic accuracy
Setting accuracy Repeat accuracy
Relay output
Contact type
Switching capacity
Electrical service life
Mechanical service life
Output fuse
General data
Supply voltage
Nominal power consumption
Degree of protection
Ambient temperature range
Dimensions W / H / D

	Ordering data
onformance	CE-compliant
onformance / approvals	
onnection data solid / stranded / AWG	0.5 2.5 mm ² / 0.5 2.5 mm ² / 20 - 14
imensions W / H / D	17.5 / 88 / 65.5 mm
mbient temperature range	-25°C 55°C
egree of protection	IP40 (housing) / IP20 (connection terminal blocks)
upply voltage ominal power consumption	230 V AC ±15% 5 VA (0.8 W)
ieneral data	
ontact type witching capacity lectrical service life lechanical service life utput fuse	1 floating PDT 1250 VA (5 A/250 V AC) 1 x 10 ⁵ cycles 15 x 10 ⁶ cycles 5 A (fast-blow)
elay output	
uput ranges iput resistance lin. setting range lax. setting range etting range for response delay asic accuracy epeat accuracy epeat accuracy	$0 \text{ A} \dots 5 \text{ A} \text{ AC}$ $0 \text{ A} \dots 10 \text{ A} \text{ AC}$ (Configurable via rotary switches) $3 \text{ m}\Omega$ $5\% \dots 95\%$ (From I_N) $10\% \dots 100\%$ (From I_N) $0.1 \text{ s} \dots 10 \text{ s}$ $\leq 5\%$ (of the nominal value) $\pm 5\%$ (of the nominal value) $\leq 2\%$
put ranges	

Technical data
Undervoltage, window
0 V DC 24 V DC (connection terminal blocks: U1 and GND) 0 V AC 24 V AC (connection terminal blocks: U2 and GND) 0 V AC 230 V AC (connection terminal blocks: U3 and GND) -
- 75% 115% (From U _N) 80% 120% (From U _N) 0.1 s 10 s ≤ 5% (of scale end value) ±5% (of scale end value) ≤ 2%
1 floating PDT 1250 VA (5 A/250 V AC) 1 x 10 ^s cycles 15 x 10 ⁶ cycles 5 A (fast-blow)
050/ , 000/ / , , , , , , , , , , , , , ,
-25% +20% (= measuring voltage) 10 VA (At 230 V AC (0.6 W)) 1.3 VA (At 24 V AC (0.8 W)) 0.6 W (at 24 V DC) IP40 (housing) / IP20 (connection terminal blocks)
-25°C 55°C 17.5 / 88 / 65.5 mm
0.5 2.5 mm ² / 0.5 2.5 mm ² / 20 - 14
CE-compliant

Conformance
Description
Compact monitoring relays with push-in connection
Compact monitoring relays with screw connection

CE-compliant			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EMD-BL-C-10-PT	2903522	1	
EMD-BL-C-10	2903521	1	

CE-compliant			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EMD-BL-V-230-PT	2903524	1	
EMD-BL-V-230	2903523	1	

Three-phase voltage monitoring, phase monitoring

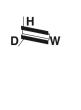
Three-phase voltage monitoring The EMD-BL-3V-400 monitors threephase AC voltages.

- 3~ 400 V AC/230 V AC ±30%
- Separately adjustable response delay
- Adjustable monitoring range
- Adjustable via potentiometer on the
- Supply from the measuring circuit

Phase monitoring

The EMD-BL-PH-400 monitors threephase AC voltages.

- 3~ 208 ... 480 V AC/120 ... 277 V AC
- Adjustable response delay
- Adjustable asymmetry: 5 ... 25%/OFF
- Adjustable via potentiometer on the front
- Supply from the measuring circuit





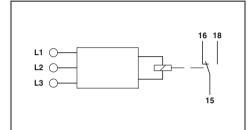
Voltage monitoring, 3-phase Window, phase sequence





Phase monitoring Phase sequence, phase failure, asymmetry

Housing width 17.5 mm



Housing width 17.5 mm 16 18 L1 (L2 ()

Functions
Input
Monitoring range
Input ranges
Input resistance
Min. setting range
Max. setting range
Setting range for response delay
Asymmetry
Basic accuracy
Setting accuracy
Repeat accuracy
Relay output
Contact type
Switching capacity
Electrical service life
Mechanical service life
Output fuse General data
Supply voltage
Nominal power consumption
Degree of protection
Ambient temperature range
Dimensions W / H / D
Connection data solid / stranded / AWG

Description
Compact monitoring relays with push-in connection
Compact monitoring relays with screw connection

Conformance / approvals

Conformance

Technical data	
Window, phase sequence	
280 V AC 519 V AC 3~400/230 V - 70% 120% (From U _N) 80% 130% (From U _N) 0.1 s 10 s	
≤ 5% (of the nominal value) ±5% (of scale end value) ≤ 2%	
1 floating PDT 1250 VA (5 A/250 V AC) 1 x 10 ⁵ cycles 15 x 10 ⁶ cycles 5 A (fast-blow)	
±30% (= measuring voltage) 10 VA (1 W) IP40 (housing) / IP20 (connection terminal blocks) -25°C 55°C 17.5 / 88 / 65.5 mm 0.5 2.5 mm² / 0.5 2.5 mm² / 20 - 14	

CE-compliant Ordering data Order No. Type Pkt EMD-BL-3V-400-PT 2903526

EMD-BL-3V-400

Technical data

Phase sequence, phase failure, asymmetry

187 V AC ... 519 V AC 3~ 208 ... 480 V/120 ... 277 V

0.1 s ... 10 s 5 % ... 25% / OFF ≤ 5% (of scale end value) ±5% (of scale end value) ≤2%

1 floating PDT 1250 VA (5 A/250 V AC) 1 x 10⁵ cycles 15 x 10⁶ cycles 5 A (fast-blow)

±10% (= measuring voltage) 10 VA ((1 W) at 400 V/50 Hz) 16 VA ((1.5 W) at 480 V/60 Hz)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C 17.5 / 88 / 65.5 mm

 $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.5 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$

CF-compliant

CL-compilant		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
EMD-BL-PH-480-PT	2903528	1
EMD-BL-PH-480	2903527	1

2903525

Single-phase current monitoring

EMD-...C... monitoring relays monitor DC and AC currents within the range 0 ... 10 A.

- Separately adjustable startup and release delays
- Variable supply voltage range
- Adjustable via potentiometer on front

1) EMC: Class A product, see page 571

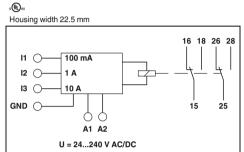


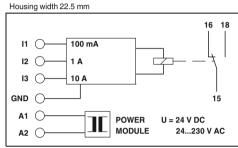
Overcurrent and undercurrent monitoring



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Overcurrent or undercurrent monitoring





Functions	
Input	
Input ranges	
Input resistance	
Min. setting range	
Max. setting range	
Setting range for response delay	
Setting range for starting delay	
Basic accuracy	
Setting accuracy	
Repeat accuracy	
Relay output	
Contact type	
Switching capacity	
Electrical service life	
Mechanical service life	
Output fuse	
General data	
Supply voltage	
Nominal power consumption	
Degree of protection	
Ambient temperature range	
Dimensions W / H / D	
Screw connection solid / stranded / AWG	
Conformance / approvals	

1 4110110110	
	Overcurrent, u
Input	
Input ranges Input resistance	0 mA 100 m 0 A 1 A AC/ 0 A 10 A AC 470 mΩ (at I _N
Min and an annual	F0/ 0F0/ /F-
Min. setting range	5% 95% (Fr
Max. setting range	10% 100% 0.1 s 10 s
Setting range for response delay Setting range for starting delay	0.1 S 10 S
Basic accuracy	±5% (of scale
Setting accuracy	±5% (of scale ≤5% (of scale
Repeat accuracy	< 2%
Relay output	3 2 /0
Contact type	2 floating PDT
Switching capacity	750 VA (3 A/2 1250 VA (5 A/2
Electrical service life	2 x 10 ⁵ cycles
Mechanical service life	Approx. 2 x 10
Output fuse	5 A (fast-blow)
General data	
Supply voltage	
Nominal power consumption	4.5 VA (1.5 W)
Degree of protection	IP40 (housing)
Ambient temperature range	-25°C 55°C
Dimensions W / H / D	22.5 / 90 / 113
Screw connection solid / stranded / AWG	0.5 2.5 mm²
Conformance / approvals	
Conformance	CE-compliant
UL, USA / Canada	UL/C-UL listed

Technical data	
vercurrent, undercurrent, window, error memory	EMD-SL-C-OC Overcurrent
mA 100 mA AC/DC (Connection terminals: I1 and GND) A 1 A AC/DC (Connection terminals: I2 and GND) A 10 A AC/DC (Connection terminals: I3 and GND) 10 m Ω (at 1 _N = 100 mA); 47 m Ω (at 1 _N = 1 A); 5 m Ω (at 1 _N = 10 A)	0 mA 100 mA 0 A 1 A AC/D 0 A 10 A AC/ 470 mΩ (at I _N =
$\% \dots 95\%$ (From $I_N)$ $1\% \dots 100\%$ (From $I_N)$ 1 s $\dots 10$ s $\dots 10$ s $\dots 10$ s $\dots 50$ scale end value) 5% (of scale end value) 2%	5% 95% (Fro 10% 100% (I 0.2 s 10 s - ±5% (of scale of ≤ 5% (of scale of ≤ 2%
floating PDT contacts 50 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 50 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	1 floating PDT 750 VA (3 A/25 1250 VA (5 A/25
x 10 ⁵ cycles at ohmic load, 1000 VA	2 x 10 ⁵ cycles a

Approx. 2 x 10 ⁷ cycles	
5 A (fast-blow)	
4.5 VA (1.5 W)	
IP40 (housing) / IP20 (connection terminal blocks)	
-25°C 55°C	
22.5 / 90 / 113 mm	
0.5 2.5 mm ² / 0.25 2.5 mm ² / 20 - 14	

UL, USA / Canada	UL/C-UL listed UL 508	
	Ordering data	
Description	Туре	Order No.
Electronic monitoring relay	EMD-FL-C-10 ¹)	2866022
Power module, plug-in, please order at the same time! Supply voltage 20 30 V DC Supply voltage 20.2 26.4 V AC Supply voltage 88 121 V AC Supply voltage 108 132 V AC		

GND O	15		
A1 ()————————————————————————————————————	POWER U = 24 V DC MODULE 24230 V AC		
Technical data			
EMD-SL-C-OC-10	EMD-SL-C-UC-10		
Overcurrent	Undercurrent		

0 mA 100 mA AC/DC (Connection terminals: I1 and GND)
0 A 1 A AC/DC (Connection terminals: I2 and GND)
0 A 10 A AC/DC (Connection terminals: I3 and GND)
$470~m\Omega$ (at I_N = 100 mA) ; $47~m\Omega$ (at I_N = 1 A) ; $5~m\Omega$ (at I_N = 10 A)

... 95% (From I_N) ... 100% (From I_N) ... 10 s (of scale end value) (of scale end value)

VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) O VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

105 cycles at ohmic load, 1000 VA Approx. 2 x 107 cycles 5 A (fast-blow)

2 VA (1.5 W) IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C 22.5 / 90 / 113 mm $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.25 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$

CE-compliant UL/C-UL listed UL 508

Pcs. / Pkt.

GEO GE HOLEG GE GOO		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
EMD-SL-C-OC-10 EMD-SL-C-UC-10	2866019 2867937	1
EMD-SL-PS- 24DC EMD-SL-PS- 24AC	2885359 2866103	1
EMD-SL-PS-110AC EMD-SL-PS-120AC EMD-SL-PS-230AC	2866116 2885731 2866129	1 1 1

Supply voltage 195 ... 264 V AC

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Single-phase voltage monitoring

EMD-...V... monitoring relays monitor DC and AC voltages within the range 0 ... 300 V.

- Separately adjustable startup and release delays
- Variable supply voltage range
- Adjustable via potentiometer on front

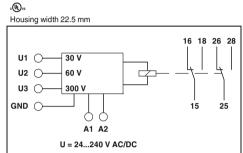
1) EMC: Class A product, see page 571



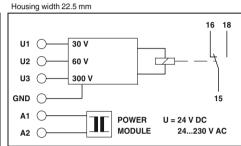
Undervoltage and overvoltage monitoring



Undervoltage monitoring



Technical data



Functions	
	l
Input	
Input ranges	(
	(
Input resistance	4
	1
Min. setting range	
Max. setting range	1
Setting range for response delay	(
Setting range for starting delay	(
Basic accuracy	=
Setting accuracy	5
Repeat accuracy	5
Relay output	
Contact type Switching capacity	2
Switching capacity	1
Electrical service life	2
Mechanical service life	,
Output fuse	5
General data	
- 1 · · · ·	

	Electrical service life		
	Mechanical service life		
	Output fuse		
	General data		
	Supply voltage		
	Nominal power consumption		
	Degree of protection		
	Ambient temperature range		
	Dimensions W / H / D		
	Screw connection solid / stranded / AWG		
Conformance / approvals			
	Conformance		
	UL, USA / Canada		

Nominal power consumption Degree of protection Ambient temperature range Dimensions W / H / D Screw connection solid / stranded / AWG	4.5 VA (1.5 W) IP40 (housing) / IP20 (connection termin -25°C 55°C 22.5 / 90 / 113 mm 0.5 2.5 mm² / 0.25 2.5 mm² / 20 - 1	,
Conformance / approvals Conformance	CE-compliant	
UL, USA / Canada	UL/C-UL listed UL 508	
	Ordering data	
Description	Туре	Order
Electronic monitoring relay	EMD-FL-V-300 ¹)	28660
Power module, plug-in, please order at the same time! Supply voltage 20 30 V DC Supply voltage 20.2 26.4 V AC Supply voltage 88 121 V AC Supply voltage 108 132 V AC Supply voltage 195 264 V AC		

Undervoltage, overvoltage, window, error memory	Undervoltage
$\begin{array}{l} 0 \ V \dots 30 \ V \ A C/D C \ (connection terminal blocks: U1 and GND) \\ 0 \ V \dots 60 \ V \ A C/D C \ (connection terminal blocks: U2 and GND) \\ 0 \ V \dots 300 \ V \ A C/D C \ (connection terminal blocks: U3 and GND) \\ 47 \ k\Omega \ (connection terminal blocks: U1 and GND) \\ 470 \ k\Omega \ (connection terminal blocks: U2 and GND) \\ 470 \ k\Omega \ (connection terminal blocks: U3 and GND) \\ 5\% \ \dots 95\% \ (From \ U_N) \\ 10\% \ \dots 100\% \ (From \ U_N) \\ 0.1 \ s \dots 10 \ s \\ \pm 5\% \ (of \ scale \ end \ value) \\ \leq 5\% \ (of \ scale \ end \ value) \\ \leq 2\% \end{array}$	$\begin{array}{l} 0 \ V \dots 30 \ V \ AC \\ 0 \ V \dots 60 \ V \ AC \\ 0 \ V \dots 300 \ V \ At \\ 47 \ k\Omega \ (connect 100 \ k\Omega \ (c$
O floating DDT contests	1 fleeting DDT
2 floating PDT contacts 750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	1 floating PDT 750 VA (3 A/25 1250 VA (5 A/2
2 x 10 ⁵ cycles at ohmic load, 1000 VA Approx. 2 x 10 ⁷ cycles 5 A (fast-blow)	2 x 10 ⁵ cycles Approx. 2 x 10 5 A (fast-blow)

CE-compliant UL/C-UL listed UL 508			C	
Ordering data				
Туре	Order No.	Pcs. / Pkt.	Т	
EMD-FL-V-300 ¹)	2866048	1	E	
			E	

	00.1			L
)—	60 V		- -	7
)—	300 V			
)—				15
)——		POWER	U = 24 V DC	
)—		MODULE	24230	V AC
	Tech	nical dat	9	

	0 V 30 V AC/DC (connection terminal blocks: U1 and GND)
(0 V 60 V AC/DC (connection terminal blocks: U2 and GND)
(0 V 300 V AC/DC (connection terminal blocks: U3 and GND)
	47 kΩ (connection terminal blocks: U1 and GND)
	100 kΩ (connection terminal blocks: U2 and GND)
	470 kΩ (connection terminal blocks: U3 and GND)
į	5% 95% (From U _N)
	10% 100% (From U _N)
	0.0 - 40 -

0.2 s ... 10 s ±5% (of scale end value) ≤ 5% (of scale end value) < 2%

1 floating PDT 750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA Approx. 2 x 10⁷ cycles 5 A (fast-blow)

2 VA (1.5 W) IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C 22.5 / 90 / 113 mm $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.25 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$

CE-compliant JL/C-UL listed UL 508

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EMD-SL-V-UV-300	2866035	1	
EMD-SL-PS- 24DC	2885359	1	
EMD-SL-PS- 24AC	2866103	1	
EMD-SL-PS-110AC	2866116	1	
EMD-SL-PS-120AC	2885731	1	
EMD-SL-PS-230AC	2866129	1	

Three-phase voltage monitoring

EMD-...-3V... monitoring relays monitor three-phase AC voltages of 160 ... 897 V AC (depending on the device concerned).

- Adjustable response delay
- Variable supply voltage range
- Adjustable via potentiometer on front
- Adjustable asymmetry

1) EMC: Class A product, see page 571

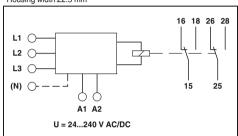




Undervoltage and phase monitoring, 400 V or 230 V



Housing width 22.5 mm



Fι	inct	io	ns

Monitoring range Input ranges Input resistance Min. setting range

Max. setting range

Setting range for response delay Asymmetry

Basic accuracy Setting accuracy Repeat accuracy Relay output Contact type

Switching capacity

Electrical service life Mechanical service life

Output fuse General data

Supply voltage

Nominal power consumption Degree of protection Ambient temperature range

Dimensions W / H / D

Screw connection solid / stranded / AWG Conformance / approvals

Conformance UL, USA / Canada

Technical data

EMD-FL-3V-4001) Undervoltage, window, asymmetry, phase sequence, phase failure

EMD-FL-3V-2301) Undervoltage, window, asymmetry, phase sequence, phase failure

161 V AC ... 299 V AC

3 N ~ 230/132 V

5 % ... 25% / OFF

470 kΩ

280 V AC ... 520 V AC 3 N ~ 400/230 V 1 ΜΩ

-30% ... 20% (From U_N) -20% ... 30% (From U_N)

0.1 s ... 10 s 5 % ... 25% / OFF

±5% (of scale end value) ≤5% (of scale end value)

≤2%

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA

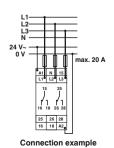
Approx. 2 x 10⁷ cycles 5 A (fast-blow)

4.5 VA (1.5 W)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C 22.5 / 90 / 113 mm

0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14



Description	
Electronic monitoring relay	
Power module, plug-in, please order at the same time! Supply voltage 20 30 V DC Supply voltage 20.2 26.4 V AC Supply voltage 88 121 V AC Supply voltage 108 132 V AC Supply voltage 195 264 V AC Supply voltage 323 456 V AC	

Ordering data				
Order No.	Pcs. / Pkt.			
2866064 2885773	1			
	Order No. 2866064			





Undervoltage and phase monitoring, 500 V or 690 V





Undervoltage/overvoltage monitoring, 400 V with/without neutral conductor

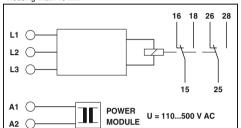




Phase monitoring, 400 V

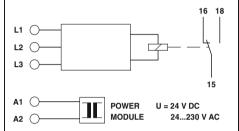
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Housing width 45 mm



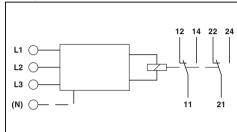
.(JJ),

Housing width 22.5 mm



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Housing width 22.5 mm



		l data	

EMD-FL-3V-690 Undervoltage, window, asymmetry, phase sequence, phase failure

EMD-FL-3V-500 Undervoltage, window, asymmetry, phase sequence, phase failure

350 V AC ... 650 V AC

5 % ... 25% / OFF

3 ~ 500 V

1 ΜΩ

483 V AC 897 V AC	
3 ~ 690 V	

1 ΜΩ -30% ... 20% (From U_N)

-20% ... 30% (From U_N) 0.1 s ... 10 s

5 % ... 25% / OFF ±5% (of scale end value)

≤ 5% (of scale end value)

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA Approx. 2 x 10⁷ cycles

5 A (fast-blow)

4.5 VA (1.5 W)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C 45 / 90 / 113 mm

 $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.25 \dots 2.5 \, \text{mm}^2 \, / \, 20$ - 14

CE-compliant UL/C-UL listed UL 508

Ordering data		
Туре	Order No.	Pcs. / Pkt.
EMD-FL-3V-690 EMD-FL-3V-500	2885249 2867979	1
EMD-SL-PS45-110AC EMD-SL-PS45-120AC EMD-SL-PS45-230AC EMD-SL-PS45-400AC	2885281 2885744 2885294 2885304	1 1 1

Technical data

280 V AC ... 520 V AC

3 N ~ 400/230 V

1 ΜΩ

EMD-SL-3V-400 EMD-SL-3V-400-N Window, without neutral Window, with neutral conductor connection conductor connection

280 V AC ... 520 V AC 3 ~ 400 V 1 ΜΩ -30% ... 20% (From U_N) -20% ... 30% (From U_N)

0.2 s ... 10 s

±5% (of scale end value) ≤ 5% (of scale end value) ≤2%

1 floating PDT

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA Approx. 2 x 10⁷ cycles 5 A (fast-blow)

2 VA (1.5 W) IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C

22.5 / 90 / 113 mm 0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14

ompliant -UL listed UL 508			(
Ordering data			
	Order No.	Pcs. / Pkt.	-
-SL-3V-400 -SL-3V-400-N	2866051 2885278	1	ı
-SL-PS- 24DC -SL-PS- 24AC -SL-PS-110AC -SL-PS-120AC -SL-PS-230AC	2885359 2866103 2866116 2885731 2866129	1 1 1 1	
-SL-3V-400-N -SL-PS- 24DC -SL-PS- 24AC -SL-PS-110AC -SL-PS-120AC	2885278 2885359 2866103 2866116 2885731	1 1 1 1 1 1	

Technical data

Phase sequence, phase failure, asymmetry

342 V AC ... -3 N ~ 400/230 V 15 kΩ

≤ 350 ms (fixed setting) Fixed, approx. 30%

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA Approx. 2 x 10⁷ cycles 5 A (fast-blow)

(From the measured voltage) 9 VA

IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C

22.5 / 90 / 113 mm 0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14

UL/C-UL listed UL 508		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
EMD-SL-PH-400	2866077	1

Effective power monitoring, load monitoring ($\cos \phi$)

Effective power monitoring

The effective power in single- and 3-phase networks can be monitored with the EMD-FL-RP-480 effective power monitoring relay.

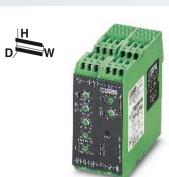
- Monitoring range up to 7.2 kW
- Separately adjustable startup and release
- Temperature monitoring of the motor winding
- Variable supply voltage range
- Detection of switched off loads

Load monitoring (cos φ)

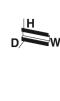
The EMD-FL-PF-400 monitoring relay is a $\cos \phi$ monitor for load monitoring in single- or three-phase networks.

Notes:

1) EMC: Class A product, see page 571



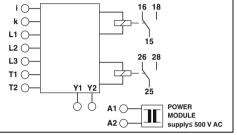
Effective power monitoring





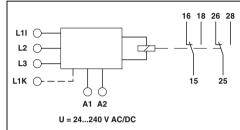
Load monitoring (cos Φ)

Housing width 45 mm 10



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Housing width 22.5 mm



Functions

Input Description of the input Measured value Measuring ranges P.

Nominal input voltage U_M Input ranges

Input ranges

Min. setting range Max. setting range Switching threshold $\cos \phi$

Relay output Contact type Switching capacity

Electrical service life Mechanical service life Output fuse General data Supply voltage

Nominal power consumption Rated insulation voltage Degree of protection Ambient temperature range Dimensions W/H/D

Screw connection solid / stranded / AWG Conformance / approvals

Conformance

Technical data

Underload, overload, window, winding temperature monitoring

Voltage input

AC sine (10 Hz ... 400 Hz)

Can be switched between 0.75 kW, 1.5 kW, 3 kW and 6 kW

480 V (3 N ~ 480/277 V)

0 V AC ... 480 V AC (1(N) ~, single-phase load) 0 V AC ... 480 V AC (3(N) ~, 3-phase load) 0.15 A ... 6 A (Range: 0.75 kW and 1.5 kW) 0.3 A ... 12 A (Range: 3 kW and 6 kW)

5% ... 110% (of P_N) 10% ... 120% (of P_N)

Min. Мах.

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

 2×10^5 cycles at ohmic load, 1000 VA

Approx. 2 x 10⁷ cycles 5 A (fast-blow)

3.5 VA (3 W)

300 V (According to EN 50178)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C 45 / 90 / 113 mm

0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14

CE-compliant

Technical data

Underload, overload, Window

AC sine (10 ... 100 Hz)

(3 N ~ 415/240 V)

40 V AC ... 415 V AC (1(N) ~, single-phase load) 40 V AC ... 415 V AC (3(N) ~, 3-phase load) 0.5 A ... 10 A (Connection terminal blocks: L1i and L1k)

0.1 ... 0.99 0.2 ... 1

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

 2×10^5 cycles at ohmic load, 1000 VA Approx. 2 x 107 cycles

5 A (fast-blow)

4.5 VA (1.5 W)

300 V (According to EN 50178)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C 22.5 / 90 / 113 mm

0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14

UL, USA / Canada
Description
Electronic monitoring relay
Power module, plug-in, please order at the same time!
Supply voltage 88 121 V AC
Supply voltage 108 132 V AC
Supply voltage 195 264 V AC
Supply voltage 323 456 V AC
Supply voltage 425 550 V AC

UL applied for			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EMD-FL-RP-480	2900177	1	
EMD-SL-PS45-110AC	2885281	1	
EMD-SL-PS45-120AC	2885744	1	
EMD-SL-PS45-230AC EMD-SL-PS45-400AC	2885294 2885304	1	
EMD-SL-PS45-500AC	2885317	1	

UL/C-UL listed UL 508			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EMD-FL-PF-400 ¹)	2885809	1	

Temperature monitoring, filling level monitoring

Temperature monitoring (motor winding)

The monitoring relay EMD-SL-PTC monitors the motor winding temperatures by means of PTC (PTC thermistor resistance) as per DIN 44081.

- Test function with integrated test/reset
- Variable supply voltage range
- Short-circuit and open-circuit monitoring

Filling level monitoring

The **EMD-SL-LL-...** monitoring relay monitors the level of electrically conductive liquids with the help of conductive probes (not supplied as standard).

- Adjustable response delay
- Adjustable via potentiometer on front







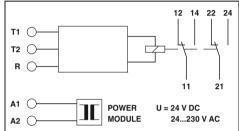
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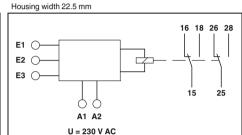
Filling level monitoring

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Housing width 22.5 mm



Technical data



Functions Input Total cold resistance Response value Release value Basic accuracy Repeat accuracy Measuring input Max. probe voltage Max. probe current Length of probe cable

Switching threshold	
Relay output	
Contact type	
Switching capacity	

Electrical service life
Mechanical service life
Output fuse
General data
Supply voltage
Nominal power consumption
Degree of protection
Ambient temperature range
Dimensions W / H / D
Screw connection solid / stranded / AWG
Conformance / approvals

Conformance

UL. USA / Canada

Description
Electronic monitoring relay
Power module, plug-in, please order at the same time!
Supply voltage 20 30 V DC
Supply voltage 20.2 26.4 V AC
Supply voltage 88 121 V AC
Supply voltage 108 132 V AC
Supply voltage 195 264 V AC

Vindina	temperature	monitoring

Winding	temperature	monitorin

< 1.5 kΩ
≥ 3.6 kΩ (Relay drops out)
≤ 1.8 kΩ (Relay picks up)
±10% (of scale end value)
≤2%
-
-

2 floating PDT contacts 750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

2 x 105 cycles at ohmic load, 1000 VA Approx. 2 x 107 cycles 5 A (fast-blow)

2 VA (1.5 W) IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C 22.5 / 90 / 113 mm

 $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.25 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$

CE-compliant

Technical data

Pumping up (minimum monitoring), pumping down (maximum monitoring)

Conductive probe, type: SK1, SK2, SK3 16 V AC $7\,\text{mA}$

< 1000 m Set value < 50% (Capacity 100 nF/km) < 100 m Set value 100% (Capacity 100 nF/km)

 $0.25 \text{ k}\Omega \dots 100 \text{ k}\Omega \text{ (4 mS} \dots 1 \text{ }\mu\text{S)}$

2 floating PDT contacts 750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

 2×10^5 cycles at ohmic load, 1000 VA Approx. 2 x 107 cycles 5 A (fast-blow)

EMD-SL-LL-230 230 V AC -15% ... +15% AC 2 VA (1.5 W)

EMD-SL-LL-110 110 V AC -10% ... +15% AC

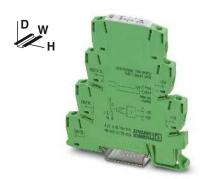
IP40 (housing) / IP20 (connection terminal blocks) -25°C ... 55°C

22.5 / 90 / 113 mm $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.25 \dots 2.5 \, \text{mm}^2 \, / \, 20 - 14$

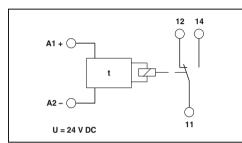
UL/C-UL listed UL 508			UL/C-UL listed UL 508		
Ordering dat	а		Ordering	data	
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
EMD-SL-PTC	2866093	1	EMD-SL-LL-230 EMD-SL-LL-110	2885906 2901137	1
EMD-SL-PS- 24DC EMD-SL-PS- 24AC EMD-SL-PS-110AC EMD-SL-PS-120AC EMD-SL-PS-230AC	2885359 2866103 2866116 2885731 2866129	1 1 1 1			

The ETD-BL-1T-... ultra-narrow timer relays show their strengths in applications that involve set parameters for functionality and time range.

- Purposeful device selection: one function, one time range
- High level of setting accuracy thanks to labeled and illuminated thumbwheel
- 6.2 mm slim design width



Timer relay with switch-on delay, voltage controlled



Technical data

ON: With switch-on delay

Functions

Control	contact

Connection Control pulse length

Relay output

Contact type Switching capacity

Mechanical service life

General data

Supply voltage

Nominal current typ.

Impulse withstand voltage

Degree of protection Ambient temperature range

Housing material

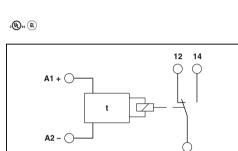
Dimensions W / H / D

Screw connection solid / stranded / AWG Spring-cage connection (solid/stranded/AWG)

Conformance / approvals

Time range 3...300 min

Conformance



Approx. 2 x 10⁷ cycles

1500 VA (6 A / 250 V AC)

24 V DC (19,2 V DC ...30 V DC)

15 mA (Relay ON) 7 mA (Relay OFF)

6 kV (According to EN 50178) IP20

-20°C ... 65°C

min. 50 ms

1 floating PDT

Polyamide PA, self-extinguishing

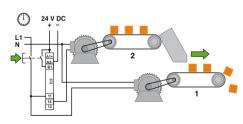
6.2 / 80 / 86 mm

 $0.14 \dots 2.5 \text{ mm}^2 / 0.14 \dots 2.5 \text{ mm}^2 / 26 - 14$

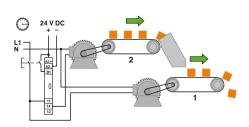
0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

CE-compliant

(E) II 3 G Ex nA nC IIC T4 Gc X



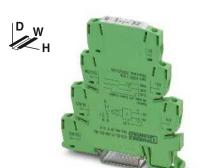
Conveyor belt 1 starts immediately



Conveyor belt 2 starts with a time delay

ATEX
Description
2000
Compact timer relay, with screw connection
Time range 0.110 s
Time range 3300 s
Time range 0.330 min
Time range 3300 min
Compact timer relay, with push-in technology
Time range 0.110 s
Time range 3300 s
Time range 0.330 min

W II 3 G EXTIATIO II O 14 GC X			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ETD-BL-1T-ON- 10S ETD-BL-1T-ON-300S ETD-BL-1T-ON- 30MIN ETD-BL-1T-ON-300MIN	2917379 2917382 2917395 2917405	1 1 1 1	
ETD-BL-1T-ON-10S-PT ETD-BL-1T-ON-300S-PT ETD-BL-1T-ON-30MIN-PT ETD-BL-1T-ON-300MIN-PT	2901476 2901477 2901478 2901479	1 1 1 1	



Timer relay with switch-on delay, with control contact



Ν

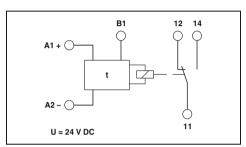
cUL) es (GL)

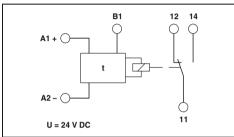
Timer relay with off delay, with control contact



Timer relay with flashing indic. function, beginning with the pulse







12 14 A1 + ()-A2 - ()-11 U = 24 V DC

Technical data

ON-CC: With switch-on delay with control contact

Technical data

OFF-CC: Off delay with control contact

Technical data

F: Flashing beginning with pulse

Non-floating, terminals A1-B1

min. 50 ms

1 floating PDT 1500 VA (6 A / 250 V AC) Approx. 2 x 10⁷ cycles

24 V DC (19.2 V DC ...30 V DC) 15 mA (Relay ON) 7 mA (Relay OFF) 6 kV (According to EN 50178) IP20 -20°C ... 65°C

Polyamide PA, self-extinguishing 6.2 / 80 / 86 mm $0.14 \dots 2.5 \, \text{mm}^2 \, / \, 0.14 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 14$ 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

CE-compliant (E) II 3 G Ex nA nC IIC T4 Gc X Non-floating, terminals A1-B1 min. 50 ms

1 floating PDT 1500 VA (6 A / 250 V AC) Approx. 2 x 10⁷ cycles

24 V DC (19,2 V DC ...30 V DC) 15 mA (Relay ON) 7 mA (Relay OFF) 6 kV (According to EN 50178) IP20 -20°C ... 65°C Polyamide PA, self-extinguishing

6.2 / 80 / 86 mm $0.14 \dots 2.5 \, \text{mm}^2 \, / \, 0.14 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 14$ $0.14 \dots 2.5 \text{ mm}^2 / 0.14 \dots 2.5 \text{ mm}^2 / 26 - 14$

CE-compliant

EN II 3 G Ex nA nC IIC T4 Gc X

min. 50 ms

cUL) es (GL)

1 floating PDT 1500 VA (6 A / 250 V AC) Approx. 2 x 107 cycles

24 V DC (19,2 V DC ...30 V DC) 15 mA (Relay ON) 7 mA (Relay OFF) 6 kV (According to EN 50178) IP20 -20°C ... 65°C Polyamide PA, self-extinguishing

6.2 / 80 / 86 mm $0.14 \dots 2.5 \, \text{mm}^2 \, / \, 0.14 \dots 2.5 \, \text{mm}^2 \, / \, 26 - 14$ 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

S II G G EXTIATIONO 14 GCX			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ETD-BL-1T-ON-CC- 10S ETD-BL-1T-ON-CC-300S ETD-BL-1T-ON-CC- 30MIN ETD-BL-1T-ON-CC-300MIN	2917418 2917421 2917434 2917447	1 1 1	
ETD-BL-1T-ON-CC- 10S-PT ETD-BL-1T-ON-CC-300S-PT ETD-BL-1T-ON-CC- 30MIN-PT ETD-BL-1T-ON-CC-300MIN-PT	2901480 2901481 2901483 2901484	1 1 1	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ETD-BL-1T-OFF-CC- 10S ETD-BL-1T-OFF-CC-300S ETD-BL-1T-OFF-CC-30MIN ETD-BL-1T-OFF-CC-300MIN	2917450 2917463 2917467 2917489	1 1 1	
ETD-BL-1T-OFF-CC- 10S-PT ETD-BL-1T-OFF-CC-300S-PT ETD-BL-1T-OFF-CC-30MIN-PT ETD-BL-1T-OFF-CC-300MIN-PT	2901485 2901486 2901487 2901488	1 1 1 1	

	W/ II 3 G EX NA NO IIC 14 GC X				
	Ordering data				
./	Туре	Order No.	Pcs./ Pkt.		
	ETD-BL-1T-F- 10S ETD-BL-1T-F-300S ETD-BL-1T-F- 30MIN ETD-BL-1T-F-300MIN	2917492 2917502 2917515 2917528	1 1 1 1		
	ETD-BL-1T-F- 10S-PT ETD-BL-1T-F-300S-PT ETD-BL-1T-F- 30MIN-PT ETD-BL-1T-F-300MIN-PT	2901489 2901490 2901491 2901492	1 1 1 1		

Multifunctional timer relays

The full range of conventional applications can be accommodated by the three versions of the **ETD** multifunctional timer relay.

- Suitable for universal use thanks to varied functions and selectable time ranges
- Time ranges from a few milliseconds to several days
- Variable supply voltage range
- 2 floating PDT outputs

1) EMC: Class A product, see page 571

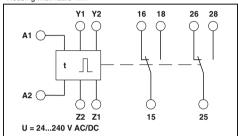




Multifunctional timer relay, two adjustable times

.(JL),

Housing width 22.5 mm



Technical data

lp: Switched-mode beginning with the pause

li: Switched-mode beginning with the pulse ER: With switch-on and release delay with control contact

EWu: With switch-on delay and single shot leading edge, voltage controlled

EWs: With switch-on delay and single shot leading edge with control

contact
WsWa: With single shot leading edge and single shot trailing edge with control contact

Wt: Pulse sequence evaluation (retriggerable release delay)

Time ranges

Functions

Setting range

Control contact

Connection

Load capacity

Cable length

Control pulse length

Relay output Contact type

Switching capacity

Cannot carry load

max. 10 m

min. 50 ms (Only with Wt function: > 7 ms)

Floating, basic isolation between connection and

50 ms ... 10 h (10 time end ranges)

2 floating PDT contacts

Approx. 2 x 107 cycles

input/output/bridge Y1-Y2

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

Mechanical service life

General data

Supply voltage

Nominal power consumption

Degree of protection Ambient temperature range

Housing material

Dimensions W/H/D

Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

UL, USA / Canada

2.5 VA (1 W)

24 V DC ... 240 V DC -20 % ... +25 % 24 V AC ... 240 V AC -15 % ... +10 %

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C

Polyamide PA, self-extinguishing

22.5 / 90 / 113 mm

 $0.5 \dots 2.5 \, \text{mm}^2 \, / \, 0.5 \dots 2.5 \, \text{mm}^2 \, / \, 20$ - 14

CE-compliant

	Tari	
A1 Y1 25 Y2 WATCHDOG		

Function: Pulse sequence evaluation

Message for incorrect pulse

Description	Туре
Electronic timer relay with adjustable functions and times	
	ETD

OL/C-OL listed OL 508			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ETD-FL-2T-DTI¹)	2866187	1	





Multifunctional timer relay, one adjustable time

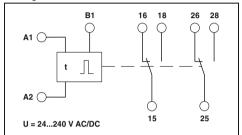




Impulse encoder, adjustable pulse and pause times

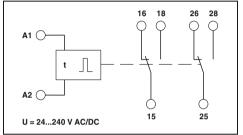


Housing width 22.5 mm



. (آل) _ت

Housing width 22.5 mm



Technical data

E: With switch-on delay

R: With release delay and control contact Es: With switch-on delay and control contact

Wu: With single shot leading edge, voltage controlled Ws: With single shot leading edge and control contact Wa: With single shot trailing edge and control contact

Bi: Flashing beginning with pulse

Bp: Flashing beginning with pause

Technical data

lp: Switched-mode beginning with the pause li: Switched-mode beginning with the pulse

50 ms ... 100 h (7 time end ranges)

Non-floating, terminals A1-B1

Parallel switched minimum load current 1 VA (0.5 W), terminals A2-B1

max. 10 m min, 70 ms

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

Approx. 2 x 107 cycles

24 V DC ... 240 V DC -20 % ... +25 % 24 V AC ... 240 V AC -15 % ... +10 %

2.5 VA (1 W)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C

Polyamide PA, self-extinguishing

22.5 / 90 / 113 mm

 $0.5 \dots 2.5 \ \text{mm}^2 \, / \, 0.5 \dots 2.5 \ \text{mm}^2 \, / \, 20 \, \text{--} \, 14$

CE-compliant

UL/C-UL listed UL 508

50 ms	100 h	(7 tim	e end	ranges)

2 floating PDT contacts

750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

Approx. 2 x 107 cycles

24 V DC ... 240 V DC -20 % ... +25 % 24 V AC ... 240 V AC -15 % ... +10 %

2.5 VA (1 W)

IP40 (housing) / IP20 (connection terminal blocks)

-25°C ... 55°C

Polyamide PA, self-extinguishing

22.5 / 90 / 113 mm

 $0.5 \dots 2.5 \ \text{mm}^2 \, / \, 0.5 \dots 2.5 \ \text{mm}^2 \, / \, 20 \, \text{--} \, 14$

CE-compliant

UL/C-UL listed UL 508

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ETD-SL-1T-DTF1)	2866161	1

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ETD-SL-2T-I1)	2866174	1

Diode modules

Diode circuits perform various tasks in electrical control systems, particularly in electronic ones:

- Electrical decoupling of messages in fault signaling systems
- Spark-suppression diodes for limiting surge voltages of inductive loads, (solenoid valves, DC relays or similar)
- Can be supplied as "diode gates" combined with anode or cathode or as freely assignable diodes





with diode type 1 N 4007



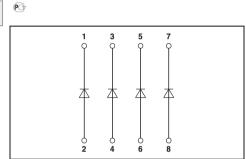
PG



with diode type 1 N 5408

Notes:

Further circuit diagrams can be found in the data sheet at www.phoenixcontact.net/products



1	3	5	7	
Y	Ŷ	Ŷ	Ŷ	
+	+	+	+	
4	4	4	4	
2	4	6	8	
-	7	٠	·	

Max. operating voltage $U_{\rm max}$ Peak reverse voltage per diode Reverse current per diode Conducting state voltage per diode Conducting state current per diode

with single load

with simultaneous loads

General data

Ambient temperature range Rated insulation voltage

Pollution degree / Surge voltage category

Pollution degree / Surge voltage category

Mounting position Mountina

Dimensions H / D Screw connection solid / stranded / AWG

Conformance / approvals

Conformance

Technical data				
4E/8E/17E/7P/7M	14P / 14M / 32P / 32M			
250 V AC	250 V AC			
1300 V	1300 V			
5 μA	5 μA			
Approx. 0.8 V	Approx. 0.8 V			
0.7 A	0.7 A			
0.5 A	0.2 A			

-20°C ... 50°C

300 V (According to EN 50178)

III, basic insulation (as per EN 50178) 2 (according to EN 50178)

Anv

In rows with zero spacing

75 / 55 mm

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

Technical data				
4E / 4P / 4M / 8E	. 8P / 8M			
250 V AC	250 V AC			
1000 V	1000 V			
10 μΑ	10 μΑ			
Approx. 0.8 V	Approx. 0.8 V			
1.5 A	1.5 A			
1 A	0.3 A			

-20°C ... 50°C

III, basic insulation (as per EN 50178)

2 (according to EN 50178)

Any

In rows with zero spacing

75 / 55 mm

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

Description		Housing width
Diode module, can be individually wire	d	
	4 diodes 8 diodes 17 diodes	22.5 mm 45 mm 90 mm
Diode module, with P-polarity (commo	n cathode)	
	4 diodes	22.5 mm
	7 diodes	22.5 mm
	8 diodes	45 mm
	14 diodes	45 mm
	32 diodes	90 mm
Diode module, with M polarity (commo	n anode)	
	4 diodes	22.5 mm
	7 diodes	22.5 mm
	8 diodes	45 mm
	14 diodes	45 mm

32 diodes

90 mm

Туре	Order No.	Pcs. / Pkt.	
EMG 22-DIO 4E EMG 45-DIO 8E EMG 90-DIO 17E	2950048 2950103 2954895	10 5 5	
EMG 22-DIO 7P EMG 45-DIO14P EMG 90-DIO 32P	2950064 2950116 2954918	10 5 5	
EMG 22-DIO 7M EMG 45-DIO14M EMG 90-DIO 32M	2950077 2950129 2954934	10 5 5	
Accessories	3		
EMG-GKS 12	2947035	50	

Ordering data

Ordering date					
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
EMG 22-DIO 4E-1N5408 EMG 45-DIO 8E-1N5408	2952790 2949389	10 5			
EMG 22-DIO 4P-1N5408 EMG 45-DIO 8P-1N5408	2952198 2954879	10 5			
EMG 22-DIO 4M-1N5408 EMG 45-DIO 8M-1N5408	2952211 2954882	10 5			
Accessories					
EMG-GKS 12	2947035	50			

Equipment marker

Lamp testing modules, display modules

Lamp testing modules

Lamp testing modules for checking lamps that are installed and ready for operation:

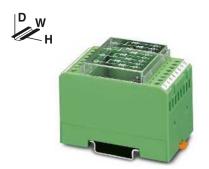
- Individual checking of separate lamps (EMG...-E/LP)
- Centrally controlled checking of lamps (EMG...-M/LP)

Display modules

- Light indicator modules facilitate the monitoring of processes on electronic control systems during troubleshooting



Further circuit diagrams can be found in the data sheet at www.phoenixcontact.net/products



Lamp testing module, groups of 2 diodes with common cathode

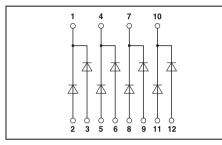


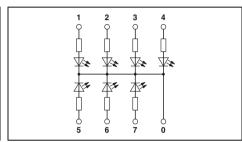
P



Light indicator module, with common return line







Diodes
Max. operating voltage U _{max}
Peak reverse voltage per diode
Reverse current per diode
Conducting state voltage per diode
Conducting state current per diode

with single load with simultaneous loads

Input Current required per light indicator General data Ambient temperature range Rated insulation voltage Pollution degree / Surge voltage category Pollution degree / Surge voltage category Mounting position Mounting

Conformance / approvals

Dimensions H / D

Screw connection solid / stranded / AWG

Conformance

Equipment marker

	Technical data
8E/16E	14M/32M
250 V AC	250 V AC
1300 V	1300 V
≤ 5 μA	≤ 5 µA
Approx. 0.8 V	Approx. 0.8 V
0.7 A	0.7 A
0.4 A	0.2 A

-20°C ... 50°C 300 V (According to EN 50178)

III, basic insulation (as per EN 50178) 2 (according to EN 50178)

Any In rows with zero spacing

75 / 55 mm

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

CE-compliant

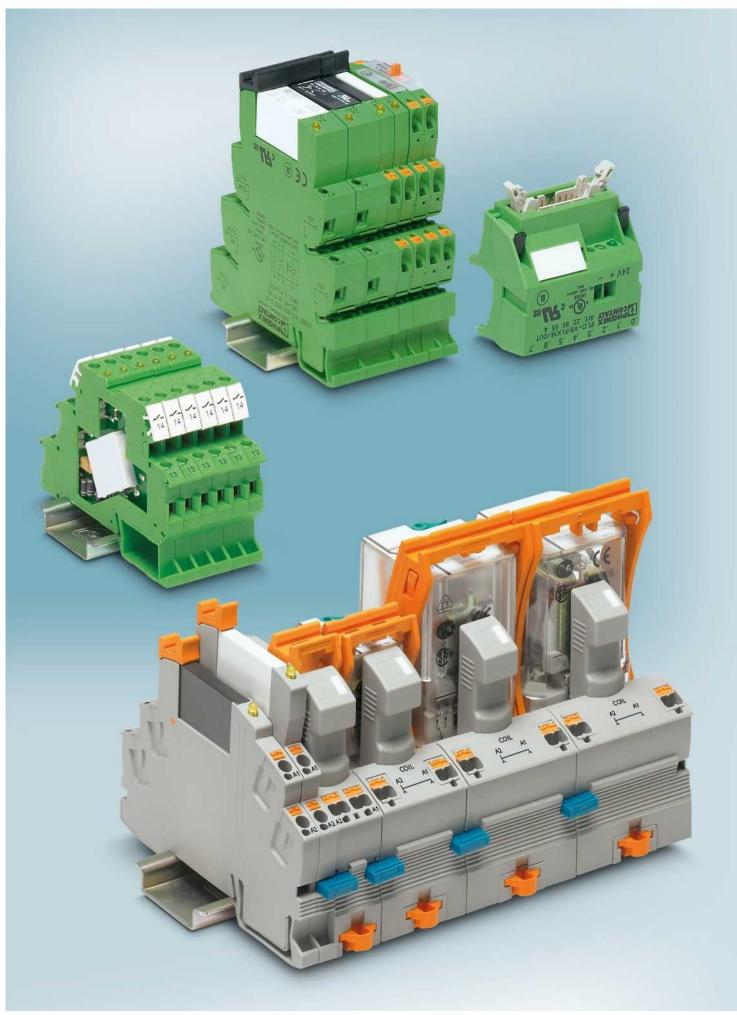
	Technical data	
LA 7S	LED 7S/LED 14S	

Approx. 1 mA Approx. 3 mA -20°C ... 45°C III, basic insulation (as per EN 50178) 2 (according to EN 50178) Any

In rows with zero spacing 75 / 47.5 mm 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

Description	Нос	using width
Lamp testing module, for individual wiring		
	4-pair 8-pair	45 mm 90 mm
Lamp testing module, with common control	ol	
	7-pair 16-pair	45 mm 90 mm
Light indicator module, 110 230 V AC input voltage		
7 glow	v lamps	22.5 mm
Light indicator module, 24 V DC input volt	tage	
	7 LEDs 4 LEDs	22.5 mm 45 mm

OL-Compilant			OL-compilant		
Ordering	data		Ordering of	lata	
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
EMG 45-DIO 8E/LP EMG 90-DIO 16E/LP	2954798 2954808	5 5			
EMG 45-DIO14M/LP EMG 90-DIO 32M/LP	2950132 2954785	5 5			
			EMG 22-LA 7S/230	2949677	10
			EMG 22-LED 7S/24 EMG 45-LED 14S/24	2952305 2952334	10 5
Accesso	ories		Accessor	ies	
EMG-GKS 12	2947035	50	EMG-GKS 12	2947035	50



Relay modules

The importance of the reliability of industrial automation equipment is growing with the increase in use of electronic modules.

Modern relay or solid-state relay interfaces perform a wide range of tasks. Whether in production engineering, for the electrical equipment of machines or in control engineering for energy distribution, building automation and materials processing - the main aim is to guarantee the exchange of signals between the process peripherals and the superior, central control systems. This exchange must provide reliable operation, be floating and electrically unambiguous. Safe electrical interface modules that meet the requirements of modern system concepts must include the following features:

- Coupling of different signal levels
- Safe electrical isolation between input and output
- High interference insensitivity.

In practice, a relay interface comes into use with a flexible interface configuration with a large switching capacity range and the possibility of combining different types of contact. Further important features of relay interfaces are:

- Electrical isolation between open con-
- Switching of independent switching current types
- High short-term overload resistance in the event of a short circuit or voltage
- Practically impervious to electromagnetic fields
- Easy handling.

Solid-state relay modules are used when an interface between the process peripherals and electronics is subject to the following requirements:

- Low control power
- High switching frequencies
- Wear-free switching with no contact bounce
- Resistance to vibration and impacts
- Long service life.

Product range overview	
Product overview	266
Basics of relay technology	268
Basics of solid-state relay technology	272
RIFLINE complete	274
PLC series	320
PR series	370
DEK series	396
Special relay and solid-state relay modules	402

Relay modules

Product overview

RIFLINE complete



RIF-0 for miniature and solid-state relays Page 276



RIF-1 for miniature and solid-state relays
Page 282



Page 290

RIF-2 for industrial relays



RIF-3 for octal relays

PLC series



With relay/solid-state relay As sensor/actuator version



For high inrush/continuous currents Page 332
Resistant to interference currents/voltages
Page 334



With switch Page 350 For railway applications Page 359



For NAMUR initiators Types of electronics

Page 364 Page 365

Page 294

DEK series



With miniature relay

Page 397

Page 322

Page 326



Actuator series with miniature relays
Page 399



Sensor series with miniature relays Page 399



With solid-state relay

Page 400

Safety devices



Safety devices See Catalog 8

Monitoring relays



Monitoring relays

Page 250

Timer relays



Timer relays

Page 258

Product overview



RIF-4 for high-power relays

Page 298



Accessories



PR1 for miniature or solid-state relays Page 372



PR2 for industrial relays

Page 378

Page 304



PR3 for octal relays

Page 382



Accessories

Page 373

Special relay and solid-state relay modules



Relay terminal blocks with switch Page 403



Interference-free relays and solid-state relays



Page 404



Relays for switching lamp loads Page 407

Solid-state power relays with 400 V AC/400 V AC/3 A output Page 408

General

Electromechanical relays are used as interface modules between the process I/O devices, on the one hand, and the openloop/closed-loop control and signaling equipment, on the other, for level and power adjustment purposes.

Essentially, electromechanical relays can be divided into two main groups: monostable and bistable relays.

With monostable DC or AC relays, the contacts automatically return to the release state as soon as they are de-energized.

In the case of bistable relays, the contacts remain in their present switch position when the excitation current is switched off.

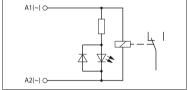
Coil side

Input circuits and voltage types

There are various kinds of input circuit depending on the type of relay used and the nature of the control voltage.

If pure AC relays are used (AC input), the input circuit is generally nothing more than a visual switching status indicator.

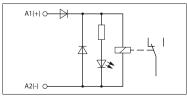
Unless otherwise specified, the frequency of the control voltage is 50/60 Hz.



Basic construction of a relay with AC input

In the case of a pure DC input, the most important addition to the circuit is a freewheeling diode. This limits the voltages induced on the coil on circuit interruption to a value of approximately 0.7 V, which does not pose a danger to any connected control electronics.

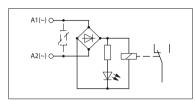
As the freewheeling diode can only perform its required function if the polarity of the voltage connection is correct, a reverse polarity protection diode is also integrated into the input circuit.



Basic construction of a relay with DC input

To allow DC or AC voltage operation, a bridge rectifier is connected in the input circuit. The diodes are simultaneously responsible for performing rectification, freewheeling, and polarity reversal protection functions. The interrupting voltage of the coil is limited to approximately 1.4 V.

To protect the input circuit against overvoltages, a varistor is also connected (depending on the type) upstream of the bridge rectifier.

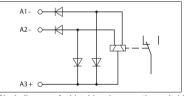


Basic construction of a relay with AC/DC input

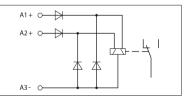
Bistable remanence relays with a double winding are only ever operated with DC voltage.

With these types of relay, there are three coil connections on the coil side. In addition to the common connection, there are separate connections for "setting" and "resetting"; these are controlled by short pulses only. As a result, the relays hardly heat up at all. Simultaneous control of both control inputs is not permitted.

A distinction is made between negative switching (M) and positive switching (P) types, depending on the polarity of the freewheeling and reverse polarity protection diodes.



Block diagram of a bistable relay, negative switching type



Block diagram of bistable relay, positive switching type

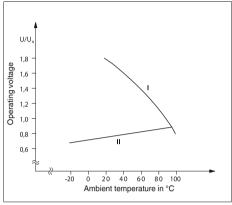
Operating voltage range

The ambient temperature prevailing at the location of use has a major impact on certain relay operating parameters.

As the ambient temperature increases, the coil winding heats up, causing the operate and release voltages to rise. At the same time, the maximum permissible coil voltage decreases, which means that the usable

working range becomes restricted as a re-

The diagram below illustrates how the operating voltage behaves as a function of the ambient temperature.



Basic curve of a relay operating voltage

- I: Maximum permissible voltage with 100% operating time (OT) and assuming compliance with the coil temperature limit
- II: Minimum operate voltage

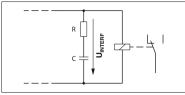
Interference voltages and interference currents on the coil side

When inductive or capacitive interference voltages are coupled into the long supply lines of a relay, this can prevent the relay from operating safely.

If the coupled-in voltage exceeds the release voltage required by the IEC 61810-1 "relay standard", in extreme cases the relay may fail to release. In the case of DC relays, this release voltage is $\geq 0.05 \times U_{N}$ and for purely AC relays, it is $\geq 0.15 \times U_N$.

The same disturbances can occur when a relay with a low input power is controlled by an electronics module with an AC voltage output featuring an RC circuit. The typical leakage current from RC elements of this kind (generally in the region of several mA) provides sufficient control power to prevent the downstream relay from releasing or even enough power to excite it.

The disturbance level of any interference voltages that are present can be reduced by connecting an RC element parallel to the relay coil. This measure also subjects the interference voltage to a capacitive load, causing it to collapse.



External RC interference suppression filter to prevent interference voltage coupling

The following values are recommended for the purpose of dimensioning the RC element.

- $R = 100 ... 220 \Omega$
- C = 220 ... 470 nF

The SO46 series have been developed to provide even higher levels of immunity to interference. These products already contain an integrated RCZ filter. See, for example, PLC...SO46.

Contact side, contact materials

Given the wide variety of potential applications in the different industrial sectors, the relays used must be matched to the various tasks that need to be performed by selecting the right kind of contact material.

The voltage, current, and power values play an important role when determining the suitability of contact materials. Other criteria include:

- Contact resistance
- Erosion resistance
- Material migration
- Welding tendency
- Chemical influences

In this way, the various contact materials (generally noble metal alloys) can be matched to the relevant areas of applica-

The adjacent table provides details of some of the key materials.

Contact protection circuit

Every electrical load constitutes a mixed load with ohmic, capacitive, and inductive components.

When these loads are switched, the switching contact is in turn subjected to a load, to either a lesser or greater extent. This load can be reduced by including a suitable contact protection circuit.

In view of the fact that loads with a large inductive component are predominantly used in practice (e.g., contactors, solenoid valves, motors, etc.), these application scenarios are worth considering in more detail.

On interruption, voltage peaks with values of up to several thousand volts occur due to the energy stored in the coil.

Contact material	Typ. properties	Typ. applications	Guide values for the area of application*
Gold Au	Largely insensitive to industrial atmospheres; low and constant contact resistances in the range of small switching capacities with nickel (AuNi) or silver (AuAg) alloys	Dry measuring and switching circuits, control inputs	μΑ 0.2 Α μV 30 V
Silver Ag	High electrical conductivity; sensitive to sulfur, therefore often gold-flashed (approximately 0.2 μm) as protection; nickel (AgNi) or copper (AgCu) alloys increase the mechanical resistance and erosion resistance and reduce the welding tendency.	Universal; suitable for medium loads; nickel alloys (AgNi 0.15) for DC circuits with medium to large loads.	≥ 12 V ≥ 10 mA
Silver, hard gold- plated Ag+Au	Properties similar to gold Au. When switching loads > 30 V/0.2 A, the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the Ag contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA
Tungsten W	Highest melting point; very high erosion resistance; greater contact resistances; very low welding tendency; susceptible to corrosion; often used as lead contact.	Loads with very high inrush cur- rents, e.g., glow lamps, fluores- cent lamps.	≥ 60 V ≥ 1 A
Silver nickel AgNi	High erosion resistance; low welding tendency; higher contact resistances than with pure silver.	Universal; suitable for medium to high loads; DC circuits and inductive loads.	≥ 12 V ≥ 10 mA
Silver nickel AgNi+Au	Properties similar to gold Au. When switching loads > 30 V/0.2 A, the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the AgNi contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA
Silver tin oxide AgSnO	Low welding tendency; very high erosion resistance for high switching capacities; low material migration	Application depends heavily on the relay type; switching circuits with high make and break loads, e.g., glow lamps and fluorescent lamps, AC and DC circuits. Due to different alloys and production procedures, partly also suitable for smaller loads.	≥ 12 V ≥ 100 mA (≥ 10 mA)
Silver tin oxide, hard gold-plated AgSnO+Au	Properties similar to gold Au. When switching loads > 30 V/0.2 A, the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the AgSnO contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA

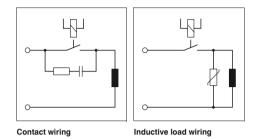
^{*} Values depend on the relay used and on further operating conditions.

These high voltages cause an arc on the switching contact which can destroy the contact due to material vaporization and material migration. The electrical service life is reduced considerably as a result. In extreme cases, the relay may fail in the very first cycle with DC voltage and a static arc.

A protective circuit must be used to suppress the formation of an arc. With optimum dimensioning, almost the same number of cycles can be achieved as with an ohmic load.

In principle, there are a number of possible ways of achieving an effective circuit:

- 1. Contact wiring
- 2. Load wiring
- 3. Combination of both wiring methods



In principle, protective measures should intervene directly at the source of the interference.

Wiring a load should therefore be given priority over wiring the contact.

The following points are advantageous for the load circuit (image on right):

- 1. The circuit is only loaded with the induction voltage during interruption. By contrast, the sum of the operating voltage and the induction voltage is applied to the contact circuit.
- 2. When the contact is open, the load is electrically isolated from the operating
- 3. It is not possible for the load to be activated or to "stick" due to undesired operating currents, e.g., from RC elements.
- 4. Cut-off peaks of the load cannot be coupled into parallel control lines.

Nowadays, solenoid valves are usually connected using valve plugs that are also supplied with LEDs and components that limit the induction voltage. Valve plugs with an RC element, varistor or Zener diode often do not quench the arc and only serve to comply with legislation governing EMC. Only valve plugs with an integrated 1N4007 freewheeling diode quench the arc quickly and safely, thereby increasing the service life of the relay by a factor of 5 to 10. Valve plugs with LED, integrated 1N4007, and free cable end can be supplied on request as part of the SAC range.

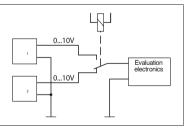
Load wiring	Additional dropout de- lay	Defined induction voltage limitation	Effective bi- polar atten- uation	Advantages/disadvantages
Diode Load U	Large	Yes (U _D)	No	Advantages: Good effect in terms of extending the service life of the contacts Easy implementation Inexpensive Reliable Dimensioning not critical Low induction voltage Disadvantages: Attenuation only via load resistor Long dropout delay
Diode/Zener diode series connection Load	Medium to small	Yes (U _{ZD})	No	Advantages: Disadvantages: Attenuation only above U _{ZD} Minimal effect in terms of extending the service life of the contacts
Suppressor diode Load United	Medium to small	Yes (U _{zD})	Yes	Advantages: Inexpensive Dimensioning not critical Limitation of positive peaks Suitable for AC voltages Disadvantages: Attenuation only above U _{ZD} Minimal effect in terms of extending the service life of the contacts
Varistor Load Uvox	Medium to small	Yes (U _{VDR})	Yes	Advantages: High energy absorption Dimensioning not critical Suitable for AC voltages Disadvantages: Attenuation only above U _{VDR} Minimal effect in terms of extending the service life of the contacts
R/C combination	Medium to small	No	Yes	Advantages: HF attenuation due to energy storage Suitable for AC voltages Level-independent damping Disadvantages: Precise dimensioning required High inrush current surge Minimal effect in terms of extending the service life of the contacts

Switching small loads

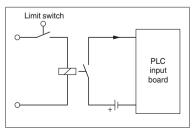
Small loads must be processed mainly in applications where signals must be forwarded to control inputs (e.g., of a PLC).

With these loads, no switching sparks (arcs) occur on the contacts in the small load range.

In addition to the constant cleaning effect due to contact friction, this switching spark assumes the function of penetrating non-conductive contamination layers that are formed on the contact surfaces of power contacts.



Application example: measurement point changeover



Application example: PLC input signal

These contamination layers are usually oxidation or sulfidation products of the contact materials silver (Ag) or silver alloys such as silver nickel (AgNi) or silver tin oxide (AgSnO). As a result, the contact resistance may rise so considerably within a short time that reliable switching is no longer possible in the case of small loads.

Due to these properties, the high-performance contact materials mentioned are not suitable for small load applications.

Gold (Au) has become accepted as the contact material of choice for these areas of application mainly on account of its low and constant contact resistances even with small loads and its insensitivity to sulfurous atmospheres.

For the smallest of loads and even greater contact reliability, double contact relays with gold contacts are used.

The slotted contact spring in this design provides two parallel contact points with even lower contact resistances and considerably higher contact reliability.

Switching large loads

A few important points also need to be considered with regard to switching operations in the large load range that involve power contacts made of either silver (Ag) or silver tin oxide (AgSnO).

A basic distinction must be made between switching DC and AC loads.

Switching large AC loads

When switching large AC loads, the relay can be operated up to the corresponding maximum values for switching voltage, current, and power. The arc that occurs during interruption depends on the current, voltage, and phase angle. This cut-off arc usually disappears automatically the next time the load current passes through zero.

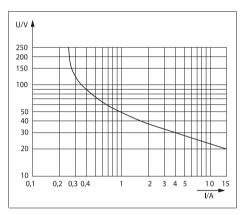
In applications with an inductive load, an effective protective circuit must be provided, otherwise the service life of the system will be reduced considerably.

Switching large DC loads

Conventional switching relays can only switch off relatively small direct currents (which contrasts with their ability to switch off the maximum permissible AC current), since there is no zero crossing to extinguish the arc automatically. This maximum DC value is also dependent to a large extent on the switching voltage and is determined, among other things, by constructional features such as contact spacing and contact opening speed.

The corresponding current and voltage values are documented by relay manufacturers in arc or load limit curves.

A non-attenuated inductive DC load fur-



Example of a load limit curve (dependent on the type)

ther reduces the values given for switchable currents. The energy stored in the inductance can cause an arc to occur, which forwards the current through the open contacts.

With an effective contact protection circuit, preferably type 1N4007 freewheeling diodes, the service life can be increased by a factor of 5 to 10 compared with unprotected or poorly protected inductive loads (see also "Contact protection circuits" section).

If higher DC loads than those documented are to be switched or if the electrical service life is to be increased, several contacts of a relay can be connected in series. See, for example, REL-IR... industrial relays.

Alternatively, solid-state relays with DC voltage output can also be used.

Switching lamps and capacitive loads

Regardless of the type of voltage, all kinds of lamps and loads with a capacitive component impose extreme requirements on the switching contacts. The moment it is switched on, in other words precisely in the dynamic chattering phase of the relay, extremely powerful current peaks occur. These are often in the region of several tens of amps, and not infrequently are known to exceed 100 A, which results in welding of the contact. This can be remedied by using specially optimized "lamp load relays" that can cope with these inrush peaks. See, for example, PLC...IC type.

Switching capacity in accordance with utilization categories AC15 and DC13 (IEC 60947)

In practice, both the maximum interrupting rating for AC loads and the DC interruption values taken from the load limit curves provide only a rough guide for the choice of relay. In reality, this is insufficient, since real loads in the vast majority of industrial applications have inductive or capacitive components and the wiring of the loads can be totally different. As already described, this sometimes leads to considerable variations in terms of service life.

The IEC 60947 contactor standard seeks to avoid these disadvantages by dividing the loads into various utilization categories (DC13, AC15, etc.). This standard is also partly applied to relays. However, users must be aware of the fact that these values are only applicable in practice to a limited extent as well, since all DC13 and AC15 test loads are highly inductive and are also operated without any protective circuit at all (see "Contact protection circuit" section). Moreover, the switching capacity test in accordance with IEC 60947 only requires 6060 cycles to be performed by way of a minimum requirement.

A much more reliable way to determine the switching capacity and the anticipated service life is to refer to the specific application data. Using a comprehensive data bank, the service life can be accurately estimated for most applications and, if necessary, suggestions for improvement can be made. In the case of critical applications, the user is advised to gather service life information based on empirical data.

Basics of solid-state relay technology

Control side

Solid-state relays for various voltage and power levels are available from Phoenix Contact for use as interface modules designed to match process I/O devices to control, signaling, and regulating devices. The solid-state relay element which is actually located in the module is limited to one defined voltage range by virtue of its design. The current consumption on the input side fluctuates depending on the circuit architecture and voltage level.

To accommodate all industrial voltages between 5 V and 230 V, an input circuit is provided. The inputs for DC voltage and AC voltage must always be differentiated.

DC input

Adjustments are made in accordance with the various voltage levels by adding electronics which have been specially adapted to the desired voltage range. In the case of most modules, a polarity protection diode provides reliable protection against destruction in the event of a control voltage being connected incorrectly. Specially coordinated filters reliably suppress possible high-frequency noise emissions.

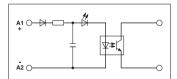


Figure 1: block diagram for DC input

AC input

The solid-state relay element requires a stable control voltage to ensure reliable operation. In the case of the AC input, this is achieved by connecting a rectifier and filter capacitor upstream. Rectifying is followed, in principle, by the same circuit architecture as the DC input.

The switching frequency always lies below half the mains frequency. Due to the filter capacitor, a higher switching frequency cannot be achieved. This would result in continuous through-switching.

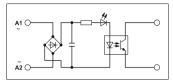


Figure 2: block diagram for AC input

Load side

Depending on the application and the type of load, the solid-state relay output must meet various requirements. The following are crucial:

- Power amplification
- Matching the switching voltage and the switching current (AC/DC)
- Short-circuit protection

For these different applications, the solid-state relay element must also be processed using additional electronics on the output side.

DC output

In order to achieve the necessary output power, the solid-state relay element is supplemented by one or more semiconductor components.

The on-site user should nevertheless simply regard the connection terminal blocks of the output as conventional switch connections. Observing the specified polarity is the only essential requirement.

For practical reasons, the following criteria should be taken into account when selecting a suitable solid-state relay:

- 1. Operating voltage range
 - (e.g., 12 ... 60 V DC)

This determines the minimum or maximum voltage to be switched. The lower value must be observed in order to ensure reliable operation. In order to protect the output transistor, the upper value must not be exceeded.

Maximum continuous current (e.g., 1 A) This value indicates the maximum continuous current. If this value is exceeded continuously, the output semiconductor will be destroyed. The dependence of the output current on the ambient temperature of the solid-state relay should also be taken into consideration. A derating curve is therefore generally specified for solid-state power relays. This

- shows the maximum load current as a function of the ambient temperature.
- 3. Output circuit

The 2-conductor output is similar to a mechanical contact. Only the polarity of the connections is specified and must be observed.

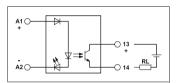


Figure 3: 2-conductor output

The 3-conductor output is non-isolated and requires both potentials from the voltage source on the output side to be connected if it is to operate reliably.

When switched off, a permanent reference to ground (negative potential) is established. In addition, this output circuit offers the advantage of an almost constant internal resistance.

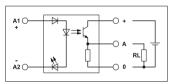


Figure 4: 3-conductor output

AC output

In order to control the switching and control devices for AC voltage, a semiconductor for AC voltage (TRIAC or thyristor) is connected downstream of the solid-state relay element.

As with the DC output, it is particularly important to consider the maximum operating voltage range and the maximum continuous load current as a function of the ambient temperature.

Basics of solid-state relay technology

In addition, the maximum peak reverse voltage of the TRIAC (e.g., 600 V) is crucial with AC outputs. This must not be exceeded even in the case of voltage fluctuations or interference voltage peaks in order to prevent destruction. That is why the AC outputs of all solid-state relays from Phoenix Contact have an internal RC protective circuit to protect against interference voltage peaks.

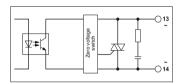


Figure 5: basic circuit diagram of AC output

Protective circuits

The moment inductive loads (contactors, solenoid valves, motors) are switched off, surge voltages occur and these can reach very high amplitudes. Electronic components and switching elements are particularly susceptible to these. A protective circuit should therefore always be provided to prevent destruction.

A parallel connection to the load effectively reduces the switching surge voltage to a harmless level. Depending on the solidstate relay output and type of load:

- A freewheeling diode/suppressor diode (DC only)
- A varistor (AC and DC)
- Or an RC element (AC only) can provide the necessary protection.

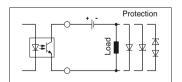


Figure 6: protective circuit with DC voltage output

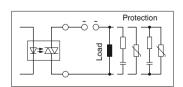


Figure 7: protective circuit with AC voltage output

Application notes

Input solid-state relays acting in the direction from the I/O devices to the controller (signaling, controlling, monitoring)

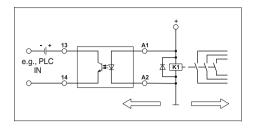
Plug-in version:

PLC-O...

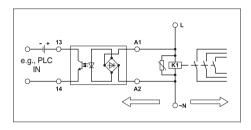
Modular version:

- DEK-OE...
- EMG 10-OE...
- SIM-EI...
- OPT...

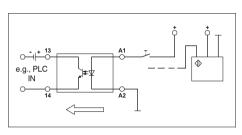
Example: load contactor monitoring (DC contactor)



Example: load contactor monitoring (AC contactor)



Example: position indication with limit stop contact or initiator



Output (power) solid-state relays acting in the direction from the controller to the I/O devices (switching, amplifying, controlling)

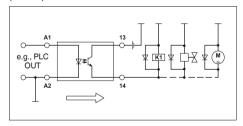
Plug-in version:

PLC-O...

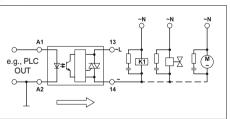
Modular version:

- DEK-OV...
- **EMG 10-OV**
- **EMG 12-OV**
- **EMG 17-OV**
- OV...
- OPT...

Example: switching the contactor, solenoid valve or motor (DC load)



Example: switching the contactor, solenoid valve or motor (AC load)



Remarks:

- 1) Ground (negative) potential from the input and output of the solidstate relay must not be connected.
- 2) DC loads must be provided with an effective protective circuit
- 3) AC loads must be protected with a varistor or an RC element.



RIFLINE complete is an inexpensive relay system with various accessories. It consists of DIN rail bases, electromechanical or solid-state relays, plug-in input/interference suppression modules, marking material, and bridging material. The range of accessories is rounded off with a timer module. This can be used to transform a basic relay into a timer relay with three different functions.

The RIFLINE complete relay range consists of seven different base versions from RIF-0 to RIF-4 - these range from one N/O contact up to four PDT contacts. The field of application of this product group ranges from coupling relay applications with switching currents of one milliamp to replacement for miniature contactors with currents up to 16 A.

The relay bases feature push-in connection technology, which enables quick and tool-free conductor contacting. The RIF-1 to RIF-4 bases offer double the contact options on both the input and output side.

On the input side of all bases, the negative potential (A2) can be bridged - regardless of the base size. On the output side, the grouped contact (11) can be bridged within the RIF-0 base version. This connection can also be bridged within the RIF-1 base size.

To offer diverse marking options, the engagement lever can be fitted with a zack marker strip. In addition, marker carriers

can be mounted on the bases so that additional marking surfaces are available.

RIFLINE complete can be extended using many elements from the CLIPLINE complete accessories range. This includes marking material, bridges, and test adapters.

To make ordering and management easy, RIFLINE complete modules are provided in the most popular voltages as complete modules with relay and input/interference suppression module. For individual assembly, tailored to the requirements of the application, additional voltage levels are offered in the modular system.



RIF-0

The narrow 6.2 mm RIF-0 base series is designed for miniature relays with one contact. Switching currents up to 6 A are implemented here. Two base versions are available: 1 N/O contact and 1 PDT contact. RIF-0 is therefore a good choice for all coupling applications.



RIF-1

The narrow 16 mm RIF-1 base series is designed for miniature relays with 2 contacts. Currents up to 13 A can be switched when using the FBS 2-8 plug-in bridge. This is the ideal relay for applications that require coupling, power switching, and signal duplication.



RIF-2

The 31 mm wide RIF-2 base series is designed for industrial relays with up to 4 contacts. Currents up to 12 A are no problem for these bases. This relay is ideal for applications that require power and signal multiplication.



RIF-3

The 40 mm wide RIF-3 base series is designed for octal relays with up to 3 contacts. Switching currents up to 10 A can be implemented here. Two base versions are available: 2 PDT contacts and 3 PDT contacts. RIF-3 bases are ideal for all applications that require power and signal multiplication.



RIF-4

The 43 mm wide RIF-4 base series is designed for power relays with up to 3 contacts. Currents up to 16 A can be switched. RIF-4 bases are a good choice for applications that require power and signal multiplication, e.g., in miniature contactor applications.



Accessories

A wide range of accessories are available for the RIFLINE complete relay system that round off the range. These include bridges, professional marking material, special function modules, test plugs, and end brackets.

Modular RIF-0 relay base

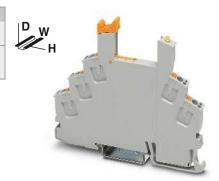
Relay base that can be fitted with miniature power relays or solid-state relays with a nominal voltage of 12 to 24 V DC.

The advantages:

- Integrated freewheeling diode for input circuit and interference suppression circuit
- LED for status display
- Safe isolation according to DIN EN 50178 between coil and contact
- Professional marking material
- Holders for test plugs
- Professional bridging of adjacent modules saves wiring time (A2 and 11/13)
- FBS 2-6 plug-in bridges for the input and output side

Type of insulating housing: Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.



1 PDT relay base for miniature power relay

Nominal voltage U_N

RIF-0 relay base, PDT version, safe isolation I/O

RIF-0 relay base, N/O contact version, safe isolation I/O

General data

Nominal current at U_N

Ambient temperature (operation)

Connection data solid / stranded / AWG Dimensions

Width

Depth

Height

Description

10-section

With push-in connection

With push-in connection

Technical data

230 V AC (Contact side) max. 8 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

6.2 mm 78 mm

93 mm

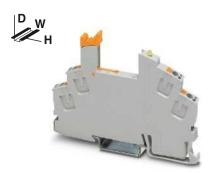
Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
RIF-0-BPT/21	2900958	10

Plug-in bridge 2-pos. red 2-pos. blue 2-pos. gray 5-pos. red 10-pos. red 20-pos. red 50-pos. red **End clamp**, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM... Test plug, consisting of: Metal part for 2.3 mm Ø socket hole and Insulating sleeve, for MPS metal part

red white blue vellow green gray black Zack marker strip, 10-section, unprinted: pack contains enough to label 100 terminal blocks

Accessories	•	
FBS 2-6 FBS 2-6 BU FBS 2-6 GY FBS 5-6 FBS 10-6 FBS 20-6 FBS 50-6	3030336 3036932 3032237 3030349 3030271 3030365 3032224	50 50 50 50 10 10
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD MPS-IH WH MPS-IH BU MPS-IH YE MPS-IH GN MPS-IH GY MPS-IH BK	0201676 0201663 0201689 0201692 0201702 0201728 0201731	10 10 10 10 10 10
ZB 6:UNBEDRUCKT	1051003	10





1 N/O contact relay base for miniature power relay

Technical data

230 V AC

max. 8 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)

 $0.14 \dots 1.5 \ \text{mm}^2 \, / \, 0.14 \dots 1.5 \ \text{mm}^2 \, / \, 26 - 16$

6.2 mm

66 mm 93 mm

93 mm		
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
RIF-0-BPT/1	2901873	10
Accessories	•	
FBS 2-6 FBS 2-6 BU FBS 2-6 GY FBS 5-6 FBS 10-6 FBS 20-6 FBS 50-6	3030336 3036932 3032237 3030349 3030271 3030365 3032224	50 50 50 50 10 10
CLIPFIX 35	3022218	50
MPS-MT MPS-IH RD MPS-IH WH MPS-IH BU	0201744 0201676 0201663 0201689	10 10 10 10
MPS-IH YE MPS-IH GN MPS-IH GY MPS-IH BK	0201692 0201702 0201728 0201731	10 10 10 10
ZB 6:UNBEDRUCKT	1051003	10

Plug-in miniature power relays

Plug-in miniature power relays suitable for RIF-0 and PLC-INTERFACE relay bases.

The advantages:

- Power contacts up to 6 A
- Multi-layer gold contact or power contact
- High degree of protection RT III (comparable with IP67)
- Safe isolation according to DIN EN 50178 between coil and contact
- Can be soldered in on PCB



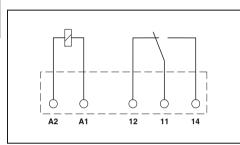
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For dimensional drawings and perforations for assembly, see page $344\,$



1 PDT





Technical data

Single contact, 1-PDT

Input data	1
Permissible range (with reference to U _N)	refe
Typ. input current at U _N [mA]	14
Typ. response time at U _N [ms]	5
Typ. release time at U _N [ms]	2.5
Output data	
Contact type	Sing

Contact material Max. switching voltage Min. switching voltage Limiting continuous current

Max. inrush current Min. switching current General data

Test voltage (winding / contact) Ambient temperature (operation) Nominal operating mode Mechanical service life Standards/regulations

Mounting position/mounting Dimensions

[mA] [ms] [ms]	refer to the diagram 14 7 5 5 2.5 2.5
	Single contact, 1-PI
	AgSnO 250 V AC/DC 5 V (at 100 mA) 6 A (on request) 10 mA (at 12 V)
	4 kV AC (50 Hz, 1 m -40°C 85°C 100% operating fact 2 x 10 ⁷ cycles

2.5 ngle contact, 1-PDT

2

SnO AgSnO, hard gold-plated 0 V AC/DC 30 V AC / 36 V DC V (at 100 mA) 100 mV (at 10 mA) 50 mA n request) 50 mA mA (at 12 V) 1 mA (at 24 V)

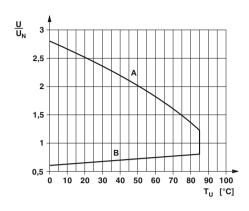
kV AC (50 Hz, 1 min.) 0°C ... 85°C 0% operating factor 10⁷ cycles

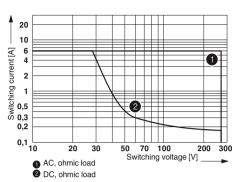
IEC 60664, EN 50178, IEC 62103 Any / In rows with zero spacing 5 mm / 28 mm / 15 mm

Description		Input voltage U _N
Plug-in miniature power relays		
with power contact	1	12 V DC
with power contact	2	24 V DC
Plug-in miniature power relays		
with gold contact	1	12 V DC
with gold contact	2	24 V DC

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-MR- 12DC/21	2961150	10	
REL-MR- 24DC/21	2961105	10	
REL-MR- 12DC/21AU	2961163	10	
REL-MR- 24DC/21AU	2961121	10	

REL-MR-.../21... (1 PDT)





Interrupting rating

Plug-in solid-state relays

Plug-in solid-state relays suitable for RIF-0 and PLC-INTERFACE relay bases.

The advantages:

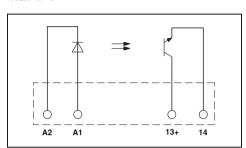
- Switching capacity of up to 24 V DC/3 A
- RT III wash tight (comparable to IP67)
- Vibration- and shock-resistant
- Wear-free and long-lasting
- Zero voltage switch at AC output
- Can be soldered in on PCB

For dimensional drawings and perforations for assembly, see



Max. DC voltage output of 3 A





Technical data

Input data	
Permissible range (with reference to U _N)	
Switching level	1 signal ("H") [V DC] ≥ 0 signal ("L") [V DC] ≤
Typ. input current at U_N Typ. switch-on time at U_N Typ. switch-off time at U_N Transmission frequency f_{imit}	[mA] [μs] [μs] [Hz]
Output data Max. switching voltage	
Min. switching voltage Limiting continuous current Min. load current	
Max. inrush current	
Leakage current in off state Phase angle (cos φ)	
Output circuit	
Max. load value	
Output protection Voltage drop at max. limiting continuous cu	rrent
General data	
Rated surge voltage Test voltage input/output Ambient temperature (operation)	
Nominal operating mode	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting Dimensions	W/II/D
Dimensions	W/H/D

Description		Input voltage $U_{\rm N}$
Plug-in solid-state relays Solid-state power relays	1	24 V DC
Plug-in solid-state relays Solid-state input relays	1	24 V DC

1
0.8 - 1.2 16 10 7 20 300
300
33 V DC 3 V DC 3 A (see derating curve) - 15 A (10 ms) 2-conductor, floating - Protection against polarity reversal, surge protection ≤ 150 mV
Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C 60°C 100% operating factor IEC 60664, EN 50178, IEC 62103 2 / III Any / In rows with zero spacing 5 mm / 28 mm / 15 mm

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
OPT-24DC/ 24DC/ 2	2966595	10		

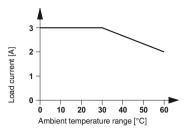
Derating curve for OPT...DC/24DC/2 and PLC-OS.../24DC/2 solid-state relays



Max. DC voltage output of 100 mA

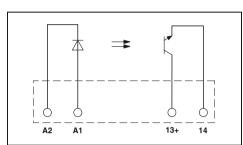


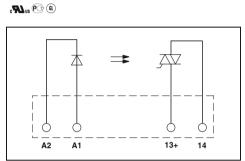
Max. AC voltage output of 750 mA



Derating curve for OPT...DC/230AC/1 and PLC-OS.../230AC/1 solid-state relays







	A						
7	50 —			_			
_				`			
Load current [mA]							
t .							
F 3	00 -						`
บี ป							
oa	0						_
_	0	10	20	30	40	50	60
		bient t					

	Technical data
1	
0.8 -	
1.2	
16	
10	
7	
20	
300	
300	
101/100	

300
48 V DC
3 V DC
100 mA
-
-
-
-
2-conductor, floating
-
Protection against polarity reversal, surge protection ≤ 1 V

Basic insulation
2.5 kV (50 Hz, 1 min.)
-25°C 60°C
100% operating factor
IEC 60664, EN 50178, IEC 62103
2/III
Any / In rows with zero spacing
5 mm / 28 mm / 15 mm

5 mm / 28 mm / 15 mm			_
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
OPT-24DC/ 48DC/100	2966618	10	

Technical data
①
0.8 - 1.2 10 5 3 6000 500
10
253 V AC 24 V AC 0.75 A (see derating curve) 10 mA 30 A (10 ms) <1 mA 0.5 2-conductor floating, zero voltage switch 4.5 A2s RCV circuit <1 V
Basic insulation
Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C 60°C 100% operating factor IEC 60664, EN 50178, IEC 62103

5 mm / 28 mm / 15 mm			
Ordering data			
Туре	Order No.	Pcs./ Pkt.	
OPT-24DC/230AC/ 1	2967950	10	

2/111

Any / In rows with zero spacing

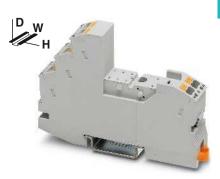
Modular RIF-1 relay base

Relay base that can be fitted with 1 or 2 PDT relays or solid-state relays. Range of accessories includes:

- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)
- FBS 2-8 plug-in bridges for the output side (11/21)

Type of insulating housing: Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.



2 PDT relay base for miniature power relay

Nominal voltage U_N Nominal current at U_N

General data

Ambient temperature (operation)

Connection data solid / stranded / AWG

Dimensions Width

Description

Depth with retaining bracket

Double marker carrier for ZB 5

Height

Technical data

230 V AC

max. 13 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

16 mm 75 mm

93 mm

	Ordering data				
	Туре	Order No.	Pcs. / Pkt.		
1	RIF-1-BPT/2X21	2900931	10		

Accessories

0800967

100

Relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-1 relay base

RIF-1 relay base, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection

Plug-in bridge			
2-pos. red	FBS 2-6	3030336	50
2-pos. blue	FBS 2-6 BU	3036932	50
2-pos. gray	FBS 2-6 GY	3032237	50
2-pos. red	FBS 2-8	3030284	10
2-pos. blue	FBS 2-8 BU	3032567	10
2-pos. gray	FBS 2-8 GY 7042	3032541	10
End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM			
	CLIPFIX 35	3022218	50
Test plug, consisting of:			
Metal part for 2.3 mm Ø socket hole and	MPS-MT	0201744	10
Insulating sleeve, for MPS metal part red	MPS-IH RD	0201676	10
white	MPS-IH WH	0201663	10
blue	MPS-IH BU	0201689	10
yellow	MPS-IH YE	0201692	10
green	MPS-IH GN	0201702	10
gray	MPS-IH GY	0201728	10
black	MPS-IH BK	0201731	10
Zack marker strip, unprinted			
10-section	ZB 5 :UNBEDRUCKT	1050004	10
5-section	ZB 15:UNBEDRUCKT	0811972	10





Relay retaining bracket

	Technical da	ta	
-			
-			
-			
-			
-			
-			
-			
	Ordering dat	ta	
_			Pcs. /

Туре	Order No.	Pcs. / Pkt.
RIF-RH-1	2900953	10
Accessories		10

Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:

- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type



If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

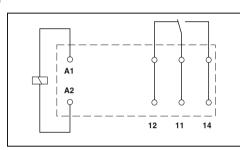


1 PDT relay

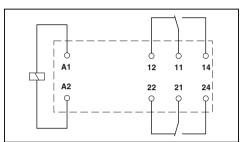


2 PDT relay









Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max, inrush current, AC	
Max, inrush current, DC	
Min. switching current	
General data	
Test voltage (winding / contact)	
Test voltage (contact/contact)	
Ambient temperature (operation), AC	
Ambient temperature (operation), DC	
Mechanical service life, AC	
Mechanical service life, DC	
Standards/regulations	

r common data							
1	2	3	4	(5)	6	7	8
refer t	o the dia	gram					
33	17	8.7	8.2	4.1	32	7	3
7	7	7	7	7			
					3 - 12	3 - 12	3 - 12
3	3	3	3	3			
					2-9	2 - 9	2 - 9
0: 1		4 007		0: 1		4 DDT	
Single	contact	, 1-PDT		Single	e contact,	1-PD1	
AgNi				AaNi.	hard gold	-plated	
-	AC/DC			-	AC / 36 V		

Technical data

AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
12 V (at 10 mA)	100 mV (at 10 mA)
16 A	50 mA
25 A (20 ms)	50 mA
50 A (20 ms)	50 mA
10 mA (at 12 V)	1 mA (at 24 V)

5 kV AC (50 Hz, 1 min.)

-40°C ... 85°C -40°C ... 85°C 1 x 10⁷ cycles 3 x 10⁷ cycles

IEC 60664, EN 50178, IEC 62103

			Techn	ical da	ata		
1	2	3	4	(5)	6	7	8
refer t	to the dia	gram					
33	17	8.7	8.2	4.1	32	7	3
7	7	7	7	7			
					3 - 12	3 - 12	3 - 12
3	3	3	3	3			
					2 - 9	2 - 9	2 - 9

Single contact, 2-	PDT	Single contact, 2-PDT	
AgNi 250 V AC/DC 5 V (at 10 mA) 8 A 12 A (20 ms) 25 A (20 ms) 10 mA (At 5 V)		AgNi, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA 50 mA 1 mA (at 24 V)	
. (. ,		,	

5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 85°C -40°C ... 85°C 1 x 10⁷ cycles 3 x 10⁷ cycles

|--|

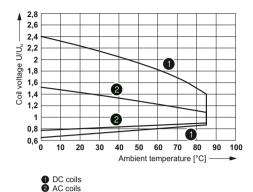
Description		Input voltage $U_{\rm N}$
Plug-in miniature power relays		
with power contact	1	12 V DC
with power contact	2	24 V DC
with power contact	3	48 V DC
with power contact	4	60 V DC
with power contact	(5)	110 V DC
with power contact	6	24 V AC
with power contact	7	120 V AC
with power contact	8	230 V AC
Plug-in miniature power relays		
with gold contact	1	12 V DC
with gold contact	2	24 V DC
with gold contact	③ ④	48 V DC
with gold contact	4	60 V DC
with gold contact	(5)	110 V DC
with gold contact	6	24 V AC
with gold contact	7	120 V AC
with gold contact	8	230 V AC

Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
REL-MR- 12DC/21HC REL-MR- 24DC/21HC REL-MR- 48DC/21HC REL-MR- 60DC/21HC REL-MR-110DC/21HC REL-MR-120AC/21HC REL-MR-120AC/21HC REL-MR-12DC/21HC REL-MR-230AC/21HC	2961309 2961312 2834821 2961325 2961338 2961406 2961419 2961422 2961532 2961545	10 10 10 10 10 10 10 10 10
REL-MR-110DC/21HC AU REL-MR- 24AC/21HC AU REL-MR-120AC/21HC AU REL-MR-230AC/21HC AU	2961561 2961503 2961516 2961529	10 10 10 10

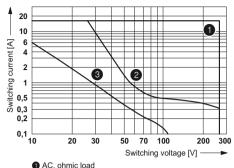
IEC 60664, EN 50178, IEC 62103				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
REL-MR- 12DC/21-21 REL-MR- 24DC/21-21 REL-MR- 48DC/21-21 REL-MR- 60DC/21-21 REL-MR-110DC/21-21 REL-MR-24AC/21-21 REL-MR-120AC/21-21 REL-MR-230AC/21-21	2961257 2961192 2834834 2961273 2961202 2961435 2961448 2961451	10 10 10 10 10 10 10		
REL-MR- 12DC/21-21AU REL-MR- 24DC/21-21AU REL-MR- 48DC/21-21AU REL-MR- 60DC/21-21AU REL-MR-110DC/21-21AU REL-MR- 24AC/21-21AU REL-MR-220AC/21-21AU REL-MR-230AC/21-21AU	2961299 2961215 2834847 2961286 2961228 2961464 2961477 2961480	10 10 10 10 10 10 10		

REL-MR...21HC... (1 PDT)



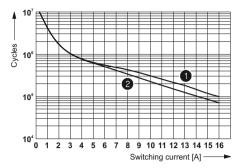


Interrupting rating



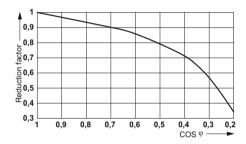
1 AC, ohmic load 2 DC, ohmic load 3 DC, L/R = 40 ms

Electrical service life



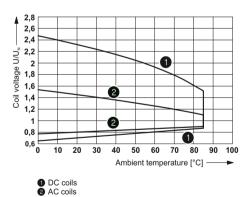
250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi

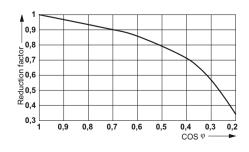


REL-MR...21-21... (2 PDTs)

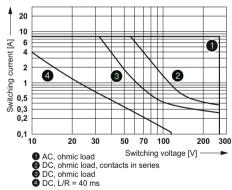
Operating voltage range



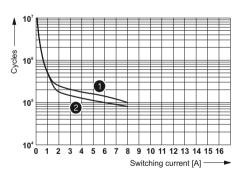
Service life reduction factor with various cos phi



Interrupting rating



Electrical service life



1 250 V AC, ohmic load (DC coils) 2 250 V AC, ohmic load (AC coils)

Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1 and PR1 relay bases.

The advantages:

- Switching current of up to 16 A
- With lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode
- Can be soldered in on PCB



If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

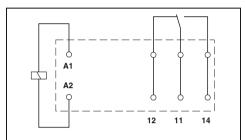


1 PDT relay



2 PDT relay

9 Us **₽**

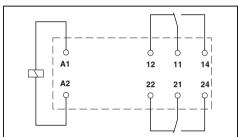


Technical data

3.5

2 - 8





Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	

Contact type

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current, AC Max. inrush current, DC Min. switching current

Standards/regulations

General data Test voltage (winding / contact) Test voltage (contact/contact) Ambient temperature (operation), AC Ambient temperature (operation), DC Mechanical service life, AC Mechanical service life, DC

1 refer to the diagram 18 6

> AgNi 250 V AC/DC 12 V (at 10 mA) 16 A 32 A (20 ms) 32 A (20 ms) 10 mA (at 12 V)

2

32

2-8

3

3-12 3-12

2-8

Single contact, 1-PDT Single contact, 1-PDT AgNi, hard gold-plated 30 V AC / 36 V DC 12 V (At 1 mA) 50 mA 50 mA 50 mA 1 mA (at 12 V)

5 kV AC (50 Hz, 1 min.) -40°C ... 70°C -40°C ... 70°C°C 5 x 106 cycles 5 x 106 cycles

DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

Technical data 2 1 3 refer to the diagram 18 9 3-12 3-12 3-12

6 2-8 2-8 2-8

Single contact, 2-PDT Single contact, 2-PDT AgNi AgNi, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 12 V (at 10 mA) 12 V (At 1 mA) 8 A 50 mA 16 A (20 ms) 50 mA 16 A (20 ms) 50 mA 10 mA (at 12 V) 1 mA (at 12 V)

5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 70°C -40°C ... 70°C 5 x 106 cycles 5 x 106 cycles

DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

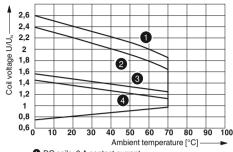
Description		Input voltage U _N		
Plug-in miniature power relays, with power contacts				
- Status LED, freewheeling diode A1+, A2-	1	24 V DC		
- Status LED - Status LED - Status LED	② ③ ④	24 V AC 120 V AC 230 V AC		
Plug-in miniature power relays with manual test function, with hard gold-plated multi-layer contacts, mechanical switch position indicator				
- Status LED, freewheeling diode A1+, A2-	1	24 V DC		
- Status LED	4	230 V AC		

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-MR- 24DC/21HC/MS REL-MR- 24AC/21HC/MS REL-MR-120AC/21HC/MS REL-MR-230AC/21HC/MS	2987888 2987891 2987901 2987914	10 10 10 10	
REL-MR- 24DC/21HC AU/MS REL-MR-230AC/21HC AU/MS	2987927 2987930	10 10	

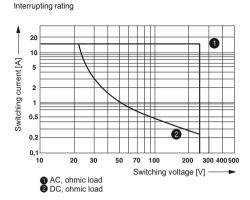
	Ordering data			
/	Туре	Order No.	Pcs. / Pkt.	
	REL-MR- 24DC/21-21/MS REL-MR- 24AC/21-21/MS REL-MR-120AC/21-21/MS REL-MR-230AC/21-21/MS	2987943 2987956 2987969 2987972	10 10 10 10	
	REL-MR- 24DC/21-21AU/MS REL-MR-230AC/21-21AU/MS	2987985 2987998	10 10	

REL-MR...21HC...MS (1 PDT)

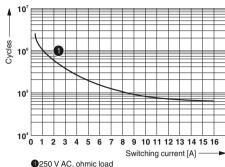
Operating voltage range



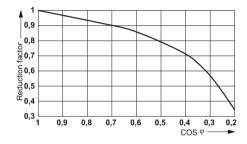
- DC coils, 0 A contact current
 DC coils, 16 A contact current
 AC coils, 0 A contact current
 AC coils, 16 A contact current



Electrical service life

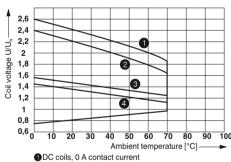


Service life reduction factor with various cos phi



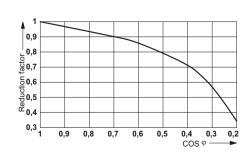
REL-MR...21-21...MS (2 PDTs)

Operating voltage range

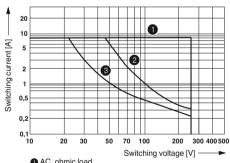


- 2DC coils, 16 A contact current 3AC coils, 0 A contact current 4AC coils, 16 A contact current

Service life reduction factor with various cos phi

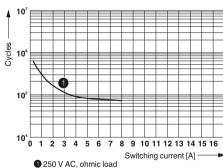


Interrupting rating



- 1 AC, ohmic load
- 2 DC, ohmic load, contacts in series
- 3 DC, ohmic load

Electrical service life



RIFLINE complete

Plug-in solid-state relays

Plug-in solid-state relays suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:

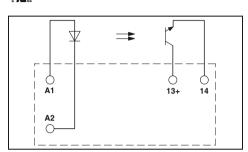
- Switching capacity of up to 24 V DC/5 A
- RT III wash tight (comparable to IP67)
- Vibration- and shock-resistant
- Wear-free and long-lasting
- Zero voltage switch at AC output
- Can be soldered in on PCB

For dimensional drawings and perforations for assembly,



Max. DC voltage output of 5 A

c**91**0s



Input data	
Permissible range (with reference to U _N)	
Switching level	1 signal ("H") [V DC] ≥ 0 signal ("L") [V DC] ≤
Typ. input current at U _N	[mA]
Typ. switch-on time at U _N	[µs
Typ. switch-off time at U _N	[µs
Transmission frequency f _{limit}	[Hz
Output data	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. load current	
Max. inrush current	
Leakage current in off state	
Phase angle (cos φ)	
Output circuit	
Max. load value	
Output protection	
Voltage drop at max. limiting continuous c	urrent
General data	
Rated surge voltage	
Test voltage input/output	
Ambient temperature (operation)	
Nominal operating mode	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting	
Dimensions	W/H/D

	W/H/D
	Input voltage
	U_N
①	5 V DC
-	
(2)	24 V DC
3	60 V DC
	1 @

			Technical data
1	2	3	
0.8 -	0.8 -	0.9 -	
1.2	1.2	1.1	
2.5	16	35	
0.8	10	20	
9	7	3	
10	20	25	
400	400	400	
300	300	300	
33 V D	С		

3 V DC

5 A (see derating curve)

15 A (10 ms)

2-conductor, floating

Protection against polarity reversal, surge protection

≤ 200 mV

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor

IEC 60664, EN 50178, IEC 62103

2 / III

Any / In rows with zero spacing 12.7 mm / 29 mm / 15.7 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
OPT- 5DC/ 24DC/ 5 OPT-24DC/ 24DC/ 5 OPT-60DC/ 24DC/ 5	2982113 2982100 2982126	10 10 10	

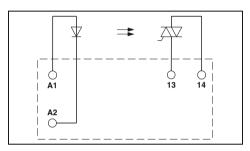
RIFLINE complete

Derating curve for OPT...DC/24DC/5 solid-state relays



Max. AC voltage output of 2 mA

c**91** us



T	nnh	ni	cal	211

i ecimicai data					

253 V AC 24 V AC

2 A (see derating curve)

25 mA

30 A (10 ms)

2-conductor floating, zero voltage switch

4 A²s (tp = 10 ms, at 25°C)

Surge protection

Basic insulation

2.5 kV (50 Hz, 1 min.)

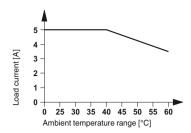
-25°C ... 60°C

100% operating factor

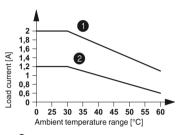
IEC 60664, EN 50178, IEC 62103

Any / See derating curve 12.7 mm / 29 mm / 15.7 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
OPT- 5DC/230AC/ 2 OPT-24DC/230AC/ 2 OPT-60DC/230AC/ 2	2982168 2982171 2982184	10 10 10	



Derating curve for OPT...DC/230AC/2 solid-state relays



1 Aligned with > 10 mm spacing
2 Aligned without spacing

Modular RIF-2 relay base

Relay base that can be fitted with 2 or 4 PDT relays.

Range of accessories includes:

- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

Notes:

Type of insulating housing: Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.



4 PDT relay base for industrial relay

Nominal voltage U_N Nominal current at U_N Seneral data Ambient temperature (operation) Connection data solid / stranded / AWG Dimensions Width Depth with retaining bracket Technical data 250 V AC max. 12 A (Depends on application/assembly) -40°C ... 85°C (Depends on application/assembly) 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 The strands of the

Height	93 mm	
	Orde	ering data
Description	Туре	Order No. Pcs. Pkt.
RIF-2 relay base, plug-in option for input/interference sup module, safe isolation I/O with push-in connection	pression RIF-2-BPT/4X21	2900934 10
Relay retaining bracket, with ejector function and holder marking material, suitable for RIF-2 relay base	for	
	Acc	cessories
Plug-in bridge 2-pos. red 2-pos. blue 2-pos. gray End clamp, to snap on NS 35, 9.5 mm wide, can be label with ZB 6, ZB 8/27, KLM Test plug, consisting of: Metal part for 2.3 mm Ø socket hole and	FBS 2-6 FBS 2-6 BU FBS 2-6 GY ed CLIPFIX 35	3030336 50 3036932 50 3032237 50 3022218 50 0201744 10
Insulating sleeve, for MPS metal part	red MPS-IH RD white MPS-IH WH blue MPS-IH BU yellow MPS-IH YE green MPS-IH GN gray MPS-IH GY black MPS-IH BK	0201676 10 0201663 10 0201689 10 0201692 10 0201702 10 0201728 10 0201731 10
Zack marker strip, unprinted 10-section 5-section Double marker carrier for ZB 5	ZB 5 :UNBEDRUCKT ZB 15:UNBEDRUCKT STP 5-2	1050004 10 0811972 10 0800967 100

20





Relay retaining bracket

	Technical	data	
-			
-			
-			
-			
-			

- -					
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
RIF-RH-2	2900954	10			
Accessories					

Plug-in industrial relays

Plug-in industrial relays with 2 or 4 PDT contacts, suitable for RIF-2 and PR2 relay bases.

The advantages:

- Detectable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode



2 PDT relay

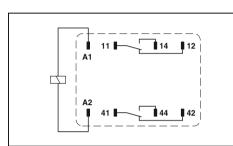


4 PDT relay

Notes:

For other voltages, see www.phoenixcontact.net/products

@ .**91**us



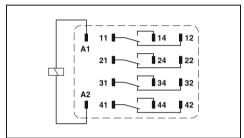
Technical data

(5)

7

2 3

(IP. 91) us



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current, AC	
Max. inrush current, DC	
Min. switching current	
General data	
Test voltage (winding / contact)	
Ambient temperature (operation), AC	
Ambient temperature (operation), DC	
Mechanical service life, AC	

refer t	to the dia	gram					
78	41	22	18	8	70	13	6.5
13	13	13	13	13			
					5 - 15	5 - 15	5 - 15
14	14	14	14	14			
14	14	14	14	14	E 20	5 - 20	5 - 20
					3-20	3-20	3-20
Single	contact	, 2-PDT					
AgNi	40/D0						
250 V AC/DC 5 V (At 24 mA)							
5 V (At 24 mA) 12 A							
12 A 30 A (20 ms, N/O contact)							
,	,	V/O conta	,				
	(at 24 V)		,				
		Iz, 1 min	.)				
	55°C						
	70°C						
	x. 2 x 10	-					
	ox. 2 x 10) [/] cycles					
IEC 6	Ubb4						

	Technical data						
1	2	3	4	(5)	6	7	8
refer t	to the dia	agram					
78	41	22	18	8	70	13	6.5
13	13	13	13	13			
					5 - 15	5 - 15	5 - 15
14	14	14	14	14			
					5 - 20	5 - 20	5 - 20
Single	Single contact, 4-PDT Single contact, 4-PDT						

g	
AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (At 24 mA)	5 V (At 24 mA)
6 A	50 mA
16 A (20 ms, N/O contact)	50 mA
16 A (20 ms, N/O contact)	50 mA
5 mA (at 24 V)	-
2.5 kV (50 Hz 1 min)	

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 55°C -40°C ... 70°C Approx. 2 x 10⁷ cycles Approx. 2 x 10⁷ cycles IEC 60664

Description	I	nput voltage U _N
Plug-in industrial relays, with power	contacts	
With freewheeling diode	1	12 V DC
With freewheeling diode	2	24 V DC
With freewheeling diode	3	48 V DC
With freewheeling diode	4	60 V DC
With freewheeling diode	(5)	110 V DC
-	6	24 V AC
	7	120 V AC
	8	230 V AC
Plug-in industrial relays, with multi-la	yer gold con	tacts
With freewheeling diode	1	12 V DC
With freewheeling diode	2	24 V DC
With freewheeling diode	3	48 V DC
With freewheeling diode	4	60 V DC
With freewheeling diode	(5)	110 V DC

6 7 8

24 V AC 120 V AC 230 V AC

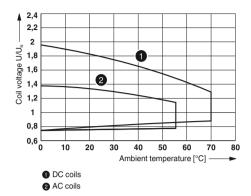
Ordering data		
Туре	Order No.	Pcs. / Pkt.
REL-IR2/LDP- 12DC/2X21 REL-IR2/LDP- 24DC/2X21 REL-IR2/LDP- 48DC/2X21 REL-IR2/LDP- 60DC/2X21 REL-IR2/LDP-110DC/2X21 REL-IR2/L-24AC/2X21 REL-IR2/L-120AC/2X21 REL-IR2/L-120AC/2X21	2903659 2903660 2903661 2903662 2903663 2903666 2903667 2903668	10 10 10 10 10 10 10

	Ordering data				
,	Туре	Order No.	Pcs. / Pkt.		
	REL-IR4/LDP- 12DC/4X21 REL-IR4/LDP- 24DC/4X21 REL-IR4/LDP- 48DC/4X21 REL-IR4/LDP- 60DC/4X21 REL-IR4/LDP-110DC/4X21 REL-IR4/L- 24AC/4X21 REL-IR4/L-120AC/4X21 REL-IR4/L-230AC/4X21	2903676 2903677 2903678 2903679 2903680 2903686 2903687 2903688	10 10 10 10 10 10 10		
	REL-IR4/LDP- 12DC/4X21AU REL-IR4/LDP- 24DC/4X21AU REL-IR4/LDP- 48DC/4X21AU REL-IR4/LDP- 60DC/4X21AU REL-IR4/LDP-110DC/4X21AU REL-IR4/L- 24AC/4X21AU REL-IR4/L-120AC/4X21AU REL-IR4/L-120AC/4X21AU	2903669 2903670 2903671 2903672 2903673 2903683 2903684 2903685	10 10 10 10 10 10 10		

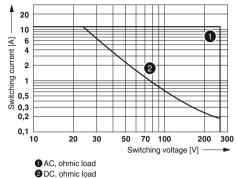
Mechanical service life, DC Standards/regulations

REL-IR2... (2 PDTs)

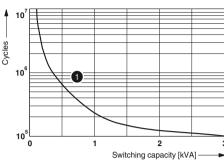




Interrupting rating

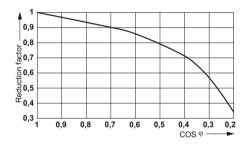


Electrical service life



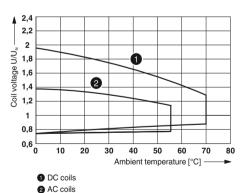
1 250 V AC, ohmic load

Service life reduction factor

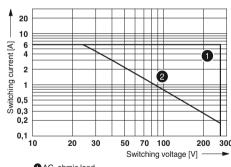


REL-IR4... (4 PDTs)

Operating voltage range

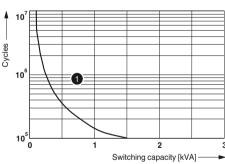


Interrupting rating



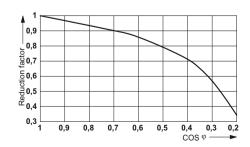
1 AC, ohmic load 2DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Modular RIF-3 relay base

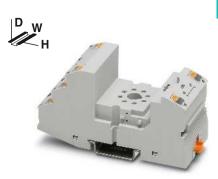
Relay base that can be fitted with 2 or 3 PDT relays.

Range of accessories includes:

- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

Type of insulating housing: Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.



2 PDT relay base for octal relay

Technical data

Nominal voltage U_N Nominal current at U_N

General data

Ambient temperature (operation)

Connection data solid / stranded / AWG

Dimensions Width

Description

Depth with retaining bracket

Height

250 V AC max. 12 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

40 mm 90 mm

100 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
RIF-3-BPT/2X21	2900937	10

RIF-3 relay base, 3 PDT version, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection

RIF-3 relay base, 2 PDT version, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection

Relay retaining bracket, with holder for marking material, suitable for RIF-3 relay base

	Accessories	5
Plug-in bridge 2-pos. red 2-pos. blue 2-pos. gray	FBS 2-6 FBS 2-6 BU FBS 2-6 GY	3030336 3036932 3032237
End clamp , to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM	CLIPFIX 35	3022218
Test plug, consisting of: Metal part for 2.3 mm Ø socket hole and Insulating sleeve, for MPS metal part red white blue yellow green gray black	MPS-MT MPS-IH RD MPS-IH WH MPS-IH BU MPS-IH GN MPS-IH GY MPS-IH BK	0201744 0201676 0201663 0201689 0201692 0201702 0201728 0201731
Zack marker strip, unprinted 10-section 5-section Double marker carrier for ZB 5	ZB 5 :UNBEDRUCKT ZB 15:UNBEDRUCKT STP 5-2	1050004 0811972 0800967

50

50

50

50

10

10

10

10

10

10

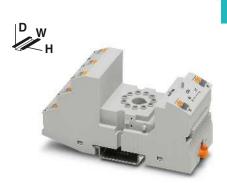
10

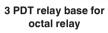
10

10

10

100







Relay retaining bracket

Technical data		Technical data				
250 V AC max. 12 A (Depends on application/assembly)		-				
-40°C 85°C (Depends on application/as	ssembly)		-			
0.14 1.5 mm ² / 0.14 1.5 mm ² / 26 - 16	3		-			
40 mm 90 mm 100 mm		- -				
Ordering date	ta			Ordering data	a	
Туре	Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs. / Pkt.
RIF-3-BPT/3X21	2900938	10				
			RIF-RH-3		2900955	10
Accessories	S		Accessories			
FBS 2-6 FBS 2-6 BU FBS 2-6 GY	3030336 3036932 3032237	50 50 50				
CLIPFIX 35	3022218	50				
MPS-MT	0201744	10				
MPS-IH RD MPS-IH WH MPS-IH BU	0201676 0201663 0201689	10 10 10				
MPS-IH YE MPS-IH GN	0201692 0201702	10				
MPS-IH GY MPS-IH BK	0201702 0201728 0201731	10 10 10				
ZB 5 :UNBEDRUCKT	1050004	10				
ZB 15:UNBEDRUCKT STP 5-2	0811972 0800967	10 100				
JIF J-2	0000907	100				

Plug-in octal relays

Plug-in octal relays with 2 or 3 PDT contacts, suitable for RIF-3 and PR3 relay bases.

The advantages:

- Detectable manual operation
- Mechanical switch position indicator
- Integrated status LED
- DC types with integrated freewheeling



2 PDT relay



3 PDT relay

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1

60

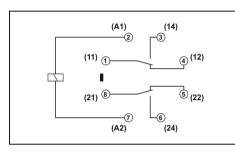
2 3

108 23

35 mm / 54.4 mm / 35 mm

5-15 5-15 5-15

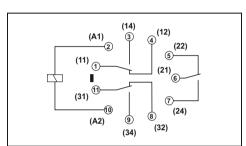
refer to the diagram



Technical data

(IP. 91) us

N



Technical data

Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	

Typ. release time at U _N (depending on phase relation)	[ms]
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current, AC	
Max. inrush current, DC	
Min. switching current	
General data	
Test voltage (winding / contact)	
Ambient temperature (operation), AC	
Ambient temperature (operation), DC	
Nominal operating mode	
Mechanical service life, AC	
Mechanical service life, DC	
Standards/regulations	
Mounting position/mounting	
Dimensions	W/H/D

5-20 5-20 5-20
Single contact, 2-PDT AgNi 250 V AC/DC 10 V (At 24 mA) 10 A 30 A (20 ms, N/O contact) 30 A (20 ms, N/O contact) 10 mA (at 24 V)
2.5 kV _{rms} (50 Hz, 1 min.) -40°C 55°C -40°C 70°C 100% operating factor Approx. 2 x 10 ⁷ cycles Approx. 2 x 10 ⁷ cycles IEC 60664

1	2	3
refer 60 18	to the diag 108	23
	5 - 15	5 -
	5 - 20	5 -
AgNi 250 V 10 V 10 A 30 A 30 A	e contact, ' AC/DC (At 24 mA) (20 ms, N/ (20 ms, N/ A (at 24 V)	O co
-40°C -40°C 100% Appro Appro IEC 6 Any	V _{rms} (50 Hz 5 55°C 6 70°C 6 operating 6 x. 2 x 10 ⁷ 6 x. 2 x 10 ⁷ 6 0664	fact cyclo cyclo

	5 - 20	5 - 20	5 - 20
AgNi 250 V A 10 V (A 10 A 30 A (2 30 A (2	AC/DC t 24 mA) 0 ms, N/	three PD O contac O contac	et)
2.5 kV	(50 Hz	z, 1 min.)	

2 3

5-15 5-15 5-15

o kv_{rms} (50 H)°C ... 55°C 0°C ... 70°C 0% operating factor prox. 2 x 107 cycles prox. 2 x 107 cycles 60664 mm / 54.4 mm / 35 mm

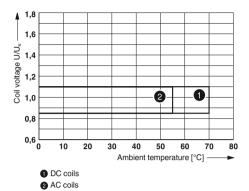
Description		Input voltage $U_{\rm N}$
Plug-in octal relays, with power contacts		
With freewheeling diode	1 2 3 4	24 V DC 24 V AC 120 V AC 230 V AC

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-OR2/LDP- 24DC/2X21	2903689	10	
REL-OR2/L- 24AC/2X21 REL-OR2/L-120AC/2X21	2903690 2903691	10 10	
REL-OR2/L-230AC/2X21	2903692	10	

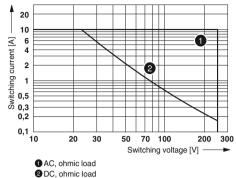
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-OR3/LDP-24DC/3X21 REL-OR3/L-24AC/3X21 REL-OR3/L-120AC/3X21 REL-OR3/L-230AC/3X21	2903693 2903694 2903695 2903696	10 10 10	

REL-OR2... (2 PDTs)

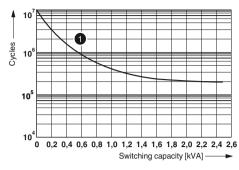




Interrupting rating

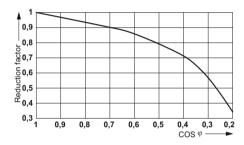


Electrical service life



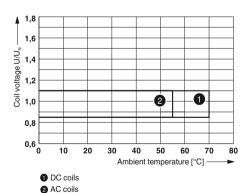
1 250 V AC, ohmic load

Service life reduction factor

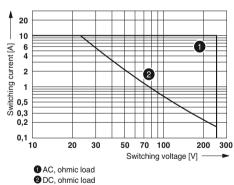


REL-OR3... (3 PDTs)

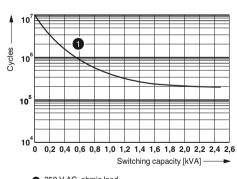
Operating voltage range



Interrupting rating

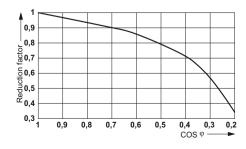


Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Modular RIF-4 relay base

Relay base that can be fitted with 2 or 3 PDT relays or 3 N/O relays. Range of accessories includes:

- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

Type of insulating housing: Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.



3 PDT relay base for

high-power relay

Nominal voltage U_N Nominal current at U_N

General data

Ambient temperature (operation)

Connection data solid / stranded / AWG

Input side Output side

Dimensions

Width

Depth with retaining bracket

Height

Technical data

400 V AC

max. 16 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

43 mm 90 mm

107 mm

Description

RIF-4 relay base, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection

Relay retaining bracket, with holder for marking material, suitable for RIF-4 relay base

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RIF-4-BPT/3X21	2900961	10	

Plug-in bridge	
2-pos. red	
2-pos. blue	
2-pos. gray	
End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM	
Test plug, consisting of:	
Metal part for 2.3 mm Ø socket hole and	
Insulating sleeve, for MPS metal part	red
	hite
	olue
ye	llow
gr	een
	gray
	lack
Zack marker strip, unprinted	
10-section	
5-section	
Double marker carrier for ZB 5	

Accessories			
FBS 2-6 FBS 2-6 BU FBS 2-6 GY	3030336 3036932 3032237	50 50 50	
CLIPFIX 35	3022218	50	
MPS-MT	0201744	10	
MPS-IH RD MPS-IH WH MPS-IH BU MPS-IH YE MPS-IH GN MPS-IH GY MPS-IH BK	0201676 0201663 0201689 0201692 0201702 0201728 0201731	10 10 10 10 10 10	
ZB 5 :UNBEDRUCKT ZB 15:UNBEDRUCKT STP 5-2	1050004 0811972 0800967	10 10 100	





Relay retaining bracket

	Techi	nical data	
-			
-			
-			
-			
-			
-			

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
RIF-RH-4	2900956	10			
Accessories	;				

Plug-in high-power relays

Plug-in high-power relays with 2 or 3 PDT contacts for the RIF-4 relay base.

The advantages:

- Use in miniature contactor applications
- Switching current of up to 16 A
- Up to 440 V AC switching voltage



2 PDT relay

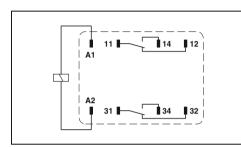


3 PDT relay

@ .**91**

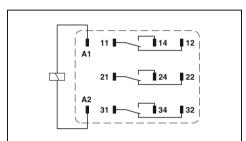
1

440 V AC



Technical data

(F. 91) us



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current, AC	
Max. inrush current, DC	
Min. switching current	
Max. interrupting rating, ohmic load	
	250 V AC

General data Test voltage (winding / contact) Ambient temperature (operation), AC Ambient temperature (operation), DC Nominal operating mode Mechanical service life, AC Mechanical service life, DC Standards/regulations Mounting position/mounting

Motor load according to UL 508

56 116 5-25 5-25 5-25 15 5-20 5-20 5-20 Single contact, 2-PDT

2 (3)

refer to the diagram

AgNi 440 V AC / 250 V DC 10 V (At 24 mA) 16 A 50 A (20 ms, N/O contact) 50 A (20 ms, N/O contact) 10 mA (at 24 V) 4000 VA

4000 VA 1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 55°C -40°C ... 70°C 100% operating factor Approx. 107 cycles Approx. 107 cycles IEC 60664 Anv 38.6 mm / 45.5 mm / 36.1 mm

				-
			Technical data	a
1	2	3	4	

refer to the diagram 56 116 20 5-25 5-25 5-25

15 5-20 5-20 5-20

Single contact, three PDTs AaNi 440 V AC / 250 V DC 10 V (At 24 mA)

16 A 50 A (20 ms, N/O contact) 50 A (20 ms, N/O contact) 10 mA (at 24 V)

4000 VA 4000 VA

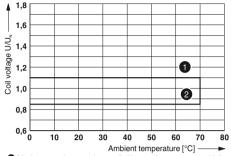
1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 55°C -40°C ... 70°C 100% operating factor Approx. 107 cycles Approx. 107 cycles IEC 60664 Any

W/H/D 38.6 mm / 45.5 mm / 36.1 mm Dimensions Ordering data Ordering data Input voltage U_N Pcs./ Pcs./ Description Order No. Type Order No. Plug-in high-power relays, 2 PDTs with power contacts 1 24 V DC REL-PR2- 24DC/2X21 2903698 24 V AC 2 REL-PR2- 24AC/2X21 2903699 3 REL-PR2-120AC/2X21 120 V AC 2903700 230 V AC REL-PR2-230AC/2X21 2903701 (4) Plug-in high-power relays, 3 PDTs with power contacts 24 V DC REL-PR3- 24DC/3X21 2903702 2 24 V AC REL-PR3- 24AC/3X21 2903703 3 120 V AC REL-PR3-120AC/3X21 4 230 V AC REL-PR3-230AC/3X21 2903705

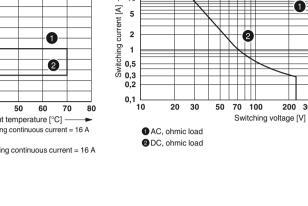
REL-PR2... (2 PDTs)

Operating voltage range



- Maximum continuous voltage at limiting continuous current = 16 A
- Minimum operate voltage
 For pre-excitation with UN and limiting continuous current = 16 A

Service life reduction factor



Interrupting rating

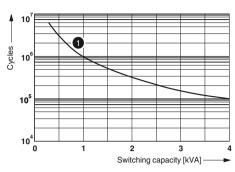
20

10

Electrical service life

200 300

500

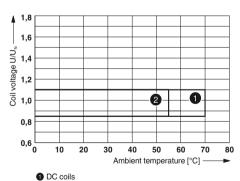


1 250 V AC, ohmic load

0,9 0,8 7,0 actor 8,000 Eduction (5,000 Eduction 0,3 **0,4** COS (0,9 0,8 0,7 0,6 0,5 0,3 0,2

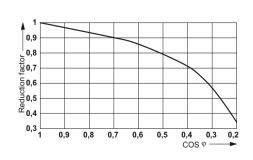
REL-PR3... (3 PDTs)

Operating voltage range

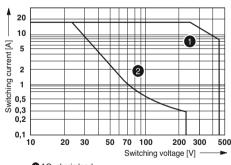


- 2 AC coils

Service life reduction factor

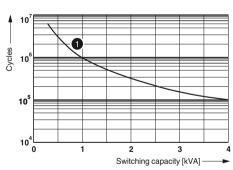


Interrupting rating



- 1 AC, ohmic load
- 2DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

RIFLINE complete

Plug-in high-power relays

Plug-in high-power relays with 3 N/O contacts suitable for the RIF-4 relay base.

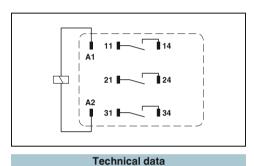
The advantages:0

- Use in miniature contactor applications
- Switching current of up to 16 A
- Up to 440 V AC switching voltage
- Full shutdown by means of ≥ 3 mm contact opening



3 N/O relay

⊕ ₀**\$**∪s



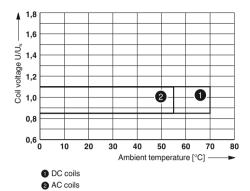
					Common data
Input data		1	2	3	4
Permissible range (with reference to U _N)		refer to	the diag	ram	
Typ. input current at U _N	[mA]	70	116	23	12
Typ. response time at U _N	[ms]	20			
Typ. response time at U _N	[ms]		5 - 25	5 - 25	5 - 25
(depending on phase relation)					
Typ. release time at U _N	[ms]	15			
Typ. release time at U_N (depending on phase relation)	[ms]		5 - 20	5 - 20	5 - 20
Output data					
Contact type		Single	contact,	3 N/O co	ntacts
Contact material		AgNi			
Max. switching voltage		440 V	AC / 250	V DC	
Min. switching voltage		10 V (A	At 24 mA))	
Limiting continuous current		16 A			
Max. inrush current, AC		50 A (2	20 ms, N/	O contac	et)
Max. inrush current, DC		50 A (20 ms, N/O contact)			
Min. switching current		10 mA (at 24 V)			
Max. interrupting rating, ohmic load					
	250 V AC	4000 V			
	440 V AC	4000 V			
Motor load according to UL 508					e-phase AC motor)
					e-phase AC motor)
General data		1/2 ПР	, 240 V F	(triree	-phase induction motor)
Test voltage (winding / contact)		25 1//	_{rms} (50 Hz	, 1 min \	
Ambient temperature (operation), AC			55°C	<u>, , , , , , , , , , , , , , , , , , , </u>	
Ambient temperature (operation), AC			70°C		
Nominal operating mode				factor	
Mechanical service life. AC		100% operating factor Approx. 10 ⁷ cycles			
Mechanical service life, AC			к. 10 сус к. 10 ⁷ сус		
Standards/regulations		IEC 60			
Mounting position/mounting		Any			
Dimensions	W/H/D	,	m / 45.5	mm / 36	1 mm
D	** / 1.1 / D	30.0 11	, 40.0	50.	

		Ordering data		
Description	Input voltage $U_{\rm N}$	Туре	Order No.	Pcs. / Pkt.
Plug-in high-power relays, 3 N/O contacts with power contacts				
①	24 V DC	REL-PR3- 24DC/3X1	2903706	1
2	24 V AC	REL-PR3- 24AC/3X1	2903707	1
3	120 V AC	REL-PR3-120AC/3X1	2903708	1
4	230 V AC	REL-PR3-230AC/3X1	2903709	1



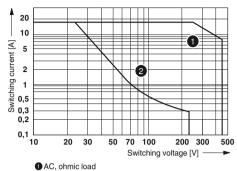
REL-PR2... (3 N/O contacts)

Operating voltage range

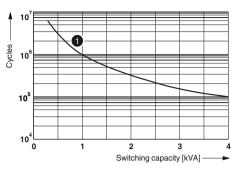


Interrupting rating

2DC, ohmic load

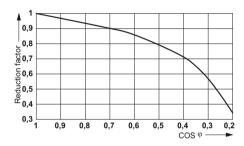


Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Input modules/interference suppression modules for RIF-1, RIF-2, RIF-3, and RIF-4

Plug-in input modules/interference suppression modules for optional fitting of RIF-1 to RIF-4 relay bases.

The advantages:

- Attenuation of reverse voltage induced in coil
- Mechanical coding to protect against incorrect connection





Input/interference suppression module

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
Plug-in module , with LED status indicator and freewheeling diode to effectively limit the coil induction voltage, polarity: A1+ , A2- , input voltage:			
- 12-24 V DC ±20% - 48-60 V DC ±20% - 110 V DC ±20%	RIF-LDP-12-24 DC RIF-LDP-48-60 DC RIF-LDP-110 DC	2900939 2900940 2900941	10 10 10
Plug-in module, with LED status indicator and varistor to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (30-V-varistor) - 48-60 V AC/DC ±20% (75-V-varistor) - 120-230 V AC/110 V DC ±20% (275-V-varistor)	RIF-LV-12-24 UC RIF-LV-48-60 UC RIF-LV-120-230 AC/110 DC	2900942 2900943 2900944	10 10 10
Plug-in module, with varistor to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (30-V-varistor) - 48-60 V AC/DC ±20% (75-V-varistor) - 120-230 V AC/110 V DC ±20% (275-V-varistor)	RIF-V-12-24 UC RIF-V-48-60 UC RIF-V-120-230 UC	2900945 2900947 2900948	10 10 10
Plug-in module , with RC element to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (220 nF/100 Ω) - 48-60 V AC/DC ±20% (220 nF/220 Ω) - 120 - 230 V AC/110 DC ±20% (100 nF/470 Ω)	RIF-RC-12-24 UC RIF-RC-48-60 UC RIF-RC-120-230 UC	2900949 2900950 2900951	10 10 10

Plug-in timer module for RIF-1, RIF-2, RIF-3, and RIF-4

The multifunctional plug-in timer module transforms the relay module into a timer relay. The RIF-1 to RIF-4 bases can be fitted with this module. Using DIP switches, you can choose from three time ranges and select four time functions. Fine adjustments to the time are made using a potentiometer. Relays can be operated with an input voltage of 24 V AC/DC.



- Switch-on delay
- Single shot leading edge
- Flasher/pulse generator

Time ranges:

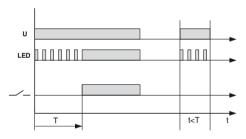
- -0.5 s 10 s
- -5 s 100 s
- 0.5 min 10 min
- 5 min 100 min



Time module

14 22 24 32 9 9 21 31 41 11

With switch-on delay



Nominal input voltage U _N
Nominal input voltage range with reference to U _N
Input circuit
Output data
Limiting continuous current
General data
Mounting position
Repeat accuracy
Ambient temperature (operation)

Standards/specifications Rated insulation voltage Rated surge voltage

Technical data

24 V DC (AC operation only permitted for RIF-1)

0.4 ... 1.2

Varistor, Yellow LED

≤ 250 mA (Relay coil current)

1%

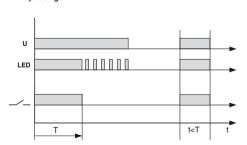
-25°C ... 50°C (RIF-1, AC coil, 2 PDTs at 6 A) -25°C ... 50°C (RIF-1, DC coil, 2 PDTs at 5 A) -25°C ... 40°C (RIF-2, DC coil, 2 PDTs at 8 A) -25°C ... 40°C (RIF-2, DC coil, 4 PDTs at 5 A) -25°C ... 40°C (RIF-3, DC coil, 3 PDTs at 6.75 A) -25°C ... 40°C (RIF-3, DC coil, 2 PDTs at 8 A)

-25°C ... 35°C (RIF-4, DC coil, 3 PDTs at 8 A) -25°C ... 25°C (RIF-4, DC coil, 3 N/O contacts at 8 A)

DIN EN 50178 50 V DC

0.4 kV

With passing make contact



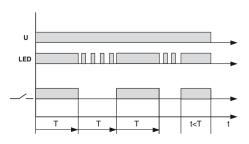
Description

Input data

Timer module, for mounting on RIF-1 to RIF-4, with LED status indicator for extending a relay module to create a timer relay with an input voltage of 24 V AC/DC

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RIF-T3-24UC	2902647	1	

Flasher/pulse generator



RIFLINE complete

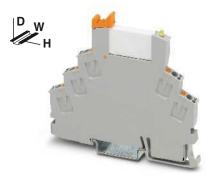
Fully mounted RIF-0 relay modules

Fully mounted RIF-0 relay modules, consisting of:

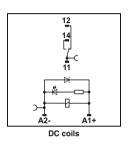
- Relay base
- 1 N/O contact or 1 PDT relay
- Relay ejector lever on the housing

The advantages:

- Status LED integrated in the relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input and output side, see page 318.



RIF-0 relay module with 1 PDT relay



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input protection:	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	
General data	
Test voltage (winding / contact)	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

Description		Input voltage $U_{\rm N}$
Coupling relay modules with power contact relay		
power contact relay	1 2	12 V DC 24 V DC
Coupling relay modules with power contact relay and gold contacts		
	1	12 V DC
	2	24 V DC

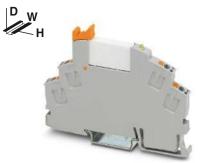
		Techn	ical data	
	1	2		
[mA] [ms] [ms]	16 5 8	the diagram 9 5 8 LED, Damping diode		
	Single	contact, 1-PDT	Single contact, 1-PDT	
	6 A `		AgSnO, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA 1 mA	
H/D	-40°C 100% c Approx DIN EN 2 / III Any / In 0.14 - 1	(50 Hz, 1 min.) 60°C perating factor 2 x 107 cycles I 50178, IEC 62103 rrows with zero spacing 5 mm² / 0.14 - 1.5 mm² / 78 mm / 93 mm	/ 26 - 16	
		Order	ing data	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RIF-0-RPT-12DC/21 RIF-0-RPT-24DC/21	2903371 2903370	10 10	
RIF-0-RPT-12DC/21AU RIF-0-RPT-24DC/21AU	2903369 2903368	10 10	

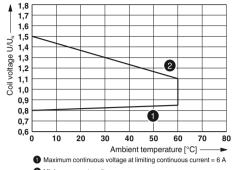


RIF-0-RPT.../21... (1 PDT)

Operating voltage range

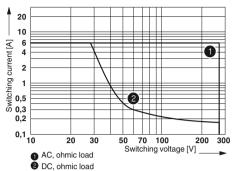


RIF-0 relay module with 1 N/O relay

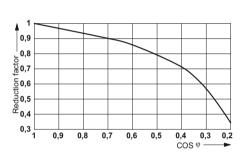


2 Minimum operate voltage For pre-excitation with \dot{U}_{N} and limiting continuous current = 6 A

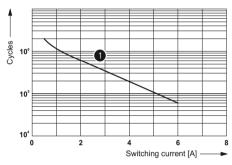
Interrupting rating



Service life reduction factor



Electrical service life



1 250 V AC, ohmic load

Technical data

1	2	
refer t	o the diagram	
16	9	
5	5	

8 Yellow LED, Damping diode

DC coils

Single contact, 1 N/O contact Single contact, 1 N/O contact

AgSnO AgSnO, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 5 V (at 100 mA) 100 mV (at 10 mA) 6 A 50 mA 10 mA (at 12 V) 1 mA (at 12 V)

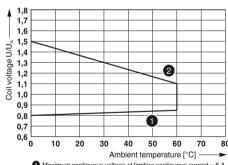
4 kV_{rms} (50 Hz, 1 min.) -40°C ... 60°C 100% operating factor Approx. 2 x 10⁷ cycles DIN EN 50178, IEC 62103 Any / In rows with zero spacing

0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16 6.2 mm / 78 mm / 93 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RIF-0-RPT-12DC/ 1 RIF-0-RPT-24DC/ 1	2903362 2903361	10 10	
RIF-0-RPT-12DC/1AU RIF-0-RPT-24DC/1AU	2903360 2903359	10 10	

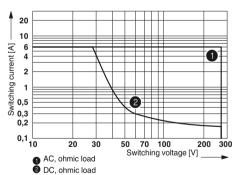
RIF-0-RPT.../1... (1 N/O contact)

Operating voltage range



Maximum continuous voltage at limiting continuous current = 6 A

Interrupting rating



2 Minimum operate voltage For pre-excitation with $U_{\rm N}$ and limiting continuous current = 6 A

Service life reduction factor

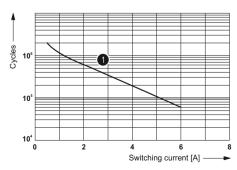
0,9 0,8 1,0 0,7

9,0 0,5 0,4

0,3

0,9 0,8 0,7

Electrical service life



1 250 V AC, ohmic load

0,6

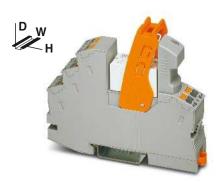
0,4 0,3

COS Ψ

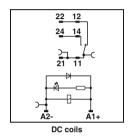
- 1 or 2 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module

The advantages:

- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.
- For FBS 2-8 plug-in bridges for the output side (11/21), see page 318.

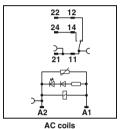


RIF-1 relay module with 1 PDT relay



2

3



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input circuit AC	
Input circuit DC	
Output data	
Contact type	

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current, AC Max. inrush current, DC Min. switching current General data

Test voltage (winding / contact) Ambient temperature (operation), AC Ambient temperature (operation), DC

Nominal operating mode Mechanical service life, AC Mechanical service life, DC

Standards/regulations Pollution degree/surge voltage category Mounting position/mounting

Connection data solid / stranded / AVVG		
Dimensions		W/H/D
Description		Input voltage U _N
Coupling relay modules with power contact relay		
	1	24 V DC
	2	24 V AC
	3	120 V AC
	4	230 V AC
Coupling relay modules with power contact relay and gold contacts		
, , ,	1	24 V DC
	2	24 V AC

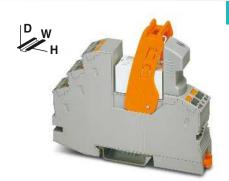
3

	refer to the diagram						
	18	33	8	6			
	8	3 - 12	3 - 12	3 - 12			
	10	3 - 20	3 - 20	3 - 20			
	Yellow	LED, Vai	ristor				
	Yellow	LED, Da	mping di	ode, Pola	arity protection diode		
Single contact, 1-PDT				Single contact, 1-PDT			
AgNi				AgNi, hard gold-plated			
250 V AC/DC				30 V AC / 36 V DC			
	12 V (at 10 mA)			100 mV (at 10 mA)			
	(refer to the diagram)			50 mA			
	25 A (20 ms, N/O contact)			50 mA			
	50 A (20 ms, N/O contact)			50 mA			
10 mA (at 12 V)				1 mA (at 24 V)			

Technical data

4 kV_{rms} (50 Hz, 1 min.) -40°C ... 70°C -40°C ... 50°C 100% operating factor Approx. 107 cycles Approx. 3 x 107 cycles DIN EN 50178, IEC 62103 2 / III Any / In rows with zero spacing 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16 16 mm / 75 mm / 93 mm

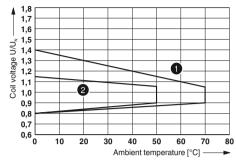
	Ordering data		
put voltage U _N	Туре	Order No.	Pcs. / Pkt.
24 V DC	RIF-1-RPT-LDP-24DC/1X21	2903342	10
24 V AC	RIF-1-RPT-LV-24AC/1X21	2903341	10
120 V AC	RIF-1-RPT-LV-120AC/1X21	2903340	10
230 V AC	RIF-1-RPT-LV-230AC/1X21	2903339	10
24 V DC	RIF-1-RPT-LDP-24DC/1X21AU	2903338	10
24 V AC	RIF-1-RPT-LV-24AC/1X21AU	2903337	10
120 V AC	RIF-1-RPT-LV-120AC/1X21AU	2903336	10
230 V AC	RIF-1-RPT-LV-230AC/1X21AU	2903335	10



RIF-1 relay module with 2 PDT relay

RIF-1-RPT.../1X21... (1 PDT)

Operating voltage range



- DC coils
- 2 AC coils

20 10 0 ₹ 6 4 current 2 Switching 1 0,5 0,3 0,1 10 20 30 70 100 200 300

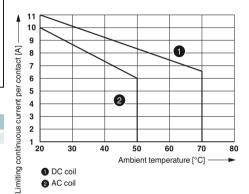
Switching voltage [V]

- AC, ohmic loadDC, ohmic loadDC, L/R = 40 ms

Contact derating

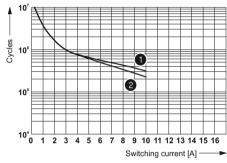
12 24

AC coils



Electrical service life

Interrupting rating



1 250 V AC, ohmic load (DC coils) 2 250 V AC, ohmic load (AC coils)

DC coils

Technical data

2 refer to the diagram 18 33 3-12 3-12 3 - 12 10 3-20 3-20 3 - 20

12

Yellow LED, Varistor

Yellow LED, Damping diode, Polarity protection diode

Single contact, 2-PDT Single contact, 2-PDT

AgNi AgNi, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 5 V (at 10 mA) 100 mV (at 10 mA) 8 A (refer to the diagram) 50 mA 12 A (20 ms, N/O contact) 50 mA 25 A (20 ms, N/O contact) 50 mA 10 mA (At 5 V) 1 mA (at 24 V)

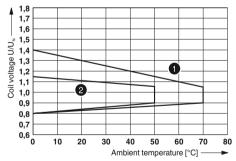
4 kV_{rms} (50 Hz, 1 min.) -40°C ... 70°C -40°C ... 50°C 100% operating factor Approx. 107 cycles Approx. 3 x 107 cycles

DIN EN 50178, IEC 62103 2/111 Any / In rows with zero spacing

0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16

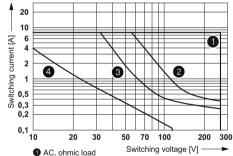
16 mm / 75 mm / 93 mm

Operating voltage range



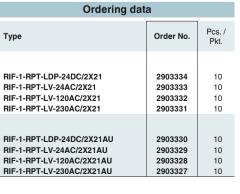
- 1 DC coils
- AC coils

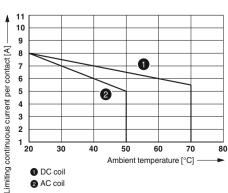
Interrupting rating



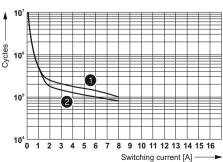
- DC, ohmic load, contacts in seriesDC, ohmic load

Contact derating





Electrical service life



250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

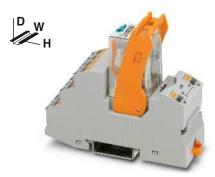
Fully mounted RIF-2 relay modules

Fully mounted RIF-2 relay modules, consisting of:

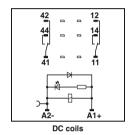
- 1 or 2 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)

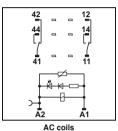
The advantages:

- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.



RIF-2 relay module with 2 PDT relay





Input data	
Permissible range (with reference to U_N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input circuit AC	
Input circuit DC	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current, AC	
Max. inrush current, DC	
Min. switching current	
General data	
Test voltage (winding / contact)	
Ambient temperature (operation), AC	

Ambient temperature (operation), DC Nominal operating mode Mechanical service life, AC Mechanical service life, DC Standards/regulations Pollution degree/surge voltage category Mounting position/mounting

Input voltage Pre-assembled coupling relay modules with miniature power contact relay 24 V DC 3 24 V AC 120 V AC 230 V AC

Connection data solid / stranded / AWG

Dimensions

Te	chn	ical	data

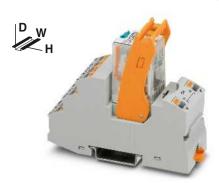
1	2	3	4			
refer to the diagram						
41	70	13	6.5			
13	5 - 15	5 - 15	5 - 15			
14	5 - 20	5 - 20	5 - 20			
Yellow LED, Varistor						
Yellow LED, Damping diode						

Single contact, 2-PDT AgNi 250 V AC/DC 5 V (At 24 mA) (refer to the diagram) 30 A (20 ms, N/O contact) 30 A (20 ms. N/O contact) 5 mA (at 24 V)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 50°C -40°C ... 60°C 100% operating factor Approx. 2 x 107 cycles Approx. 2 x 10⁷ cycles DIN EN 50178, IEC 62103 2/111 Any / In rows with zero spacing

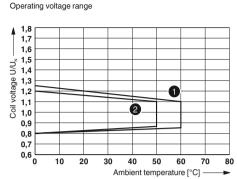
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16 31 mm / 75 mm / 93 mm

W/H/D	31 mm / 75 mm / 93 mm			
	Ordering data			
out voltage U _N	Туре	Order No.	Pcs. / Pkt.	
24 V DC 24 V AC	RIF-2-RPT-LDP-24DC/2X21 RIF-2-RPT-LV-24AC/2X21	2903315 2903313	10 10	
120 V AC	RIF-2-RPT-LV-120AC/2X21 RIF-2-RPT-I V-230AC/2X21	2903311	10 10	



RIF-2 relay module with 4 PDT relay

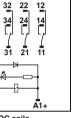
RIF-2-RPT.../2X21 (2 PDTs)

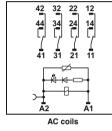


- DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Interrupting rating 20 10 ₹ 6 4 0 itching current 2 1 0,5 ു യ 0,3 0,1 L 10 20 30 50 70 100 200 300 Switching voltage [V]

- 1 AC, ohmic load
- 2DC, ohmic load





Technical data

Ð	2	3	4				
efer to the diagram							
41	70	13	6.5				
13	5 - 15	5 - 15	5 - 15				
14	5 - 20	5 - 20	5 - 20				
Yellow LED. Varistor							

DC coils

3<u>2</u> 3<u>4</u> 22

42 44

Single contact, 4-PDT AgNi 250 V AC/DC 5 V (At 24 mA) (refer to the diagram) 16 A (20 ms, N/O contact) 16 A (20 ms, N/O contact)

Yellow LED, Damping diode

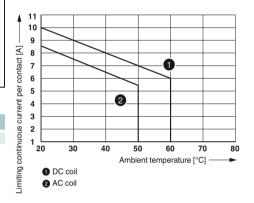
2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 50°C -40°C ... 60°C 100% operating factor Approx. 2 x 10⁷ cycles Approx. 2 x 10⁷ cycles DIN EN 50178, IEC 62103

5 mA (at 24 V)

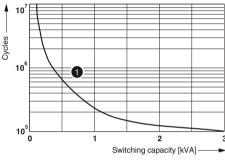
Any / In rows with zero spacing 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16

31 111111 / 73 111111 / 93 111111	31 111111 / 73 111111 / 93 111111				
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
RIF-2-RPT-LDP-24DC/4X21 RIF-2-RPT-LV-24AC/4X21	2903308 2903306	10 10			
RIF-2-RPT-LV-120AC/4X21 RIF-2-RPT-LV-230AC/4X21	2903305 2903304	10 10			

Contact derating



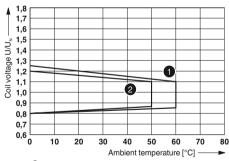
Electrical service life



1 250 V AC, ohmic load

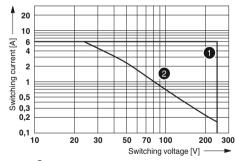
RIF-2-RPT.../4X21 (4 PDTs)

Operating voltage range



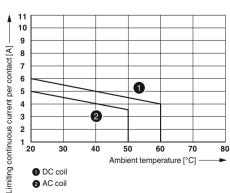
- 1 DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Interrupting rating

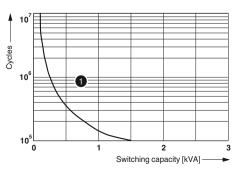


- AC, ohmic load
- 2DC, ohmic load

Contact derating



Electrical service life



1 250 V AC, ohmic load

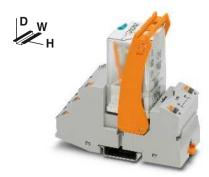
Fully mounted RIF-3 relay modules

Fully mounted RIF-3 relay modules, consisting of:

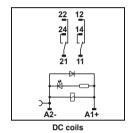
- Relay base
- 2 or 3 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)

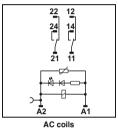
The advantages:

- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.



RIF-3 relay module with 2 PDT relay





Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input circuit AC	
Input circuit DC	
Output data	
Contact type	
Contact material	
Max switching voltage	

Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current, AC Max. inrush current. DC Min. switching current General data

Test voltage (winding / contact) Ambient temperature (operation), AC Ambient temperature (operation), DC Nominal operating mode

Mechanical service life, AC Mechanical service life, DC Standards/regulations

Descript

Pollution degree/surge voltage category Mounting position/mounting

Connection data solid / stranded / AWG

W/H/D Dimensions

Technical da

1	2	3			
refer to the diagram					
60	23	13			
18	5 - 15	5 - 15			
20	5 - 20	5 - 20			
Yellow LED, Varistor					
Yellow LED, Damping diode					

Single contact, 2-PDT AgNi 250 V AC/DC 10 V (At 24 mA) (refer to the diagram) 30 A (20 ms, N/O contact) 30 A (20 ms, N/O contact) 10 mA (at 24 V)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 50°C -40°C ... 60°C 100% operating factor Approx. 2 x 107 cycles Approx. 2 x 10⁷ cycles DIN EN 50178, IEC 62103 2/111

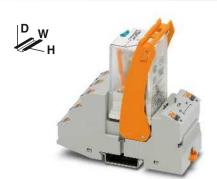
Any / In rows with zero spacing 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16 40 mm / 90 mm / 100 mm

tion	Input voltage U _N

24 V DC

Pre-assembled coupling relay modules with miniature power contact relay (1) 2 120 V AC 3 230 V AC

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
RIF-3-RPT-LDP-24DC/2X21	2903297	5
RIF-3-RPT-LV-120AC/2X21	2903296	5
RIF-3-RPT-LV-230AC/2X21	2903295	5



RIF-3 relay module with 3 PDT relay

22 22 14 14 31 31 21 11 21 11 Δ1 DC coils AC coils

Technical data

1	2	3
refer t	o the diag	ram
60	23	13
18	5 - 15	5 - 15
20	5 - 20	5 - 20
Yellov	v LED, Va	ristor
Yellov	v LED, Da	mping diode

Single contact, three PDTs AgNi 250 V AC/DC 10 V (At 24 mA) (refer to the diagram) 30 A (20 ms, N/O contact) 30 A (20 ms, N/O contact)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 50°C -40°C ... 60°C 100% operating factor Approx. 2 x 10⁷ cycles Approx. 2 x 10⁷ cycles

10 mA (at 24 V)

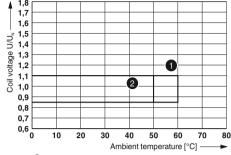
DIN EN 50178, IEC 62103

Any / In rows with zero spacing 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16 $40 \, mm \, / \, 90 \, mm \, / \, 100 \, mm$

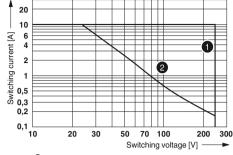
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
RIF-3-RPT-LDP-24DC/3X21	2903294	5
RIF-3-RPT-LV-120AC/3X21	2903293	5
RIF-3-RPT-LV-230AC/3X21	2903292	5

RIF-3-RPT.../2X21 (2 PDTs)

Operating voltage range

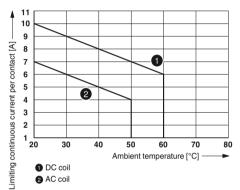


- DC coil (observe contact derating)
- 2 AC coil (observe contact derating)



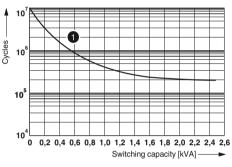
- 1 AC, ohmic load
- 2DC, ohmic load

Contact derating



Electrical service life

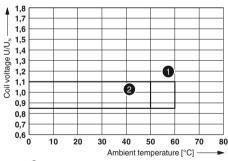
Interrupting rating



1 250 V AC, ohmic load

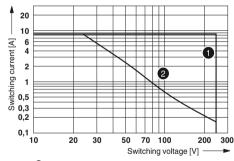
RIF-3-RPT.../3X21 (3 PDTs)

Operating voltage range



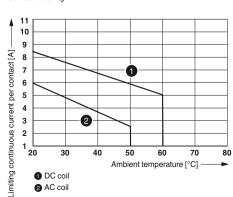
- 1 DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Interrupting rating

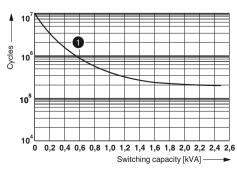


- AC, ohmic load
- 2DC, ohmic load

Contact derating



Electrical service life



1 250 V AC, ohmic load

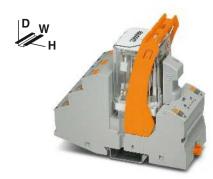
Fully mounted RIF-4 relay modules

Fully mounted RIF-4 relay modules, consisting of:

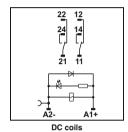
- Relay base
- 2 or 3 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module

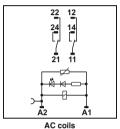
The advantages:

- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.



RIF-4 relay module with 2 PDT relay





Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input circuit AC	
Input circuit DC	
Output data	
Contact type	

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current, AC Max. inrush current. DC Min. switching current

Max. interrupting rating, ohmic load

Motor load according to UL 508

	Technical data
(3)	

1 2 refer to the diagram 56 24 5-25 5-25 5-20 5-20

Yellow LED, Varistor

Yellow LED, Damping diode, Polarity protection diode

Single contact, 2-PDT AgNi 440 V AC / 250 V DC 10 V (At 24 mA) (refer to the diagram) 50 A (20 ms, N/O contact) 50 A (20 ms, N/O contact) 10 mA (at 24 V)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 40°C

100% operating factor

DIN EN 50178, IEC 62103

Approx. 10⁷ cycles

Approx. 107 cycles

-40°C ... 60°C

2500 VA 4000 VA

250 V AC

440 V AC

1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor)

General data

Test voltage (winding / contact) Ambient temperature (operation), AC Ambient temperature (operation), DC Nominal operating mode Mechanical service life, AC Mechanical service life, DC Standards/regulations Pollution degree/surge voltage category Mounting position/mounting Connection data solid / stranded / AWG

Input side Output side

Dimensions

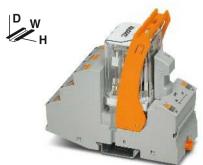
Any / In rows with zero spacing

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

W/H/D 43 mm / 90 mm / 107 mm

Description		Input voltage $U_{\rm N}$
Pre-assembled coupling relay modules variety miniature power contact relay	vith	
	1	24 V DC
	2	120 V AC
	(3)	230 V AC

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
RIF-4-RPT-LDP-24DC/2X21 RIF-4-RPT-LV-120AC/2X21 RIF-4-RPT-LV-230AC/2X21	2903281 2903280 2903279	5 5 5



RIF-4 relay module with 3 PDT relay

22 24 22 14 14 31 31 21 11 21 11 $\bar{\Delta}_1$ DC coils AC coils

Technical data

1	2	3
refer	to the diag	ram
56	24	14
20	5 - 25	5 - 25
20	5 - 20	5 - 20

Yellow LED, Varistor

Yellow LED, Damping diode, Polarity protection diode

Single contact, three PDTs AgNi 440 V AC / 250 V DC 10 V (At 24 mA) (refer to the diagram) 50 A (20 ms, N/O contact) 50 A (20 ms, N/O contact) 10 mA (at 24 V)

2500 VA 4000 VA

1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 40°C -40°C ... 60°C 100% operating factor

Approx. 10⁷ cycles Approx. 107 cycles DIN EN 50178, IEC 62103

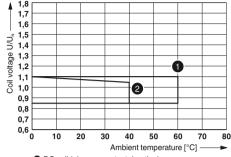
Any / In rows with zero spacing

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 43 mm / 90 mm / 107 mm

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
RIF-4-RPT-LDP-24DC/3X21 RIF-4-RPT-LV-120AC/3X21 RIF-4-RPT-LV-230AC/3X21	2903278 2903277 2903276	5 5 5

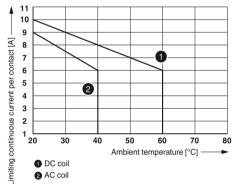
RIF-4-RPT.../2X21 (2 PDTs)

Operating voltage range

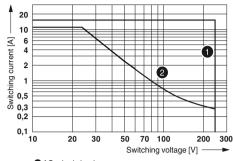


- DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Contact derating

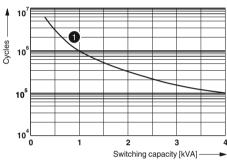


Interrupting rating



- 1 AC, ohmic load
- 2DC, ohmic load

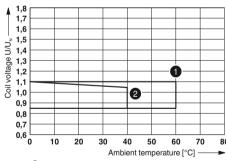
Electrical service life



1 250 V AC, ohmic load

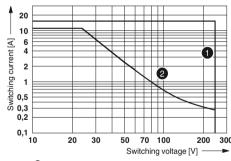
RIF-4-RPT.../3X21 (3 PDTs)

Operating voltage range



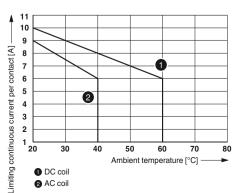
- 1 DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Interrupting rating

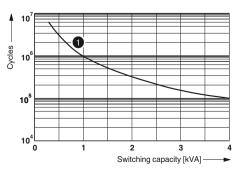


- AC, ohmic load
- 2DC, ohmic load

Contact derating



Electrical service life



1 250 V AC, ohmic load

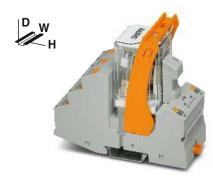
Fully mounted RIF-4 relay modules

Fully mounted RIF-4 relay modules, consisting of:

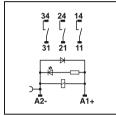
- Relay base
- 3 N/O relays
- Relay retaining bracket
- Input module/interference suppr. module

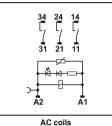
The advantages:

- Logical contact arrangement thanks to 1/3-level relay base
- Full shutdown by means of ≥ 3 mm contact opening
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.



RIF-4 relay module with 3 N/O relay





DC coils

Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input circuit AC	
Input circuit DC	
Output data	
Contact type	

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current, AC Max. inrush current. DC Min. switching current

Max. interrupting rating, ohmic load

Motor load according to UL 508

General data

Description Pre-assemble miniature powe

Test voltage (winding / contact) Ambient temperature (operation), AC Ambient temperature (operation), DC Nominal operating mode Mechanical service life, AC Mechanical service life, DC Standards/regulations Pollution degree/surge voltage category Mounting position/mounting Connection data solid / stranded / AWG Input side Output side

Dimensions W/H/D

|--|

(1)	(2)	(3)	
refer t	o the diag	ram	
70	24	14	
20	5 - 25	5 - 25	
20	5 - 20	5 - 20	

Yellow LED, Varistor

Yellow LED, Damping diode, Polarity protection diode

Single contact, 3 N/O contacts AgNi

440 V AC / 250 V DC 10 V (At 24 mA) (refer to the diagram) 50 A (20 ms, N/O contact) 50 A (20 ms, N/O contact) 10 mA (at 24 V)

2500 VA 4000 VA

250 V AC

440 V AC

1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)

2.5 kV_{rms} (50 Hz, 1 min.) -40°C ... 40°C -40°C ... 60°C 100% operating factor Approx. 10⁷ cycles Approx. 107 cycles DIN EN 50178, IEC 62103

Any / In rows with zero spacing

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 43 mm / 90 mm / 107 mm

		Į
	Input voltage $U_{\rm N}$	
d coupling relay modules with r contact relay		

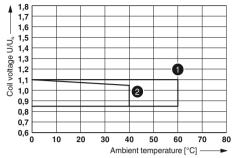
1	24 V DC
2	120 V AC
(3)	230 V AC

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
RIF-4-RPT-LDP-24DC/3X1	2903275	5	
RIF-4-RPT-LV-120AC/3X1	2903274	5	
RIF-4-RPT-LV-230AC/3X1	2903273	5	



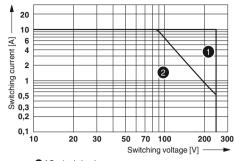
RIF-4-RPT.../3X1 (3 N/O contacts)





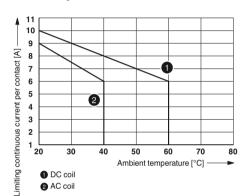
- 1 DC coil (observe contact derating)
- 2 AC coil (observe contact derating)

Interrupting rating

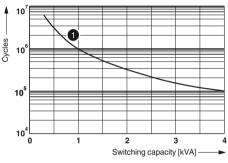


- 1 AC, ohmic load
- 2DC, ohmic load

Contact derating



Electrical service life



1 250 V AC, ohmic load

RIFLINE complete

RIFLINE complete accessories Plug-in bridges

The plug-in bridges can be used for simple potential distribution via all relay bases.

The end clamp is used for safe isolation between adjacent modules and to visually separate the various function groups.





Description	Color
Plug-in bridge	
2-pos. red	
2-pos. blue	
2-pos. gray	
5-pos. red	
10-pos. red	
20-pos. red	
50-pos. red	
2-pos. red	
2-pos. blue	
2-pos. gray	
End clamp, to snap on NS 35, 9.5 mm wide, can be labele ZB 6, ZB 8/27, KLM	d with

Ordering data				
Туре		Order No.	Pcs. / Pkt.	
FBS 2-6 FBS 2-6 BU FBS 2-6 GY FBS 5-6 FBS 10-6 FBS 20-6 FBS 20-6 FBS 2-8 FBS 2-8 BU FBS 2-8 GY	7042	3030336 3036932 3032237 3030349 3030271 3030365 3032224 3030284 3032567 3032541	50 50 50 50 10 10 10 10 10	

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
OLIDEW OF				
CLIPFIX 35	3022218	50		

RIFLINE complete accessories Marking material

The ZB zack marker strip system offers numerous marking options that can be attached directly to the relay retaining brackets. In addition, further markings can be fixed to the relay base by means of double marker carriers.



5.2 mm, 6.2 mm, and 15.2 mm wide



Double marker carrier

Description	Color
Zack marker strip, unprinted	
10-section	white
10-section	white
5-section	white
Double marker carrier for ZB 5	
	gray

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
ZB 5 :UNBEDRUCKT ZB 6:UNBEDRUCKT ZB 15:UNBEDRUCKT	1050004 1051003 0811972	10 10 10	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
STP 5-2	0800967	100	

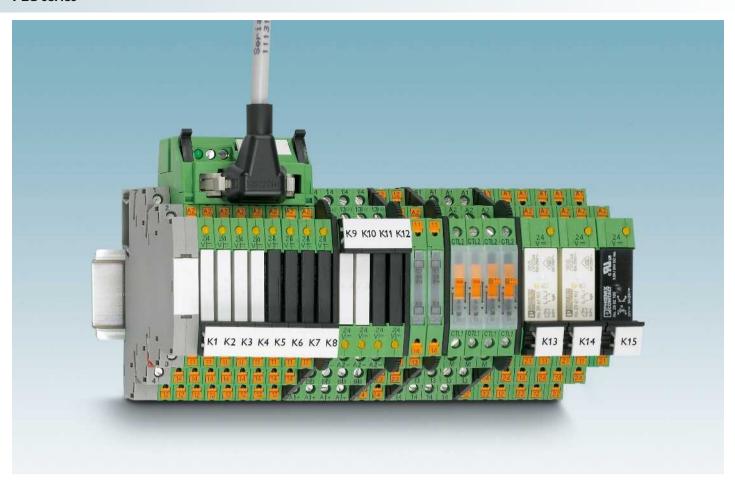
RIFLINE complete accessories **Test plugs**

The two-piece test plug offers individual plug color combinations. The test plug is inserted directly in the function shaft of the push-in connection.



		Ordering data		
Description	Color	Туре	Order No.	Pcs. / Pkt.
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and		MPS-MT	0201744	10
Insulating sleeve, for MPS metal part	red	MPS-IH RD	0201676	10
	white	MPS-IH WH	0201663	10
	blue	MPS-IH BU	0201689	10
	yellow	MPS-IH YE	0201692	10
	green	MPS-IH GN	0201702	10
	gray	MPS-IH GY	0201728	10
	black	MPS-IH BK	0201731	10

PLC series



The PLC-INTERFACE relay system is the interface between the controller and system I/O devices.

The universal design is compact and space-saving. While the narrow 6.2 mm module has one contact, the 14 mm version is available with two contacts. The modules can be equipped with either an electromechanical or a solid-state relay.

They are protected against environmental influences by RTIII (IP67). The relays also offer safe isolation according to DIN EN 50178 (VDE 0160).

PLC-INTERFACE is available with three connection technologies. Depending on the area of application, screw, spring-cage or push-in connection can be selected.

In addition to the universal types, PLC-INTERFACE is also available in numerous special versions. These include:

- Sensor and actuator modules that can accommodate all connections directly on the interface
- Modules for high inrush or continuous currents
- Railway modules, which meet specific railway requirements
- Filter modules, which filter out interference on the input side

Plug-in bridges are available for all modules for simple potential distribution. In addition, solutions from system cabling applications offer easy connection to the plant control system. VARIOFACE adapters can be used to reduce wiring effort considerably. Installation is simplified significantly thanks to the integrated input and protective circuit.

Standard marking material from CLIPLINE complete modular terminal blocks can be used to mark PLC-INTERFACE.



Adapters for the system cabling

The PLC-V8... adapter is used to connect 8 PLC-INTERFACE modules to the PLC system cabling for input and output functions. For more details, see page 369



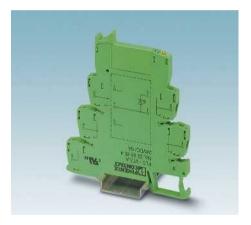
6.2 mm design width

PLC-R...21 and PLC-O... relay and solidstate relay modules with PDT or N/O contact, designed for universal use. Available with screw, spring-cage or push-in connection.



14 mm design width

PLC-R...21-21 includes plug-in relays with two PDT contacts for switching capacities of up to 250 V AC/6 A. Available with screw, spring-cage, and push-in connection.



Feed-through terminal block

PLC-VT... is the feed-through terminal block for PLC-INTERFACE and the system cabling for passive signal transfer. For more details, see page 486



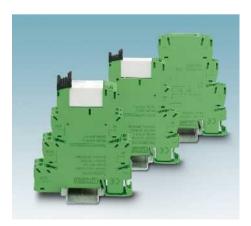
Sensors/actuators

PLC...SEN and PLC...ACT do not require additional supply/output terminal blocks. All connections are connected directly.



High currents

PLC...IC is ideal for high inrush currents, e.g., from lamp loads. PLC...HC are the modules to use for applications with high continuous load currents.



Railway applications

PLC...RW relay or solid-state relay modules are suitable for railway requirements. They are only available with spring-cage and push-in connection.



Interference signals on the input side

PLC-B...SO46 basic terminal blocks are used for filtering interference currents and interference voltages on the input side.



Accessories

The entire PLC-INTERFACE system can be extended with a wide range of accessories, such as power terminal blocks or plugin bridges. For more details, see page 368

PLC series

Universal PLC series with **PDT** relay

PLC-R... is the relay series that can be used universally and consists of basic terminal blocks and plug-in relays with PDT con-

The advantages:

- Slim design
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Integrated input and interference suppression circuit
- RT III sealed relay
- Safe isolation according to DIN EN 50178 between coil and contact
- Efficient connection to system cabling using V8 adapter

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For diagrams of operating voltage ranges, see page 343

Note: for marking material (ZB 6), see "CLIPLINE industrial connection technology, marking material for terminals, conductors, and cables".

1) 120 and 230 V types up to 55°C

2) 230 V types up to 55°C

Input data Typ. input current at U_N

Input circuit DC

Output data Contact material

General data

Dimensions

Description

Input circuit AC/DC

Max. switching voltage

Min. switching voltage

Min. switching current

Test voltage input/output

Mechanical service life

Standards/regulations

Ambient temperature (operation)

Connection data solid / stranded / AWG

PLC INTERFACE with screw connection

Limiting continuous current Max. inrush current

Response/release time at U_N

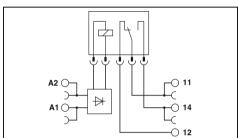
3) EMC: Class A product, see page 571





1 PDT with power contact

(I) (P) 211 (II) (II)



		10	→			11 14 12 12	
			Techni	ical da	ata		
1	2	3	4	(5)	6	7	
15.3	9	11	9.2	4.8	3.5	3.2	

5/8

Yellow LED, Protection against polarity reversal, freewheeling diode

6/15 7/15

Yellow LED, Bridge rectifier AgSnO 250 V AC/DC 5 V (at 100 mA) (on request)

5/8

[mA]

W/H/D

Input voltage

12 V DC

24 V DC

48 V DC

24 V AC/DC

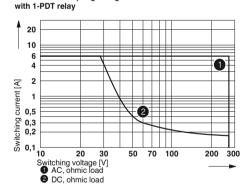
4 kV AC (50 Hz, 1 min.) -40°C ... 60°C1) 2 x 107 cycles IEC 60664, EN 50178, IEC 62103

10 mA (at 12 V)

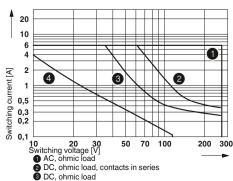
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 94 mm

6/15 5/8

Electrical interrupting	rating	for	PLC	.21



Electrical interrupting rating for PLC...21-21 with 2-PDT relay



(5) 60 V DC 6 120 V AC (110 V DC) 7 230 V AC (220 V DC) PLC INTERFACE, with spring-cage connection 1 12 V DC 2 24 V DC 3 24 V AC/DC 4 48 V DC (5) 60 V DC 6 120 V AC (110 V DC) 7 230 V AC (220 V DC) PLC-INTERFACE, with push-in connection 12 V DC (1) 2 24 V DC 3 24 V AC/DC 4 48 V DC (5) 60 V DC 6 120 V AC (110 V DC) 230 V AC (220 V DC)

(1)

(2)

3 4

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PLC-RSC-12DC/21³) PLC-RSC-24DC/21³) PLC-RSC-24UC/21³) PLC-RSC-48DC/21³) PLC-RSC-60DC/21³) PLC-RSC-120UC/21³)	2966906 2966171 2966184 2966113 2966139 2966197	10 10 10 10 10	
PLC-RSC-1200C/213) PLC-RSC-230UC/213)	2966207	10	
PLC-RSP- 12DC/21³) PLC-RSP- 24DC/21³) PLC-RSP- 24UC/21³) PLC-RSP- 48DC/21³) PLC-RSP- 60DC/21³) PLC-RSP-120UC/21³) PLC-RSP-230UC/21³)	2967439 2966472 2966485 2966498 2966511 2966524 2966537	10 10 10 10 10 10	
PLC-RPT- 12DC/21³) PLC-RPT- 24DC/21³) PLC-RPT- 24UC/21³) PLC-RPT- 48DC/21³) PLC-RPT- 60DC/21³) PLC-RPT-120UC/21³) PLC-RPT-230UC/21³)	2900316 2900299 2900300 2900301 2900303 2900304 2900305	10 10 10 10 10 10	

4 DC, L/R = 40 ms



1 PDT with multi-layer gold contact

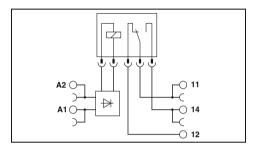


2 PDT with power contact



2 PDT with multi-layer gold contact





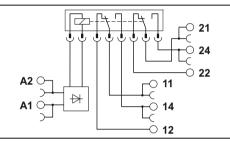
	Technical data									
1	2	3	4	(5)	6	7				
15.3	9	11	9.2	4.8	3.5	3.2				
5/8	5/8	6/15	5/8	5/8	6/15	7 / 15				
Yellow	LED, Pro	otection a	gainst po	olarity rev	ersal, free	wheeling diode				

Yellow LED, Bridge rectifier AgSnO, hard gold-plated 30 V AC / 36 V DC

100 mV (at 10 mA) 50 mA 50 mA 1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C1) 2 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 94 mm

.(U) .: .(U) US (EL

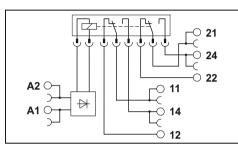


		Т	echni	cal da	ta	
1	2	3	4	(5)	6	7
33	18	17.5	20	10	4.5	4.5
8/10	8/10	8/10	8 / 10	8/10	7 / 10	7 / 10
Yellow	LED, Pro	tection a	gainst po	larity reve	ersal, free	wheeling diode
Yellow	LED, Bri	dge recti	ifier			

AgNi 250 V AC/DC 5 V AC/DC (at 10 mA) 6 A 15 A (300 ms) 10 mA (At 5 V)

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C2) 3 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm

.(U) .: . CL US (EL



		Т	echni	cal da	ta	
1	2	3	4	(5)	6	7
33	18	17.5	20	10	4.5	4.5
8/10	8/10	8/10	8 / 10	8/10	7/10	7/10
Yellow	LED, Pro	tection a	gainst po	larity reve	ersal, free	wheeling diode
Yellow	LED, Bri	dge recti	fier			

AgNi, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA 50 mA 1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C2) 3 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm

CLE HILLY CO HILLY C THILL				14 111117 00 111117 04 111111				
Ordering data		Ordering data			Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
PLC-RSC- 12DC/21AU ³) PLC-RSC- 24DC/21AU ³) PLC-RSC- 24UC/21AU ³) PLC-RSC- 48DC/21AU ³) PLC-RSC- 60DC/21AU ³) PLC-RSC-120UC/21AU ³) PLC-RSC-230UC/21AU ³)	2966919 2966265 2966278 2966126 2966142 2966281 2966294	10 10 10 10 10 10	PLC-RSC- 12DC/21-21 ³) PLC-RSC- 24DC/21-21 ³) PLC-RSC- 24UC/21-21 ³) PLC-RSC- 48DC/21-21 ³) PLC-RSC- 60DC/21-21 ³) PLC-RSC-120UC/21-21 ³) PLC-RSC-230UC/21-21 ³)	2967235 2967060 2967073 2967248 2967293 2967086 2967099	10 10 10 10 10 10	PLC-RSC- 12DC/21-21AU ³) PLC-RSC- 24DC/21-21AU ³) PLC-RSC- 24UC/21-21AU ³) PLC-RSC- 48DC/21-21AU ³) PLC-RSC- 60DC/21-21AU ³) PLC-RSC-120UC/21-21AU ³) PLC-RSC-230UC/21-21AU ³)	2967277 2967125 2967112 2967280 2967303 2967138 2967141	10 10 10 10 10 10
PLC-RSP- 12DC/21AU ³) PLC-RSP- 24DC/21AU ³) PLC-RSP- 24UC/21AU ³) PLC-RSP- 48DC/21AU ³) PLC-RSP- 60DC/21AU ³) PLC-RSP-120UC/21AU ³) PLC-RSP-230UC/21AU ³)	2967442 2966540 2966553 2966566 2966579 2966582 2966647	10 10 10 10 10 10	PLC-RSP- 12DC/21-21 ³) PLC-RSP- 24DC/21-21 ³) PLC-RSP- 24UC/21-21 ³) PLC-RSP- 48DC/21-21 ³) PLC-RSP- 60DC/21-21 ³) PLC-RSP-120UC/21-21 ³) PLC-RSP-230UC/21-21 ³)	2912497 2912507 2912510 2912523 2912536 2912549 2912552	10 10 10 10 10 10	PLC-RSP- 12DC/21-21AU ³) PLC-RSP- 24DC/21-21AU ³) PLC-RSP- 24UC/21-21AU ³) PLC-RSP- 48DC/21-21AU ³) PLC-RSP- 60DC/21-21AU ³) PLC-RSP-120UC/21-21AU ³) PLC-RSP-230UC/21-21AU ³)	2912565 2912578 2912581 2912594 2912604 2912617 2912620	10 10 10 10 10 10
PLC-RPT- 12DC/21AU ³) PLC-RPT- 24DC/21AU ³) PLC-RPT- 24UC/21AU ³) PLC-RPT- 48DC/21AU ³) PLC-RPT- 60DC/21AU ³) PLC-RPT-120UC/21AU ³) PLC-RPT-230UC/21AU ³)	2900317 2900306 2900307 2900308 2900309 2900310 2900311	10 10 10 10 10 10	PLC-RPT- 12DC/21-21 ³) PLC-RPT- 24DC/21-21 ³) PLC-RPT- 24UC/21-21 ³) PLC-RPT- 48DC/21-21 ³) PLC-RPT- 60DC/21-21 ³) PLC-RPT-120UC/21-21 ³) PLC-RPT-230UC/21-21 ³)	2900329 2900330 2900332 2900333 2900334 2900335 2900336	10 10 10 10 10 10	PLC-RPT- 12DC/21-21AU ³) PLC-RPT- 24DC/21-21AU ³) PLC-RPT- 24UC/21-21AU ³) PLC-RPT- 48DC/21-21AU ³) PLC-RPT- 60DC/21-21AU ³) PLC-RPT-120UC/21-21AU ³) PLC-RPT-230UC/21-21AU ³)	2900337 2900338 2900339 2900340 2900341 2900342 2900343	10 10 10 10 10 10

Universal PLC series with solid-state relays

PLC-O... is the solid-state relay series that can be used universally consisting of basic terminal blocks and plug-in solid-state relays.

The advantages:

- Slim design
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Integrated input circuit
- RT-III sealed solid-state relays
- High switching capacity
- Zero voltage switch at AC output
- Efficient connection to system cabling using V8 adapter

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

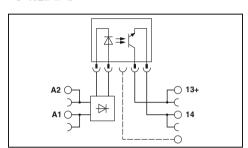
For derating curves see page 345

1) EMC: Class A product, see page 571



Max. DC voltage output of 100 mA

.D. ... (II) ...



Input data		(
Permissible range (with reference to U_N)		0
Typ. input current at U_N Typ. switch-on time at U_N Typ. switch-off time at U_N Transmission frequency $f_{\rm invit}$	0 signal ("L") [mA] [ms] [ms]	1 ≥ ≤ 0 0 3
Input circuit DC Input circuit AC/DC		Y
Output data		
Max. switching voltage Min. switching voltage Max. inrush current Min./max. switching current Output protection Voltage drop at max. limiting continuous current Leakage current in off state Phase angle (cos φ) Max. load value General data		4 3 - - ≤ -
Test voltage input/output Ambient temperature (operation) Standards/regulations Pollution degree/surge voltage category Connection data solid / stranded / AWG		2 -: 11 2

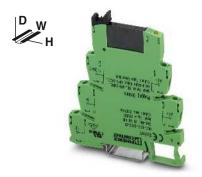
				eciiiii	cai ua	ıa	
	1	2	3	4	(5)	6	
	0.8 -	0.8 -				***	
					1.1		
	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.9	≥ 0.8	
1	≤ 0.4	≤ 0.3	≤ 0.4	≤ 0.4	≤ 0.3	≤ 0.3	
	8.5	9	5	3	3.5	3.5	
	0.02	0.03	0.04	1	3	3	
	0.3	0.3	2	3	4	5	
	300	300	100	50	10	10	
					larity reve	ersal, freewheeling diode	
	Yellow	LED, Bri	dge rect	itier			
	40 V/D	^					
	48 V D						
	3 V DC						
	- -/100	4					
	,				-1 0		
		lion agail	nst polar	ty revers	ai, Surge	protection	
	≤1 V						
	-						
	-						
	-						
		(50 Hz, 1	l mın.)				
		60°C	=0.4=0 !!	-0.0040	_		
		664, EN	50178, II	EC 6210	3		
	2/111	2		- 2			
	0.14 - 2	2.5 mm ² .	/ 0.14 - 2	.5 mm² /	26 - 14		

Dimensions	W/H/D	6.2 mm / 80 mm / 94 mm		
		Ordering dat	а	
Description	Input voltage $U_{\rm N}$	Туре	Order No.	Pcs. / Pkt.
PLC INTERFACE, with screw connection	1			
1	24 V DC	PLC-OSC- 24DC/ 48DC/1001)	2966728	10
2	48 V DC	PLC-OSC- 48DC/ 48DC/1001)	2966993	10
3	60 V DC	PLC-OSC- 60DC/ 48DC/1001)	2967455	10
4	125 V DC	PLC-OSC-125DC/ 48DC/1001)	2980047	10
5	120 V AC (110 V DC)	PLC-OSC-120UC/ 48DC/1001)	2966744	10
6	230 V AC (220 V DC)	PLC-OSC-230UC/ 48DC/1001)	2966757	10
PLC INTERFACE, with spring-cage conn	ection			
1	24 V DC	PLC-OSP- 24DC/ 48DC/1001)	2967549	10
2	48 V DC	PLC-OSP- 48DC/ 48DC/1001)	2967743	10
3	60 V DC	PLC-OSP- 60DC/ 48DC/1001)	2967756	10
4	120 V AC (110 V DC)	PLC-OSP-120UC/ 48DC/1001)	2967552	10
5	230 V AC (220 V DC)	PLC-OSP-230UC/ 48DC/1001)	2967565	10
PLC-INTERFACE, with push-in connection				
1	24 V DC	PLC-OPT- 24DC/ 48DC/1001)	2900352	10
2	48 V DC	PLC-OPT- 48DC/ 48DC/1001)	2900353	10
3	60 V DC	PLC-OPT- 60DC/ 48DC/1001)	2900354	10
4	120 V AC (110 V DC)	PLC-OPT-120UC/ 48DC/1001)	2900355	10
5	230 V AC (220 V DC)	PLC-OPT-230UC/ 48DC/1001)	2900356	10



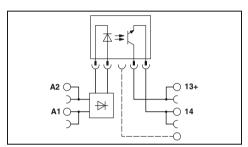


Max. DC voltage output of 3 A

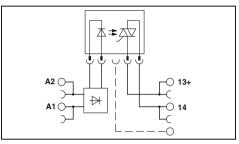


Max. AC voltage output of 750 mA









		1	lechni	cal da	ta	
1	2	3	4	(5)	6	
0.8 -	0.8 -	0.8 -	0.8 -	0.9 -	0.9 -	
1.2	1.2	1.2	1.1	1.1	1.1	
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	
≤ 0.4	≤ 0.4	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.3	
8.5	9	5	3	3.5	3.5	
0.02	0.03	0.04	0.04	3.5	4	
0.3	0.3	0.5	0.6	7	7	
300	300	100	100	10	10	

Yellow LED, Protection against polarity reversal, freewheeling diode Yellow LED, Bridge rectifier

33 V DC 3 V DC

15 A (10 ms)

-/3 A (see derating curve)

Protection against polarity reversal, Surge protection

2.5 kV (50 Hz, 1 min.) -25°C ... 60°C

IEC 60664, EN 50178, IEC 62103 2/111

0.

6.2

		' لرّ			o
		Т	echni	cal dat	ta
1	2	3	4	(5)	6
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.1	0.9 - 1.1	0.8 - 1.1
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.25	≤ 0.25
8	9	6	3.5	4	3.5
10	10	10	10	10	10

10

10

10 10 10 10 3 3 Yellow LED, Protection against polarity reversal, freewheeling diode Yellow LED, Bridge rectifier

10

253 V AC

10

24 V AC

30 A (10 ms)

10

10 mA / 0.75 A (see derating curve)

10

RCV circuit

< 1 V

< 1 mA (in off state) 0.5

4.5 A²s

2.5 kV (50 Hz, 1 min.) -25°C ... 60°C

IEC 60664, EN 50178, IEC 62103 2/111

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14 .2 mm / 80 mm / 94 mm		
Ordering dat	а	
уре	Order No.	
LC-OSC- 24DC/ 24DC/ 21)	2966634	

Ordering dat	а		Ore
Туре	Order No.	Pcs. / Pkt.	Туре
PLC-OSC- 24DC/ 24DC/ 2¹) PLC-OSC- 48DC/ 24DC/ 2¹) PLC-OSC- 60DC/ 24DC/ 2¹) PLC-OSC-125DC/ 24DC/ 2¹) PLC-OSC-120UC/ 24DC/ 2¹) PLC-OSC-230UC/ 24DC/ 2¹)	2966634	10	PLC-OSC- 24DC/230AC/
	2967002	10	PLC-OSC- 48DC/230AC/
	2967468	10	PLC-OSC- 60DC/230AC/
	2980050	10	PLC-OSC-125DC/230AC/
	2966650	10	PLC-OSC-120UC/230AC/
	2966663	10	PLC-OSC-230UC/230AC/
PLC-OSP- 24DC/ 24DC/ 21) PLC-OSP- 48DC/ 24DC/ 21) PLC-OSP- 60DC/ 24DC/ 21) PLC-OSP-120UC/ 24DC/ 21) PLC-OSP-230UC/ 24DC/ 21)	2967471	10	PLC-OSP- 24DC/230AC/
	2967727	10	PLC-OSP- 48DC/230AC/
	2967730	10	PLC-OSP- 60DC/230AC/
	2967484	10	PLC-OSP-120UC/230AC/
	2967497	10	PLC-OSP-230UC/230AC/
PLC-OPT- 24DC/ 24DC/2¹) PLC-OPT- 48DC/ 24DC/2¹) PLC-OPT- 60DC/ 24DC/2¹) PLC-OPT-120UC/ 24DC/2¹) PLC-OPT-230UC/ 24DC/2¹)	2900364	10	PLC-OPT- 24DC/230AC/1
	2900365	10	PLC-OPT- 48DC/230AC/1
	2900366	10	PLC-OPT- 60DC/230AC/1
	2900367	10	PLC-OPT-120UC/230AC/1
	2900368	10	PLC-OPT-230UC/230AC/1

Ordering of	data	
Туре	Order No.	Pcs./ Pkt.
PLC-OSC-24DC/230AC/ 1¹) PLC-OSC-48DC/230AC/ 1¹) PLC-OSC-60DC/230AC/ 1¹) PLC-OSC-125DC/230AC/ 1¹) PLC-OSC-120UC/230AC/ 1¹) PLC-OSC-230UC/230AC/ 1¹)	2967840 2967853 2967866 2980063 2967879 2967882	10 10 10 10 10
PLC-OSP-24DC/230AC/ 1¹) PLC-OSP-48DC/230AC/ 1¹) PLC-OSP-60DC/230AC/ 1¹) PLC-OSP-120UC/230AC/ 1¹) PLC-OSP-230UC/230AC/ 1¹)	2967895 2967905 2967918 2967921 2967934	10 10 10 10
PLC-OPT- 24DC/230AC/11) PLC-OPT- 48DC/230AC/11) PLC-OPT- 60DC/230AC/11) PLC-OPT-120UC/230AC/11) PLC-OPT-230UC/230AC/11)	2900369 2900370 2900371 2900372 2900374	10 10 10 10

PLC actuator series for output functions

PLC actuator series for coupling controller and actuators, such as motors, contactors, valves, etc.

The advantages:

- Actuator connected directly to relay module
- No need for additional modular terminal blocks
- Space savings of up to 80%
- Time savings of up to 60%
- Screw, spring-cage, and push-in technology
- Relay modules with safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

For diagrams of operating voltage ranges, see page 343

For derating curves see page 345

1) EMC: Class A product, see page 571

Permissible range (with reference to U_N)

Typ. response time/switch-on time at U_N

Voltage drop at max. limiting continuous current

Typ. release time/switch-off time at U_n

Switching level (with reference to U_N)

Typ. input current at U_N

Input circuit DC

Contact material

Max. switching voltage

Min. switching voltage

Max. inrush current

Output protection

Min. switching current

Limiting continuous current

Leakage current in off state Phase angle (cos φ) Max. load value General data Test voltage input/output

Ambient temperature (operation)

Pollution degree/surge voltage category

Connection data solid / stranded / AWG

Mechanical service life

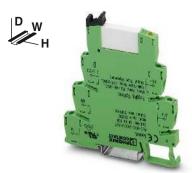
Standards/regulations

Dimen

Output data

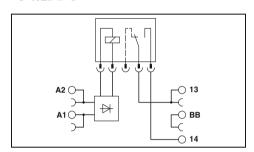
0

200 300 Transmission frequency flimit



1 N/O contact with power contact

(I) (P) 211 (II) (II)



Technical data

(2) See diagram

1 signal ("H") 0 signal ("L")

[mA]

[ms]

[ms]

[Hz]

q 5 8

Yellow LED, Protection against polarity reversal, freewheeling diode

AgSnO 250 V AC/DC 5 V (at 100 mA) (on request)

10 mA (at 12 V)

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C

2 x 107 cycles IEC 60664, EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

nsions		W/H/D	6.2 m
iption		Input voltage $U_{\rm N}$	Туре
NTERFACE, with screw c	onnection		
	1	5 V DC	
	2	24 V DC	PLC-
NTERFACE, with spring-o	cage connection		
	1	5 V DC	
	2	24 V DC	PLC-
NITEDEA OF THE LA			

Electrical interrupting rating for PLC...24DC/1-1/ACT with 2-N/O relay 20

70 100

Electrical interrupting rating for PLC...24DC/1/ACT

with 1-N/O relay

20

10

Switching current [A] 0,5 0,3 0,1 0,1

10

20

Switching voltage [V]

AC. ohmic load

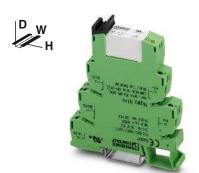
② DC, ohmic load

10 6 O 4 2 Switching current [A] 0,5 0,3 0,2 0,1 10 20 30 Switching voltage [V] 1 AC, ohmic load 70 300 2 DC, ohmic load, contacts in series3 DC, ohmic load

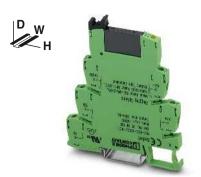
4 DC, L/R = 40 ms

Description		Input voltage $U_{\rm N}$
PLC INTERFACE, with scr	ew connection	
	1	5 V DC
	2	24 V DC
PLC INTERFACE, with spr	ring-cage connection	on
	1	5 V DC
	2	24 V DC
PLC-INTERFACE, with pus	sh-in connection	
	①	5 V DC
	2	24 V DC

6.2 Hill / 60 Hill / 94 Hill					
Ordering dat	Ordering data				
Туре	Order No.	Pcs. / Pkt.			
PLC-RSC- 24DC/ 1/ACT ¹)	2966210	10			
PLC-RSP- 24DC/ 1/ACT¹)	2967345	10			
PLC-RPT- 24DC/ 1/ACT ¹)	2900312	10			



2 N/O contacts with power contact

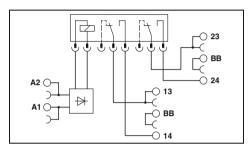


Max. DC voltage output of 3 A

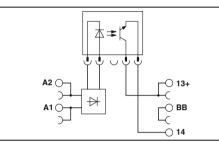


Max. AC voltage output of 750 mA









2 0.8 -1.2

≥ 0.8

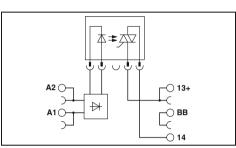
9

3

9

10

≤ 0.25



Technical data

Yellow LED, Protection against polarity reversal, freewheeling diode

	Technical data
_	
2	
See diagram	
g	
18	
10	
8	
10	

Yellow LED, Protection against polarity reversal, freewheeling diode

AgNi
250 V AC/DC
5 V AC/DC
6 A
8 A
10 mA
-
-
-
-

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C 3 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103

14 mm / 80 mm / 94 mm

3 / III 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 Ordering data

			0 14
		Techni	cal data
1	2		
0.8 -	0.8 -		

1.2 1.2 ≥ 0.8 ≥ 0.8 ≤ 0.25 ≤ 0.4 9.5 8.5 0.02 0.02 0.3 0.3 300 300 Yellow LED, Protection against polarity reversal, freewheeling diode

3 V DC
3 A (see derating curve)
15 A (10 ms)
-
Protection against polarity reversal, Surge protection
≤ 200 mV
-

2.5 kV (50 Hz, 1 min.) -25°C ... 60°C IEC 60664, EN 50178, IEC 62103

33 V DC

2/111 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 94 mm

A * A	
A2 🖳 📗 🖂 13+	
A1 O BB	

-
253 V AC
24 V AC
0.75 A (see derating curve)
30 A (10 ms)
10 mA
RCV circuit
< 1 V
< 1 mA (in off state)
0.5
4.5 A ² s
2.5 kV (50 Hz, 1 min.)
-25°C 60°C
-
IEC 60664, EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
PLC-OSC- 5DC/ 24DC/ 2/ACT ¹) PLC-OSC- 24DC/ 24DC/ 2/ACT ¹) PLC-OSP- 5DC/ 24DC/ 2/ACT ¹)	2980144 2966676 2980157	10 10	PLC-OSC- 24DC/230AC/ 1/ACT1)	2967947	10
PLC-OSP- 24DC/ 24DC/ 2/ACT ¹)	2967507	10			
PLC-OPT- 5DC/ 24DC/2/ACT ¹) PLC-OPT- 24DC/ 24DC/2/ACT ¹)	2900375 2900376	10 10			

2/111

Туре	Order No.	Pcs. / Pkt.
PLC-RSC- 24DC/ 1- 1/ACT ¹)	2967109	10

PLC actuator series for output functions

PLC actuator series with solid-state power relays for coupling the controller and actuators, such as motors, contactors, valves, etc.

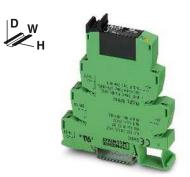
Notes:

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....

For derating curves see page 345



Max. DC voltage output of 5 A



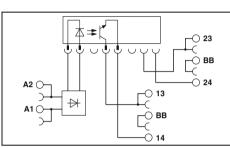
Max. AC voltage output of 2 mA

.(N) .: .(R) US (EL

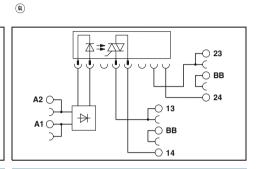
0.8 -

Type

PLC-OSC- 24DC/ 24DC/ 5/ACT



Technical data



Input data	
Permissible range (with reference to U_N)	
Switching level (with reference to U_N)	1 signal ("H") 0 signal ("L")
Typ. input current at U _N	[mA]
Typ. switch-on time at U _N	[ms]
Typ. switch-off time at U_N	[ms]
Transmission frequency f _{limit}	[Hz]
Input circuit DC	
Output data	
Max. / min. switching voltage	
Max. inrush current	
Min./max. switching current	
Output protection	
Voltage drop at max. limiting continuous current	
Leakage current in off state	
Phase angle (cos φ) Max load value	
General data	
Rated insulation voltage	
Rated surge voltage	
Ambient temperature (operation)	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

Description	Input voltage $U_{\rm N}$
PLC INTERFACE, with screw connection	
1	24 V DC

Ordering data
100 V DC 1.5 kV, basic insulation -20°C 60°C IEC 60664, EN 50178, IEC 62103 2 / III Refer to Derating / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm
33 V DC / 3 V DC 15 A (10 ms) - / 5 A (see derating curve) Protection against polarity reversal, Surge protection ≤ 200 mV
1.2 ≥ 0.8 ≤ 0.4 9 0.02 0.4 300 Yellow LED, Protection against polarity reversal, freewheeling diode

0

	Technical data
	①
iode	0.8 - 1.2 ≥ 0.8 ≤ 0.4 9 10 10 10 Yellow LED, Protection against polarity reversal, freewheeling diode
	253 V AC / 24 V AC 30 A (10 ms) 25 mA / 2 A (see derating curve) Surge protection ≤1 V Typ. 1 mA 0.5 4 A²s (tp = 10 ms, at 25°C)
	250 V AC 4 kV / basic insulation -20°C 60°C IEC 60664, EN 50178, IEC 62103 2 / III Refer to Derating / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm

		14 mm / 80 mm / 94 mm
		0
rder No.	Pcs. / Pkt.	Туре
982786	10	PLC-OSC- 24DC/230AC

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
PLC-OSC- 24DC/230AC/ 2/ACT	2982760	10		

PLC actuator series for output functions

PLC actuator basic terminal blocks that can be fitted with a mechanical or solidstate relay. For coupling the controller and actuators, such as motors, contactors, valves, etc.

N			

Maximum interrupting rating diagrams, see page 346

For derating curves see page 345

1) EMC: Class A product, see page 571



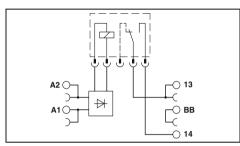
Basic terminal block that can be fitted with mech. relay



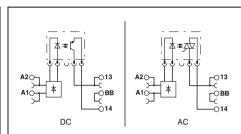
Basic terminal block that can be fitted with solid-state relay

c**SN**us (EL

c**SN** us (EL



Technical data



Technical data

Input data		
Permissible range (with reference to U _N)		0
Typ. input current with U _N (50 /60 Hz)		1
Typ. response time at U _N		5
Typ. release time at U _N		3
Input circuit		L
Output data with:		R
Contact type		S
Contact material		Α
Max. switching voltage		3
Min. switching voltage		1
Limiting continuous current		5
Min. switching current		1
Output protection		-
Malla and describe and the state of the stat		
Voltage drop at limiting continuous current		-
Leakage current in off state Max. load value I ² x t (t = 10 ms)		-
General data		i
Rated insulation voltage		2
Rated surge voltage / insulation		6
Tated surge voltage / modiation		0
Ambient temperature (operation)		-2
Air and creepage distances		Е
Pollution degree / Surge voltage category		2
Connection data solid / stranded / AWG		0
Dimensions	W/H/D	6

Contact material Max. switching voltage Min. switching voltage Limiting continuous current		AgSnO, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA	AgSi 250 V 5 V (6 6 A
Min. switching current Output protection		1 mA (at 24 V)	10 m -
Voltage drop at limiting continuous current Leakage current in off state Max. load value ² x t (t = 10 ms)			- - -
General data			
Rated insulation voltage Rated surge voltage / insulation		250 V AC 6 kV / Safe isolation, increase	d insulatio
Ambient temperature (operation) Air and creepage distances Pollution degree / Surge voltage category Connection data solid / stranded / AWG Dimensions	W/H/D	-20°C 60°C EN 50178, IEC 62103 2 / III 0.14 - 2.5 mm² / 0.14 - 2.5 mn 6.2 mm / 80 mm / 94 mm	n² / 26 - 14
		Orde	ering d
Description	Voltage U _N	Туре	

0.8 1.2	0.8 1.2				
15.6 mA / 8.5 mA	15 mA / 8.3 mA				
5 ms	10 ms				
30 ms	20 ms				
LED yellow, Bridge rectifier		Yellow LED, Brid	dge rectifier		
REL-MR-24DC/21AU	REL-MR-24DC/21	OPT48DC/	OPT24DC/	OPT230AC/	
Single contact, 1 N/O contact	Single contact, 1 N/O contact	-	-	-	
AgSnO, hard gold-plated	AgSnO	-	-	-	
30 V AC / 36 V DC	250 V AC/DC	48 V DC	33 V DC	253 V AC	
100 mV (at 10 mA)	5 V (at 100 mA)	3 V DC	3 V DC	24 V AC	
50 mA	6 A	100 mA	3 A	0.75 A	
			(see derating curve)	(see derating curve)	
1 mA (at 24 V)	10 mA (at 12 V)			-	
-	-	Protection against polarity reversal, Surge protection	Protection against polarity reversal, Surge protection	RCV circuit	
-	-	≤1 V	≤ 150 mV	≤ 1 V	
-	-	-	-	≤ 1 mA	
-	-	-	-	$4.5 \text{ A}^2\text{s} \text{ (tp = 10 ms, at } 25^{\circ}\text{C)}$	
250 V AC		250 V AC			
6 kV / Safe isolation, increased insulation		6 kV / Safe isolation, increased insulation			
-20°C 60°C		-20°C 60°C			
EN 50178, IEC 62103		EN 50178, IEC 62103			
2/III		2/III			
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14		0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14			
6.2 mm / 80 mm / 94 mm		6.2 mm / 80 mm / 94 mm			

W/H/D	0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14 6.2 mm / 80 mm / 94 mm			0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14 6.2 mm / 80 mm / 94 mm		
	Ordering da	Ordering data			ta	
Voltage U _N	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
24 V AC/DC	PLC-BSC- 24UC/ 1/ACT	2982799	10	PLC-BSC- 24UC/ 1/ACT	2982799	10
24 V AC/DC	PLC-BSP- 24UC/ 1/ACT	2982809	10	PLC-BSP- 24UC/ 1/ACT	2982809	10
24 V AC/DC	PLC-BPT- 24UC/ 1/ACT ¹)	2900450	10	PLC-BPT- 24UC/ 1/ACT ¹)	2900450	10
	Accessories			Accessories	S	
	REL-MR- 24DC/21AU REL-MR- 24DC/21	2961121 2961105	10 10			
				OPT-24DC/ 48DC/100 OPT-24DC/ 24DC/ 2 OPT-24DC/230AC/ 1	2966618 2966595 2967950	10 10 10
	Voltage U _N 24 V AC/DC 24 V AC/DC	W/H/D 6.2 mm/80 mm/94 mm Ordering da Voltage U _N Type 24 V AC/DC PLC-BSC- 24UC/ 1/ACT 24 V AC/DC PLC-BSP- 24UC/ 1/ACT 24 V AC/DC PLC-BPT- 24UC/ 1/ACT Accessories REL-MR- 24DC/21AU	Ordering data Voltage U _N Type Order No. 24 V AC/DC PLC-BSC- 24UC/ 1/ACT 2982799 24 V AC/DC PLC-BSP- 24UC/ 1/ACT 2982809 24 V AC/DC PLC-BPT- 24UC/ 1/ACT¹) 2900450 Accessories REL-MR- 24DC/21AU 2961121	W/H/D 6.2 mm/80 mm/94 mm Ordering data Voltage U _N Type Order No. Pcs. / Pkt. 24 V AC/DC PLC-BSC-24UC/1/ACT 2982799 10 24 V AC/DC PLC-BSP-24UC/1/ACT 2982809 10 24 V AC/DC PLC-BPT-24UC/1/ACT¹) 2900450 10 Accessories REL-MR-24DC/21AU 2961121 10	W/H/D 6.2 mm / 80 mm / 94 mm 6.2 mm / 80 mm / 94 mm Ordering data Ordering data Ordering data Ordering data Ordering data Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Order No. Order No. Pcs. / Pkt. Order No. Order No.	W/H/D 6.2 mm/80 mm/94 mm 6.2 mm/80 mm/94 mm Cordering data Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Order No. Order No.

PLC sensor series for input functions

PLC sensor series for coupling controller and sensors, such as proximity switches, limit switches or auxiliary contacts

The advantages:

- Direct connection of sensor to relay module
- No need for additional modular terminal
- Space savings of up to 80%
- Time savings of up to 60%
- Screw, spring-cage, and push-in technology
- Relay modules with safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500..

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For diagrams of operating voltage ranges, see page 343

1) 120 and 230 V types up to 55°C

2) EMC: Class A product, see page 571

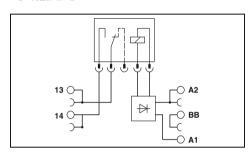
Permissible range (with reference to U_N)





Relay module 1 N/O contact

.D. : **AV** us (E)



Technical data

2 (3) See diagram

Switching level (with reference to U_N) 1 signal ("H") 0 signal ("L") Typ. input current at U_N [mA] q Typ. response time/switch-on time at U_N [ms] 5

Typ. release time/switch-off time at U_n [ms] Transmission frequency flimit [Hz] Input circuit DC

Input circuit AC/DC Output data

Input data

Contact material Max. switching voltage Min. switching voltage

Limiting continuous current Max. inrush current Min. switching current Output protection

Voltage drop at max. limiting continuous current

General data

Test voltage input/output Ambient temperature (operation) Mechanical service life

Standards/regulations

Pollution degree/surge voltage category Connection data solid / stranded / AWG

W/H/D Dimensions

3.5 3.2 6 15 15

Yellow LED, Protection against polarity reversal, freewheeling diode Yellow LED, Bridge rectifier

Pcs./

10

10

10

10

10

10

10

10

10

Order No.

2966317

2966320

2966333

2967374

2967390

2967413

2900313

2900314

2900315

AgSnO, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA

1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C1) 2 x 107 cycles

IEC 60664, EN 50178, IEC 62103

3 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

PLC-RPT-230UC/ 1AU/SEN2)

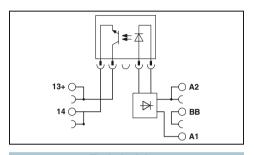
			Ordering dat		
Description		Input voltage $U_{\rm N}$	Туре	(
PLC INTERFACE, with screw cor	nection				
	① ② ③	24 V DC 120 V AC (110 V DC) 230 V AC (220 V DC)	PLC-RSC- 24DC/ 1AU/SEN ²) PLC-RSC-120UC/ 1AU/SEN ²) PLC-RSC-230UC/ 1AU/SEN ²)		
PLC INTERFACE, with spring-cag	_		FEC-NGC-2500C/ TAO/SEN-)		
TEO INTERII AOE, WIII SPINING CA	① ② ③	24 V DC 120 V AC (110 V DC) 230 V AC (220 V DC)	PLC-RSP- 24DC/ 1AU/SEN ²) PLC-RSP-120UC/ 1AU/SEN ²) PLC-RSP-230UC/ 1AU/SEN ²)		
PLC-INTERFACE, with push-in co	onnectio	n			
	① ②	24 V DC 120 V AC (110 V DC)	PLC-RPT- 24DC/ 1AU/SEN ²) PLC-RPT-120UC/ 1AU/SEN ²)		

230 V AC (220 V DC)



Max. DC voltage output of 100 mA

.(I):: c**511** us (C; (i)



Technical dat	ĉ
---------------	---

		r common data	
1	2	3	
0.8 -	0.8 -	0.8 -	
1.2	1.1	1.1	
≥ 0.8	≥ 0.8	≥ 0.8	
≤ 0.4	≤ 0.3	≤ 0.3	
8.5	3.5	3.5	
0.02	6	3	
0.3	10	5	
300	10	10	
Vallow	I ED Dro	a atiana a mainat malanitu un canal. fun accida a dina di	_

Yellow LED, Protection against polarity reversal, freewheeling diode

Yellow LED, Bridge rectifier

48 V DC

3 V DC

100 mA

Protection against polarity reversal, Surge protection

2.5 kV (50 Hz, 1 min.)

-25°C ... 60°C

IEC 60664, EN 50178, IEC 62103

2/111

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm							
Ordering data							
Туре	Order No.	Pcs. / Pkt.					
PLC-OSC- 24DC/ 48DC/100/SEN ²) PLC-OSC-120UC/ 48DC/100/SEN ²) PLC-OSC-230UC/ 48DC/100/SEN ²) PLC-OSP- 24DC/ 48DC/100/SEN ²) PLC-OSP-120UC/ 48DC/100/SEN ²) PLC-OSP-230UC/ 48DC/100/SEN ²) PLC-OSP-230UC/ 48DC/100/SEN ²)	2966773 2966799 2966809 2967578 2967581 2967594	10 10 10 10 10					
PLC-OPT- 24DC/ 48DC/100/SEN ²) PLC-OPT-120UC/ 48DC/100/SEN ²) PLC-OPT-230UC/ 48DC/100/SEN ²)	2900358 2900359 2900361	10 10 10					

PLC-INTERFACE for high inrush currents

PLC relay modules for high inrush currents due, for example, to capacitive loads The advantages:

- Max. inrush current of 130 A
- Direct connection of load return line thanks to actuator type
- Screw, spring-cage, and push-in technology
- Safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

For diagrams of operating voltage ranges, see page 343

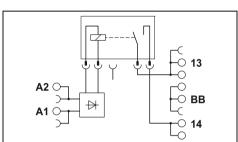
1) EMC: Class A product, see page 571



1 N/O contact of up to 130 A peak

.D . Sus 60 (I)

18



Input data	
Typ. input current at U _N Response/release time at U _N	[mA] [ms]
Input circuit DC	[III0]
Output data Contact material	
Max. switching voltage	
Min. switching voltage Max. inrush current	
General data	

G	iE	r	1	е	r	ĉ	ıl	d	a	ta	
_							٠.				

Test voltage input/output Ambient temperature (operation) Mechanical service life Standards/regulations

Connection data solid / stranded / AWG

	A2 0 BB C 14						
Technical data							
①							

reliow LED, Protection against polarity reversal, freewheeling did
AgSnO
250 V AC/DC
12 V AC/DC (at 100 mA)
80 A (for 20 ms) / 130 A (peak, at capacitive load, 230 V AC, 2

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C 3 x 107 cycles IEC 60664, EN 50178, IEC 62103

PLC-RSP- 24DC/ 1IC/ACT1)

PLC-RPT- 24DC/ 1IC/ACT1)

 $0.14 - 2.5 \text{ mm}^2 / 0.14 - 2.5 \text{ mm}^2 / 26 - 14$ 14 mm / 80 mm / 94 mm

Ordering data	a	
Туре	Order No.	Pcs./ Pkt.
PLC-RSC- 24DC/ 1IC/ACT ¹)	2967604	10

2912413

2900298

10

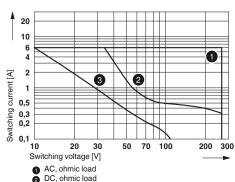
Oud auton date

Description	Input voltage $U_{\rm N}$
PLC INTERFACE, with screw connection	
1	24 V DC
PLC INTERFACE, with spring-cage connection	
•	24 V DC
PLC-INTERFACE, with push-in connection	
1	24 V DC

Basic behavior of capacitive loads:

- Very high input current - Voltage increases with an e-function

Max. interrupting rating



PLC-INTERFACE for high continuous currents

PLC relay modules for high continuous switching currents

The advantages:

- Max. continuous current of 10 A
- Safe isolation according to DIN EN 50178 between coil and contact
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter
- Long electrical service life thanks to 16 A relay
- All common input voltages of 12 V DC to 230 V AC

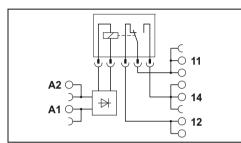
Type of housing: Polyamide PA non-reinforced, color: green. Marking systems and mounting material See Catalog 5 Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500... For diagrams of operating voltage ranges, see page 343 1) 230 V types up to 55°C 2) EMC: Class A product, see page 571





1 PDT up to 10 A

.(h)... _c**511**...s (PC) (il)



Input data	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input circuit DC	
Input circuit AC/DC	
Output data	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Min. switching current	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

Technical data							
1	2	3	4	(5)	6	7	
33	18	17.5	20	10	4.5	4.5	
8/10	8/10	8/10	8/10	8/10	7/10	7 / 10	
Yellow LED, Protection against polarity reversal, freewheeling diode							
Yellow	LED, Bri	dge recti	fier				

AgNi 250 V AC/DC 12 V AC/DC 10 A 30 A (300 ms) 100 mA

4 kV AC (50 Hz, 1 min.) -40°C ... 60°C1) 3 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

A [П	_	П			_	
20							T					
_ 10 <u></u>							ŧ				A	1
8 Switching current [A] 2 2 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3							Ŧ				v	7
ē .			— `	$\overline{}$	Н	H	+	Н			+	+
∄ 2 <u></u>			3	/	1	2	T	П				1
를 1 <u></u>		<u> </u>			7		#					#
₽ 0,5						ì	$\overline{}$	H	_			₹
							+					٦
0,2						7	\star					†
0,1	20) 3	80	5	0	7	0	10	00	2	200	3
					Sv	vitc	hind	qν	oltag	e [V]		-

Max.	interr	upti	ng	rati	ng
------	--------	------	----	------	----

Dimensions	W/H/D	14 mm / 80 mm / 94 mm		
		Ordering da	ta	
Description	Input voltage $U_{\rm N}$	Туре	Order No.	Pcs. / Pkt.
PLC INTERFACE, with screw connection	ı			
① ② ③ ④ ⑤	12 V DC 24 V DC 24 V AC/DC 48 V DC 60 V DC 120 V AC (110 V DC)	PLC-RSC- 12DC/21HC ²) PLC-RSC- 24DC/21HC ²) PLC-RSC- 24UC/21HC ²) PLC-RSC- 48DC/21HC ²) PLC-RSC- 60DC/21HC ²) PLC-RSC-120UC/21HC ²)	2967617 2967620 2967633 2967646 2967659 2967662	10 10 10 10 10
<u> </u>	230 V AC (220 V DC)	PLC-RSC-230UC/21HC ²)	2967675	10
PLC INTERFACE, with spring-cage conn ① ② ③ ④ ⑤ ⑥ ⑦	12 V DC 24 V DC 24 V AC/DC 48 V DC 60 V DC 120 V AC (110 V DC) 230 V AC (220 V DC)	PLC-RSP- 12DC/21HC²) PLC-RSP- 24DC/21HC²) PLC-RSP- 24UC/21HC²) PLC-RSP- 48DC/21HC²) PLC-RSP- 60DC/21HC²) PLC-RSP-120UC/21HC²) PLC-RSP-230UC/21HC²)	2912264 2912277 2912280 2912293 2912303 2912316 2912329	10 10 10 10 10 10
PLC-INTERFACE, with push-in connection				
① ② ③ ④ ⑤ ⑦	12 V DC 24 V DC 24 V AC/DC 48 V DC 60 V DC 120 V AC (110 V DC) 230 V AC (220 V DC)	PLC-RPT- 12DC/21HC ²) PLC-RPT- 24DC/21HC ²) PLC-RPT- 24UC/21HC ²) PLC-RPT- 48DC/21HC ²) PLC-RPT- 60DC/21HC ²) PLC-RPT-120UC/21HC ²) PLC-RPT-230UC/21HC ²)	2900290 2900291 2900293 2900294 2900295 2900296 2900297	10 10 10 10 10 10 10

Basic terminal blocks with interference current filter that can be fitted with relays

PLC basic terminal blocks with integrated filter to protect against interference voltages or currents due, for example, to long control lines

The advantages:

- Resistant to interference currents
- High relay release voltage Typical applications:
- Applications with long control lines
- Use of AC output boards, resulting in residual AC currents
- Screw, spring-cage, and push-in technology

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

For diagrams of operating voltage ranges, see page 343

Maximum interrupting rating diagrams, see page 346

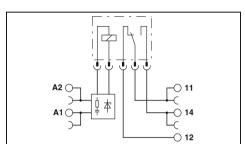
1) EMC: Class A product, see page 571





Universal design

c**SN**us (EL



Technical data

Input data
Nominal input voltage U _N
Permissible range (with reference to U _N)
Typ. release voltage (with relay)
Typ. input current with U _N (50 /60 Hz)
Typ. response time at U _N
Typ. release time at U _N
Input circuit
Output data with:
Contact type
Contact material
Max. switching voltage
Min. switching voltage
Limiting continuous current

Min. switching current General data Test voltage input/output Ambient temperature (operation) Mechanical service life Standards/regulations

Max. inrush current

With spring-cage connection

Pollution degree / Surge voltage category Connection data solid / stranded / AWG

Dimensions W/H/D 120 V AC 230 V AC

0.8 ... 1.4 0.78 ... 1.14 50 V AC 80 V AC 7 mA / 8 mA 8.8 mA / 10 mA 20 ms

Yellow LED, Bridge rectifier, Filter

REL-MR-60DC/21 REL-MR-60DC/21AU Single contact, 1-PDT Single contact, 1-PDT

AgSnO AgSnO, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 5 V (at 100 mA) 100 mV (at 10 mA) 50 mA 50 mA

(on request) 10 mA (at 12 V) 1 mA (at 24 V) 4 kV (50 Hz, 1 min.)

-20°C ... 55°C 2 x 107 cycles

IEC 60664, EN 50178, IEC 62103 3 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 94 mm

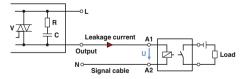
Description	Voltage U _N
PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays	
With screw connection	120 V AC
With screw connection	230 V AC
With spring-cage connection	120 V AC

230 V AC

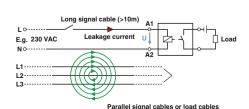
With push-in connection	120 V AC
With push-in connection	230 V AC
Plug-in miniature relays	
with gold contact	
with power contact	

Ordering data Pcs./ Type Order No. PLC-BSC-120UC/21/SO461) 2980319 10 PLC-BSC-230UC/21/SO461) 2980335 10 PLC-BSP-120UC/21/SO461) 2980351 10 PLC-BSP-230UC/21/SO461) 2980377 10 PLC-BPT-120UC/21/SO461) 2900453 10

PLC-BPT-230UC/21/SO461)	2900455	10
Accessories	S	
REL-MR- 60DC/21AU REL-MR- 60DC/21	2961134 2961118	10 10



Occurrence of interference signals Scenario 1: controller - AC output card



Occurrence of interference signals Scenario 2: long signal cables





Sensor design



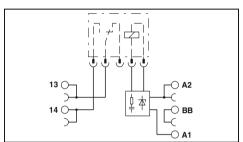


2 PDT universal design

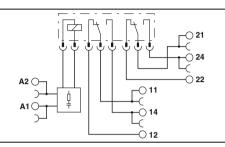


1 PDT for high continuous currents

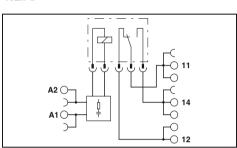












Technical data					
120 V AC	230 V AC				
0.8 1.4	0.78 1.14				
50 V AC	80 V AC				
7 mA / 8 mA	8.8 mA / 10 mA				
7 ms	7 ms				
20 ms	20 ms				
Yellow LED, Bridge rectifier, Fi	lter				
REL-MR-60DC/21	REL-MR-60DC/21AU				
Single contact, 1 N/O contact	Single contact, 1 N/O con				
AgSnO	AgSnO, hard gold-plated				
250 V AC/DC	30 V AC / 36 V DC				

5 V (at 100 mA) 100 mV (at 10 mA) 6 A 50 mA (on request) 50 mA 10 mA (at 12 V) 1 mA (at 24 V) 4 kV (50 Hz, 1 min.) -20°C ... 55°C 2 x 107 cycles IEC 60664, EN 50178, IEC 62103 3 / III 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 94 mm

REL-MR- 60DC/21

Technical data		
20 V AC	230 V AC	
0.78 1.4	0.78 1.14	
6 V AC	70 V AC	
6 mA / 7 mA	8.5 mA / 10 mA	
'ms	7 ms	
0 ms	10 ms	
ellow LED, Bridge rectifier, Filter		
REL-MR-110DC/21-21	REL-MR-110DC/21-21AU	
Single contact, 2-PDT	Single contact, 2-PDT	
AgNi	AgNi, + 5 μm Au	
PSO V AC/DC	30 V AC / 36 V DC	

5 V AC/DC 100 mV 6 A 50 mA 15 A (300 ms) 50 mA 10 mA 4 kV (50 Hz, 1 min.) -20°C ... 55°C 3 x 107 cycles IEC 60664, EN 50178, IEC 62103 3 / III 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm

	Technical data	
	120 V AC	230 V AC
	0.85 1.4	0.78 1.14
	16 V AC	70 V AC
	6 mA / 7 mA	8.5 mA / 10 mA
	7 ms	7 ms
	20 ms	20 ms
	Yellow LED, Bridge rectifier, Filte	r
AU	REL-MR-110DC/21HC	
	Single contact, 1-PDT	

AgNi 250 V AC/DC 12 V AC/DC 10 A 30 A (300 ms) 100 mA

Type

4 kV (50 Hz, 1 min.) -20°C ... 55°C 3 x 107 cycles IEC 60664, EN 50178, IEC 62103 3 / III 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm Ordering data

PLC-BSC-120UC/21HC/SO461)

PLC-BSC-230UC/21HC/SO461)

Ordering da	ıta		Ordering da	ta	
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
PLC-BSC-120UC/ 1/SEN/SO46¹) PLC-BSC-230UC/ 1/SEN/SO46¹) PLC-BSP-120UC/ 1/SEN/SO46¹) PLC-BSP-230UC/ 1/SEN/SO46¹) PLC-BPT-120UC/ 1/SEN/SO46¹) PLC-BPT-230UC/ 1/SEN/SO46¹)	2980322 2980348 2980364 2980380 2900456 2900457	10 10 10 10 10	PLC-BSC-120UC/21-21/SO46 ¹) PLC-BSC-230UC/21-21/SO46 ¹)	2980416 2980429	10 10
Accessorie	s		Accessorie	s	
REL-MR- 60DC/21AU	2961134	10	REL-MR-110DC/21-21AU	2961228	10

10

REL-MR-110DC/21-21

2961118

_			
	Accessories	}	
	REL-MR-110DC/21HC	2961338	10

Pcs./

10

10

Order No.

2980432

2980445

2961202

Basic terminal blocks with interference current filter that can be fitted with solid-state relays

PLC basic terminal blocks with integrated filter to protect against interference voltages or currents due, for example, to long control lines

The advantages:

- Resistant to interference currents
- High relay release voltage Typical applications:
- Applications with long control lines
- Use of AC output boards, resulting in residual AC currents
- Screw, spring-cage, and push-in technology

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500...

For derating curves see page 345

1) EMC: Class A product, see page 571

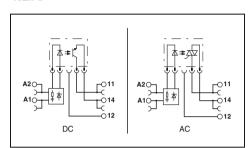




Universal design

c**SZ**us (EL

120 V AC



Input data
Nominal input voltage U _N
Permissible range (with reference to U _N)
Switching level (with optocoupler) 0 signal ("L")
Typ. input current with U _N (50 /60 Hz)
Typ. response time/switch-on time at U _N

Ty Typ. switch-off time at U_N

Input circuit Output data with:

Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current Output protection

Voltage drop at limiting continuous current Leakage current in off state Max. phase shift (inductive consumer)

Max. load value I2 x t (t = 10 ms)

General data

Test voltage input/output Ambient temperature (operation) Standards/regulations

Pollution degree / Surge voltage category Connection data solid / stranded / AWG

Dimensions W/H/D

Techn	ica	l data
-------	-----	--------

230 V AC

120 V AC	230 V AC						
0.85 1.1	0.8 1.1						
≤ 0.4		≤ 0.4					
7 mA / 8 mA		8.8 mA / 10 mA					
6 ms	6 ms						
10 ms	10 ms						
Yellow LED, Bridge rectifier, Filter							
OPT48DC/	OPT24DC/	OPT230AC/					
48 V DC	30 V DC	253 V AC					
3 V DC	3 V DC	24 V AC					
100 4		0 == 4					

100 mA 0.75 A 15 A (10 ms) 30 A (10 ms) Protection Protection RCV circuit against polarity reversal, Surge against polarity reversal, Surge protection protection < 1 V DC < 200 mV < 1 V AC < 1 mA 0.5 4.5 A²s

2.5 kV (50 Hz, 1 min.) -20°C ... 55°C

IEC 60664, EN 50178, IEC 62103

2/III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

		Ordering data		
Description	Voltage U _N	Туре	Order No.	Pcs. / Pkt.
PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays				
With screw connection	120 V AC	PLC-BSC-120UC/21/SO461)	2980319	10
With screw connection	230 V AC	PLC-BSC-230UC/21/SO461)	2980335	10
With spring-cage connection	120 V AC	PLC-BSP-120UC/21/SO461)	2980351	10
With spring-cage connection	230 V AC	PLC-BSP-230UC/21/SO461)	2980377	10
With push-in connection	120 V AC	PLC-BPT-120UC/21/SO461)	2900453	10
With push-in connection	230 V AC	PLC-BPT-230UC/21/SO461)	2900455	10

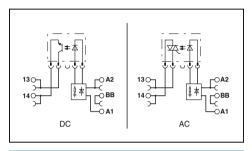
	Accessories		
Plug-in solid-state relays			
Solid-state input relays	OPT-60DC/ 48DC/100	2966621	10
Solid-state power relays	OPT-60DC/ 24DC/ 2	2966605	10
Solid-state power relays	OPT-60DC/230AC/ 1	2967963	10





Sensor design

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Technical data

120 V AC		230 V AC			
0.85 1.1		0.8 1.1			
≤ 0.4		≤ 0.4			
7 mA / 8 mA		8.8 mA / 10 mA			
6 ms		6 ms			
10 ms		10 ms			
	Yellow LED, Bridge rectifier, Filter				
	OPT24DC/	OPT230AC/			
48 V DC	30 V DC	253 V AC			
3 V DC	3 V DC	24 V AC			
100 mA	3 A	0.75 A			
	15 A (10 ms)	30 A (10 ms)			
Protection	Protection	RCV circuit			
against polarity	against polarity				
reversal, Surge protection	reversal, Surge protection				
< 1 V	< 200 mV	< 1 V			
-	< 200 IIIV	< 1 mA			
	-	0.5			
-	-	0.5			
-	-	4.5 A ² s			

2.5 kV (50 Hz, 1 min.) -20°C ... 55°C IEC 60664, EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

OPT-60DC/ 48DC/100 OPT-60DC/ 24DC/ 2 OPT-60DC/230AC/ 1

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
PLC-BSC-120UC/ 1/SEN/SO46¹) PLC-BSC-230UC/ 1/SEN/SO46¹) PLC-BSP-120UC/ 1/SEN/SO46¹) PLC-BSP-230UC/ 1/SEN/SO46¹) PLC-BPT-120UC/ 1/SEN/SO46¹) PLC-BPT-230UC/ 1/SEN/SO46¹)	2980322 2980348 2980364 2980380 2900456 2900457	10 10 10 10 10		
Accessories				

10 10

10

2966621 2966605 2967963

Plug-in miniature power relays

Plug-in miniature power relays suitable for PLC-INTERFACE and RIF-0, RIF-1, and PR1 relay bases.

The advantages:

- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type
- Safe isolation according to DIN EN 50178 between coil and contact

Notes:

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

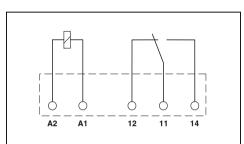
For dimensional drawings and perforations for assembly, see page 344

For diagrams of operating voltage ranges, see page 343



1 PDT

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					Techn	ical data
Input data		1	2	3	4	(5)
Permissible range (with reference to U _N)		refer to	the dia	gram		-
Typ. input current at U _N	[mA]	38	14	9	7	3
Typ. response time at U _N	[ms]	5	5	5	5	5
Typ. release time at U _N	[ms]	2.5	2.5	2.5	2.5	2.5
Output data						
Contact type		Single	contact,	1-PDT		Single contact, 1-PDT
Contact material		AgSn0				AgSnO, hard gold-plated
Max. switching voltage		250 V	AC/DC			30 V AC / 36 V DC
Min. switching voltage		,	100 mA	.)		100 mV (at 10 mA)
Limiting continuous current		6 A				50 mA
Max. inrush current		(on red	. ,			(on request)
Min. switching current		10 mA (at 12 V)				1 mA (at 24 V)
Max. interrupting rating, ohmic load						
	24 V DC	140 W				1.2 W
	48 V DC	20 W				-
	60 V DC	18 W				-
	110 V DC	23 W				-
	220 V DC	40 W				-
General data	250 V AC	1500 \	/A			•
Test voltage (winding / contact) Ambient temperature (operation) Nominal operating mode Mechanical service life Standards/regulations Mounting position/mounting		-40°C 100% 2 x 10 IEC 60	.C (50 Hz 85°C operatin ⁷ cycles 0664, EN n rows w	g factor	IEC 6210)3
Dimensions	W/H/D	5 mm	/ 28 mm	/ 15 mm		

Description		Input voltage U _N
Plug-in miniature power relays		
with power contact	1	4.5 V DC
with power contact	2	12 V DC
with power contact	3	18 V DC
with power contact	4	24 V DC
with power contact	(5)	60 V DC
with power contact	6	110 V DC
Plug-in miniature power relays		
with gold contact	1	4.5 V DC
with gold contact	2	12 V DC
with gold contact	3	18 V DC
with gold contact	4	24 V DC
with gold contact	(5)	60 V DC
with gold contact	6	110 V DC

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
REL-MR- 4,5DC/21	2961367	10				
REL-MR- 12DC/21	2961150	10				
REL-MR- 18DC/21	2961383	10				
REL-MR- 24DC/21	2961105	10				
REL-MR- 60DC/21	2961118	10				
REL-MR 4,5DC/21AU	2961370	10				
REL-MR-12DC/21AU	2961163	10				
REL-MR-18DC/21AU	2961493	10				
REL-MR-24DC/21AU	2961121	10				
REL-MR-60DC/21AU	2961134	10				



2 PDT

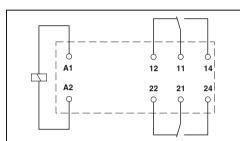


1 N/O contact, for high inrush currents

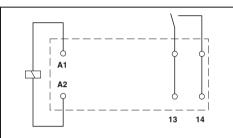


1 PDT for high continuous currents

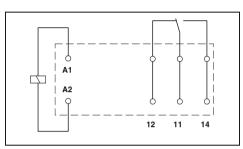








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Technical data					
2	4	(5)	6		
refer to the diagram					
33	17	8.2	4.1		
7	7	7	7		
3	3	3	3		

Technical data			
	4		
refer to the diagram	17 8 3		

Technical data				
2	4	(5)	6	
refer to the diagram				
33	17	8.2	4.1	
7	7	7	7	
3	3	3	3	

Single contact, 2-PDT	Single contact, 2-PDT
AaNi	AgNi, hard gold-plated

Agini	Agini, riard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 10 mA)	100 mV (at 10 mA)
8 A	50 mA
25 A (20 ms)	50 mA
10 mA (At 5 V)	1 mA (at 24 V)
190 W	1.2 W
85 W	-
60 W	-
44 W	-
60 W	-
2000 VA	-

Single contact, 1 N/O contact
AgenO

250 V AC/DC	
12 V (at 100 mA)	
16 A	
80 A (20 ms)	
100 mA (at 12 V DC)	
384 W	
58 W	
48 W	
50 W	
80 W	
4000 VA	

Single contact, 1-PDT

AgNi 250 V AC/DC 12 V (at 10 mA) 16 A 30 A (300 ms) 100 mA	
384 W 58 W 48 W	
50 W 80 W 4000 VA	

5 kV AC (50 Hz, 1 min.) -40°C ... 85°C

100% operating factor 3 x 10⁷ cycles

IEC 60664, EN 50178, IEC 62103

Any / Can be aligned without spacing (> 70°C ≥ 2.5 mm)

5 kV AC (50 Hz, 1 min.) -40°C ... 85°C 100% operating factor 3 x 10⁷ cycles

IEC 60664, EN 50178, IEC 62103

Any / Can be aligned without spacing (> 70° C ≥ 2.5 mm)

12.7 mm / 29 mm / 15.7 mm

5 kV AC (50 Hz, 1 min.) -40°C ... 85°C 100% operating factor 3 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103

Any / Can be aligned without spacing (> 70° C ≥ 2.5 mm)

12.7 mm / 29 mm / 15.7 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-MR- 12DC/21-21	2961257	10	
REL-MR- 24DC/21-21 REL-MR- 60DC/21-21 REL-MR-110DC/21-21	2961192 2961273 2961202	10 10 10	
REL-MR- 12DC/21-21AU	2961299	10	
REL-MR- 24DC/21-21AU REL-MR- 60DC/21-21AU REL-MR-110DC/21-21AU	2961215 2961286 2961228	10 10 10	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
REL-MR- 24DC/1IC	2961341	10	

12.7 mm / 29 mm / 15.7 mm							
Ordering data							
Type Order No.							
REL-MR- 12DC/21HC REL-MR- 24DC/21HC REL-MR- 60DC/21HC REL-MR-110DC/21HC	2961309 2961312 2961325 2961338	10 10 10 10					

Plug-in solid-state relays

Plug-in solid-state relays suitable for PLC-INTERFACE and RIF-0, RIF-1, and PR1 relay bases.

The advantages:

- Switching capacity of up to 24 V DC/5 A
- RT III wash tight (comparable to IP67)
- Vibration- and shock-resistant
- Wear-free and long-lasting
- Zero voltage switch at AC output
- Can be soldered in on PCB

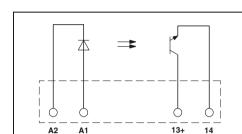


Max. DC voltage output of 3 A

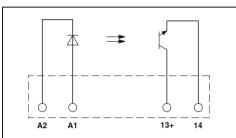


Max. DC voltage output of 100 mA

For dimensional drawings and perforations for assembly, see page 345



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Input data	
Permissible range (with reference to \mathbf{U}_{N})	
Switching level	1 signal ("H") [V DC] ≥ 0 signal ("L") [V DC] ≤
Typ. input current at U_N Typ. switch-on time at U_N Typ. switch-off time at U_N	[mA] [μs] [μs]
Transmission frequency f _{limit}	[Hz]
Output data	

Max. switching voltage Min. switching voltage Limiting continuous current Min. load current Max. inrush current

Leakage current in off state Phase angle (cos φ) Output circuit Max. load value Output protection

Voltage drop at max. limiting continuous current

General data

Rated surge voltage Test voltage input/output Ambient temperature (operation) Nominal operating mode Standards/regulations

Pollution degree/surge voltage category

Mounting position/mounting

W/H/D Dimensions

	Technical data				
1	2	3			
0.8 - 1.2 2.5	0.8 - 1.2 16	0.8 - 1.2 35			
0.8 9 20 300 300	10 7 20 300 300	20 3 40 500 300			

33 V DC 3 V DC

3 A (see derating curve)

15 A (10 ms)

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2-conductor, floating

Protection against polarity reversal, Surge protection ≤ 150 mV

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C

100% operating factor IEC 60664, EN 50178, IEC 62103

2/111

Any / In rows with zero spacing

5 mm / 28 mm / 15 mm

Technical data				
1	2	3		
0.8 -	0.8 -	0.9 -		
1.2	1.2	1.1		
2.5	16	52		
0.8	10	40		
4	7	3		
20	20	50		
300	300	800		
300	300	100		

48 V DC 3 V DC 100 mA

2-conductor, floating

Protection against polarity reversal, Surge protection

≤1 V

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor IEC 60664, EN 50178, IEC 62103

Any / In rows with zero spacing

Description		Input voltage $U_{\rm N}$
Plug-in solid-state relays		
Solid-state power relays	1	5 V DC
Solid-state power relays	2	24 V DC
Solid-state power relays	3	60 V DC
Plug-in solid-state relays		
Solid-state input relays	1	5 V DC
Solid-state input relays	2	24 V DC
Solid-state input relays	3	60 V DC

Ordering data									
Туре	Order No.	Pcs. / Pkt.							
OPT- 5DC/ 24DC/ 2 OPT-24DC/ 24DC/ 2 OPT-60DC/ 24DC/ 2	2967989 2966595 2966605	10 10 10							

5 mm / 28 mm / 15 mm		
Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
OPT- 5DC/ 48DC/100	2967992	10
OPT-24DC/ 48DC/100	2966618	10
OPT-60DC/ 48DC/100	2966621	10
OPT-24DC/ 48DC/100	2966618	10



Max. DC voltage output of 5 A

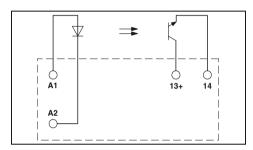


Max. AC voltage output of 750 mA

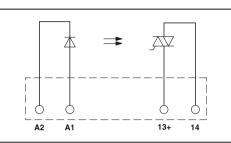


Max. AC voltage output of 2 mA

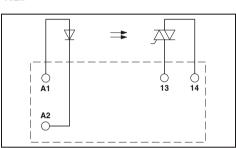








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		Technical data
1	2	3
0.8 -	0.8 -	0.9 -
1.2	1.2	1.1
2.5	16	35
8.0	10	20
9	7	3
10	20	25
400	400	400
300	300	300

33 V DC	
3 V DC	
5 A (see derating cu	

5 A (see derating curve)

15 A (10 ms)

2-conductor, floating

Protection against polarity reversal, Surge protection ≤ 200 mV

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor IEC 60664, EN 50178, IEC 62103 2/111

Any / In rows with zero spacing 12.7 mm / 29 mm / 15.7 mm

	Technical data									
2	3									
0.8 - 1.2 10 5 3 6000 500	0.9 - 1.1 50 15 3 9000 700									
10	10									

253 V AC 24 V AC

0.75 A (see derating curve)

10 mA 30 A (10 ms)

< 1 mA 0.5

2-conductor floating, zero voltage switch

4.5 A²s RCV circuit

< 1 V

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor IEC 60664, EN 50178, IEC 62103

2/III Any / In rows with zero spacing 5 mm / 28 mm / 15 mm

		Technical data
1	2	3
0.8 -	0.8 -	0.9 -
1.2	1.2	1.1
3	18	40
1	8.4	20
15	7	2.6
10000	10000	10000
10000	10000	10000
10	10	10

253 V AC 24 V AC 2 A (see derating curve) 25 mA

30 A (10 ms) < 1 mA

2-conductor floating, zero voltage switch

4 A²s (tp = 10 ms, at 25°C) Surge protection

≤ 1 V

Basic insulation 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor IEC 60664 2/III

Any / See derating curve 12.7 mm / 29 mm / 15.7 mm

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
OPT- 5DC/ 24DC/ 5 OPT-24DC/ 24DC/ 5 OPT-60DC/ 24DC/ 5	2982113 2982100 2982126	10 10 10

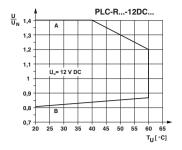
Ordering data	а	
Туре	Order No.	Pcs./ Pkt.
OPT-24DC/230AC/ 1 OPT-60DC/230AC/ 1	2967950 2967963	10 10

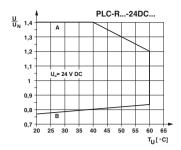
Ordering data										
Туре	Order No.	Pcs. / Pkt.								
OPT-5DC/230AC/ 2 OPT-24DC/230AC/ 2 OPT-60DC/230AC/ 2	2982168 2982171 2982184	10 10 10								

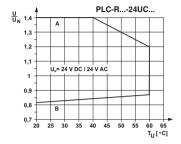
Relay options for PLC basic terminal blocks

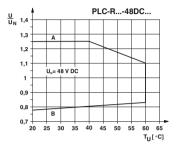
				,												,									1	1													_
			2980225	2966896	2966016	2966029	2966090	2966100	2966032	2980018	2966045		2967251	2967015	2967028	2967264	2967316	2967031	2967044		2967769	2967772	2967785	2967798	2967808	2967811	2967824		2980267	2966061	2966074	2966087		2980241	2966058	2982799			2967837
	ction		ŭ	Ki	Ki	i Ki	ŭ	ĸ	ĸ	ŭ	Ki		Ň	Κí	ŭ	čí					ŭ								čί					ŭ					
	Screw connection		2/21)C/21)C/21	JC/21)C/21)C/21	DC/21	DC/21	DC/21		PLC-BSC-12DC/21-21	PLC-BSC-24DC/21-21	PLC-BSC-24UC/21-21	PLC-BSC-48DC/21-21	PLC-BSC-60DC/21-21	PLC-BSC-120DC/21-21	PLC-BSC-230DC/21-21		PLC-BSC-12DC/21HC	2912345 PLC-BSC-24DC/21HC	PLC-BSC-24UC/21HC	PLC-BSC-48DC/21HC	PLC-BSC-60DC/21HC	PLC-BSC-120DC/21HC	PLC-BSC-230DC/21HC		PLC-BSC-5DC/1/SEN	PLC-BSC-24DC/1/SEN	PLC-BSC-120UC/1/SEN	PLC-BSC-230UC/1/SEN		PLC-BSC-5DC/1/ACT	PLC-BSC-24DC/1/ACT	PLC-BSC-24UC/1/ACT			PLC-BSC-24DC/11C/ACT
	Scre		PLC-BSC-5DC/21	PLC-BSC-12DC/21	PLC-BSC-24DC/21	PLC-BSC-24UC/21	PLC-BSC-48DC/21	PLC-BSC-60DC/21	PLC-BSC-120DC/21	PLC-BSC-125DC/21	PLC-BSC-230DC/21		BSC-12[BSC-24[BSC-24	BSC-48	BSC-60[BSC-120	BSC-23(BSC-12[BSC-24[BSC-24	BSC-48[BSC-60	BSC-120	BSC-230		BSC-5D	BSC-24[BSC-120	BSC-230		BSC-5D	BSC-24[BSC-24			BSC-24
			PLC	PLC	PLC-	임임	PLC	PLC	PLC	PLC	PLC			PLC	PLC	PLC-	PLC	PLC-			PLC.	PLC	PLC	PLC-	PLC	PLC-	PLC-		PLC-	PLC-	PLC	PLC		PLC	PLC	PLC			
	_	×	2980238	2967426	2967219	2967222	2967329	2967332	2967167		2967183	×	2912426	2912439	2912442	2912455	2912468	2912471	2912484	,	2912332	2345	2912358	2912361	2912374	2912387	2912390	쓩		2967206	2967154	2967170	ock	2980254	2967196	2982809	2961396		2912400
	Spring-cage connection	1 PDT basic terminal block	298	296	296	296	296	296	296		296	2 PDT basic terminal block	291	291	291	291	291	291	291	block	291	291	291	291	291	291	291	Sensor basic terminal block		296	296	296	Actuator basic terminal block	298	296	298	296	IC basic terminal block	
	Sonne	rmina							_			rmina	2	21	21	21	21	-5	1-21	ninal	우	우	우	우	우	오	오	rmin		Ä	SEN	SEN	ermir	F	Ę	Ę	۸	linal	PLC-BSP-24DC/11C/ACT
	cage	sic te	2/21)C/21	C/21	JC/21	C/21)C/21	DC/2		DC/2	sic te)C/21)C/21	JC/21)C/21)C/21	DC/2	DC/2	HC basic terminal	C/21)C/21	JC/21)C/21)C/21	DC/2	DC/2	sic te		C/1/S)UC/1/	UC/1	asic 1	C/1/AC)C/1/	JC/1/)C/21	c tern	OC/11C
	ring	от ра	P-5D(3P-12[P-24	P-24	P-48	J09-4	P-120		P-230	от ра	P-12[P-24	P-24	P-48	109-d	P-120	P-230	basi	P-12[P-24[P-24	P-48	J09-4	P-120	P-230	or be		P-24	P-120	P-230	ator b	P-5D	P-24	P-24	P-24	basi	P-24
	တ္တ	1 1	PLC-BSP-5DC/21	PLC-BSP-12DC/21	PLC-BSP-24DC/21	PLC-BSP-24UC/21	PLC-BSP-48DC/21	PLC-BSP-60DC/21	PLC-BSP-120DC/21		PLC-BSP-230DC/21	2 PI	PLC-BSP-12DC/21-21	PLC-BSP-24DC/21-21	PLC-BSP-24UC/21-21	PLC-BSP-48DC/21-21	PLC-BSP-60DC/21-21	PLC-BSP-120DC/21-21	PLC-BSP-230DC/21-21	H	PLC-BSP-12DC/21HC	PLC-BSP-24DC/21HC	PLC-BSP-24UC/21HC	PLC-BSP-48DC/21HC	PLC-BSP-60DC/21HC	PLC-BSP-120DC/21HC	PLC-BSP-230DC/21HC	Sens		PLC-BSP-24DC/1/SEN	PLC-BSP-120UC/1/SEN	PLC-BSP-230UC/1/SEN	Actua	PLC-BSP-5DC/1/ACT	PLC-BSP-24DC/1/ACT	PLC-BSP-24UC/1/ACT	PLC-BSP-24DC/21RW	2	LC-BS
			\vdash	+	+-	_	\vdash	-			-		\vdash	+	1	1																		-		1			\vdash
	ction		2900443	2900444	2900445	2900446	2900447	2900279	2900280		2900281		2900282	2900283	2900284	2900285	2900286	2900287	2900288		2900253	2900254	2900255	2900256	2900257	2900258	2900259			2900262	2900451	2900452		2900448	2900449	2900450	2900261		r 2900260
	Push-in connection			_	_	_	_	_	21		21		1-21	1-21	1-21	1-21	1-21	21-21	21-21		웃	1HC	무	1HC	1 무	21HC	21HC			/SEN	1/SEN	PLC-BPT-230UC/1/SEN		Ğ	ACT/	ACT/	1RW		PLC-BPT-24DC/1IC/ACT
Relay and solid-state relay	h-in c)C/21	PLC-BPT-12DC/21	PLC-BPT-24DC/21	PLC-BPT-24UC/21	PLC-BPT-48DC/21	PLC-BPT-60DC/21	PLC-BPT-120DC/21		PLC-BPT-230DC/21		PLC-BPT-12DC/21-21	PLC-BPT-24DC/21-21	PLC-BPT-24UC/21-21	PLC-BPT-48DC/21-21	PLC-BPT-60DC/21-21	PLC-BPT-120DC/21-21	PLC-BPT-230DC/21-21		PLC-BPT-12DC/21HC	PLC-BPT-24DC/21HC	PLC-BPT-24UC/21HC	PLC-BPT-48DC/21HC	PLC-BPT-60DC/21HC	PLC-BPT-120DC/21HC	PLC-BPT-230DC/21HC			PLC-BPT-24DC/1/SEN	PLC-BPT-120UC/1/SEN	30UC/		PLC-BPT-5DC/1/ACT	PLC-BPT-24DC/1/ACT	PLC-BPT-24UC/1/ACT	PLC-BPT-24DC/21RW		tDC/1
options	Pus		PLC-BPT-5DC/21	PT-12	PT-24	PT-2	3PT-48	PT-60	PT-12		PT-23		PT-12	PT-24	PT-2	PT-48	PT-60	PT-12	PT-23		PT-12	PT-2	PT-2	3PT-48	PT-60	PT-12	PT-23			PT-2	PT-12	PT-23		PT-5[PT-2	PT-2	PT-2		PT-24
			PLC-B	PLC-B	PLC-B	김	PLC-B	PLC-B	PLC-B		PLC-B		다. 무건	PLC-B	PLC-B	-LC-B	PLC-B	PLC-B	PLC-B		PLC-B	PLC-B	-LC-B	PLC-B	-C-B	P-C-B	PLC-B			PLC-B	PLC-B	PLC-B		고 문	PLC-B	PLC-B	-LC-B		P.C.B
REL-MR-4,5DC/21	2961367		Х	_																									Х					х					
REL-MR-4,5DC/21AU	2961370		х																										Х					Х					
REL-MR-12DC/21	2961150			X																															X				
REL-MR-12DC/21AU	2961163			Х																																			
REL-MR-24DC/21	2961105				X		X																							X						X			
REL-MR-24DC/21AU REL-MR-60DC/21	2961121 2961118				Х	X	Х	Х	Х	Х	X																			Х	Х	х			Х	Х			
REL-MR-60DC/21AU	2961118							X	X	X	X																				X	X							
REL-MR-24DC/1IC	2961341							, ,	,																							,							Х
REL-MR-18DC/21	2961383																																				Х		
REL-MR-18DC/21AU	2961493																																				Х		
REL-MR-12DC/21-21	2961257												х																										
REL-MR-12DC/21-21AU	2961299												х																										
REL-MR-24DC/21-21	2961192													х	X	х																							Г
REL-MR-24DC/21-21AU	2961215													X	X	X																							
REL-MR-60DC/21-21	2961273																X																						
REL-MR-60DC/21-21AU	2961286																X																						
REL-MR-110DC/21-21	2961202																	X	X																				
REL-MR-110DC/21-21AU REL-MR-12DC/21HC	2961228																	Х	Х		v																		
REL-MR-12DC/21HC	2961309 2961312																				Х	х	Х	Х															
REL-MR-60DC/21HC	2961312																					^	^	^	х														
REL-MR-110DC/21HC	2961323																								^	х	х												
DPT-24DC/230AC/1	2967950				х		х																							Х					Х	х			
DPT-60DC/230AC/1	2967963							Х	Х		Х																				х	Х							
DPT-5DC/24DC/2	2967989		х																										х					х					
OPT-24DC/24DC/2	2966595				Х	1	Х																							х					х	х			
DPT-60DC/24DC/2	2966605							Х	х		х																				х	х							
DPT-5DC/48DC/100	2967992		Х																										X					Х					
DPT-24DC/48DC/100	2966618				Х	1	Х																							х					х	X			
DPT-60DC/48DC/100	2966621							X	X		X																				X	Х							
DPT-24DC/24DC/5	2982100													X		X						Х		Х															Х
DPT-60DC/24DC/5	2982126																X								Х														
OPT-24DC/230AC/2	2982171													Х		Х						Х		Х															Х
OPT-60DC/230AC/2	2982184																X								Х														

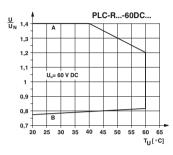
Operating voltage ranges for PLC-INTERFACE, 6.2 mm versions, equipped with relay

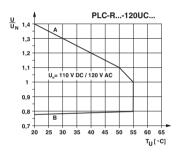


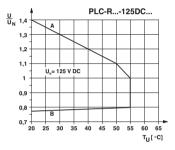


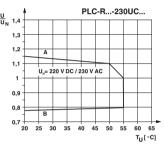




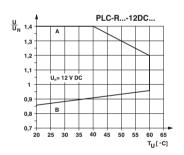


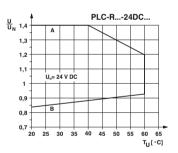


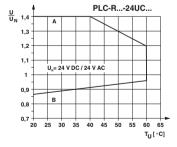


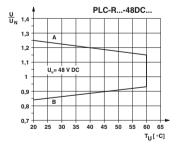


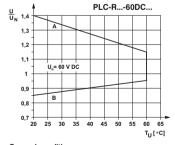
Operating voltage ranges for PLC-INTERFACE, 14 mm versions, equipped with relay

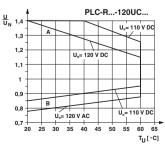


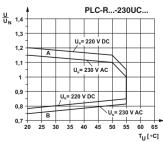












General conditions:

Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Maximum permissible continuous voltage U_{max} with limiting continuous current on the contact side (see relevant technical data).

Curve B

Minimum permissible operate voltage U_{op} after pre-excitation¹) (see relevant technical data).

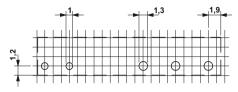
1) Pre-excitation: relay has been operated in a thermally steady state at the ambient temperature T_{A} with nominal voltage U_{N} and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at U_{op} . The U_{op} values for cold coils ($T_{coil} = T_A = 20^{\circ}$ C) indicated by other manufacturers yield better values, but are not practical.

Plug-in miniature power relays

REL-MR...21

5 mm design width

Perforations for assembly: view of the connections

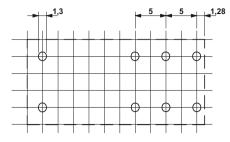


Pitch division: 1.25 mm and 1.27 mm

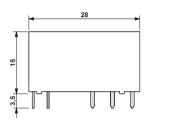
REL-MR...21-21

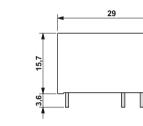
12.7 mm design width

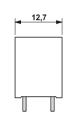
Perforations for assembly: view of the connections



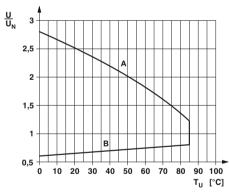
Pitch division: 2.5 mm







Permissible input voltage range for REL-MR...21



General conditions:

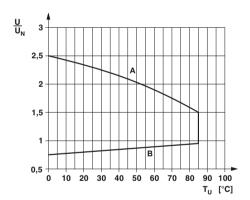
Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Maximum permissible continuous voltage \mathbf{U}_{\max} with limiting continuous current on the contact side (see relevant technical data).

Minimum permissible operate voltage \mathbf{U}_{op} after pre-excitation¹) (see relevant technical data).

1) **Pre-excitation**: relay has been operated in a thermally steady state at the ambient temperature T_A with nominal voltage U_N and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at U_{op} . The U_{op} values for cold coils ($T_{coil} = T_A = 20^{\circ}\text{C}$) indicated by other manufacturers yield better values, but are not practical.

Permissible input voltage range for REL-MR...21-21, REL-MR-24DC/1IC, REL-MR...21HC

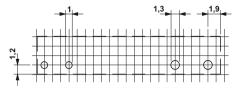


Plug-in solid-state relays

OPT...DC/24DC/2 OPT...DC/230AC/1

5 mm design width

Perforations for assembly: view of the connections

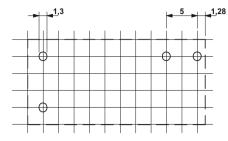


Pitch division: 1.25 mm and 1.27 mm

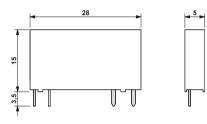
OPT...DC/24DC/5 OPT...DC/230AC/2

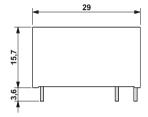
12.7 mm design width

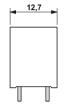
Perforations for assembly: view of the connections



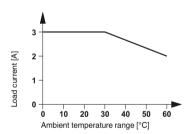
Pitch division: 2.5 mm



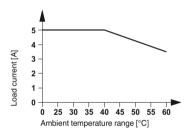




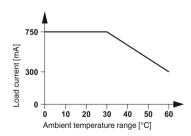
Derating curve for OPT...DC/24DC/2 and PLC-OS.../24DC/2 solid-state relays



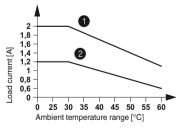
Derating curve for OPT...DC/24DC/5 and PLC-OS.../24DC/5/ACT solid-state relays



Derating curve for OPT...DC/230AC/1 and PLC-OS.../230AC/1 solid-state relays



Derating curve for OPT...DC/230AC/2 and PLC-OS.../230AC/2/ACT solid-state relays

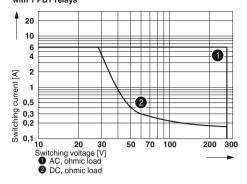


Aligned with > 10 mm spacingAligned without spacing

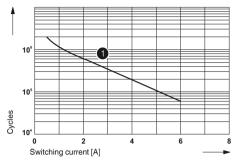
Electrical interrupting rating for **PLC-INTERFACE**

PLC-INTERFACE for railway applications

Electrical interrupting rating for PLC...21 with 1 PDT relays

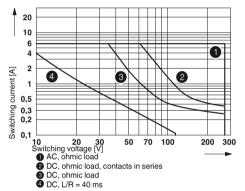


Electrical service life for PLC-RSP...UC/21RW

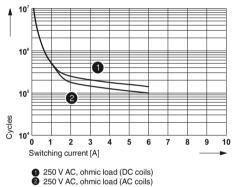


1 250 V AC, ohmic load

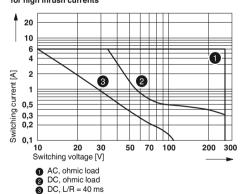
Electrical interrupting rating for PLC...21-21 with 2 PDT relays



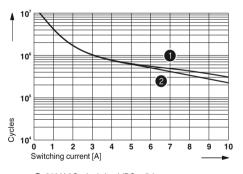
Electrical service life for PLC-RSP...UC/21-21/RW



Electrical interrupting rating for PLC...1IC/ACT for high inrush currents

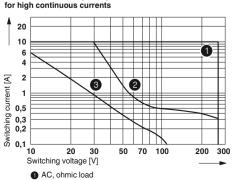


Electrical service life for PLC-RSP...UC/21HC/RW



250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

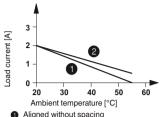
Electrical interrupting rating for PLC...21HC



2 DC, ohmic load 3 DC, L/R = 40 ms

EMG-OV solid-state power relays

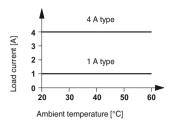
Derating curve for EMG 17-OV...48DC/2



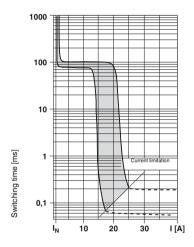
Aligned without spacing Stand-alone device

ST-OV 4-24DC/24DC...PRO power circuit breaker solid-state relays with signal logic

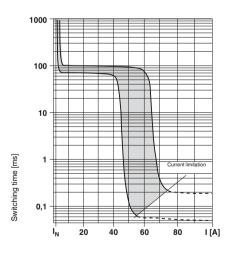
Derating curve for ST-OV 4-24DC/24DC...PRO



Time-current characteristic, 1 A version



Time-current characteristic, 4 A version



State diagram

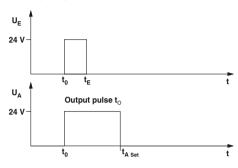
Operating state	Switching level Input	Light indi- cator, yellow LED	Light indi- cator, red LED	Alarm con- tact/ CONTROL					
Not activat- ed	L	L	L						
Normal op- eration	н	н	L						
Over- load/short circuit	н	н	н	7					
Open circuit	L	L	Н	<u> </u>					

UEGM-OE/AV logic pulse expansion module

Time diagrams for UEGM-OE/AV-24DC/24DC/100

Scenario 1: input pulse t_i < output pulse $t_{O set}$

Operating voltage present



Scenario 2: input pulse $\mathbf{t_i} \ge \mathbf{output}$ pulse $\mathbf{t_O}$ set: $\mathbf{t_i} = \mathbf{t_O}$

Operating voltage present

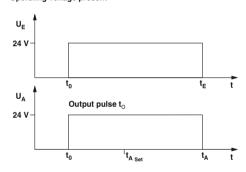


Table of adjustable output pulse lengths

		DIP switches¹)													
	S1	S2	S3	S4	S5	S6	S7	S8							
	10	-	_	_	-	-	-	-							
Length of	-	20	20		-	-	_	_							
	-	-	50	-	-	-	_	-							
output puls- es [ms]	-	-	-	100	-	-	_	-							
(when in "on" switch	-	-	-	-	200	-	-	-							
position)	-	-	-	-	-	500	-	-							
	-	-	-	-	-	-	1000	-							
	-	-	-	-	-	-	-	1500							

1) If no switch is actuated, the output voltage is not defined.

If the input pulse is longer than the set time, the output is switched off almost simultaneously with the input.

Intermediate values can be obtained by combining several DIP switches according to the following formula:

$$T_{tot} = \frac{1}{\begin{array}{c} 1 \\ 1 \\ t_1 \end{array} \begin{array}{c} 1 \\ t_2 \end{array} \begin{array}{c} 1 \\ t_r \end{array}}$$

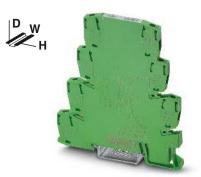
PLC-INTERFACE with two integrated relays

Relay module with two permanently soldered-in power relays

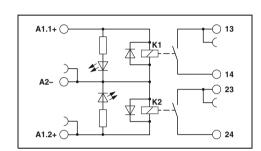
The advantages:

- 100% more channel density than the conventional 6.2 mm relay
- Two switching channels in a 6.2 mm housing
- Integrated input circuit/protective circuit
- Safe isolation according to DIN EN 50178 between coil and contacts and between contacts
- Screw, spring-cage, and push-in technolo-

Notes:		
Type of I Polyamid	ousing: e PA non-reinforced, color: green.	
Marking See Cata	ystems and mounting material og 5	
1) EMC:	Class A product, see page 571	



Two integrated relays



Technical data

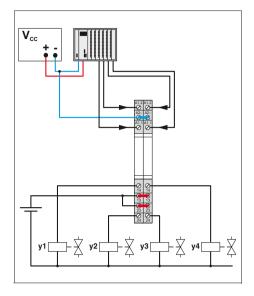
Input data	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input circuit DC	
Output data	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	
General data	
Test voltage input/output	
Test voltage output/output	
Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

Description	Input voltage $U_{\rm N}$	
PLC INTERFACE, with screw connection		
1	24 V DC	
PLC INTERFACE, with spring-cage connection		
1	24 V DC	
PLC-INTERFACE, with push-in connection		
1	24 V DC	

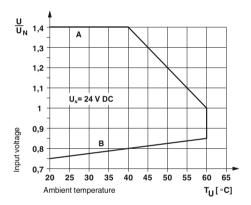
①
7
4/6
Yellow LED, Protection against polarity reversal, freewheeling diode
AgNi 250 V AC/DC 24 V AC/DC 3.5 A 5 mA
3 kV AC (50 Hz, 1 min.) 3 kV AC (50 Hz, 1 min.) -20°C 60°C 2 x 10 ⁷ cycles IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14 6.2 mm / 80 mm / 86 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
PLC-2RSC-24DC/ 11)	2987309	10
PLC-2RSP-24DC/ 11)	2987312	10
PLC-2RPT-24DC/11)	2901639	10

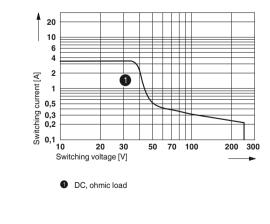
Application example for PLC-2RS...24DC/1



Operating voltage range



Interrupting rating



PLC-INTERFACE with manual switch and relay

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

The advantages are:

- Max. switching current of 6 A
- Only 6.2 mm wide
- Floating confirmation contact
- Safe isolation according to DIN EN 50178 between coil and contact
- Screw, spring-cage, and push-in technology

Type of housing: Polyester PBT non-reinforced, color: green

Marking systems and mounting material See Catalog 5

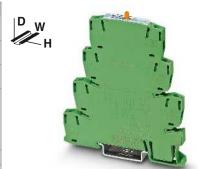
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

Module height: PLC-...-S/H = 90 mm; PLC-...-S/L: = 86 mm

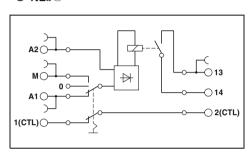
PLC...H - manual operation PLC...L - operation using screwdriver

1) EMC: Class A product, see page 571

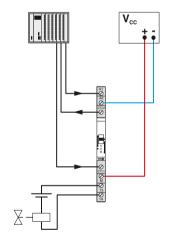


Relay module with manual switch and integrated relay

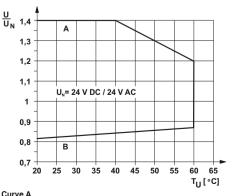
GL ... GL



Application example PLC-RS...24UC/1/S...



Permissible input voltage range for PLC-RS...24UC/1/S...



maximum continuous voltage at limiting continuous current = 6 A

Curve B

minimum operating voltage for pre-excitation with U_N and limiting continuous current = 6 A

Input data	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input circuit AC/DC	
Output data	
Contact material	
Max cwitching voltage	

Max. switching voltage Min. switching voltage

Limiting continuous current Max. inrush current Min. switching current

Feedback

Operating mode "Automatic" floating

General data

Rated insulation voltage Rated surge voltage

Ambient temperature (operation)

Standards/regulations

Pollution degree/surge voltage category

Connection data solid / stranded / AWG

W/H/D Dimensions

	1
[mA] [ms]	11 6 / 1 Yell
	AgS 250 5 V 6 A (on 10 r
	max min
	250 6 k\ -20° IEC 2 / I

24 V AC/DC

24 V AC/DC

Description		Input voltage $U_{\rm N}$
PLC INTERFACE, with screw connection		
	1	24 V AC/DC
	2	24 V AC/DC
PLC INTERFACE, with spring-cage connection		
	1	24 V AC/DC
	2	24 V AC/DC
PLC-INTERFACE, with push-in con	nection	

1	2
11	11
6/15	6/15
Yellow	LED, Bridge rectifier
AgSnO	
250 V A	AC/DC
5 V (at	100 mA)
6 A	
(on req	uest)
10 mA	(at 12 V)
	2 V 4 O / D O / F O A

Technical data

x. 30 V AC/DC / 50 mA . 2 V AC/DC / 1 mA

V AC °C ... 60°C

60664, EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 90 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PLC-RSC- 24UC/ 1/S/H	2982236	10	
PLC-RSC- 24UC/ 1/S/L ¹)	2834876	10	
PLC-RSP- 24UC/ 1/S/H	2982249	10	
PLC-RSP- 24UC/ 1/S/L ¹)	2834889	10	
PLC-RPT- 24UC/ 1/S/H¹)	2900328	10	
PLC-RPT- 24UC/ 1/S/L¹)	2900327	10	

PLC-INTERFACE with manual switch without relay

Switching module without relay for manual, zero, and automatic functions

The advantages:

- Only 6.2 mm wide
- Floating confirmation contact
- Screw and spring-cage connection tech-

Type of housing: Polyester PBT non-reinforced, color: green

Marking systems and mounting material See Catalog 5

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

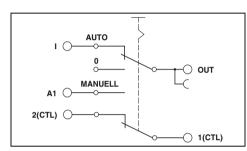
Module height: PLC-...-S/H = 90 mm; PLC-...-S/L: = 86 mm

PLC...H - manual operation
PLC...L - operation using screwdriver



Module with manual switch without relay





Technical data

100 (At 72 V DC / 50 mA) / 10000 (at 12 V DC / 100 mA)

72 V DC Max. switching voltage Min. switching voltage 2 V DC Max. inrush current 50 mA Min. switching current

Cycles, max. Feedback

Operating mode "Automatic" floating

General data

Rated insulation voltage

Rated surge voltage Ambient temperature (operation)

Standards/regulations

Pollution degree/surge voltage category

W/H/D

≤ 72 V DC / 50 mA

85 V AC

0.5 kV / basic insulation

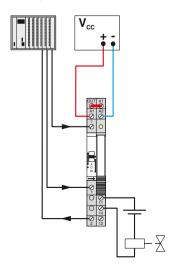
-20°C ... 60°C

IEC 60664, EN 50178, IEC 62103

6.2 mm / 80 mm / 90 mm

	Ordering data	
Description	Туре	Order No.
PLC INTERFACE, with screw connection		
	PLC-SC-S/H	2980733
	PLC-SC-S/L	2980775
PLC INTERFACE, with spring-cage connection		
	PLC-SP-S/H	2980746
	PLC-SP-S/L	2980788

Application example PLC-S...S...



Pkt.

10 10

10 10

PLC-INTERFACE with an integrated solid-state relay

The slim 6.2 mm PLC housing with integrated electronics in various versions offers the following advantages:

- Option of bridging adjacent modules
- Status display
- Protection circuits in input and output
- Wear-resistant and bounce-free switching
- Integrated protection circuit
- DC outputs of up to 300 V DC/1 A or up to 24 V DC/10 A
- Electronic PDT output of up to 48 V DC/500 mA
- Screw, spring-cage, and push-in technology

Type of housing: Polyester PBT non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

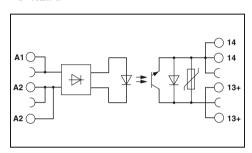
The housings of the following modules are open on one side:

- PLC-OS...-24DC/24DC/10/R
- 1) EMC: Class A product, see page 571



Power solid-state relay with DC voltage output, max. 1 A

(I) su (R) ::(II):



Input data	
Permissible range (with reference to U _N)	
·	
Switching level (with reference to U _N)	1 signal ("H")
	0 signal ("L")
Typ. input current at U _N	[mA]
Transmission frequency f _{limit}	[Hz]
Alarm output	
Operating range	
Output data	
Max. / min. switching voltage	
Limiting continuous current	
Voltage drop at max. limiting continuous current	
General data	
Rated insulation voltage	
Rated surge voltage	
Ambient temperature (operation)	
Standards/regulations	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

Technical data								
1	2	3	4	(5)	6	7	8	
0.8 -	0.8 -	0.8 -	0.8 -	0.8 -	0.8 -	0.8 -	0.8 -	
1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	
≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	
15	6	8	5	5	3	5.6	8.4	
50	50	50	50	50	50	10	10	

-/-

300 V DC / 12 V DC

- 1 A (see derating curve)
- < 500 mV

300 V

4 kV / basic insulation

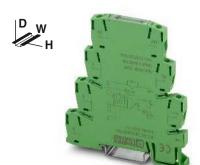
-25°C ... 60°C

IEC 60664, EN 50178, IEC 62103

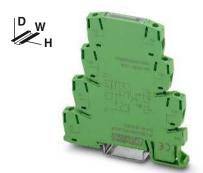
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 86 mm

Dimensions		W//11/D	0.2 111117 00 111117 00 111111		
			Ordering data		
Description		Input voltage U _N	Туре	Order No.	Pcs. / Pkt.
PLC INTERFACE, with screw	connection				
	1	5 V DC	PLC-OSC- 5DC/300DC/ 11)	2980652	10
	2	12 V DC	PLC-OSC- 12DC/300DC/ 11)	2980665	10
	3	24 V DC	PLC-OSC- 24DC/300DC/ 11)	2980678	10
48 V DC 60 V DC	4	60 V DC	PLC-OSC- 60DC/300DC/ 11)	2980681	10
	(5)	110 V DC	PLC-OSC-110DC/300DC/ 11)	2980694	10
	6	220 V DC	PLC-OSC-220DC/300DC/ 11)	2980704	10
	7	120 V AC	PLC-OSC-120AC/300DC/ 11)	2980717	10
	8	230 V AC	PLC-OSC-230AC/300DC/ 11)	2980720	10
PLC INTERFACE, with spring	-cage connection				
	1	5 V DC	PLC-OSP- 5DC/300DC/ 11)	2980814	10
	2	12 V DC	PLC-OSP- 12DC/300DC/ 11)	2980827	10
	3	24 V DC	PLC-OSP- 24DC/300DC/ 11)	2980830	10
48 V DC 60 V DC	4	60 V DC	PLC-OSP- 60DC/300DC/ 11)	2980843	10
	(5)	110 V DC	PLC-OSP-110DC/300DC/ 11)	2980856	10
	6	220 V DC	PLC-OSP-220DC/300DC/ 11)	2980869	10
	7	120 V AC	PLC-OSP-120AC/300DC/ 11)	2980872	10
	8	230 V AC	PLC-OSP-230AC/300DC/ 11)	2980885	10
PLC-INTERFACE, with push-i	_				
	1	5 V DC	PLC-OPT- 5DC/300DC/11)	2900381	10
	2	12 V DC	PLC-OPT- 12DC/300DC/11)	2900382	10
	3	24 V DC	PLC-OPT- 24DC/300DC/11)	2900383	10
48 V DC 60 V DC	4	60 V DC	PLC-OPT- 60DC/300DC/11)	2900384	10
	5	110 V DC	PLC-OPT-110DC/300DC/11)	2900385	10
	6	220 V DC	PLC-OPT-220DC/300DC/11)	2900387	10
	7	120 V AC	PLC-OPT-120AC/300DC/11)	2900388	10
	8	230 V AC	PLC-OPT-230AC/300DC/11)	2900389	10



Power solid-state relay with short-circuit-proof DC voltage output, max. 10 A, with feedback

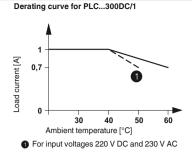


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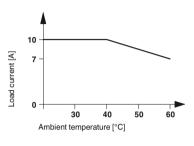
Input solid-state relay with DC voltage output, max. 500 mA, with electronic PDT

Technical data

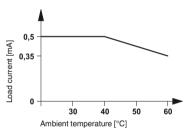
⊕ 12



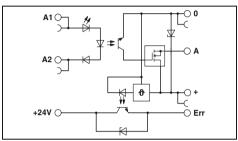
Derating curve for PLC-...24DC/24DC/10/R



Derating curve for PLC...24DC/48DC/500/W



. (I) .: . **A1** us (El



•	Technical data
3	
0.8 - 1.2 ≥ 0.8 ≤ 0.4 3 100	

3 V DC	33 V DC (High active)	/ 100 mA

33 V DC / 5 V DC 10 A (see derating curve)

≤ 50 mV 300 V

4 kV / basic insulation

-25°C ... 60°C

IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 86 mm

1.2 ≥ 0.8 ≤ 0.4 3 1000
-/-
48 V DC / 3 V DC 500 mA (see derating curve) < 1.2 V
300 V 4 kV / basic insulation -25°C 60°C IEC 60664, EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

0.8 -

6.2 mm / 80 mm / 86 mm

Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 24DC/ 10/R1)	2982702	10	PLC-OSC- 24DC/ 48DC/500/W ¹)	2980636	10
PLC-OSP- 24DC/ 24DC/ 10/R¹)	2982715	10	PLC-OSP- 24DC/ 48DC/500/W ¹)	2980649	10
PLC-OPT- 24DC/ 24DC/10/R¹)	2900398	10	PLC-OPT- 24DC/ 48DC/500/W ¹)	2900378	10

PLC-INTERFACE Solid-state relays up to 100 kHz

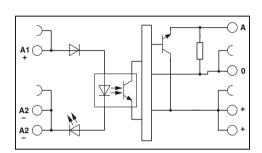
A solid-state relay for the safe acquisition of short pulses.

- Status display
- Bridging options
- Limit frequency of up to 100 kHz
- Push-pull stage on output side
- Features a capacitor on the input side for interference suppression

Notes:		
Type of housing Polyamide PA r	: on-reinforced, color: green.	
Marking system See Catalog 5	s and mounting material	
1) EMC: Class /	product, see page 571	



with DC voltage output Transmission frequency 100 kHz



		Technical data
Input data		① ②
Permissible range (with reference to U _N)		0.8 - 0.8 - 1.2 1.2
Switching level with reference to \mathbf{U}_{N}	1 signal ("H") 0 signal ("L")	> 0.8
Typ. input current at U _N	[mA]	7 6
Typ. switch-on time at U _N	[µs]	1.5 1.5
Typ. switch-off time at U _N	[µs]	2 2
Transmission frequency f _{limit}	[kHz]	100 100
Input protection:		LED yellow, Protection against polarity reversal, Surge protection
Output data		
Operating voltage range		4 V DC 30 V DC
Limiting continuous current		50 mA
Quiescent current		4.3 mA
Residual voltage drop at "H"		< 0.5 V
Output circuit		3-conductor, ground-referenced
Output protection		Protection against polarity reversal, Surge protection
General data		
Test voltage input/output		2.5 kV _{rms} (50 Hz, 1 min.)
Ambient temperature (operation)		-20°C 60°C
Standards/regulations		DIN EN 50178
Pollution degree/surge voltage category		2/11
Connection data solid / stranded / AWG		0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14
Dimensions	W/H/D	6.2 mm / 80 mm / 86 mm

	Ordering dat	а	
Input voltage U _N	Туре	Order No.	Pcs. / Pkt.
5 V DC 24 V DC	PLC-OSC- 5DC/24DC/100KHZ ¹) PLC-OSC- 24DC/24DC/100KHZ ¹)	2902963 2902964	1 1
5 V DC	PLC-OPT- 5DC/ 24DC/100KHZ¹)	2902969	1
	5 V DC 24 V DC	Input voltage	5 V DC PLC-OSC- 5DC/24DC/100KHZ¹) 2902963 29V DC PLC-OPT- 5DC/ 24DC/100KHZ¹) 2902969

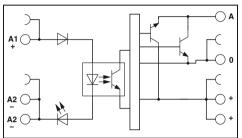


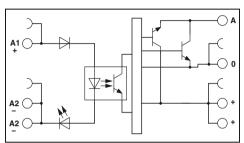
with DC voltage output push-pull Transmission frequency 100 kHz



N

with DC voltage output push-pull Transmission frequency 100 kHz





Technical data

	Technical data
1	2
0.5 -	0.8 -
1.2	1.2
> 0.5	> 0.8
< 0.3	< 0.4
8	8
1	1
2	2
100	100
LED ye	ellow, Protection against polarity reversal, Surge protection

(1)	(2)
0.5 -	0.8 -
1.2	1.2
> 0.5	> 0.8
< 0.3	< 0.4
8	8
1	1
2	2
100	100
LEDV	llow Prot

14 V DC ... 30 V DC

LED yellow, Protection against polarity reversal, Surge protection

4 V DC ... 18 V DC 50 mA 8.5 mA < 1.2 V 3-conductor push-pull, ground referenced Protection against polarity reversal, Surge protection 2.5 kV_{rms} (50 Hz, 1 min.) -20°C ... 60°C

DIN EN 50178 2/II

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 86 mm

1. 1 DO 00 1 DO
50 mA
15 mA
< 2.2 V
3-conductor push-pull, ground referenced
Protection against polarity reversal, Surge protection
2.5 kV _{rms} (50 Hz, 1 min.)
-20°C 60°C
DIN EN 50178
0 / 11

2 / II 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 86 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PLC-OSC- 5DC/ 5DC/100KHZ-G¹) PLC-OSC- 24DC/ 5DC/100KHZ-G¹)	2902965 2902966	1	
PLC-OPT- 5DC/5DC/100KHZ-G ¹) PLC-OPT- 24DC/ 5DC/100KHZ-G ¹)	2902971 2902972	1 1	

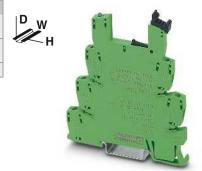
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
PLC-OSC- 5DC/ 24DC/100KHZ-G¹) PLC-OSC- 24DC/ 24DC/100KHZ-G¹)	2902967 2902968	1		
PLC-OPT- 5DC/24DC/100KHZ-G ¹) PLC-OPT- 24DC/24DC/100KHZ-G ¹)	2902973 2902974	1 1		

PLC-INTERFACE for the TTL signal at the input

The PLC-BS...TTL/1 basic terminal block is controlled using a TTL (5 V) input signal and can be equipped with a mechanical relay or a solid-state relay as an option. The basic terminal block equipped with a robust miniature relay offers the following advantages:

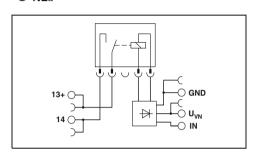
- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- RTIII degree of protection
- Safe isolation in accordance with EN 50178 (VDE 0160)
- 4 kV_{rms} electrical isolation between coil and contact.
- Screw, spring-cage, and push-in technology

	Notes:
	Type of housing: Polyester PBT non-reinforced, color: green.
	Marking systems and mounting material See Catalog 5
ı	1) EMC: Class A product ass page F71



Basic terminal block, for fitting with relay for TTL (5 V)

20 **40** 20 **10** 20



i ecnnicai dat

Rated control supply voltage U_{VN}

Rated control supply voltage range with reference to U_{VN}

Rated control supply current I_{VN} Rated actuating voltage U_c (IN)

Rated actuating voltage range with reference to U_C

Rated actuating current I_C Typ, response time at U_c Typ. release time for U

Input circuit

Output data with:

Contact type

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current Min. switching current

General data

Rated insulation voltage Rated surge voltage / insulation Ambient temperature (operation) Mechanical service life

Air and creepage distances between the power circuits

Pollution degree / Surge voltage category

Mounting position / Assembly

Connection data solid / stranded / AWG

Dimensions

5 V DC

0.9 ... 1.2

41 mA 5 V DC (TTL)

0.9 ... 1.2

2.5 mA

4.5 ms 3.5 ms

Yellow LED. Protection against polarity reversal. Surge protection

REL-MR-4,5DC/21 AU Single contact, 1 N/O contact

REL-MR-4,5DC/21 Single contact, 1 N/O contact

AgSnO, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA)

AgSnO 250 V AC/DC 5 V (at 100 mA) 6 A

50 mA 50 mA (on request)

1 mA (at 24 V) 10 mA (at 12 V)

250 V 6 kV -20°C ... 60°C 2 x 107 cycles

IEC 60664, EN 50178, IEC 62103

Any / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

A 20				П	П				7
10				Ш	Ш				
			_	Ħ	#			=	Ξ
± 4		_/		H	H			O	7
Switching current [A] 6 6 7 1 1 2 9 9 3 1					Ш				
no -									
E 1			\rightarrow						=
.⋛ 0,5				E 2				\equiv	3
				H	\dashv			\dashv	+
0,2				Ħ	П	\top		=	1
0,1		0 00			70	100	- 00		
	AC, ohm	ic load	, ;	50 Swi	70 tchir	100 ng volta	20 ge [V] _	· 3	00
•	DC, ohm	ic load							

Max. interrupting rating

Description	
PLC-INTERFACE	
With screw connection	
With spring-cage connection	
With push-in connection	

ı	Plug-in miniature power relays
	with gold contact
١	with power contact

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
PLC-BSC-TTL/1¹) PLC-BSP-TTL/1¹) PLC-BPT-TTL/1¹)	2982689 2982692 2900458	10 10 10		
Accessories				
REL-MR 4,5DC/21AU REL-MR- 4,5DC/21	2961370 2961367	10 10		

PLC-INTERFACE for the TTL signal at the input

The PLC-BS...TTL/1 basic terminal block is controlled using a TTL (5 V) input signal and can be equipped with a mechanical relay or a solid-state relay as an option. The basic terminal block equipped with a solid-state relay offers the following advantages:

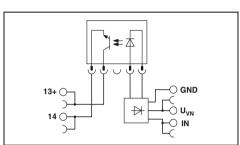
- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- IP67-protected solid-state relay electron-
- Switching capacity of up to 24 V DC/3 A
- Alternative input or power solid-state re-
- Wear-free and output-free
- Integrated protection circuit
- Insensitive to vibrations and shocks
- 2.5 kV_{rms} electrical isolation between input and output
- Screw, spring-cage, and push-in technology

Notes:
Type of housing: Polyester PBT non-reinforced, color: green.
Marking systems and mounting material See Catalog 5
For derating curves see page 345
1) EMC: Class A product, see page 571



Basic terminal block for fitting with solid-state relay for TTL (5 V)

2U ... JU) .



Technical data

Input data

Rated control supply voltage U_{VN}

Rated control supply voltage range with reference to U_{VN}

Rated control supply current I_{VN} Rated actuating voltage U_c (IN) Switching level 1 signal ("H") (TTL signal) Switching level 0 signal ("L") (TTL signal) Rated actuating current I_C Typ. response time/switch-on time at Uc Typ. switch-off time at $U_{\mathbb{C}}$

Input circuit Output data with: Max. switching voltage Min. switching voltage Limiting continuous current

Voltage drop at limiting continuous current

General data

Output protection

Rated insulation voltage Rated surge voltage / insulation Ambient temperature (operation)

Air and creepage distances between the power circuits

Pollution degree / Surge voltage category Connection data solid / stranded / AWG

Dimensions W/H/D

5 V DC	
0.9 1.2	

11.5 mA 5 V DC (TTL)

> 2 V DC < 0.8 V DC 2.5 mA

35 us 320 µs

Yellow LED, Protection against polarity reversal, Surge protection

OPT-5DC/48DC/100 OPT-5DC/24DC/2 48 V DC 33 V DC 3 V DC 3 V DC

100 mA 3 A Protection against polarity reversal, Protection against polarity reversal,

Surge protection Surge protection < 1 V < 200 mV

250 V

6 kV/basic isolation -20°C ... 60°C

IEC 60664, EN 50178, IEC 62103

 $0.14 - 2.5 \, \text{mm}^2 / 0.14 - 2.5 \, \text{mm}^2 / 26 - 14$

6.2 mm / 80 mm / 94 mm

	Ordering data		
Description	Туре	Order No.	Pcs. / Pkt.
PLC-INTERFACE	PLO POO TTI (41)	0000000	40
With screw connection	PLC-BSC-TTL/1¹)	2982689	10
With spring-cage connection	PLC-BSP-TTL/11)	2982692	10
With push-in connection	PLC-BPT-TTL/11)	2900458	10
	Accessories		
Plug-in solid-state relays			
Solid-state input relays	OPT- 5DC/ 48DC/100	2967992	10
Solid-state power relays	OPT- 5DC/ 24DC/ 2	2967989	10

PLC-INTERFACE for the TTL signal at the output

The PLC-OS...24DC/TTL with a built-in solid-state relay can be used for fast and wear-free switching of TTL (5 V) signals.

The module offers the following advantages:

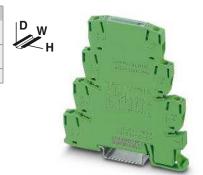
- Switching capacity TTL (5 V), fan out = 1
- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- Integrated protection circuit
- Insensitive to vibrations and shocks
- Screw, spring-cage, and push-in technology

N			

Type of housing:
Polyester PBT non-reinforced, color: green

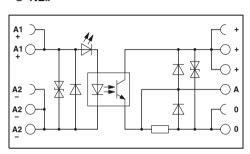
Marking systems and mounting material

1) EMC: Class A product, see page 571



Input solid state relay with TTL (5 V) output

: **(JL)** :: **(AL)** us



- 1	nnı	ıt	d	а	ta

Rated actuating voltage $U_{\rm C}$

Rated actuating voltage range with reference to U_{C}

Switching level 1 signal ("H") Switching level 0 signal ("L") Rated actuating current I_C Typ. switch-on time for U_c Typ. switch-off time at U_{C} Transmission frequency flimit

Input circuit DC

Output data with:

Rated control supply voltage U_S

Rated control supply voltage range with reference to \mathbf{U}_{S}

Limiting continuous current

Output protection

Voltage drop at max. limiting continuous current

General data

Description

PLC-INTERFACE

With screw connection With spring-cage connection With push-in connection

Rated insulation voltage Rated surge voltage / insulation

Ambient temperature (operation) Air and creepage distances between the power circuits

Pollution degree/surge voltage category Connection data solid / stranded / AWG

Dimensions W/H/D

Technical data

24 V DC 0.8 ... 1.2

> 0.8 < n 4

3.4 mA 35 µs

35 µs

1 kHz

Yellow LED, Protection against polarity reversal, Surge protection

5 V DC

0.9 ... 1.2

(A TTL load (Fan out = 1)/50 mA for switching mode)

Protection against polarity reversal, Surge protection

< 80 mV

250 V DC

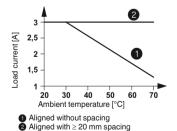
4 kV / basic insulation

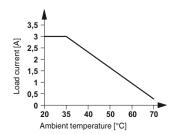
IEC 60664, EN 50178, IEC 62103

 $0.14 - 2.5 \text{ mm}^2 / 0.14 - 2.5 \text{ mm}^2 / 26 - 14$

6.2 mm / 80 mm / 80 mm					
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
PLC-OSC- 24DC/TTL¹) PLC-OSP- 24DC/TTL¹) PLC-OPT- 24DC/TTL¹)	2982728 2982731 2900363	10 10 10			

Derating curve for PLC-OSP...24DC/3RW





Derating curve for PLC-OSP...110DC/3RW

PLC-INTERFACE with solid-state relays for railway applications

The PLC-OSP...RW interface modules are intended for use as per DIN EN 50155 (VDE 0115 part 200) "Railway applications, Part 200: Electronic devices in rail vehicles".

- The advantages:
- Temperature range -25°C to +70°C
- Input voltage range 0.7 1.25 x U_N
- Shock resistance according to DIN 50155 (requirements according to EN 61373).
- Screw, spring-cage, and push-in technology



1 0.7 -1.25

≥ 0.6

≤ 0.3

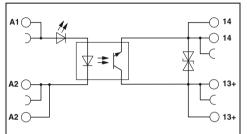
Power solid-state relay with DC voltage output, max. 3 A



Power solid-state relay with DC voltage output, max. 3 A

. U) .. c**511** us (il)

Notes: Type of housing: Polyester PBT non-reinforced, color: green. Marking systems and mounting material See Catalog 5 For derating curves see page 358 1) EMC: Class A product, see page 571

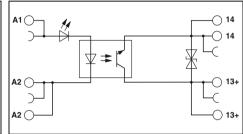


Technical data

0.7 -1.25

≥ 0.6

≤ 0.3



Input data	
Permissible range (with reference to \mathbf{U}_{N})	
Switching level (with reference to U _N)	1 signal ("H") 0 signal ("L")
Typ. input current at U _N	[mA]
Typ. switch-on time at U _N	[ms]
Typ. switch-off time at U _N	[ms]
Transmission frequency f _{limit}	[Hz]
Input circuit DC	
Output data	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Output protection	
Voltage drop at max. limiting continuous current	
General data	
Rated insulation voltage	
Rated surge voltage	
Ambient temperature (operation)	
Standards/regulations	
Pollution degree/surge voltage category Connection data solid / stranded / AWG	
Dimensions	W/H/D
Differsions	W/n/D

Ordering data	1
250 V 4 kV / basic insulation -25°C 70°C IEC 60664, EN 50178, IEC 62103 2/III 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 86 mm	
33 V DC 3 V DC 3 A (see derating curve) Protection against polarity reversal, Surge < 200 mV	protection
Yellow LED, Protection against polarity rev	ersal
300	100
0.2	0.6
0.04	0.08
0.0	3

	(2)	0	0	6	0
1	_	3	4	⑤	6
0.7 -	0.7 -	0.7 -	0.7 -	0.7 -	0.7 -
1.25	1.25	1.25	1.25	1.25	1.25
> 0.6	> 0.6	> 0.6	> 0.6	> 0.6	> 0.6
< 0.4	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3
12	12	5.5	5.5	5.5	5.5
0.4	0.4	0.04	0.04	0.04	0.4
0.2	0.1	0.2	0.2	0.2	0.2
50	50	300	300	300	300
Yellow LED, Protection against polarity reversal, Surge protection					

12 V DC
3 A (see derating curve)
Protection against polarity reversal, Surge protection < 150 mV
160 V DC
4 kV / basic insulation
-25°C 70°C
IEC 60664, EN 50178, IEC 62103
2 / III
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14
6.2 mm / 80 mm / 86 mm

140 V DC

Description		Input voltage U_{N}
PLC INTERFACE, with spring-ca	ge connection	
	1	24 V DC
	2	36 V DC
	3	48 V DC
	4	72 V DC
	(5)	96 V DC
	6	110 V DC
PLC-INTERFACE, with push-in c	onnection	
	1	24 V DC
	2	36 V DC
	3	48 V DC
	4	72 V DC
	5	96 V DC
	6	110 V DC

Туре	Order No.	Pcs. / Pkt.	7
PLC-OSP- 24DC/ 24DC/ 3RW	2980513	10	F F F
PLC-OSP-110DC/ 24DC/ 3RW	2980526	10	i
PLC-OPT- 24DC/ 24DC/3RW ¹)	2900379	10	
PLC-OPT-110DC/ 24DC/3RW1)	2900380	10	I

Ordering data			
Туре	1	Order No.	Pcs. / Pkt.
PLC- PLC- PLC- PLC-	OSP-24DC/110DC/ 3RW1) OSP-36DC/110DC/ 3RW1) OSP-48DC/110DC/ 3RW1) OSP-72DC/110DC/ 3RW1) OSP-96DC/110DC/ 3RW1) OSP-110DC/110DC/ 3RW1)	2982511 2982524 2982537 2982540 2982553 2982566	10 10 10 10 10
PLC- PLC- PLC-	OPT- 24DC/110DC/3RW1) OPT- 36DC/110DC/3RW1) OPT- 48DC/110DC/3RW1) OPT- 72DC/110DC/3RW1) OPT- 96DC/110DC/3RW1) OPT-110DC/110DC/3RW1)	2900391 2900392 2900393 2900394 2900395 2900396	10 10 10 10 10 10

PLC-INTERFACE for railway applications

Relay modules with extended input voltage and temperature range, specifically for use in railway applications

The advantages:

- Temperature range -25°C to +70°C
- Input voltage range 0.7 to 1.25 x UN
- Vibration and shock resistance to EN 50155
- Safe isolation according to DIN EN 50178 between coil and contact
- Spring cage and push-in connection meth-

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....

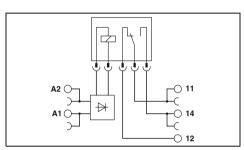
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

1) EMC: Class A product, see page 571

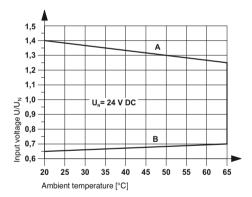


Basic terminal block that can be fitted with 1 PDT relay

.(I) .: .(II)



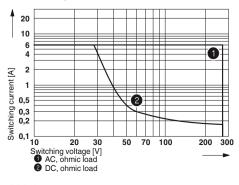
Permissible input voltage range for PLC-BSP-24DC/21RW (with REL-MR-18DC/21... relay)



Curve A Maximum continuous voltage at limiting continuous current = 3 A

Minimum operate voltage for pre-excitation with \boldsymbol{U}_{N} and limiting continuous current = 3 A

Electrical interrupting rating for PLC...21 with 1 PDT relay



Inp

No

Pe

Typ. input current at U_N

pui uaia	
ominal input voltage U _N	
ermissible range (with reference to U_N)	

Typ. response time at U_N

Typ. release time at U_N

Input circuit

Output data with

Contact type

Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Min. switching current	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Pollution degree / Surge voltage category	
Connection data solid / stranded / AWG	
Dimensions	W/H/D
Description	Voltage U _N

Description	Voltage U _N
PLC-INTERFACE basic terminal block, for plug-in miniature relay	
With spring-cage connection	24 V DC
With push-in connection	24 V DC

Plug-in miniature relays	
with power contact	
with gold contact	

Technical data

24 V DC

See diagram 12 mA

5 ms

Yellow LED, Protection against polarity reversal, freewheeling diode REL-MR-18DC/21AU

REL-MR-18DC/21

Single contact, 1-PDT Single contact, 1-PDT

AgSnO AgSnO, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC

5 V (at 100 mA) 100 mV (at 10 mA) 3 A 50 mA

(on request) 50 mA 10 mA (at 12 V) 1 mA (at 24 V)

4 kV (50 Hz, 1 min.)

-25°C ... 70°C

2 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
PLC-BSP- 24DC/21RW1)	2961396	10
PLC-BPT- 24DC/21RW1)	2900261	10

Accessories	;	
REL-MR- 18DC/21	2961383	10
REL-MR- 18DC/21AU	2961493	10

PLC-INTERFACE for railway applications

Relay module for input voltages with a nominal frequency of 16.7 Hz

The advantages:

- Input nominal frequency 16.7 Hz
- Vibration and shock resistance to EN 50155
- Safe isolation according to DIN EN 50178 between coil and contact
- Spring cage and push-in connection meth-

Notes:

Type of housing:
Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The values in parentheses then apply for further operation. This can result in a shorter service life than with a pure power contact.

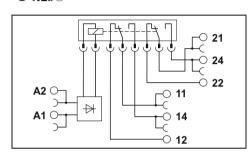
1) EMC: Class A product, see page 571





For 16.7 Hz input frequency with 2 PDTs

.(I) .: (II) ... (IL)



Technical data

Input data

Nominal input voltage U_N Input nominal frequency

Permissible range (with reference to U_N)

Typ. input current at U_N Typ. response time at U_N

Typ. release time at U_N

Input circuit

Output data Contact type

Contact material

Max. switching voltage Min. switching voltage

Limiting continuous current

Max. inrush current

Min. switching current

General data

Test voltage input/output

Ambient temperature (operation)

Mechanical service life

Standards/regulations

Pollution degree / Surge voltage category

Connection data solid / stranded / AWG

W/H/D Dimensions

230 V AC

16.67 Hz

(refer to the diagram)

4.8 mA (with AC)

60 ms

Yellow LED, Bridge rectifier

Single contact, 2-PDT

AgNi, hard gold-plated 30 V AC / 36 V DC

(250 V AC/DC) (5 V AC/DC) 100 mV

50 mA (6A)

50 mA (8A)

1 mA (10 mA)

6 kV

-25°C ... 60°C

Approx. 3 x 107 cycles IEC 60664, EN 50178, IEC 62103

 $0.14 - 2.5 \, \text{mm}^2 / 0.14 - 2.5 \, \text{mm}^2 / 26 - 14$

14 mm / 80 mm / 94 mm

44	1					
1,4 -						
1,3 -						
1,2 -						
-	_		Α			
1,1 -						
_z 1−		U _N =	230 V	AC -	\rightarrow	
_N 1 − 9,0,9 −						
≂ 0,9 —						

Permissible input voltage range

for PLC-RSP-230UC/21-21AU/RWF

30 35

Ambient temperature [°C]

Curve A

maximum continuous voltage at limiting continuous current = 6 A

55 60

minimum operating voltage for pre-excitation with U_N and limiting continuous current = 6 A

Description	Voltage U _N
PLC-INTERFACE	
With spring-cage connection	230 V AC
With push-in connection	230 V AC

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
PLC-RSP-230UC/21-21AU/RWF¹) PLC-RPT-230UC/21-21AU/RWF¹)	2968001 2900345	10 10

PLC-INTERFACE for railway applications

Relay modules with extended input voltage and temperature range, specifically designed for railway applications

The advantages:

- Certified to EN 50155
- Optimum relay operation thanks to widerange electronics
- Temperature range from -40°C to +70°C (short-term 85°C)
- Input voltage range 0.7 to $1.25 \times U_{N}$ (short-term $1.4 \times U_{N}$)
- Vibration and shock resistance to EN 50155
- Safe isolation according to DIN EN 50178 between coil and contact
- Spring cage and push-in connection meth-

Type of housing:
Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500..

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

Electrical service life diagrams, see page 346

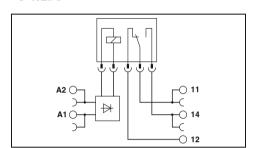
1) EMC: Class A product, see page 571





1 PDT

(I) 211 (II) (II)



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input protection:	

Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms
Typ. release time at U _N	[ms
Input protection:	

Output data

Contact type

Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current

Min. switching current

General data

Test voltage (winding / contact) Ambient temperature (operation) Mechanical service life

Standards/regulations

Connection data solid / stranded / AWG

Dimensions

		Technical	data
2	3		
0.7	0 7		

0.7 -1.25 1.25 1.25 9 3 2 4 4

1

Yellow LED, Bridge rectifier, freewheeling diode

Single contact, 1-PDT Single contact, 1-PDT AgSnO, hard gold-plated AgSnO 250 V AC/DC 30 V AC / 36 V DC 5 V (at 100 mA) 100 mV 6 A 50 mA (on request) 50 mA

4 kV_{rms} (50 Hz, 1 min.)

10 mA (at 12 V)

-40°C ... 70°C (Temperature class TX)

Approx. 2 x 107 cycles

EN 50155 (VDE 0115 part 200), EN 50178, IEC 62103, EN 61373,

1 mA

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

			Ordering dat	ta	
Description		Input voltage $U_{\rm N}$	Туре	Order No.	Pcs. / Pkt.
PLC-INTERFACE, with power contact					
With spring-cage connection	1	24 V DC	PLC-RSP- 24UC/21/RW1)	2987011	10
	2	72 V DC	PLC-RSP- 72UC/21/RW1)	2987037	10
	3	110 V DC	PLC-RSP-110UC/21/RW1)	2987053	10
With push-in connection	1	24 V DC	PLC-RPT- 24UC/21/RW1)	2900318	10
	2	72 V DC	PLC-RPT- 72UC/21/RW1)	2900319	10
	3	110 V DC	PLC-RPT-110UC/21/RW1)	2900320	10
PLC-INTERFACE, with hard gold-plated	contact				
With spring-cage connection	1	24 V DC	PLC-RSP- 24UC/21AU/RW1)	2987024	10
	2	72 V DC	PLC-RSP- 72UC/21AU/RW1)	2987040	10
	3	110 V DC	PLC-RSP-110UC/21AU/RW1)	2987066	10
With push-in connection	1	24 V DC	PLC-RPT- 24UC/21AU/RW1)	2900321	10
	2	72 V DC	PLC-RPT- 72UC/21AU/RW1)	2900322	10
	3	110 V DC	PLC-RPT-110UC/21AU/RW1)	2900323	10





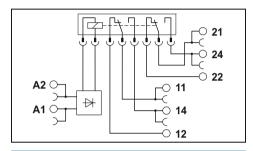
D W



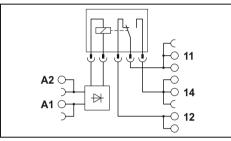
1 PDT up to 10 A

Derating curve for PLC-RSP...21/RW PLC-RSP...21AU/RW PLC-RSP...21-21/RW PLC-RSP...21-21AU/RW 5 Switching current [A] 3 2 0 30 35 40 45 50 55 60 65 70 Ambient temperature [°C]

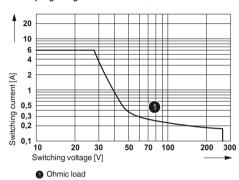
رال) و **جمل** الله (18)



. U) :: (U) :: (IU) :



Interrupting rating for PLC-RSP...UC/21RW



Technical data

1	2	3
0.7 -	0.7 -	0.7 -
1.25	1.25	1.25
20	6	4.5
5	5	5
11	11	11
V-II	LED D	days as attended to a substitute of the substitute of

Yellow LED, Bridge rectifier, freewheeling diode

Single contact, 2-PD1	Single contact, 2-PD1
AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 100 mA)	100 mV
2x 6 A	50 mA
15 A (300 ms)	50 mA
10 mA (at 12 V)	1 mA

5 kV_{rms} (50 Hz, 1 min.) -40°C ... 70°C (Temperature class TX)

EN 50155 (VDE 0115 part 200), EN 50178, IEC 62103, EN 61373,

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 14 mm / 80 mm / 94 mm

Approx. 3 x 107 cycles

Ordering data

Oracinig data	u	
Туре	Order No.	Pcs. / Pkt.
PLC-RSP- 24UC/21-21/RW¹) PLC-RSP- 72UC/21-21/RW¹) PLC-RSP-110UC/21-21/RW¹) PLC-RPT- 24UC/21-21/RW¹) PLC-RPT- 72UC/21-21/RW¹) PLC-RPT-110UC/21-21/RW¹)	2987105 2987121 2987147 2900346 2900347 2900348	10 10 10 10 10
PLC-RSP- 24UC/21-21AU/RW¹) PLC-RSP- 72UC/21-21AU/RW¹) PLC-RSP-110UC/21-21AU/RW¹) PLC-RPT- 24UC/21-21AU/RW¹) PLC-RPT- 72UC/21-21AU/RW¹) PLC-RPT-110UC/21-21AU/RW¹)	2987118 2987134 2987150 2900349 2900350 2900351	10 10 10 10 10 10

Technical data

1	2	3
0.7 -	0.7 -	0.7 -
1.25	1.25	1.25
20	6	4.5
5	5	5
11	11	11

Single contact, 1-PDT

AgNi 250 V AC/DC 12 V AC/DC

10 A (With inserted bridge 2967691)

10 mÀ

5 kV_{rms} (50 Hz, 1 min.) -40°C ... 70°C (Temperature class TX)

EN 50155 (VDE 0115 part 200), EN 50178, IEC 62103, EN 61373,

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

14 mm / 80 mm / 94 mm

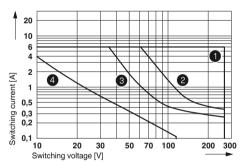
Yellow LED, Bridge rectifier, freewheeling diode

30 A (300 ms)

Approx. 3 x 107 cycles

1	2	3
0.7 -	0.7 -	0.7 -
1.25	1.25	1.25
20	6	4.5
5	5	5
11	11	11

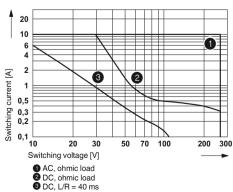
Interrupting rating for PLC-RSP...UC/21-21/RW



- AC, ohmic load
 DC, ohmic load, contacts in series
 DC, ohmic load
- **4** DC, L/R = 40 ms

Ordering data								
Туре	Order No.	Pcs. / Pkt.						
PLC-RSP- 24UC/21HC/RW¹) PLC-RSP- 72UC/21HC/RW¹) PLC-RSP-110UC/21HC/RW¹) PLC-RPT- 24UC/21HC/RW¹) PLC-RPT- 72UC/21HC/RW¹) PLC-RPT-110UC/21HC/RW¹)	2987079 2987082 2987095 2900324 2900325 2900326	10 10 10 10 10						

Interrupting rating for PLC-RSP...UC/21HC/RW



PLC electronic sensor terminal block for NAMUR proximity sensors

The PLC-...EIK 1-SVN electronic sensor terminal block from Phoenix Contact converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

In addition, the electronics unit monitors the sensor side for short-circuits or wire breaks and reports this error via an integrated LED.

Due to a corresponding resistance circuit, the PLC-...-EIK 1-SVN can be used to monitor all mechanical switches (N/C contact or N/O contact) for short-circuits and/or wire

In addition to a high packing density, this switching amplifier features the following:

- Regulated power supply for the NAMUR proximity switch
- 24 V/50 mA digital output for directly connecting programmable logic controls
- Connection option for PLC-V8 adapter
- Screw, spring-cage, and push-in technology

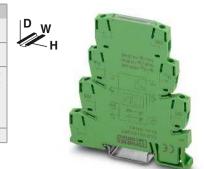
Notes:

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

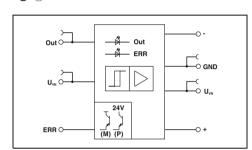
Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

1) EMC: Class A product, see page 571



For inductive proximity sensors according to NAMUR, with light indicators for sensor signal and faults

cUL) es (GL)



Input supply nominal voltage U_{VN} Typ. input current at U_{VN} Transmission frequency f_{limit} Input circuit

Control circuit

No-load voltage

Switching points in accordance with EN 60947-5-6:

Protective circuit

Alarm output

Operating voltage range (positive switching)

Limiting continuous current

Voltage drop at max. limiting continuous current

Output protection

Signal output

Limiting continuous current

Voltage drop U_R at max. limiting continuous current

Output protection

General data

Rated insulation voltage

Rated surge voltage / insulation Ambient temperature (operation)

Standards/regulations

Pollution degree / Surge voltage category

Connection data solid / stranded / AWG

Dimensions

Technical data

24 V DC ±20% Approx. 14 mA Approx. 350 Hz

Green LED, Protection against polarity reversal, Surge protection

8.2 V DC ±10%

≥ 2.1 mA (In conductive state) ≤ 1.2 mA (In blocking state)

6.3 mA ... 10 mA (in the event of a short-circuit)

0 mA ... 0.35 mA (In the event of a wire break)

Surge protection

(U_{VN} - U_{Res}) 50 mA

≤ 1.5 V (U_R)

Red LED, Surge protection

50 mA

≤ 1.5 V (U_R)

Surge protection

50 V DC

0.4 kV / Basic isolation

-25°C ... 50°C

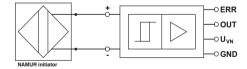
IEC 60664, EN 50178, IEC 62103

W/H/D

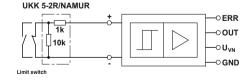
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12

6.2 mm / 80 mm / 86 mm

Application 1



Application 2



Initiator state	Switchi	ng level	LED		
	OUT	ERR	Green	Red	
conductive	L	L	OFF	OFF	
blocking	Н	L	ON	OFF	
short circuit	L	Н	OFF	ON	
open circuit	L	Н	OFF	ON	

Description

Switching amplifier electronic terminal block, positive switching

With screw connection With spring-cage connection With push-in connection

Double-level terminal block, with preassembled resistors

With screw connection

Ordering data						
Order No.	Pcs. / Pkt.					
	10 10					
2900397	10					
	Order No. 2982663 2982676					

1 LO-1 1-LIK 1-5 VIV 2-1 /1 /	2300331	10
Accessories	;	
UKK 5-2R/NAMUR	2941662	50

PLC series Electronic reversing load relay for **DC** motors

The PLC-S...-ELR W 1/2-24DC electronic reversing load relays are used to switch mechanically commutated DC motors up to 24 V/2 A.

- Wear-free reversing
- Braking by controlling both inputs
- Short-circuit and surge- and overloadproof output
- Integrated locking circuit and load wiring
- Screw, spring-cage, and push-in technology

Type of housing:
Polyester PBT non-reinforced, color: green

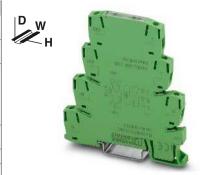
Marking systems and mounting material See Catalog 5

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

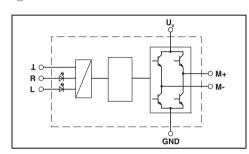
PWM = Pulse Width Modulation

1) EMC: Class A product, see page 571

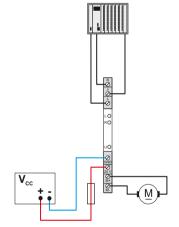


With overload and short-circuit-proof output

(GL)



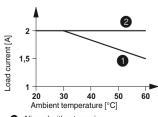
Application example for PLC-S...ELR W 1/2-24DC



Status table

Inp	out	Output				
Right	Left	M +	M –			
0	0	High resistance	High resistance			
1	0	+24 V	GND			
0	1	GND	+24 V			
1	1	GND	GND			

Derating curve for PLC-S...ELR W 1/2-24DC



Aligned without spacing Aligned with > 20 mm spacing

Input data

Control voltage U_{ST} right/left

Control input current I_{ST} right/left Input protection:

PWM option

Max. clock frequency of the PWM at the control inputs

Pulse width repetition rate of the PWM

Output data

Supply voltage range U_V Quiescent current

Output protection

Motor switching output

Continuous current IA max.

Current limitation at short-circuits

General data

Rated insulation voltage

Rated surge voltage / insulation Ambient temperature (operation)

Standards/regulations

Pollution degree / Surge voltage category

Mounting position

Mounting

Description

With screw connection With spring-cage connection

Connection data solid / stranded / AWG

with light indicator and protection circuit

W/H/D Dimensions

Electronic reversing load relays, for driving DC motors,

Technical data

24 V DC ±20%

Approx. 3 mA

Yellow LED, Protection against polarity reversal, Surge protection

1000 Hz

0% ... 100%

10 V DC ... 30 V DC

10 mA

Green LED, Protection against polarity reversal, Surge protection

2 A (see derating curve) 15 A (during braking)

50 V DC

0.5 kV / basic insulation

-25°C ... 60°C

IEC 60664, EN 50178, IEC 62103

Vertical (horizontal DIN rail)

In rows with zero spacing $0.14 - 2.5 \, \text{mm}^2 / 0.14 - 2.5 \, \text{mm}^2 / 26 - 14$

6.2 mm / 80 mm / 86 mm

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
PLC-SC-ELR W1/2-24DC1) PLC-SP-ELR W1/2-24DC1)	2980539 2980555	1					

PLC-INTERFACE

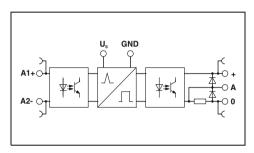
Pulse expansion module

A solid-state relay for acquiring and extending short pulses.

- Pulse detection can be set from > 0.1 ms or > 2 ms
- Status display
- Delay times of 10 to 2550, can be set via **DIP** switches
- Bridging options
- Can be retriggered
- Screw and push-in connection technology



With DC voltage output Max. 100 mA



					ta	

Input data

Rated control supply voltage $U_{\rm S}$

Rated control supply voltage range with reference to U_S

Rated control supply current I_S Input low, output low

Input high, output high Rated actuating voltage $U_{\mathbb{C}}$ Rated actuating current $I_{\rm C}$

Switching threshold "0" signal in reference to U_{C} Switching threshold "1" signal in reference to U_C Status indication

Operating voltage display Input circuit

Output data

Output voltage range U_E

Limiting continuous current

Voltage drop at max. limiting continuous current

Output circuit

Output protection

General data Rated insulation voltage Rated surge voltage Ambient temperature (operation)

Standards/regulations

Connection data solid / stranded / AWG

Dimensions

24 V DC

0.8 ... 1.2

13 mA 19 mA 24 V DC

3 mA < 0.4 > 0.8 Yellow LED

Green LED Protection against polarity reversal, Surge protection

3 V DC ... 48 V DC 100 mA < 1 V DC

3-conductor, ground-referenced

Protection against polarity reversal, Surge protection, Free running

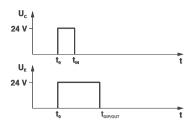
50 V DC 0.5 kV -25°C ... 60°C DIN EN 50178

 $0.14 - 2.5 \text{ mm}^2 / 0.14 - 2.5 \text{ mm}^2 / 26 - 14$

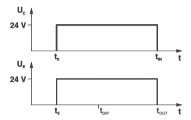
6.2 mm / 80 mm / 86 mm

Ordering data								
Туре	Order No.	Pcs. / Pkt.						
PLC-OSC-LPE-24DC/48DC/100	2903171	1						
PLC-OPT-LPE-24DC/48DC/100	2903173	1						

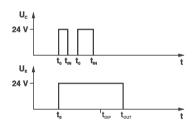
W/H/D Description PLC INTERFACE, with screw connection PLC-INTERFACE, with push-in connection



Input pulse t1 < set output pulse t3 (no restart when triggered again)



Input pulse t1 \geq set output pulse t3, then input pulse t1 = output pulse t2 (no restart when triggered again)

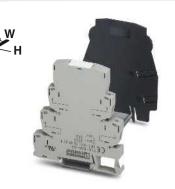


Input pulse t1 < set output pulse t3 (restart when triggered again)

DIP										
S1	S2	S3	S4	S5	S6	S 7	S8			
10	-		-	-	-	-				
-	20		-	-	-	-				
-	-	40	-	-	-	-				
-	-		80			-				
-	-		-	160	-	-				
-	-		-	-	320	320 -				
-	-	-	-	-	(
-	-	-	-	-	-	-	1280			

PLC accessories

The **PLC-ESK** power terminal helps with supplying the bridge potentials; the PLC-ATP partition plate helps with optical and safe disconnection of the adjacent PLC modules. The PLC-BP (A1-14) passive feed-through bridge is used instead of a relay and connects the A1 and 14 terminal points.





	Ordering data			Ordering data			
Description Color	Туре	Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs. / Pkt.	
Power terminal block, for supply of up to four potentials, with the same shape as PLC standard series, max. 32 A/250 V AC							
gray	PLC-ESK GY	2966508	5				
Separating plate, thickness 2 mm, required at the start and end of a PLC terminal strip. It is also used for visual separation of groups, safe isolation of different voltages of neighboring PLC interfaces as per DIN EN 50178/VDE0160, separation of neighboring bridges of different potentials, and separation of PLC interfaces at voltages > 250 V	PLC-ATP BK	2966841	25				
Screwdriver	TEO-ATT BIX	2300041	25				
Blade: 0.6 x 3.5 x 100 mm, length: 181 mm	SZF 1-0,6X3,5	1204517	10				
Passive feed-through bridge, can be plugged in instead of relay or solid-state relay, bridges terminal points A1 and 14							
black				PLC-BP A1-14	2980283	10	

PLC accessories

The colored isolated FBST plug-in bridges are not required for the PLC interface up to 70%. The 500 mm long **FBST 500-PLC** "endless bridges" are especially effective. The 2-pos. **FBST 6** single plug-in bridges are especially suited for bridging a smaller number of PLC modules.





		Ordering data			Ordering data			
Description	Color	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
Cont. plug-in bridge, 500 mm long, isolated, can be cut for potential distribution	to length,							
Nominal current: 32 A	red blue gray	FBST 500-PLC RD FBST 500-PLC BU FBST 500-PLC GY	2966786 2966692 2966838	20 20 20				
Plug-in bridge , 2-pos., 6 mm long, for potential distribution								
Nominal current: 6 A	red blue gray	FBST 6-PLC RD FBST 6-PLC BU FBST 6-PLC GY	2966236 2966812 2966825	50 50 50				
Plug-in bridge , 2-pos., 8 mm long, for potential distribution with a partition plate								
Nominal current: 6 A Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution	gray	FBST 8-PLC GY	2967688	50				
Nominal current: 10 A	black	FBST 14-PLC BK	2967691	50				
Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91	-100				ZB 6,LGS:FORTL.ZAHLEN	1051016	10	

Adapter for PLC-INTERFACE

PLC-V8/... are VARIOFACE adapters which connect the 6.2 mm wide PLC RELAY modules to the VARIOFACE system cabling

For cross-reference list with matching PLC-INTERFACE modules, see page 488



VARIOFACE adapter for 6.2 mm PLC-INTERFACE

Technical data

Ordering data



VARIOFACE adapter for 14 mm PLC-INTERFACE

Ordering data

.(U) .: c**511** us (C+ (il

24 V DC ±25%

1 A (per signal path)

500 V AC (50 Hz, 1 min.)

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Test voltage Ambient temperature (operation) Standards/regulations

Connection method

Connection data solid / stranded / AWG

Dimensions

-40°C ... 70°C IEC 60664, DIN EN 50178, IEC 62103 Screw connection Power supply

Signal level

H/D

IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

100 mm / 94 mm

Technical data 24 V DC ±25% 1 A (per signal path) 500 V (50 Hz, 1 min.) -40°C ... 70°C IEC 60664, DIN EN 50178, IEC 62103 Screw connection IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

100 mm / 94 mm

Description	No. of pos.	Module width W
V8 adapter, for 8 PLC interfaces (6.2 LK connection, for PLC system cablin		ritching
OUTPUT INPUT	14 14	49.6 mm 49.6 mm
V8 adapter, for 8 PLC interfaces (6.2 with FLK connection, for PLC system		ive switching
OUTPUT	14 14	49.6 mm 49.6 mm
V8 output adapter, for 8 PLC interfa with 15-pos. D-SUB connection		49.0 11111
Pin strip	15	49.6 mm
Socket strip	15	49.6 mm
V8 input adapter, for 8 PLC interface with 15-pos. D-SUB connection	es (6.2 mm),	
Pin strip	15	49.6 mm
Socket strip	15	49.6 mm
V8 adapter, for 8 PLC interfaces (14 for PLC system cabling, positive switches)		connection,
	14	112.3 mm
V8 adapter, for 8 PLC interfaces (14 for PLC system cabling, negative sw		connection,
	14	112.3 mm

Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
PLC-V8/FLK14/OUT PLC-V8/FLK14/IN	2295554 2296553	1 1			
PLC-V8/FLK14/OUT/M PLC-V8/FLK14/IN/M	2304102 2304115	1			
PLC-V8/D15S/OUT PLC-V8/D15B/OUT	2296058 2296061	1			
PLC-V8/D15S/IN PLC-V8/D15B/IN	2296074 2296087	1			
			PLC-V8L/FLK14/OUT	2299660	1
			PLC-V8L/FLK14/OUT/M	2304306	1



The PR series is a low-priced relay modular system, consisting of DIN rail bases, relays, plug-in input/interference suppression modules, engagement levers, and the matching marking labels and universal bridging materials for all bases. The modules are largely compatible with the usual standards on the market, have the major international approvals and are therefore accepted worldwide.

Besides the familiar relay bases with the screw connection method, relay bases with the spring-cage connection method for miniature power relays with one or two PDT contacts and for industrial relays with two or four PDT contacts are available in the PR series. The connections in these bases are configured with double spring cages for free, simple bridging of all potentials.

The PR series also boasts its own particular features:

- Relay retaining bracket: The EL... plastic relay retaining bracket, with which the relays can be held and, if necessary, ejected, have an exposed, smooth, large equipment marking area for standard self-adhesive labels that can be printed easily and inexpensively using standard printers. When fitted, the engagement lever is securely connected to the base, which means that the labeling cannot be lost.
- Industrial relays: All REL-IR... industrial relays have as standard an LED status display

- and all DC types also have an integrated freewheeling diode. In most cases, this eliminates the plug-in input modules that are otherwise also used.
- Plug-in input modules with RC element: most standard input/interference suppression modules with an RC element used for compensation of interference coupling on long lines or in the event of leakage currents from electronic AC outputs have only low capacitance values. This greatly limits the filter effect. In contrast, the RC-120-230UC and RC3-120-230UC plug-in module series for mains voltage applications have a filter function that is improved up to a factor of 10. Unlike with the discharge resistors that are normally used for such applications, using RC plug-in modules gives rise to no additional heating!



The narrow 16 mm PR1 base series for relays with one or two contacts is available with a screw or spring-cage connection method. Both the traditional 2/2-level bases and two modern "logical" 1/3-level versions with fully opposite coil and contact connections are available.



PR2 series

The PR2 base series accommodates plugin industrial relays with two or four PDT contacts. Like the PR1 series, the bases are available with screw and spring-cage connection methods, as well as in the traditional 2/2-level and modern "logical" 1/3-level versions.



PR3 series

The robust octal relays with two or three PDT contacts that are widely used in some areas fit on the PR3 base with touch-protected screw connections. All the base connections have a wide connection cross section and are arranged on one level with good accessibility.



The active components of the PR1 modular system include various miniature power relays (optionally available with manual test function) and electronic solid-state relays. Matching relay retaining brackets with integrated marking area prevent them from being shaken loose. Depending on requirements, input/interference suppression modules with various functions can also be plugged in. Marking labels and loop bridges in various colors that are suitable for universal use with all PR bases complete the range of accessories.



The PR2 modular system is specifically designed for plug-in industrial relays. Industrial relays from Phoenix Contact feature the following as standard: a manual test button, switch position indicator, status LED, and freewheeling diode (DC coils only). Interference suppression modules with a varistor or RC element can also be plugged in as an option. Relay retaining brackets with integrated marking areas prevent the relays from being shaken loose. Marking labels and loop bridges in various colors that are suitable for universal use with all PR bases complete the range of accessories.



The PR3 modular system is specifically designed for the robust octal relays. The relays have a switch position indicator and a manual test button and there is a wire bracket to prevent them from being shaken loose. Input/interference suppression modules with various functions can also be plugged in as an option. The base can be marked with an 8 x 20 mm standard adhesive label. Loop bridges in various colors for universal use round off the range of accessories.

Modular PR1 relay base

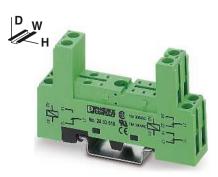
Range of relay bases that can be fitted with 1 PDT or 2 PDT relay or solid-state relay

Range of accessories includes:

- Plug-in input modules/interference suppression modules
- Relay retaining bracket with labeling field and ejection function
- Marking labels
- Loop bridges

Type of housing: Polyamide fiber reinforced PA-F, color: green.

Marking systems and mounting material See Catalog 5



2/2-level design with screw connection

c**91**us

	Technical data
Nominal voltage U _N	300 V AC/DC
Nominal current at U _N	12 A
General data	
Ambient temperature (operation)	-25°C 85°C
Connection data solid / stranded / AWG	0.2 2.5 mm ² / 0.2 2.5 mm ² / 26 - 14
Dimensions	
Width	16 mm
Depth with retaining bracket	63 mm (EL1-P16)
	71 mm (EL1-P25)
Height	75 mm

Depth with retaining bracket Height	63 mm (EL1-P16) 71 mm (EL1-P25) 75 mm		
Tiongri	Ordering data	а	
			Pcs./
Description	Туре	Order No.	Pkt.
Relay base PR1, 2/2-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack			
With screw connection	PR1-BSC2/2X21	2833518	10
Relay base PR1, 1/3-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack			
With screw connection			
Relay base PR1, 1/3-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack			
With spring-cage connection			
Relay retaining bracket, with ejector function and integrated equipment marking area (7.5 x 15 mm), suitable for relay socket PR1			
for 16 mm tall miniature power relay and solid-state relay	EL1-P16	2833547	10
for 25 mm tall miniature switching relay and solid-state relay	EL1-P25	2833550	10
	Accessories		
Equipment marking label, labeling surface 6 x 15 mm			
	MP 1	2833631	10
Device marking label , for thermal transfer printer, labeling surface $6 \times 15 \text{ mm}$			
2500 labels per roll	EML (15X6) R YE	0819288	1
Loop bridge, 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm ²			
blue	DB 50- 90 BU	2821180	1
black	DB 50- 90 BK	2820916	1

DB 50- 90 GY

2820929



1/3-level design with screw connection





1/3-level design with spring-cage connection



Relay retaining bracket

c 92 us			c 91 0s					
Technical da	Technical data Technical data			Technical data				
300 V AC/DC 12 A			300 V AC/DC 10 A			:		
-25°C 85°C 0.2 2.5 mm² / 0.2 2.5 mm² / 26 - 14			-25°C 85°C 0.5 1.5 mm² / 0.5 1.5 n	nm² / 26 - 16		:		
16 mm 71 mm (EL1-P16) 79 mm (EL1-P25) 78.5 mm			16 mm 72 mm (EL1-P16) 80 mm (EL1-P25) 97 mm			: -		
Ordering data			Ore	dering data		Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order	No. Pcs. / Pkt.
PR1-BSC3/2X21	2833521	10						
			PR1-BSP3/2X21	2833534	10			
EL1-P16	2833547	10	EL1-P16	2833547	10	EL1-P16	28335	47 10
EL1-P25	2833550	10	EL1-P25	2833550	10	EL1-P25	28335	50 10

EL1-P25	2833550	10	EL1-P25	2833550	10	EL1-P25	2833550	10
Accessories			Accessories			Accessories		
MP 1	2833631	10	MP 1	2833631	10			
EML (15X6) R YE	0819288	1	EML (15X6) R YE	0819288	1			
DB 50- 90 BU	2821180	1	DB 50- 90 BU	2821180	1			
DB 50- 90 BK	2820916	1	DB 50- 90 BK	2820916	1			
DB 50- 90 GY	2820929	1	DB 50- 90 GY	2820929	1			

Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:

- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type



If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

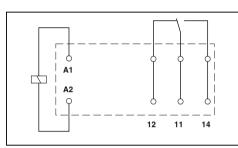


1 PDT relay

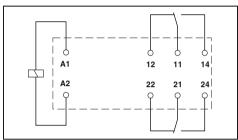


2 PDT relay









Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	

Will. Switching current	
Max. interrupting rating, ohmic load	
	250 V AC
General data	
Test voltage (winding / contact)	
T44	

General data
Test voltage (winding / contact)
Test voltage (contact/contact)
Ambient temperature (operation)
Mechanical service life
Electrical service life
Standards/regulations

Max. inrush current

i ecnnicai data									
1	2	3	4	(5)	6	7	8		
refer to the diagram									
33	17	8.7	8.2	4.1	32	7	3		
7	7	7	7	7					
					3 - 12	3 - 12	3 - 12		
_	_	_	_	_					
3	3	3	3	3					
					2 - 9	2 - 9	2-9		

Single contact, 1-PD1	Single contact, 1-PD1
AgNi 250 V AC/DC 12 V (at 10 mA) 16 A 25 A (20 ms) 10 mA (at 12 V)	AgNi, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA 50 mA 1 mA (at 24 V)

5 kV AC (50 Hz, 1 min.) -40°C ... 85°C

1 x 10⁷ cycles See diagram

4000 VA

IEC 60664, EN 50178, IEC 62103

	Technical data								
1	2	3	4	(5)	6	7	8		
refer t	o the dia	gram							
33	17	8.7	8.2	4.1	32	7	3		
7	7	7	7	7					
					3 - 12	3 - 12	3 - 12		
3	3	3	3	3					
					2 - 9	2 - 9	2 - 9		

Single contact, 2-PD1	Single contact, 2-PD1
AgNi 250 V AC/DC 5 V (at 10 mA) 8 A 12 A (20 ms)	AgNi, hard gold-plated 30 V AC / 36 V DC 100 mV (at 10 mA) 50 mA 50 mA
10 mA (At 5 V)	1 mA (at 24 V)
2000 VA	-

5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 85°C 1 x 10⁷ cycles See diagram IEC 60664, EN 50178, IEC 62103

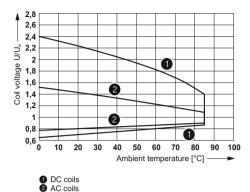
Description		Input voltage $U_{\rm N}$
Plug-in miniature power relays		
with power contact	1	12 V DC
with power contact	2	24 V DC
with power contact	② ③ ④	48 V DC
with power contact		60 V DC
with power contact	(5)	110 V DC
with power contact	6	24 V AC
with power contact	7	120 V AC
with power contact	8	230 V AC
Plug-in miniature power relays		
with gold contact	1	12 V DC
with gold contact	2	24 V DC
with gold contact	3	48 V DC
with gold contact	4	60 V DC
with gold contact	② ③ ④ ⑤	110 V DC
with gold contact	6	24 V AC
with gold contact	7	120 V AC
with gold contact	8	230 V AC

Ordering data				
Туре	Order No.	Pcs./ Pkt.	7	
REL-MR- 12DC/21HC REL-MR- 24DC/21HC REL-MR- 48DC/21HC REL-MR- 60DC/21HC REL-MR-110DC/21HC REL-MR- 24AC/21HC REL-MR-120AC/21HC REL-MR-230AC/21HC	2961309 2961312 2834821 2961325 2961338 2961406 2961419 2961422	10 10 10 10 10 10 10		
REL-MR- 12DC/21HC AU REL-MR- 24DC/21HC AU REL-MR-110DC/21HC AU REL-MR- 24AC/21HC AU REL-MR-120AC/21HC AU REL-MR-120AC/21HC AU	2961532 2961545 2961561 2961503 2961516 2961529	10 10 10 10 10 10		

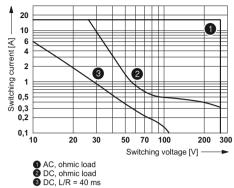
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
REL-MR- 12DC/21-21 REL-MR- 24DC/21-21 REL-MR- 48DC/21-21 REL-MR- 60DC/21-21 REL-MR-110DC/21-21 REL-MR- 24AC/21-21 REL-MR-230AC/21-21	2961257 2961192 2834834 2961273 2961202 2961435 2961448 2961451	10 10 10 10 10 10 10		
REL-MR- 12DC/21-21AU REL-MR- 24DC/21-21AU REL-MR- 48DC/21-21AU REL-MR- 60DC/21-21AU REL-MR-110DC/21-21AU REL-MR- 24AC/21-21AU REL-MR-220AC/21-21AU REL-MR-230AC/21-21AU	2961299 2961215 2834847 2961286 2961228 2961464 2961477 2961480	10 10 10 10 10 10 10		

REL-MR...21HC... (1 PDT)

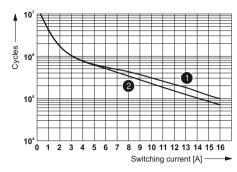




Interrupting rating

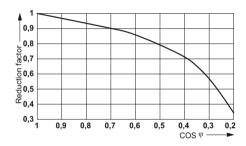


Electrical service life



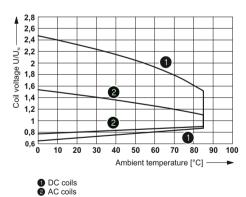
250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi

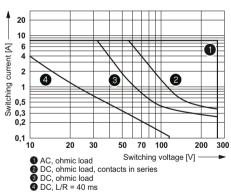


REL-MR...21-21... (2 PDTs)

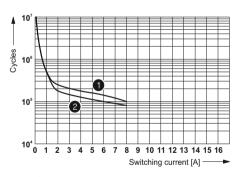
Operating voltage range



Interrupting rating

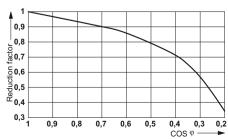


Electrical service life



1 250 V AC, ohmic load (DC coils) 2 250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi





Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1 and PR1 relay bases.

The advantages:

- Switching current of up to 16 A
- With lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling di-
- Can be soldered in on PCB



1 PDT relay

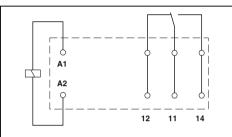


2 PDT relay

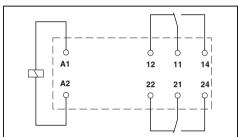
Notes:

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.





₽ 20 **₽** 20



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	

Contact type Contact material

Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current Min. switching current Max. interrupting rating, ohmic load

General data

Test voltage (winding / contact) Test voltage (contact/contact) Ambient temperature (operation) Mechanical service life Electrical service life

Standards/regulations

Technical data 1 2 (3) refer to the diagram 18 32 3.5 9 3-12 3-12 6 2-8 2-8 2 - 8

Single contact, 1-PDT Single contact, 1-PDT AgNi AgNi, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 12 V (at 10 mA) 12 V (At 1 mA) 16 A 50 mA 32 A (20 ms) 50 mA 10 mA (at 12 V) 1 mA (at 12 V)

5 kV AC (50 Hz, 1 min.)

-40°C 70°C 5 x 106 cycles See diagram

4000 VA

250 V AC

DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

Technical data

1 2 4 refer to the diagram 18 3.5 9 3-12 3-12 3-12

6 2-8 2-8 2-8

Single contact, 2-PDT

AgNi AgNi, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 12 V (At 1 mA) 12 V (at 10 mA) 8 A 50 mA 16 A (20 ms) 50 mA 1 mA (at 12 V) 10 mA (at 12 V)

Single contact, 2-PDT

2000 VA

5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 70°C 5 x 106 cycles See diagram

DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

Input voltage Description Plug-in miniature power relays, with power contacts - Status LED, freewheeling diode A1+, A2-24 V DC 1 2 - Status LED 24 V AC - Status LED 3 120 V AC - Status I FD (4) 230 V AC Plug-in miniature power relays with manual test function, with hard gold-plated multi-layer contacts, mechanical switch position - Status LED, freewheeling diode A1+, A2-24 V DC

4

230 V AC

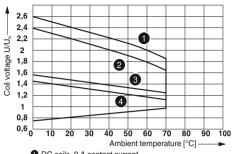
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
REL-MR- 24DC/21HC/MS REL-MR- 24AC/21HC/MS REL-MR-120AC/21HC/MS REL-MR-230AC/21HC/MS	2987888 2987891 2987901 2987914	10 10 10 10		
REL-MR- 24DC/21HC AU/MS REL-MR-230AC/21HC AU/MS	2987927 2987930	10		

	Ordering data					
/	Туре	Order No.	Pcs. / Pkt.			
	REL-MR- 24DC/21-21/MS REL-MR- 24AC/21-21/MS REL-MR-120AC/21-21/MS REL-MR-230AC/21-21/MS	2987943 2987956 2987969 2987972	10 10 10 10			
	REL-MR- 24DC/21-21AU/MS REL-MR-230AC/21-21AU/MS	2987985 2987998	10 10			

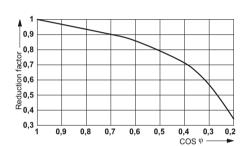
- Status LED

REL-MR...21HC...MS (1 PDT)

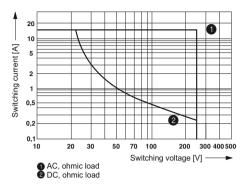
Operating voltage range



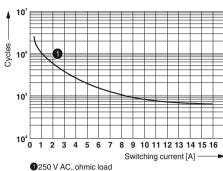
- DC coils, 0 A contact current
 DC coils, 16 A contact current
 AC coils, 0 A contact current
 AC coils, 16 A contact current



Interrupting rating



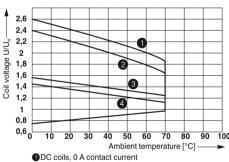
Electrical service life



Service life reduction factor with various cos phi

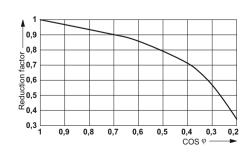
REL-MR...21-21...MS (2 PDTs)

Operating voltage range

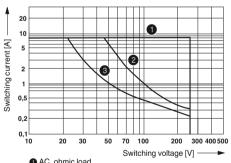


- 2DC coils, 16 A contact current 3AC coils, 0 A contact current 4AC coils, 16 A contact current

Service life reduction factor with various cos phi

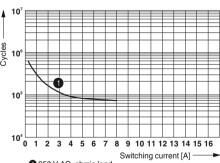


Interrupting rating



- 1 AC, ohmic load
- 2 DC, ohmic load, contacts in series
- 3 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Modular PR2 relay base

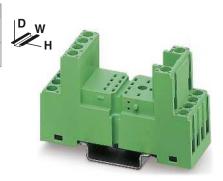
Range of relay bases that can be fitted with 2 PDT or 4 PDT relays

Range of accessories includes:

- Plug-in input modules/interference suppression modules
- Relay retaining bracket with labeling field and ejection function
- Marking labels
- Loop bridges

Type of housing: Polyamide fiber reinforced PA-F, color: green.

Marking systems and mounting material See Catalog 5



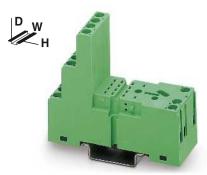
2/2-level design with screw connection

c**911** us

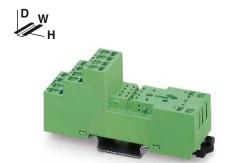
Nominal voltage U_N Nominal current at U_N General data Ambient temperature (operation) Connection data solid / stranded / AWG Dimensions Depth with retaining bracket Height

Technical data 300 V AC/DC 12 A -25°C ... 85°C $0.2 \dots 1.5 \, \text{mm}^2 \, / \, 0.2 \dots 1.5 \, \text{mm}^2 \, / \, 26 - 16$ 27 mm 84 mm (EL2-P35) 75 mm

i leight	· 			
	Ordering data			
Description	Туре	Order No.	Pcs. / Pkt.	
Relay base PR2-B, for industrial relay, REL-IR with two or four PDTs, 2/2-level design, connection option for input/interference suppression module, including ten MP2 marking labels per packaging				
With screw connection	PR2-BSC2/4X21	2833563	10	
Relay base PR2-B, for industrial relay, REL-IR with two or four PDTs, 1/3-level design, connection option for input/interference suppression module, including ten MP2 marking labels per packaging				
With screw connection				
Relay base PR2-B, for industrial relay, REL-IR with two or four PDTs, 1/3-level design, connection option for input/interference suppression module, including ten MP1 marking labels per packaging				
With spring-cage connection				
Relay retaining bracket, with eject function and integrated device marking area (8 x 25 mm), to suit relay base PR2, for 35 mm high industrial relay				
	EL2-P35	2833592	10	
	Accessories			
Equipment marking label, labeling surface 6 x 15 mm				
Equipment marking label, labeling surface 9 x 25 mm				
	MP 2	2833644	10	
Device marking label , for thermal transfer printer, labeling surface 6 x 15 mm	(4-VA) V			
2500 labels per roll	EML (15X6) R YE	0819288	1	
Loop bridge , 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm ²				
blue	DB 50- 90 BU	2821180	1	
black	DB 50- 90 BK	2820916	1	
gray	DB 50- 90 GY	2820929	1	



1/3-level design with screw connection



1/3-level design with spring-cage connection



Relay retaining bracket

c**91** us

DB 50- 90 BU

DB 50- 90 BK

DB 50- 90 GY

2821180

2820916

2820929

DB 50- 90 BU

DB 50- 90 BK

DB 50-90 GY

c**91**0s

	Technical da	ta		Technical da	ta	
	300 V AC/DC 10 A			-		
	-25°C 85°C 0.2 1.5 mm² / 0.2 1.5 mm² / 24 - 16			:		
	31 mm 84 mm (EL2-P35) 95 mm			: :		
	Ordering da	ta		Ordering da	Ordering data	
Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
10						
	PR2-BSP3/4X21	2833589	10			
10	EL2-P35	2833592	10	EL2-P35	2833592	10
Accessories		S		Accessorie	s	
	MP 1	2833631	10			
10						
3 1	EML (15X6) R YE	0819288	1			
2	6 10 2 10 4 10	300 V AC/DC 10 A -25°C 85°C 0.2 1.5 mm² / 0.2 1.5 mm² / 24 - 16 31 mm 84 mm (EL2-P35) 95 mm Ordering dat o. Pcs. / Pkt. Type PR2-BSP3/4X21 2 10 EL2-P35 Accessories MP 1	10 A -25°C 85°C 0.2 1.5 mm² / 0.2 1.5 mm² / 24 - 16 31 mm 84 mm (EL2-P35) 95 mm Ordering data o. Pcs. / Pkt. Type Order No. PR2-BSP3/4X21 2833589 2 10 EL2-P35 2833592 Accessories MP 1 2833631	300 V AC/DC 10 A -25°C 85°C 0.2 1.5 mm²/0.2 1.5 mm²/24 - 16 31 mm 84 mm (EL2-P35) 95 mm Ordering data O. Pcs. / Pkt. Type Order No. Pcs. / Pkt. PR2-BSP3/4X21 2833589 10 Accessories MP 1 2833631 10	300 V AC/DC 10 A -25°C 85°C 0.2 1.5 mm² / 0.2 1.5 mm² / 24 - 16 31 mm 94 mm (EL2-P35) 95 mm Ordering data O. PCs. / Pkt. Type Order No. Pcs. / Pkt. Type PR2-BSP3/4X21 2833589 10 PR2-BSP3/4X21 2833589 10 EL2-P35 Accessories Accessorie MP 1 2833631 10	300 V AC/DC 10 A -25°C 85°C 02 1.5 mm² / 02 1.5 mm² / 24 - 16 31 mm 84 mm (EL2-P35) 95 mm Ordering data Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Pcs. / Pkt. Type Order No. Pcs. / Pkt. Type Order No. Accessories Accessories Accessories MP 1 2833631 10

2821180

2820916

2820929

Plug-in industrial relays suitable for PR2 relay base

Plug-in industrial relays with 2 or 4 PDT contacts, suitable for PR2 and RIF-2 relay bases.

The advantages:

- Lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode



For 48 V DC and 60 V DC types, see www.phoenixcontact.net/products

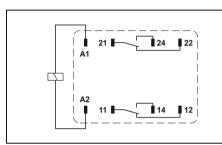


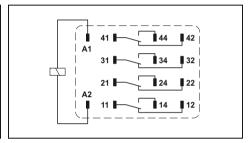
2 PDT relay with power contacts



4 PDT relay with multi-layer gold contact







Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(AC, depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(AC, depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	

wax. menapung raung, emme tead	
General data	
Test voltage (winding / contact)	
Test voltage (contact/contact)	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Electrical service life	
Standards/regulations	

Max interrupting rating obmic load

Mounting	position/mounting

	recililical data							
1	2	3	4	(5)	6	7	8	
refer to the diagram								
75	38	10	7.2	3.6	54	11	5	
13	13	13	13	13				
					4 - 10	4 - 10	4 - 10	
5	5	5	5	5				
					3 - 12	3 - 12	3 - 12	

Single contact, 2-PDT
Ag
250 V AC/DC
5 V
10 A
1 mA
2500 VA

2 kV AC (50 Hz, 1 min.)
2 kV AC (50 Hz, 1 min.)
-55°C 70°C
100% operating factor
5 x 10 ⁷ cycles
See diagram
DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

Any / On relay base PR2

250 V AC

	Technical data								
1	2	3	4	(5)	6	7	8		
refer t	o the dia	ıgram							
75	38	10	7.2	3.6	54	11	5		
13	13	13	13	13					
					4 - 10	4 - 10	4 - 10		
5	5	5	5	5					
					3 - 12	3 - 12	3 - 12		

Single contact, 4-PDT AgNi, hard gold-plated 250 V AC/DC 1 V 5 A 1 mA

1250 VA

2 kV AC (50 Hz, 1 min.) 2 kV AC (50 Hz, 1 min.) -55°C ... 70°C 100% operating factor 5×10^7 cycles See diagram

DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103

Any / On relay base PR2

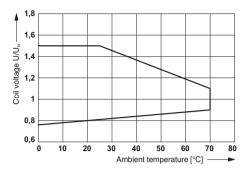
Description		Input voltage $U_{\rm N}$				
Plug-in industrial relay with a test button, status LED, mechanical switch position indicator						
with freewheeling diode, A1 +, A2 -	1	12 V DC				
with freewheeling diode, A1 +, A2 -	2	24 V DC				
with freewheeling diode, A1 +, A2 -	3	110 V DC	- 1			
with freewheeling diode, A1 +, A2 -	4	125 V DC	- 1			
with freewheeling diode, A1 +, A2 -	(5)	220 V DC	- 1			
	6	24 V AC	- 1			
	7	120 V AC	- 1			
	8	230 V AC				
Plug-in industrial relay with a test button, st switch position indicator (Japanese standard		, mechanical				
with freewheeling diode, A1 -, A2 +	1	12 V DC				
with freewheeling diode, A1 -, A2 +	2	24 V DC	1			
with freewheeling diode, A1 -, A2 +	3	48 V DC	-			
with freewheeling diode, A1 -, A2 +	4	110 V DC				

Ordering data	а		
Туре	Order No.	Pcs. / Pkt.	Туј
REL-IR/LDP- 12DC/2X21 REL-IR/LDP- 24DC/2X21 REL-IR/LDP-110DC/2X21 REL-IR/LDP-125DC/2X21 REL-IR/LDP-220DC/2X21 REL-IR/L-24AC/2X21 REL-IR/L-120AC/2X21 REL-IR/L-230AC/2X21	2834012 2834025 2834041 2834960 2834957 2834054 2834067 2834070	10 10 10 10 10 10 10	RE RE RE RE RE
REL-IR/LDM- 12DC/2X21 REL-IR/LDM- 24DC/2X21 REL-IR/LDM- 48DC/2X21 REL-IR/LDM-110DC/2X21	2834151 2834164 2834177 2834180	10 10 10	RE RE RE

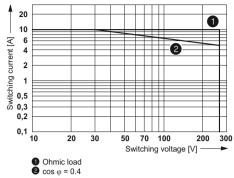
Ordering data							
Туре	Order No.	Pcs. / Pkt.					
REL-IR/LDP- 12DC/4X21AU REL-IR/LDP- 24DC/4X21AU REL-IR/LDP-110DC/4X21AU REL-IR/LDP-125DC/4X21AU REL-IR/LDP-220DC/4X21AU REL-IR/L- 24AC/4X21AU REL-IR/L- 220AC/4X21AU REL-IR/L-230AC/4X21AU	2834083 2834096 2834119 2834313 2834973 2834122 2834135 2834148	10 10 10 10 10 10 10					
REL-IR/LDM- 12DC/4X21AU REL-IR/LDM- 24DC/4X21AU REL-IR/LDM- 48DC/4X21AU REL-IR/LDM-110DC/4X21AU	2834193 2834203 2834216 2834229	10 10 10 10					

REL-IR...2x21 (2 PDTs)

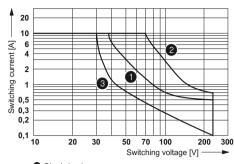
Operating voltage range



AC interrupting rating

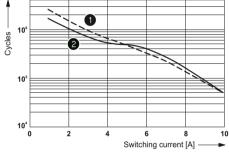


DC interrupting rating

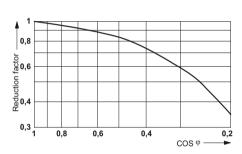


- Ohmic load
 ohmic load, contacts in series
 L/R < 7 ms

Electrical service life



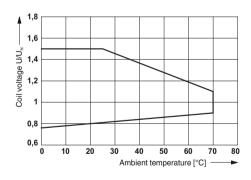
Service life reduction factor



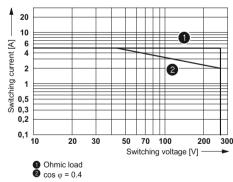
1 250 V AC, ohmic load 2 30 V DC, ohmic load

REL-IR...4x21AU (4 PDTs)

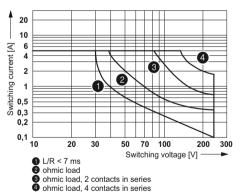
Operating voltage range



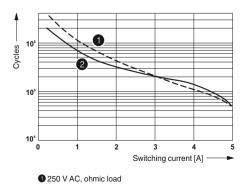
AC interrupting rating



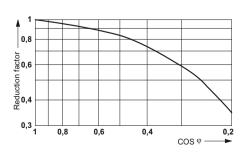
DC interrupting rating



Electrical service life



Service life reduction factor



- 2 30 V DC, ohmic load

Relay modules

PR series

Modular PR3 relay base

Range of relay bases that can be fitted with 2 PDT or 3 PDT relays

Range of accessories includes:

- Plug-in input modules/interference suppression modules
- Relay retaining bracket
- Loop bridges

Type of housing: Polyamide fiber reinforced PA-F, color: green.

Marking systems and mounting material See Catalog 5



Relay base for 2 PDT octal relay

. FLL us

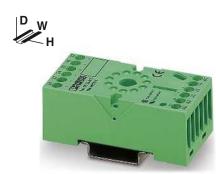
Nominal voltage U_N Nominal current at U_N General data Ambient temperature (operation) Connection data solid / stranded / AWG Dimensions Depth with retaining bracket

Technical data					
400 V AC/DC 10 A					
-40°C 85°C					
0.2 2.5 mm ² / 0.2	2 2.5 mm ² / 26 - 14				
38 mm					
84 mm (EL3-M52)					
75 mm					

2820929

Height	75 mm		
	Ordering dat	а	
Description	Туре	Order No.	Pcs. / Pkt.
Relay base PR3, for octal relay REL-OR with two PDTs, plug-in option for input/interference suppression modules			
With screw connection	PR3-BSC1/2X21	2833602	10
Relay base PR3, for octal relay REL-OR with three PDTs, plug-in option for input/interference suppression modules With screw connection			
Relay retaining bracket, wiring to suit relay base PR3, for 52 mm high octal relay			
	EL3-M52	2833628	10
	Accessories	3	
Loop bridge , 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm ²	DB 50- 90 BU	2821180	1
black	DB 50- 90 BK	2820916	1

DB 50- 90 GY



Relay base for 3 PDT octal relay



Relay retaining bracket

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Technical data	Technical data
400 V AC/DC	-
10 A	
-40°C 85°C	
0.2 2.5 mm ² / 0.2 2.5 mm ² / 26 - 14	-
38 mm	-
84 mm (EL3-M52)	
75 mm	

75 mm						
Ordering data			Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs. / Pkt.
PR3-BSC1/3X21	2833615	10				
EL3-M52	2833628	10	EL3-M52		2833628	10
Accessories	3		Accessories			
DB 50- 90 BU	2821180	1				
DB 50- 90 BK	2820916	1				
DB 50- 90 GY	2820929	1				

Plug-in octal relays suitable for PR3 relay base

Plug-in octal relays with 2 or 3 PDT contacts, suitable for PR3 and RIF-3 relay bases.

The advantages:

- Lockable manual operation
- Mechanical switch position indicator
- Extremely robust design

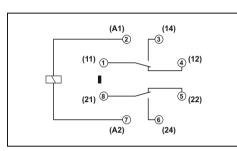


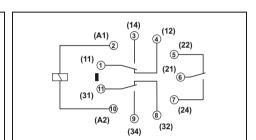
2 PDT relay with power contacts



3 PDT relay with power contacts

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Input data	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(AC, depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(AC, depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	
Max. interrupting rating, ohmic load	
	250 V AC
General data	
Test voltage (winding / contact)	

Test voltage (contact/contact) Ambient temperature (operation) Nominal operating mode Mechanical service life Electrical service life Standards/regulations Mounting position/mounting

		T	echnical data
1	2	3	4
56 12	110	22	10
	5 - 20	5 - 20	5 - 20
6	5 - 20	5 - 20	5 - 20
Single of AgSnIn	contact, 2	2-PDT	

250 V AC/DC 1 V 10 A (N/O contact) 10 mA 2500 VA

2.5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 60°C 100% operating factor 10 x 106 cycles See diagram IEC 60664 Any / On relay base PR3

Technical data			
1	2	3	4
56 12	110	22	10
	5 - 20	5 - 20	5 - 20
6	5 - 20	5 - 20	5 - 20
Single	contact,	three PD	Ts

AgSnIn 250 V AC/DC 1 V 10 A (N/O contact) 10 mA

2500 VA

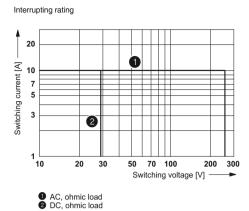
c**91**0s

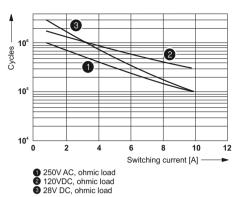
2.5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 60°C 100% operating factor 10 x 106 cycles See diagram IEC 60664 Any / On relay base PR3

		Orden	ng data	
Description	Input voltage $U_{\rm N}$	Туре	Order No.	Pcs./ Pkt.
Plug-in octal relay with power contacts , with a temechanical switch position indicator	st button and			
①	24 V DC	REL-OR- 24DC/2X21	2834232	10
2	24 V AC	REL-OR- 24AC/2X21	2834245	10
3	120 V AC	REL-OR-120AC/2X21	2834258	10
(4)	230 V AC	REL-OR-230AC/2X21	2834261	10

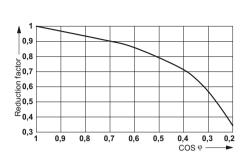
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
REL-OR- 24DC/3X21	2834274	10
REL-OR- 24AC/3X21	2834287	10
REL-OR-120AC/3X21	2834290	10
REL-OR-230AC/3X21	2834300	10

REL-OR...2x21 (2 PDTs)



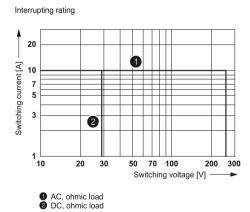


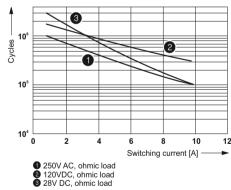
Electrical service life



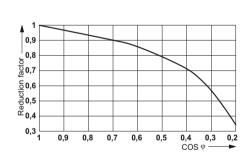
Service life reduction factor with various cos phi

REL-OR...3x21 (3 PDTs)





Electrical service life



Service life reduction factor with various cos phi

Plug-in octal relays for high DC loads

Plug-in octal relays with two N/O contacts connected in series suitable for PR3 and RIF-3 relay bases.

The relays are specially designed for switching high DC loads.

Further advantages:

- Full shutdown by means of 2 x 1.7 mm contact opening
- With lockable manual operation
- Integrated status LED
- Integrated freewheeling diode with DC types



1 N/O contact, with blow magnet



1 N/O contact

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c**91** us

1

55

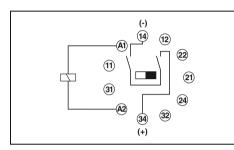
2

refer to the diagram

13

Any / On relay base PR3

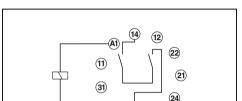
3



Technical data

22

100



Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U _N	[ms]
(depending on phase relation)	
Typ. release time at U _N	[ms]
Typ. release time at U _N	[ms]
(depending on phase relation)	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	
Max. interrupting rating, ohmic load	
	250 V AC
General data	
Test voltage (winding / contact)	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	

20	20	20	5 - 20	5 - 20	5 - 20
30	30	30	5 - 20	5 - 20	5 - 20
with blo AgNi 250 V A 10 V (a 10 A	contact, bwout ma AC / 220 tt 10 mA) (at 10 V)	gnet	ntact (se	ries conr	nection, 2 N/O contacts)
2500 V	Ά				
-40°C . 100% c Approx	ms (50 Hz 60°C operating a. 10 ⁷ cyc 810, EN	factor			

		Т	echnic	cal dat	ta
1	2	3	4	(5)	6
refer to	the diag	ram			
55	13	7	100	22	11
20	20	20			
			5 - 20	5 - 20	5 - 20
30	30	30			
			5 - 20	5 - 20	5 - 20

Single contact, 1 N/O contact (series connection, 2 N/O contacts) 250 V AC / 220 V DC 10 V (at 10 mA) Any / On relay base PR3

10 A 10 mA (at 10 V)
2500 VA
2.5 kV _{rms} (50 Hz, 1 min.) -40°C 60°C
100% operating factor Approx. 10 ⁷ cycles
IEC 61810, EN 60947

Description	Input voltage $U_{\rm N}$
Plug-in octal relay for high DC loads	
1	24 V DC
2	110 V DC
3	220 V DC
4	24 V AC
(5)	120 V AC
6	230 V AC

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
REL-OR/LDP- 24DC/1/MB REL-OR/LDP-110DC/1/MB REL-OR/LDP-220DC/1/MB REL-OR/L- 24AC/1/MB	2901901 2901902 2901904 2901905	10 10 10		
REL-OR/L-120AC/1/MB REL-OR/L-230AC/1/MB	2901906 2901907	10 10		

Ordering data

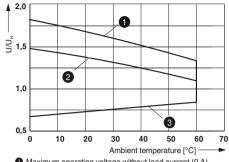
	Ordering dat	а	
/	Туре	Order No.	Pcs. / Pkt.
	REL-OR/LDP-24DC/1 REL-OR/LDP-110DC/1 REL-OR/LDP-220DC/1 REL-OR/L-24AC/1 REL-OR/L-120AC/1 REL-OR/L-330AC/1	2901908 2901909 2901910 2901911 2901912 2901913	10 10 10 10 10

Standards/regulations

Mounting position/mounting

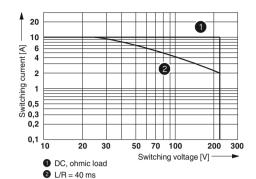
REL-OR.../1/MB (1 N/O contact with blow magnet)

Operating voltage range of the relay



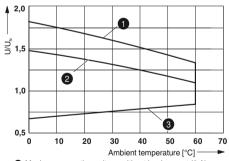
- Maximum operating voltage without load current (0 A)
 Maximum operating voltage at limiting continuous current (10 A)
 Minimum pick-up voltage without pre-excitation

DC interrupting rating



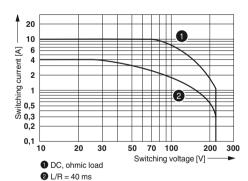
REL-OR.../1 (1 N/O contact)

Operating voltage range of the relay



- Maximum operating voltage without load current (0 A)
 Maximum operating voltage at limiting continuous current (10 A)
 Minimum pick-up voltage without pre-excitation

DC interrupting rating



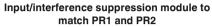
Input modules/interference suppression modules for PR1, PR2, and PR3

Plug-in input modules/interference suppression modules for optional fitting of PR... relay base

The advantages:

- Attenuation of reverse voltage induced in coil
- Mechanical coding to protect against incorrect connection







Input/interference suppression module to match PR3

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c**91** us

	Ordering dat	а		Ordering dat	a	
	Ordering date	u 	1	Ordering date		7
Description	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Plug-in module, for mounting on PR, with LED status indicator and freewheeling diode to limit the coil induction voltage effectively, polarity: A1 +, A2 -, Input voltage:						
- 12-24 V DC ±20% - 48-60 V DC ±20% - 110 V DC ±20%	LDP- 12- 24DC LDP- 48- 60DC LDP-110DC	2833657 2833660 2833673	10 10 10	LDP3- 12- 24DC LDP3- 48- 60DC LDP3-110DC	2833770 2833783 2833796	10 10 10
Plug-in module, for mounting on PR, with LED status indicator and freewheeling diode to limit the coil induction voltage effectively, polarity: A1 -, A2 + (Japanese standard), Input voltage:						
- 12-24 V DC ±20%	LDM- 12- 24DC	2833686	10	LDM3- 12- 24DC	2833806	10
- 48-60 V DC ±20% - 110 V DC ±20%	LDM- 48- 60DC LDM-110DC	2833699 2833709	10 10	LDM3- 48- 60DC LDM3-110DC	2833819 2833822	10 10
Plug-in module, for mounting on PR, with LED status indicator and varistor to limit the coil induction voltage and/or external interference peaks, Input voltage:	LDW-110DC	2033709	10	EDWS-1100C	2033022	10
- 12-24 V AC/DC ±20% (30-V-varistor)	LV- 12- 24UC	2833712	10	LV3- 12- 24UC	2833835	10 10
- 48-60 V AC/DC ±20% (75-V-varistor) - 120-230 V AC/110 V DC ±20% (275-V-varistor)	LV- 48- 60UC LV-120-230AC/110DC	2833725 2833738	10 10	LV3- 48- 60UC LV3-120-230AC/110DC	2833848 2833851	10
Plug-in module, for mounting on PR, with varistor to limit the coil induction voltage and/or external interference peaks, Input voltage:						
- 12-24 V AC/DC ±20% (30-V-varistor)	V- 12- 24UC	2833864	10	V3- 12- 24UC	2833929	10
- 48-60 V AC/DC ±20% (75-V-varistor)	V- 48- 60UC	2833877	10	V3- 48- 60UC	2833932	10
- 120-230 V AC/DC ±20% (275-V-varistor) Plug-in module, for mounting on PR, with RD-element to attenuate the coil induction voltage and/or external interference peaks, Input voltage:	V-120-230UC	2833880	10	V3-120-230UC	2833945	10
- 12-24 V AC/DC ±20% (220 nF/100 Ω)	RC- 12- 24UC	2833741	10	RC3- 12- 24UC	2833893	10
- 48-60 V AC/DC ±20% (220 nF/220 Ω)	RC- 12- 24UC	2833754	10	RC3- 48- 60UC	2833903	10
- 120-230 V AC/DC ±20% (100 nF/470 Ω)	RC-120-230UC	2833767	10	RC3-120-230UC	2833916	10

Terminal assignment PR1 b	ase / Sol	id-state	relay					
	Terminal blocks, PR1 base							
	A1	A2	11	12	14	21	22	24
Solid-state relays								
SIM-EI48DC/100	A2 (-)	A1 (+)			Α	+		
SIM-EITTL/100	A2 (-)	A1 (+)			Α	+	0	
SIM-EI48DC/100RC	A2 (-)	A1 (+)			Α	+		
SIM-EI-OV-24DC/24DC/3	A2 (-)	A1 (+)			Α	+		
OPT24DC/5	A1 (+)	A2 (-)	13		14			
OPT230AC/2	A1 (+)	A2 (-)	13		14			

The relay bases of the PR1 series can also be equipped with wear-free solid-state relays (OPT... or SIM-EI...) as an alternative to the electromechanical relay.

LDP... and LV... plug-in modules cannot be used in conjunction with SIM-EI... solid-state relays

Fully mounted PR1 relay modules with screw connection

Fully mounted PR1 relay modules, consisting of:

- Relay base
- 1/2 PDT relay
- Relay retaining bracket
- Input module/interference suppr. module
- Marking labels
- The advantages: - Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side

Notes:

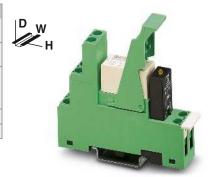
Type of housing: Polyamide fiber reinforced PA-F, color: green.

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

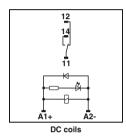
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

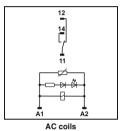
Other input voltages on request

1) EMC: Class A product, see page 571



PR1 relay module with 1 PDT relay





Input data	
Permissible range (with reference to U _N)	
Typ. input current with U _N (for AC: 50/60 Hz)	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input protection:	24 V DC
	24, 120, 230 V AC
_	

Output data

Contact type

Contact material

Maximum switching voltage Minimum switching voltage Limiting continuous current Maximum inrush current Min. switching current

Interrupting rating (ohmic load) max.

Test voltage Winding to contact Contact/contact Ambient temperature (operation)

Mechanical service life Service life, electrical Standards/regulations Pollution degree/surge voltage category

Nominal operating mode

Mounting position / Mounting

Connection data solid / stranded / AWG

W/H/D Dimensions

	Tech	nical data		
24 V DC	24 V AC	120 V AC	230 V AC	
See diagram				
19	34 / 26	9/7	6 / 5.5	
8	3 12	3 12	3 12	
10	1.5 14	1.5 16	2 22	
Damping diod	de, Yellow LED			
Varistor, Yello	w LED			
PR		PRAU		
Single contact	t, 1-PDT	Single contact, 1-PDT		
AgNi		AgNi, hard gold-plated		
250 V AC/DC		30 V AC / 36	V DC	
12 V (at 10 m.	A)	100 mV (at 1	0 mA)	
12 Δ		50 mA		

30 A (300 ms) 50 mA 100 mA 1 mA (at 24 V) 3000 VA (for 250 V AC) For more data, see diagram

-25°C ... 60°C 100% operating factor 3 x 107 cycles See diagram IEC 60664, EN 50178, IEC 62103 3 / III Any / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

16 mm / 78.5 mm / 71 mm

EML (15X6) R YE

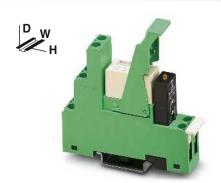
4 kV (50 Hz, 1 min.)

Description	Input voltage U _N
Pre-assembled coupling relay modules with miniature power contact relay	
	24 V DC
	24 V AC
	120 V AC
	230 V AC
Pre-assembled coupling relay modules with multi-layer contact relay	
	24 V DC
	24 V AC
	120 V AC
	230 V AC

Device marking label, for thermal transfer printer,
labeling surface 6 x 15 mm

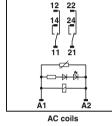
Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
PR1-RSC3-LDP-24DC/211) PR1-RSC3-LV-24AC/211) PR1-RSC3-LV-120AC/211) PR1-RSC3-LV-230AC/211)	2834326 2834339 2834342 2834355	5 5 5 5
PR1-RSC3-LDP-24DC/21AU¹) PR1-RSC3-LV-24AC/21AU¹) PR1-RSC3-LV-120AC/21AU¹) PR1-RSC3-LV-230AC/21AU¹)	2834368 2834371 2834384 2834397	5 5 5 5
Accessories	;	

0819288



PR1 relay module with 2 PDT contact relay

14 24 <u>[</u> 21 11 DC coils



	Tech	nical data	
24 V DC	24 V AC	120 V AC	230 V AC
See diagram	1		
19	34 / 26	9/7	6/5.5
8	3 12	3 12	3 12
10	1.5 14	1.5 16	2 22
Damping did	de, Yellow LED		
Varistor, Yel	low LED		
PR		PRAU	
Single conta	ct, 2-PDT	Single contact	ct, 2-PDT
AgNi		AgNi, hard g	•
250 V AC/D	C	30 V AC / 36	V DC
5 V (at 10 m.	A)	100 mV (at 1	0 mA)

8 A 50 mA 15 A (300 ms) 50 mA 10 mA (At 5 V) 1 mA (at 24 V) 2000 VA (for 250 V AC) For more data, see diagram

4 kV (50 Hz, 1 min.) 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor 3 x 10⁷ cycles See diagram IEC 60664, EN 50178, IEC 62103

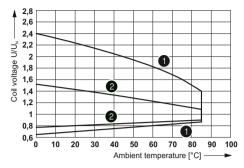
Any / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

16 mm / 78.5 mm / 71 mm

Ordering data Pcs. / Order No. Туре Pkt. PR1-RSC3-LDP-24DC/2X211) 2834481 5 PR1-RSC3-LV- 24AC/2X211) 2834494 5 PR1-RSC3-LV-120AC/2X211) 2834504 5 PR1-RSC3-LV-230AC/2X211) 2834517 PR1-RSC3-LDP-24DC/2X21AU1) 2834520 PR1-RSC3-LV- 24AC/2X21AU1) 2834533 5 PR1-RSC3-LV-120AC/2X21AU1) 2834546 PR1-RSC3-LV-230AC/2X21AU1) 2834559 5 **Accessories** EML (15X6) R YE 0819288 1

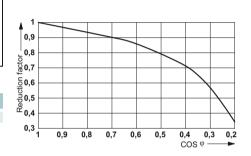
PR1-RSC3.../21 (1 PDT)

Operating voltage range of the relay

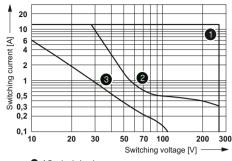




Service life reduction factor

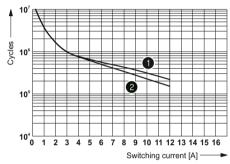


Interrupting rating



AC, ohmic loadDC, ohmic loadDC, L/R = 40 ms

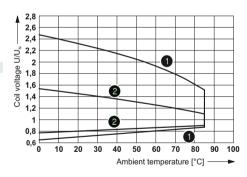
Electrical service life



1 250 V AC, ohmic load (DC coils) 2 250 V AC, ohmic load (AC coils)

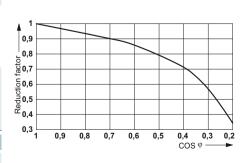
PR1-RSC3.../2x21 (2 PDT)

Operating voltage range of the relay

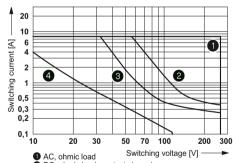


1 DC coils 2 AC coils

Service life reduction factor with various cos phi

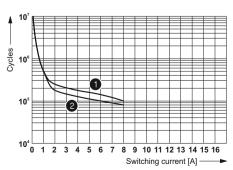


Interrupting rating



- DC, ohmic load, contacts in seriesDC, ohmic load
- 4 DC, L/R = 40 ms

Electrical service life



250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

Fully mounted PR1 relay modules with spring-cage connection

Fully mounted PR1 relay modules, consisting of:

- Relay base
- 1/2 PDT relay
- Relay retaining bracket
- Input module/interference suppr. module
- Marking labels
 - The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side

Notes:

Type of housing:
Polyamide fiber reinforced PA-F, color: green.

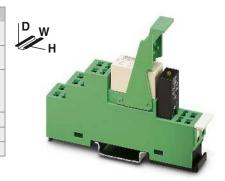
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

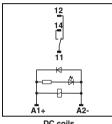
There is a double spring-cage for each terminal point.

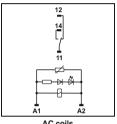
Other input voltages on request.

1) EMC: Class A product, see page 571



PR1 relay module with 1 PDT relay





Input data	
Permissible range (with reference to U _N)	
Typ. input current with U _N (for AC: 50/60 Hz)	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U _N	[ms]
Input protection:	24 V DC
	24, 120, 230 V AC

Output data

Contact type

Contact material

Maximum switching voltage Minimum switching voltage Limiting continuous current Maximum inrush current Min. switching current

Interrupting rating (ohmic load) max.

Ga	noral	l data

Test voltage Winding to contact Contact/contact Ambient temperature (operation)

Nominal operating mode Mechanical service life Service life, electrical Standards/regulations

Pollution degree/surge voltage category Mounting position / Mounting

Connection data solid / stranded / AWG Dimensions

Device marking label, for thermal transfer printer,

labeling surface 6 x 15 mm

See diagram IEC 60664, EN 50178, IEC 62103 3 / III

Any / In rows with zero spacing 0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16

16 mm / 97 mm / 72 mm

EML (15X6) R YE

100% operating factor

Single contact, 1-PDT

-25°C ... 60°C

3 x 107 cycles

<u>↓</u> A1+		A1	
DC coils		AC coils	
	Techni	cal data	
24 V DC	24 V AC	120 V AC	230 V AC
See diagram			
19	34 / 26	9/7	6 / 5.5
8	3 12	3 12	3 12
10	1.5 14	1.5 16	2 22
Damping diode	, Yellow LED		
Varistor, Yellov	/ LED		
PR		PRAU	

AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
12 V (at 10 mA)	100 mV (at 10 mA)
10 A	50 mA
30 A (300 ms)	50 mA
100 mA	1 mA (at 24 V)
2500 VA	-
For more data, see diagram	
4 kV (50 Hz, 1 min.)	
-	
-25°C 60°C	

Pcs./

Pkt.

5

5

5

5

5

5

5

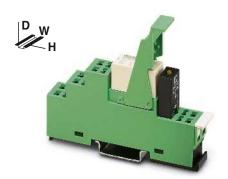
1

0819288

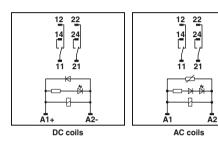
Single contact, 1-PDT

		Ordering data	
Description	Input voltage U _N	Туре	Order No.
Pre-assembled coupling relay modules with miniature power contact relay	24 V DC 24 V AC 120 V AC 230 V AC	PR1-RSP3-LDP-24DC/21¹) PR1-RSP3-LV- 24AC/21¹) PR1-RSP3-LV-120AC/21¹) PR1-RSP3-LV-230AC/21¹)	2834407 2834410 2834423 2834436
Pre-assembled coupling relay modules with multi-layer contact relay	24 V DC 24 V AC 120 V AC 230 V AC	PR1-RSP3-LDP-24DC/21AU¹) PR1-RSP3-LV-24AC/21AU¹) PR1-RSP3-LV-120AC/21AU¹) PR1-RSP3-LV-120AC/21AU¹)	2834449 2834452 2834465 2834478
		Accessories	;

W/H/D



PR1 relay module with 2 PDT contact relay



Technical data				
24 V DC	24 V AC	120 V AC	230 V AC	
See diagram				
19	34 / 26	9/7	6/5.5	
8	3 12	3 12	3 12	
10	1.5 14	1.5 16	2 22	
Damping dio	de, Yellow LED			
Varistor, Yell	ow LED			
PR		PRAU		
Single conta	ct, 2-PDT	Single contact	ct, 2-PDT	
AgNi		AgNi, hard g	•	
250 V AC/DC			30 V AC / 36 V DC	
5 V (at 10 mA)		`	100 mV (at 10 mA)	
8 A		50 mA		
15 A (300 ms	s)	50 mA		
10 mA (At 5 '	V)	1 mA (at 24 \	1 mA (at 24 V)	
2000 VA		-		

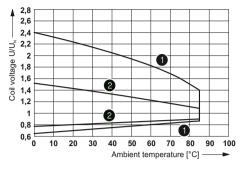
4 kV (50 Hz, 1 min.) 2.5 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor 3 x 10⁷ cycles See diagram IEC 60664, EN 50178, IEC 62103 Any / In rows with zero spacing 0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16

For more data, see diagram

16 mm / 97 mm / 72 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PR1-RSP3-LDP-24DC/2X211) PR1-RSP3-LV- 24AC/2X211) PR1-RSP3-LV-120AC/2X211) PR1-RSP3-LV-230AC/2X211)	2834562 2834575 2834588 2834591	5 5 5 5	
PR1-RSP3-LDP-24DC/2X21AU¹) PR1-RSP3-LV-24AC/2X21AU¹) PR1-RSP3-LV-120AC/2X21AU¹) PR1-RSP3-LV-230AC/2X21AU¹)	2834601 2834614 2834627 2834630	5 5 5 5	
Accessories			
EML (15X6) R YE	0819288	1	

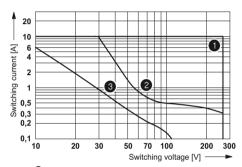
PR1-RSP3.../21 (1 PDT)

Operating voltage range of the relay



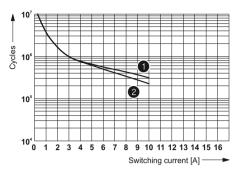
1 DC coils 2 AC coils

Interrupting rating



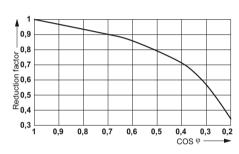
AC, ohmic loadDC, ohmic loadDC, L/R = 40 ms

Electrical service life



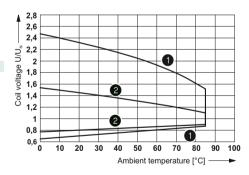
250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi



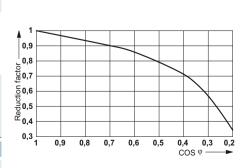
PR1-RSP3.../2x21 (2 PDT)

Operating voltage range of the relay

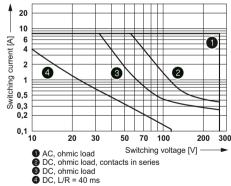


1 DC coils 2 AC coils

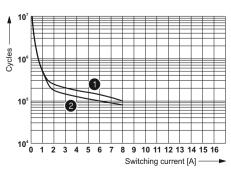
Service life reduction factor with various cos phi



Interrupting rating



Electrical service life



250 V AC, ohmic load (DC coils)250 V AC, ohmic load (AC coils)

Fully mounted PR2 relay modules

Fully mounted PR2 relay modules, consisting of:

- Relay base
- 2/4 PDT relay
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)
- Marking labels The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Screw or spring-cage connection
- 4 PDT types with multi-layer gold con-

Notes:

Type of housing:
Polyamide fiber reinforced PA-F, color: green.

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

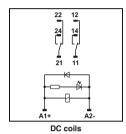
Other input voltages on request

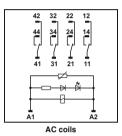
The DC types do not have a plug-in module because the status LED and the freewheeling diode are integrated directly into the re-

1) EMC: Class A product, see page 571



PR2 relay module with screw connection





Input data	
Permissible range (with reference to U _N)	
Typ. input current with U _N (for AC: 50/60 Hz)	[mA]
Typ. response time at U _N	[ms]
Typ. release time at U_N	[ms]
Input protection:	24 V DC
	24, 120, 230 V AC

Output data

Contact type

Contact material

Maximum switching voltage Minimum switching voltage Limiting continuous current Maximum inrush current Min. switching current

Interrupting rating (ohmic load) max.

Test voltage Winding to contact Contact/contact Ambient temperature (operation)

Mechanical service life Service life, electrical Standards/regulations Pollution degree/surge voltage category

Nominal operating mode

Mounting position / Mounting

Connection data solid / stranded / AWG

W/H/D Dimensions

Technical data				
24 V DC	24 V AC	120 V AC	230 V AC	
See diagram				
38	54 / 46	11/9	5/4	
13	4 10	4 10	4 10	
5	3 12	3 12	3 12	
Damping diode, Green LED				
Varistor, LED	red			
PR		PRAU		
Single contact, 2-PDT		Single contact	Single contact, 4-PDT	

AgNi, hard gold-plated 250 V AC / 125 V DC 250 V AC / 125 V DC 5 V 1 V 10 A 20 A (15 ms) 12 A (15 ms) 1 mA 2500 VA 1250 VA For more data, see diagram

2 kV (50 Hz, 1 min.) 2 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor 5 x 107 cycles See diagram IEC 60664, EN 50178, IEC 62103 3/11

Any / In rows with zero spacing 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

27 mm / 78.5 mm / 86 mm

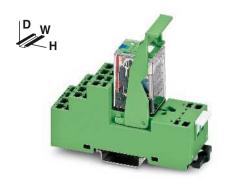
Description	Input voltage U _N
Pre-assembled coupling relay mod 2-PDT contact relay	lules with
	24 V DC
	24 V AC
	120 V AC
	230 V AC
Pre-assembled coupling relay mod 4-PDT contact relay and additional ha	
	24 V DC
	24 V AC
	120 V AC
	230 V AC

Device marking label, for thermal transfer printer.

labeling surface 6 x 15 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
PR2-RSC3-LDP-24DC/2X211) PR2-RSC3-LV-24AC/2X211) PR2-RSC3-LV-120AC/2X211) PR2-RSC3-LV-230AC/2X211)	2834643 2834656 2834669 2834672	5 5 5 5
PR2-RSC3-LDP-24DC/4X21AU1) PR2-RSC3-LV-24AC/4X21AU1) PR2-RSC3-LV-120AC/4X21AU1) PR2-RSC3-LV-230AC/4X21AU1)	2834724 2834737 2834740 2834753	5 5 5 5

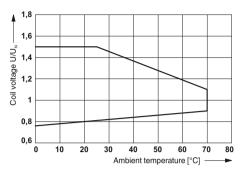
,		_
Accessories		
EML (15X6) R YE	0819288	1



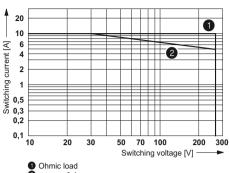
PR2 relay module with spring-cage connection

PR2-RS.../2x21 (2 PDT)

Operating voltage range of relay T_u=T_{coil}

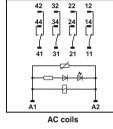


AC interrupting rating



1 Ohmic load **2** cos φ = 0.4

22 24 21 12 14 11



	AC coils				
echr	nical data				
	120 V AC	230 V AC			
	11 / 9 4 10 3 12	5 / 4 4 10 3 12			

Damping diode, Green LED

54 / 46

4 ... 10

3 ... 12

Varistor, LED red

See diagram

38

13

PR... PR...AU Single contact, 2-PDT Single contact, 4-PDT

AgNi, hard gold-plated 250 V AC / 125 V DC 250 V AC / 125 V DC 5 V 1 V 10 A 5 A 20 A (15 ms) 12 A (15 ms) 1 mA 2500 VA 1250 VA

For more data, see diagram

2 kV (50 Hz, 1 min.) 2 kV (50 Hz, 1 min.) -25°C ... 60°C 100% operating factor 5 x 10⁷ cycles See diagram IEC 60664, EN 50178, IEC 62103

Any / In rows with zero spacing 0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16 31 mm / 95 mm / 84 mm

A1+	A2-	
	Techni	С
24 V DC	24 V AC	

_	32 22 34 24	12
į į		ξ
41	31 21	11
	— <u> </u> ZJ—	*
A1		A2
AI		A4

44 [-] 41	34 24 31 21	14
A1		A2
1	AC coils	

	A							
31 21 11	7 20							_
	10		_	-		\vdash	-	
~ ×	₹ 6			- '				Ξ
	달 4			-			2	! _
L I	ը 1 2			-		\sqcup	$\perp \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$	_
A2	5			3	1		-	/
AC coils	1 ig 1			<u> </u>	\setminus		$ \leftarrow $	=
	್ಕ್ 0,5					\vee		\equiv
						++	+	
	0,2						++`	_
230 V AC	0,1							
	1	0	20	30	50	70	100	

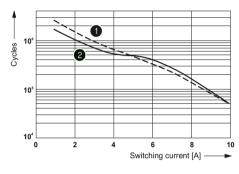
DC interrupting rating

Ohmic load
ohmic load, contacts in series

Switching voltage [V]

200 300

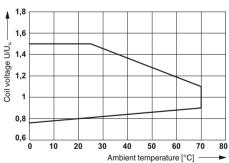
Electrical service life



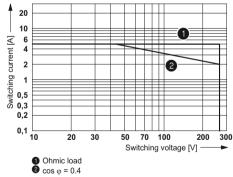
1 250 V AC, ohmic load 2 30 V DC, ohmic load

PR2-RS.../4x21 (4 PDT)

Operating voltage range of relay T_u=T_{coil}



AC interrupting rating





200 300

Ordering data

Туре	Order No.	Pcs. / Pkt.
PR2-RSP3-LDP-24DC/2X211) PR2-RSP3-LV-24AC/2X211) PR2-RSP3-LV-120AC/2X211) PR2-RSP3-LV-230AC/2X211)	2834685 2834698 2834708 2834711	5 5 5 5
PR2-RSP3-LDP-24DC/4X21AU1) PR2-RSP3-LV-24AC/4X21AU1) PR2-RSP3-LV-120AC/4X21AU1) PR2-RSP3-LV-230AC/4X21AU1)	2834766 2834779 2834782 2834795	5 5 5 5

Accessories						
EML (15X6) R YE		0819288	1			

10 Switching current [A] 6 4 2 1 0,5 0,3 0,2

1 L/R < 7 ms

DC interrupting rating

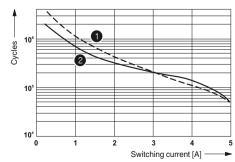
20

0,1 10

> Ohmic load, 2 contacts in series 4 ohmic load, 4 contacts in series

20 30

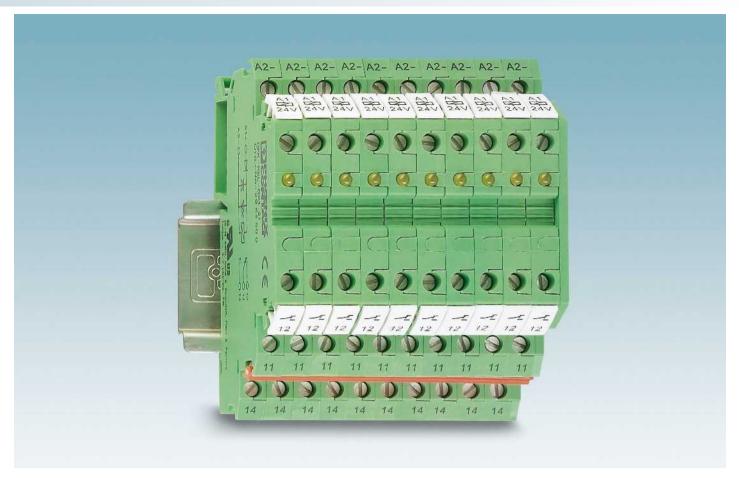
Electrical service life



- 1 250 V AC, ohmic load
- 2 30 V DC, ohmic load

50 70 100

Switching voltage [V]



The Phoenix Contact DEK interface terminal blocks provide complete interface functions in modular terminal block housing that is just 6.2 mm wide. In conjunction with standard terminal block accessories, these high-capacity interfaces have not only the design but also the high level of user convenience of modular terminal blocks.

The main common feature of all Phoenix Contact interface terminal blocks is their width of just 6.2 mm. This saves 60% space in the control cabinet in comparison to conventional 15 mm wide coupling relays from modular systems.

The DEK range offers the best solution for all industrial voltages both for signal input and output.

High switching capacities are a matter of course for the DEK-REL... relay terminal block and the DEK-OV... solid-state relay terminal block.

The wear-free DEK-OV... power solidstate relay terminal block is used for applications that require a greater switching frequency in which electromechanical relays reach the end of their service life in a short

Integrated LEDs clearly indicate the switching status of the electronic terminal blocks and provide an excellent overview of the coupling level and the system.

Colored EB-DIK insertion bridges for the supply and ground signals make it possible to design the circuit simply and effectively.

Integrated protective circuits such as freewheeling diodes, polarity reversal protection diodes, and surge protection elements protect the coupling modules and ensure optimum availability of the system.

DEK-REL-... relay terminal block

The Phoenix Contact relay terminal block with PDT contact offers the following advantages:

- Width of only 6.2 mm
- High switching capacity of 250 V AC/6 A
- Less storage, since PDT, N/O or N/C contacts can be wired
- Little wiring expense due to the use of EB-DIK insertion bridges
- IP67 protected relay housing
- Cadmium-free relay contacts
- 4 kV electrical isolation of input and output
- Safe isolation according to DIN EN 50178 (VDE 0160)
- Light indicator for signaling the switching status.

Notes:

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.

For further EB...DIK... insertion bridges, refer to page 403

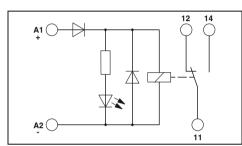
1) EMC: Class A product, see page 571





For medium to large power 1 PDT (21)





		Technical data
Input data		1
Permissible range (with reference to U _N) Typ. input current at U _N Response/release time at U _N Input protection:	[mA] [ms]	0.8 - 1.1 9 8/5 Yellow LED, Protection against polarity reversal, freewheeling diode
Output data		
Contact type Contact material Max. switching voltage Min. switching voltage Limiting continuous current Max. inrush current Min. switching current Max. interrupting rating, ohmic load	24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 255 V AC	Single contact, 1-PDT AgSnO 250 V AC/DC 12 V AC/DC 6 A 6 A 10 mA 140 W 20 W 18 W 23 W 40 W
General data	200 1710	1000 V/
Test voltage (winding / contact) Ambient temperature (operation) Mechanical service life Standards/regulations Connection data solid / stranded / AWG Dimensions	W/H/D	4 kV AC (50 Hz, 1 min.) -20°C 50°C Approx. 10° cycles IEC 60664, EN 50178, IEC 62103 0.2 - 2.5 mm²/0.2 - 2.5 mm²/24 - 14 6.2 mm /80 mm /56 mm
		Ordering data

Description		Input voltage $U_{\rm N}$	Туре
Relay terminal block with power relay	1	24 V DC	DEK-REL-G24/211)

			Accessories			
Cover			D-DEK 1,5 GN		2716949	10
Insertion bridge, for middle and lower levels	No. of pos.	Color				
	80	blue	EB 80- DIK BU	26 A	2715940	1
	80	red	EB 80- DIK RD	26 A	2715953	1
	80	white	EB 80- DIK WH	26 A	2715788	1

Pcs./

10

Order No.

2964500

DEK-REL-24/1/SEN input interface and DEK-REL-24/1/AKT output interface

In addition to the familiar advantages of the DEK-REL... electronic terminal blocks, such as

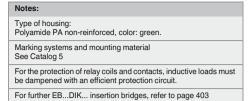
- 2-layer contact with hard gold-plating for universal applications from 1 mA to 5 A continuous current
- 2 kV_{rms} electrical isolation of input and
- Integrated input circuit

With this terminal block, "ALL" connections for a sensor or actuator are provided over a width of just 6.2 mm!

This means that 16 outputs take up a total constructional width of just 105.4 mm (including the power terminal block).

Advantages:

- Lower costs as the N terminal block is no longer required
- Wiring is reduced to a minimum
- Up to 73% more space

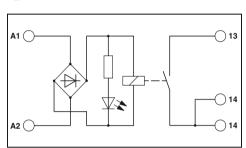


1) EMC: Class A product, see page 571



for small to medium loads 1 N/O contact (1)

	v	
u٠		쭈
4		



Technical data

Input data	
Permissible range (with reference to U_N)	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input protection:	
Output data	
Contact type Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Min. switching current	
Max. interrupting rating, ohmic load	
	24 V DC
	48 V DC
	60 V DC
	110 V DC
	250 V AC
General data	
Test voltage (winding / contact)	

Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

]	8 / 15 5 / 15 Yellow LED, Bridge rectifier
	Double contact, 1 N/O contact AgNi, hard gold-plated 250 V AC / 125 V DC 0.1 V 3 A (5 A up to 35°C at 24 V DC) 5 A 1 mA
;	72 W
;	60 W
;	50 W
)	50 W
;	750 VA
	2 kV AC (50 Hz, 1 min.)

2

0.8 -

1.1 6.5

1 0.9 -

1.1

Input voltage

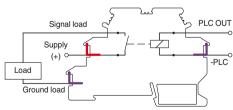
2 10 70 (00 112, 1 111111.)
-20°C 50°C
Approx. 2 x 107 cycles
IEC 60664, EN 50178, IEC 62103
0.2 - 2.5 mm ² / 0.2 - 2.5 mm ² / 24 - 14
6.2 mm / 80 mm / 56 mm

-PLC	Description
	Relay terminal block with miniature relay
DEK DEL AKT	

		(1)	5 V AC/DC
		2	24 V AC/DC
			_
	Terminal block , with three through for mounting on NS 35 For busbar feeding	contacts,	
PLC IN	Cover		
	Insertion bridge, for middle and lower levels	No. of pos.	Color
+PLC		80	blue
J		80	red
\neg (80	white

Ordering data		
Туре	Order No.	Pcs. / Pkt.
DEK-REL- 5/l/11) DEK-REL- 24/l/11)	2941183 2940171	10 10
Accessories		

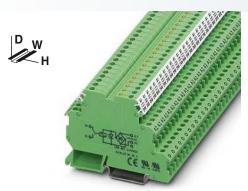
Accessories			
D-DEK 1,5 GN		2716949	10
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

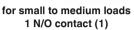


Pin configuration, DEK-REL-...AKT



Pin configuration, DEK-REL-...SEN







for small to medium loads 1 N/O contact (1)

PLus 🕑

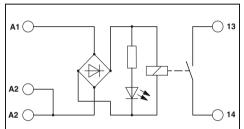


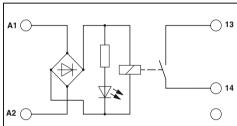
PLus 🕝

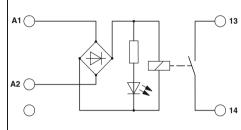
6.5 5/15

for small to medium loads 1 N/O contact (1)









	Technical data
1	2
0.9 -	0.8 -
1.1	1.1
23	6.5
8/15	5/15
Yellow	LED, Bridge rectifier
Double contact, 1 N/O contact AgNi, hard gold-plated	

Double contact, 114/0 contact
AgNi, hard gold-plated
250 V AC / 125 V DC
0.1 V
3 A (5 A up to 35°C at 24 V DC)
5 A
1 mA
72 W
60 W
50 W
50 W
750 VA

2 kV AC (50 Hz, 1 min.) -20°C ... 50°C Approx. 2 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14 6.2 mm / 80 mm / 56 mm

EB 80- DIK WH

Technical data
0
0.8 -
1.1
6.5
5 / 15
Yellow LED, Bridge rectifier
Double contact, 1 N/O contact

AgNi, hard gold-plated 250 V AC / 125 V DC 0.1 V 3 A (5 A up to 35°C at 24 V DC) 5 A 1 mA 72 W 60 W 50 W 50 W 750 VA

2 kV AC (50 Hz, 1 min.) -20°C ... 50°C Approx. 2 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14 6.2 mm / 80 mm / 56 mm

A2 ()		14
	Technical data	
1		
0.8 -		

0710
Yellow LED, Bridge rectifier
Double contact, 1 N/O contact AgNi, hard gold-plated 250 V AC / 125 V DC 0.1 V 3 A (5 A up to 35°C at 24 V DC) 5 A 1 mA
72 W 60 W 50 W 50 W 750 VA

2 kV AC (50 Hz, 1 min.) -20°C ... 50°C Approx. 2 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14 6.2 mm / 80 mm / 56 mm

Ordering data			
Туре		Order No.	Pcs. / Pkt.
DEK-REL- 5/O/1 ¹) DEK-REL- 24/O/1 ¹)		2941170 2941154	10 10
Accessories			
D-DEK 1,5 GN		2716949	10
EB 80- DIK BU	26 A	2715940	1
FR 80- DIK RD	26 ∆	2715953	1

2715788

26 A

Туре	Order No.	Pcs. / Pkt.	
DEK-REL- 24/1/AKT¹)	2964063	10	
Accessories			
DIKD 1,5	2715979	50	
D-DEK 1,5 GN	2716949	10	
EB 80- DIK BU 26	A 2715940	1	
EB 80- DIK RD 26	A 2715953	1	
EB 80- DIK WH 26	A 2715788	1	

Ordering data

t.	Туре		Order No.	Pcs. / Pkt.
0	DEK-REL- 24/1/SEN1)		2964050	10
	Access	sories	i	
0	DIKD 1,5		2715979	50
0	D-DEK 1,5 GN		2716949	10
1	EB 80- DIK BU	26 A	2715940	1
1	EB 80- DIK RD	26 A	2715953	1
1	EB 80- DIK WH	26 A	2715788	1

Ordering data

DEK-OE... and **DEK-OV...** solid-state relay terminal blocks

Phoenix Contact DEK-OE and DEK-OV interface terminal blocks are only 6.2 mm wide but still provide a complete input or output interface with:

- Electrical isolation between input and output at up to 2.5 kV_{rms}
- Integrated input circuit
- Status display
- EB-DIK insertion bridges
- Labeling and mounting with modular terminal block convenience
- Wear-free switching up to 24 V DC/10 A and 240 V AC/800 mA
- Integrated output protection circuit
- Zero voltage switch at AC output
- Actuator version available.

Notes:

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

For the protection of input and output, inductive loads must be

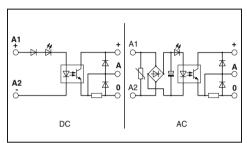
dampened with an effective protection circuit. For further EB...DIK... insertion bridges, refer to page 403

1) EMC: Class A product, see page 571

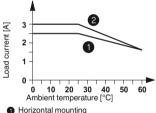


with DC voltage output max. = 100 mA



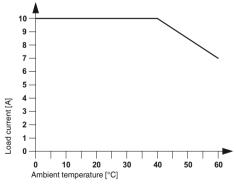


Derating curve for DEK-OV-24DC/24DC/3/AKT

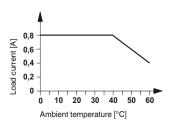


Vertical mounting

Derating curve for DEK-OV-24DC/24DC/10



Derating curve for DEK-OV...240AC/800



nput data	
Pormicciblo	

range (with reference to U_N)

Switching level with reference to U _N	1 signal ("H")
	0 signal ("L")
Typ. input current at U _N	[mA]
Transmission frequency flimit	[Hz]
Input circuit AC	

Input circuit DC

Output data

Operating voltage range

Periodic peak reverse voltage

Limiting continuous current

Min. load current Surge current

Leakage current in off state Max. load value

Output protection

Voltage drop at max. limiting continuous current

General data

Test voltage input/output Ambient temperature (operation)

Standards/regulations

Pollution degree/surge voltage category

Connection data solid / stranded / AWG

W/H/D Dimensions

		1	echni	cal da	ta
1	2	3	4	(5)	6
0.9 - 1.1	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.9 - 1.1	0.9 - 1.1
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.9
≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
6.5	11	7	4	3.2	2.5
300	300	300	300	3	3

Yellow LED, Protection against polarity reversal, Surge protection

Yellow LED, Protection against polarity reversal

3 V DC ... 48 V DC

100 mA

Protection against polarity reversal, freewheeling diode

≤ 0.9 V

2.5 kV (50 Hz, 1 min.)

-20°C ... 60°C

IEC 60664, EN 50178, IEC 62103

 $0.2 - 2.5 \, \text{mm}^2 \, / \, 0.2 - 2.5 \, \text{mm}^2 \, / \, 24 - 14$

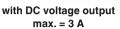
Description		Input voltage $U_{\rm N}$
Solid-state input relays	① ② ③ ④ ⑤	5 V DC 12 V DC 24 V DC 60 V DC 120 V AC 230 V AC
Solid-state power relays Actuator principle	① ② ③ ⑦	5 V DC 12 V DC 24 V DC 24 V DC

Insertion bridge , for middle and lower levels	No. of pos.	Color
	80	blue
	80	red
	80	white

6.2 mm / 80 mm / 56 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
DEK-OE- 5DC/ 48DC/100¹) DEK-OE- 12DC/ 48DC/100¹) DEK-OE- 24DC/ 48DC/100¹) DEK-OE- 60DC/ 48DC/100¹) DEK-OE-120AC/ 48DC/100 DEK-OE-230AC/ 48DC/100	2940223 2964487 2940207 2941536 2941659 2940210	10 10 10 10 10 10	
Accessories			

Accessories			
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1







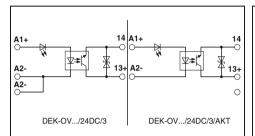
with DC voltage output max. = 10 A

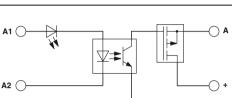


with AC voltage output max. = 800 mA

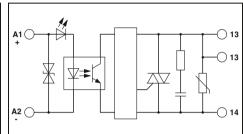
PG







Technical data



Technical data

		Technical data	
1	2	3	7
0.8 -	0.8 -	0.8 -	0.8 -
1.2	1.2	1.2	1.2
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
11	8.5	7	7
300	300	300	300

•		•	0
0.8 -	0.8 -	0.8 -	0.8 -
1.2	1.2	1.2	1.2
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
11	8.5	7	7
300	300	300	300

Yellow LED, Protection against polarity reversal, Surge protection				
	Yellow LED. Protection	against polarit	v reversal. Surae	protection

1	2	3
0.8 -	0.8 -	0.8 -
1.2	1.2	1.2
≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4
10.2	10.5	10.7
10	10	10

Yellow LED, Protection against polarity reversal

3 V DC 30 V DC
-
3 A (see derating curve)
-
-

3 // DC 30 // DC

Protection against polarity reversal, Surge protection ≤ 0.2 V

2.5 kV (50 Hz, 1 min.) -20°C ... 60°C IEC 60664, EN 50178, IEC 62103

0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14

5 V DC ... 30 V DC 10 A (see derating curve) 100 A (t = 20 ms)

c**91**us

1

0.8 -1.2

≥ 0.8 ≤ 0.4

5.1

100

2

0.8 -

1.2

≥ 0.8

≤ 0.4

47

100

(3)

0.8 -

1.2

≥ 0.8

≤ 0.4

3.5

100

Protection against polarity reversal, Surge protection < 50 mV

2.5 kV (50 Hz, 1 min.) -20°C ... 60°C IEC 60664, EN 50178, IEC 62103 2/111 $0.2 - 2.5 \, \text{mm}^2 \, / \, 0.2 - 2.5 \, \text{mm}^2 \, / \, 24 - 14$ Yellow LED, Protection against polarity reversal, Surge protection

10 V AC ... 253 V AC (50/60 Hz) 600 V 0.8 A (see derating curve) 10 mA 30 A (t = 10 ms) 1.2 mA 4.5 A²s RCV circuit ≤ 1 V

2.5 kV (50 Hz, 1 min.) -20°C ... 60°C IEC 60664, EN 50178, IEC 62103 2/111 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

6.2 mm / 80 mm / 56 mm			6.2 mm / 80 mm / 56 mm		6.2 mm / 80 mm / 56 mm					
Ordering data			Ordering data		Ordering data		ı			
Туре		Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs. / Pkt.	Туре		C
DEK-OV- 5DC/ 24DC/ 31)		2941361	10	DEK-OV- 5DC/ 24DC/ 101)		2961752	10	DEK-OV- 5DC/240AC/800		2
DEK-OV- 12DC/ 24DC/ 31)		2941387	10	DEK-OV- 12DC/ 24DC/ 101)		2961749	10	DEK-OV- 12DC/240AC/800		2
DEK-OV- 24DC/ 24DC/ 31) 2941374 10		DEK-OV- 24DC/ 24DC/ 101)		2964322	10	DEK-OV- 24DC/240AC/800		2		
DEK-OV- 24DC/ 24DC/ 3/AK	T	2964296	10							
Accessories		Accessories		Accessories						
EB 80- DIK BU	26 A	2715940	1	EB 80- DIK BU	26 A	2715940	1	EB 80- DIK BU	26 A	,
EB 80- DIK RD	26 A	2715953	1	EB 80- DIK RD	26 A	2715953	1	EB 80- DIK RD	26 A	2
EB 80- DIK WH	26 A	2715788	1	EB 80- DIK WH	26 A	2715788	1	EB 80- DIK WH	26 A	2

Pcs./

Pkt.

10

10

Order No.

2964623

2964636

2964649

2715940 2715953



DEK-REL-24/1/S switch/relay terminal block

The functions "Manual", "0", "Automatic" are provided in a 6.2 mm narrow relay terminal block.

Interference-free relay and solid-state relay interfaces

Coupled interference voltages on the coil lines or leakage currents can cause malfunctions in conventional modules. These special interface modules, equipped with high switching thresholds and/or effective filters, ensure good functioning.

ST-REL... and EMG 17-REL... relay interfaces for switching lamp loads

Lamp loads and capacitive consumers produce extremely high inrush currents which weld conventional relay contacts. To prevent this, Phoenix Contact uses an arc-resistant contact optimized for these applications, which keeps these peaks under control.

ST-OV 3-24DC/400/3 plug-in solidstate power relay

The output of this component, dimensioned with a peak reverse voltage of 800 V, allows, for example, 230 V motors to be driven in simple reversible mode.

Power circuit breaker solid-state relay, with signal logic

These modules combine the features of a short-circuit-proof power solid-state relay and those of a thermomagnetic protection element.

DEK-OE-...100KHZ 100 kHz input solid-state relay

Input solid-state relay for reliable transmission of high frequency signals of the type that occur with, for example, incremental encoders.

Electronic sensor terminal block for **NAMUR** proximity sensors

For converting the changeable resistance of a NAMUR sensor into a digital signal that can be read by a PLC.

DEK-TR/INV inverter module

Module for converting NPN outputs to PNP outputs and PNP to NPN.

Relay module with manual switch

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

The advantages:

- Max. switching current of 5 A
- Only 6.2 mm wide
- Increased contact stability thanks to double contact
- Safe isolation according to DIN EN 50178 between coil and contact

Notes:

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5

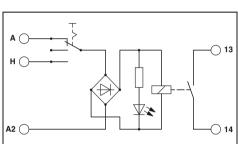
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

1) EMC: Class A product, see page 571



Relay module with manual switch and integrated relay

SUus 🕑



Technical data

Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input protection:	
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Min. switching current	
Max. interrupting rating, ohmic load	
	24 V DC
	48 V DC
	60 V DC
	110 V DC
	250 V AC
General data	
Test voltage (winding / contact)	

	00.20
	110 V DC
	250 V AC
General data	
Test voltage (winding / contact)	
Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Connection data solid / stranded / AWG	
Dimensions	W/H/D

\cup
0.8 -
1.1 6.5
5/15
Yellow LED, Bridge rectifier
Tollow 225, 2 liago roomici
Double contact, 1 N/O contact AgNi, hard gold-plated 250 V AC / 125 V DC 0.1 V 3 A (5 A up to 35°C at 24 V DC) 5 A 1 mA
72 W
72 W 60 W
50 W
50 W
750 VA
2 kV AC (50 Hz, 1 min.) -20°C 50°C Approx. 2 x 10 ⁷ cycles IEC 60664, EN 50178, IEC 62103
0.2 - 2.5 mm ² / 0.2 - 2.5 mm ² / 24 - 14

6.2 mm / 80 mm / 61 mm

Type

Description		Input voltage $U_{\rm N}$
Relay module with power relay		
	1	24 V AC/DC

Cover		
Insertion bridge	No. of pos.	Color
	2	red
	3	red
	4	red
	5	red
	10	red
	2	blue
	3	blue
	4	blue
	5	blue
	10	blue
	80	blue
	80	red
	80	white

DEK-REL- 24/1/S1)	2964131	10
Acces	ssories	
D-DEK 1,5 GN	2716949	10
EB 2- DIK RD	2716693	10
EB 3- DIK RD	2716745	10
EB 4- DIK RD	2716758	10
EB 5- DIK RD	2716761	10
EB 10- DIK RD	2716774	10
EB 2- DIK BU	2716648	10
EB 3- DIK BU	2716651	10
EB 4- DIK BU	2716664	10
EB 5- DIK BU	2716677	10
EB 10- DIK BU	2716680	10
EB 80- DIK BU	2715940	1
EB 80- DIK RD	2715953	1
EB 80- DIK WH	2715788	1

Ordering data

Pcs./

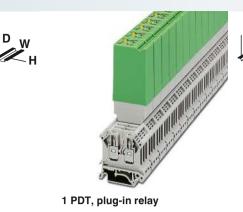
Order No.

Relay modules with interference current filter

Relay and solid-state relay modules with integrated filter to protect against interference voltages or currents due, for example, to long control lines

The advantages:

- Resistant to interference currents
- High relay release voltage Typical applications:
- Applications with long control lines
- Use of AC output boards, resulting in residual AC currents





1 PDT, soldered-in relay

PG

Notes:

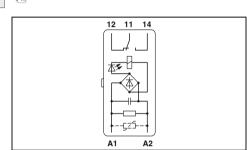
Output data

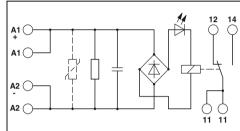
Standards/regulations

Dimensions

Connection data solid / stranded / AWG

Load current diagrams, see page 347





Input data	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input protection:	

		i echnicai data
1	2	3
0.9 -	0.85 -	0.9 -
1.1	1.1	1.1
26	19	18
8/10	8/11	10/8
Yellow	LED, Brid	dge rectifier, Surge protection

Double contact, 1 PDT

30 V AC / 36 V DC

0.5 A

0.2 A

5 W

Ordering data

Pcs./

10

10 10

10 10 10

10

2820136

Technical data		
	3	
	0.9 -	
	1.1	
	18	
	10/8	
Yellow LED, Brid	dge rectifier, Surge protection	

Contact type	
Contact material	
Max. switching voltage Limiting continuous current Max. inrush current Max. interrupting rating, ohmic load	
, 5	24 V DC
	48 V DC
	60 V DC
	110 V DC
	220 V DC
	250 V AC
General data	
Test voltage (winding / contact) Ambient temperature (operation) Mechanical service life	

2.5 kV AC (50 Hz, 1 min.)
-20°C 50°C
Approx. 2 x 107 cycles
IEC 60664, EN 50178, IEC 62103
-/-/-
20.8 mm / 42.5 mm / 112 mm

Single contact, 1-PDT

AgNi 250 V AC/DC

6 A

8 A

140 W

60 W 45 W 35 W 55 W 1500 VA

W/H/D

Single contact, 1-PDT	Double contact, 1 PDT
AgNi	AgPd60, hard gold-plated
250 V AC/DC 6 A 8 A	30 V AC / 36 V DC 0.5 A 0.2 A
95 W 50 W 45 W 35 W 55 W	5 W - - - -
2.5 kV AC (50 Hz. 1 min.)	

Description		Input voltage U _N
Relay module with power contact relay		
	1	24 V AC
	2	120 V AC
	0	000 1/ 40

put voltage U _N	Туре	Order No.
24 V AC	ST-REL3-KG 24/21/SO46	2826091
120 V AC	ST-REL3-KG120/21/SO46	2833026
230 V AC	ST-REL3-KG230/21/SO46	2832027
24 V AC	ST-REL3-KG 24/21/AU/SO46	2826981
120 V AC	ST-REL3-KG120/21/AU/SO46	2829797
230 V AC	ST-REL3-KG230/21/AU/SO46	2826266
	Accessories	

URELG 3

Ordering data
22.5 mm / 75 mm / 62.5 mm
0.2 - 4 mm ² / 0.2 - 2.5 mm ² / 24 - 12
IEC 60664, EN 50178, IEC 62103
Approx. 2 x 10 ⁷ cycles
-20°C 40°C
2.5 kV AC (50 Hz, 1 min.)

Description		U _N		
Relay module with power contact relay				
	1	24 V AC		
	2	120 V AC		
	3	230 V AC		
Relay module with multi-layer contact relay				
	1	24 V AC		
	2	120 V AC		
	3	230 V AC		
Basic terminal block, complete with end cover				

Ordering data		
Туре	Order No.	Pcs. / Pkt.
EMG 22-REL/KSR-230/21/ SO46	2940760	10
EMG 22-REL/KSR-230/21/AU/SO46	2940061	10
Accessories		
EMG-GKS 12	2947035	50

Equipment marker

Notes:

Type of housing:
ST-REL: Polyamide non-reinforced PA, color: bottom part gray, hood green
EMG: Polyamide fiber reinforced PA-F, color: green.

Input data

Equipment marker

DEK: Polyamide non-reinforced PA, color: green.

Marking systems and mounting material See Catalog 5

For derating curve, refer to page 345

1) EMC: Class A product, see page 571



Solid-state input relay 100 mA, maximum



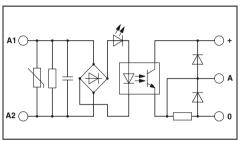
P



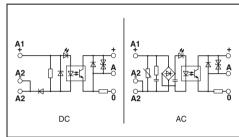
Solid-state power relay Max. 2 A



0.9 -1.1



Technical data



Permissible range (with reference to U_{N})	
Switching level	1 signal ("H") [V DC] ≥ 0 signal ("L") [V DC] ≤
Typ. input current at U _N	[mA]
Typ. switch-on time at U _N	[ms]
Typ. switch-off time at U _N	[ms]
Transmission frequency f _{limit}	[Hz]
Input circuit AC	
Input circuit DC	
Output data	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Output circuit	
Output protection	
Voltage drop at max. limiting continuous cur	rent
General data	
Test voltage input/output	
Ambient temperature (operation)	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting	
_	

Pollution degree/surge voltage category Mounting position/mounting	
Connection data solid / stranded / AWG Dimensions	W/H/D
Description	Input voltage

Pollution degree/surge voltage category Mounting position/mounting		
Connection data solid / stranded / AWG Dimensions		W/H/D
Description		Input voltage U _N
Solid-state power relays	1 2	24 V DC 230 V AC

C 50°C EC 60664, EN 50178, IEC 62103 2/ III Any / In rows with zero spacing 2.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 5.2 mm / 80 mm / 56 mm Ordering data
EC 60664, EN 50178, IEC 62103 :/ III kny / In rows with zero spacing 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
EC 60664, EN 50178, IEC 62103
2.5 kV AC 0°C 50°C
l-conductor, ground-referenced Protection against polarity reversal, Free running : 0.9 V
V DC 00 mA
8 V DC
'ellow LED, Surge protection, RC element
5
14
4.4
2.5 4.4
4.4

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 6.2 mm / 80 mm / 56 mm			
Ordering data	а		
Туре	Order No.	Pcs. / Pkt.	
DEK-OE-230AC/ 48DC/100/SO 46	2964678	10	
Accessories	;		

Technical data
1
0.8 -
1.2
16.8
16
8
0.02
0.2
300

48 V DC
12 V DC
2 A (see derating curve)
5 A (t = 1 s)
3-conductor, ground-referenced
Protection against polarity reversal, Surge protection
1.17

3.5 kV AC
-10°C 55°C
IEC 60664, EN 50178, IEC 62103
2/III

Protection against polarity reversal

- / Mounted in rows with zero spacing: Horizontal/not in rows: Any

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 17.5 mm / 75 mm / 102 mm

Ordering dat	а			
Туре	Order No.	Pcs. / Pkt.		
EMG 17-OV- 24DC/ 48DC/21)	2942810	10		
Accessories				

Accessories	•	
EMG-GKS 12	2947035	50

Relay modules for high inrush currents

The Phoenix Contact relay modules of the type SO 38 have been designed for switching electrical equipment with high inrush currents.

Areas of application are:

- Inductive loads (motors, power contactors, etc.)
- Inductive/capacitive loads (fluorescent) lamps, etc.)
- Ohmic loads (glow lamps, heaters).

The module is based on a relay with a special arc-resistant tungsten lead contact. This takes over the high inrush and interrupting current capacitively. The inductive main contact made of AgCdO takes over the continuous current up to 10 A reliably. With the EMG 17-REL...2E/SO38 model, this switching capacity is reached using a power relay with a set of silver tin oxide (AgSnO) contacts.

The module is available in two versions:

- Modular EMG rail-mountable housing with a design width of 17.5 mm
- Convenient ST-REL plug-in housing from the Phoenix ST series for mounting on the URELG or UDK-RELG basic terminal blocks.

Further features are:

- Snap-on mounting on the common EN rails
- Easy maintenance
- Clear labeling of the terminal blocks using Phoenix Contact marking material.

Notes:

Type of housing: Polycarbonate fiber reinforced PC-F, color: green or black.

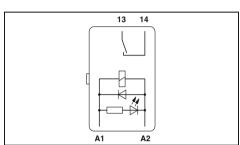
Marking systems and mounting material





medium to large loads 1 N/O contact (1)





nput data	
Permissible range (with reference to U_N)	
Typ. input current at U _N Response/release time at U _N	[mA] [ms]

Input protection:

Output data Contact type Contact material Max. switching voltage Limiting continuous current

Max. inrush current

Max. interrupting rating, ohmic load

48 V DC 60 V DC 110 V DC 220 V DC 250 V AC

General data

Test voltage (winding / contact) Ambient temperature (operation) Mechanical service life Standards/regulations Mounting position/mounting

Connection data solid / stranded / AWG

W/H/D Dimensions

	l echnical data
1	
0.85 -	

1.1 28 13 /

Yellow LED, freewheeling diode

1 N/O contact with lead contact

AgCdO 250 V AC 80 A (20 ms)

24 V DC

2500 VA

2.5 kV AC (50 Hz. 1 min.) -20°C ... 50°C Approx. 107 cycles

IEC 60664, EN 50178. IEC 62103

-/ Horizontal with zero spacing, vertical with spacing

20.8 mm / 42.5 mm / 112 mm

		Ordering data		
Description	Input voltage $U_{\rm N}$	Туре	Order No.	Pcs. / Pkt.
Relay module with power contact relay + wolfran	n lead contact			
①	24 V DC	ST-REL3-KG 24/ 1/SO38	2829564	10
Relay module with power contact relay, with two manual, automatic	inputs for			
1	24 V DC			
		Accessories	}	
Basic terminal block, complete with end cover		URELG 3	2820136	10
Equipment marker				



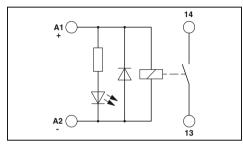


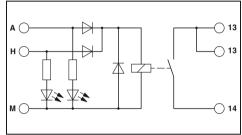


medium to large loads 1 N/O contact (1)

medium to large loads 1 N/O contact (1)







Technical data
① 0.85 - 1.1 28 13 / 15 Yellow LED, freewheeling diode

0.9 -1.1 23 9/10 Automatic: Yellow LED, Manual: Red LED, freewheeling diode, Protection against polarity reversal

Technical data

1 N/O contact with lead contact AgCdO 250 V AC 80 A (20 ms)

Single contact, 1 N/O contact AgSnO 250 V AC/DC 120 A (20 ms)

2500 VA 4 kV AC (50 Hz, 1 min.) -20°C ... 50°C Approx. 10⁷ cycles IEC 60664, EN 50178, IEC 62103 120 W 85 W 70 W 90 W 2500 VA

240 W

PG

1

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

4 kV AC (50 Hz, 1 min.) -20°C ... 50°C 3 x 10⁷ cycles IEC 60664, EN 50178, IEC 62103

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

17.5 mm / 75 mm / 62.5 mm			17.5 mm / 75 mm / 62.5 mm		
Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs./ Pkt.
EMG 17-REL/KSR-G 24/SO38 BK	2949994	10			
			EMG 17-REL/KSR-G 24/2E/S038	2941646	10
Accessories		Accessories			
EMG-GKS 12	2947035	50	EMG-GKS 12	2947035	50

ST-OV 3 plug-in solid-state power relays

The plug-in version of the module provides all the advantages of the ST series, such as:

- Switching of up to 400 V AC/3 A
- Control of 230 V motors in straightforward reversing mode (e.g., synchronous motor in single-phase operation, see illustration)
- Plug-in

Notes:

Type of insulating housing: polyamide PA non-reinforced, color: bottom part gray, hood green

Ground (minus) potential from the input and output of the optocoupler should not be connected.

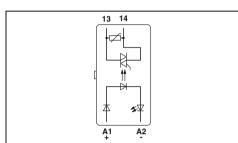
AC loads must be protected with a varistor or an RC element.





with AC voltage output max. = 3 A





Technical data

Input data	
Switching level with reference to U _N	1 signal ("H" 0 signal ("L")
Typ. input current at U _N	[mA
Transmission frequency f _{limit}	[Hz
Input protection:	
Output data	
Operating voltage	
Operating voltage range	
Periodic peak reverse voltage	
Limiting continuous current	
Min. load current	
Surge current	
Residual voltage drop at "H"	
Leakage current in off state	
Output protection	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Standards/regulations	
Pollution degree/surge voltage category	
Mounting position/mounting	
Dimensions	W/H/D

Description		Input voltage U _N
Solid-state power relays	1	24 V DC
Pagie terminal black complete with and cou		

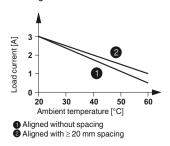
	①
') ')	≥ 0.8 ≤ 0.4
.]	7
:]	Yellow LED, Protection against polarity reversal, RC element
	400 V AC
	24 V AC 420 V AC
	800 V
	3 A (see derating curve)
	50 mA
	125 A (t = 10 ms) < 1.2 V
	Approx. 12 mA
	Surge protection, RC element
	Salgo plotosticit, i to cloniciti
	2.5 kV AC
	0°C 60°C
	IEC 60664, EN 50178, IEC 62103
	2/III
	Horizontal DIN rail / -
)	20.8 mm / 42.5 mm / 112 mm

EO.O MINITY TELO MINITY TTE MINI		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
ST-OV3- 24DC/400AC/3	2905417	10
Accessories		

2820136

URELG 3

Derating curve for ST-OV 3-24DC/400AC/3



ST-OV 4-24DC/24DC/...-PRO power protection circuit solid-state relay with signal logic

The ST-OV 4-...PRO provides protection and monitoring functions that are otherwise only known from thermomagnetic protection elements.

The PROtect modules have the following features:

- Fast disconnection with short-circuits and simultaneous current limitation
- Time-dependent overload shutdown for reliable protection against continuous overloads
- Brief inrush peaks are ignored
- After an overload or short-circuit has been triggered, a defined reset of the control voltage must be carried out
- Reliable recognition and indication of a line break on the load side
- Feedback in the event of an error

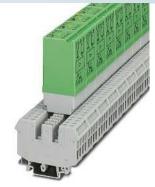
Type of housing: Polyamide PA non-reinforced, color: bottom part gray, hood green

Marking systems and mounting material See Catalog 5

For load current diagram, see page 347

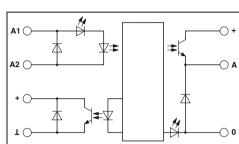
Derating curve, time/current characteristic curves, and state diagram, see page 347





with short-circuit-proof DC voltage output max. = 1 A or 4 A





Technical data

Input data Operating voltage

Switching level 1 signal ("H") 0 signal ("L") Typ. input current at U_N

Transmission frequency f_{limit}

Reset period after short-circuit / overload shut down

Input circuit

Output data signaling contact / CONTROL

Operating voltage range Limiting continuous current Residual voltage drop at "H"

Output protection Output circuit Output data load contact

Operating voltage range Limiting continuous current

Min. load current

Residual voltage drop at "H" Open circuit alarm with load current

Overload disconnection (~ 1.4 x continuous current) Short-circuit disconnection

Current limitation at short-circuits

Switching time t_{in} /t_{out} Output protection Output circuit

General data

Test voltage input/output Test voltage output/output Rated surge voltage

Ambient temperature (operation)

Standards/regulations

Screw connection solid / stranded / AWG

W/H/D Dimensions

24DC/ 24DC/1-PRO	ST-OV4- 24DC/ 24DC/4

ST-OV4-4-PRO 24 V DC ±50%

8.5 V DC 5 V DC 6.5 mA

100 Hz

Yellow LED, Polarity protection diode

5 V DC ... 36 V DC

50 mA ≤ 1.5 V

Polarity protection diode

3-conductor, ground-referenced

18 V DC ... 36 V DC

4 A (see derating curve) 1 A (see derating curve)

1 mA

300 mV 200 mV

< 100 µA

≤ 100 ms (See the time-current characteristic curve)

< 200 µs (See the time-current characteristic curve) Approx. 25 A Approx. 70 A

300 μs / 700 μs

Red LED, Damping diode

3-conductor, ground-referenced

2.5 kV AC 2.5 kV AC Basic insulation

0°C ... 60°C

IEC 60664 / EN 50178 / IEC 62103 $0.2 - 4 \text{ mm}^2 / 0.2 - 4 \text{ mm}^2 / 24 - 12$

27 mm / 63.5 mm / 114 mm

Description	Output current	Туре
Power circuit breaker solid-state rela	ay, with signal logic	
	1 A 4 A	ST-OV4- 24DC/ ST-OV4- 24DC/

Basic terminal block, complete with end cover

Ordering data		
Туре	Order No.	Pcs. / Pkt.
ST-OV4- 24DC/ 24DC/1-PRO ST-OV4- 24DC/ 24DC/4-PRO	2905572 2905585	10 10

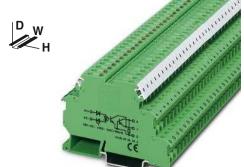
Access	sories	
UDK-RELG 4	2777056	10

DEK-OE 100 kHz input solid-state relay

A solid-state relay for the reliable detection of short pulses

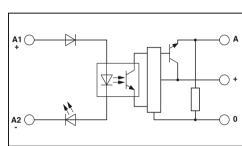
- Limit frequency of up to 100 kHz
- Push-pull stage on output side
- Includes signal inputs on PLC counter boards
- Features a capacitor on the input side for interference suppression

Notes:		
	nousing: de PA non-reinforced, color: green.	
Marking See Ca	systems and mounting material alog 5	
1) EMC	Class A product, see page 571	



with DC voltage output Transmission frequency 100 kHz





Technical data

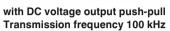
Input data Permissible range (with reference to U _N)	
· cimicoloro range (marrelerence le C _N)	
Switching level with reference to U _N	1 signal ("H" 0 signal ("L"
Typ. input current at U _N	[mA
Typ. switch-on time at U _N	[µs
Typ. switch-off time at U _N	[µs
Transmission frequency f _{limit}	[kHz
Input protection:	
Output data	
Operating voltage range	
Limiting continuous current	
Quiescent current	
Residual voltage drop at "H"	
Output circuit	
Output protection	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Standards/regulations	
Pollution degree/surge voltage category	
Connection data solid / stranded / AWG	
Dimensions	W/H/E

Description		Input voltage U_{N}
Solid-state input relays	1 2	5 V DC 24 V DC

	1	2
))]]	1.5 2 100	1.2 ≥ 0.8 ≤ 0.4 6
	50 mA 4.3 mA ≤ 0.5 V 3-cond	1
	IEC 60 2 / II 0.2 - 4	AC 60°C 664, EN 50178, IEC 62103 mm² / 0.2 - 2.5 mm² / 24 - 12 n/80 mm / 56 mm

Ordering data		
Туре	Order No.	Pcs./ Pkt.
DEK-OE- 5DC/ 24DC/100KHZ ¹) DEK-OE- 24DC/ 24DC/100KHZ ¹)	2964270 2964283	10 10



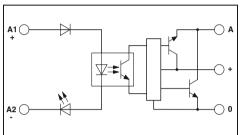


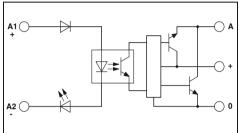


with DC voltage output push-pull Transmission frequency 100 kHz

P







	Technical data
1	2
0.5 - 1.2	0.8 - 1.2
≥ 0.5 ≤ 0.3	≥ 0.8 ≤ 0.4
8	8
1 2	1 2
100 Yellow	100 LED, Protection against polarity reversal, Surge protection

4 V DC 18 V DC
50 mA
8.5 mA
≤ 1.2 V DC
3-conductor push-pull, ground referenced
Surge protection

2.5 kV AC -20°C ... 60°C IEC 60664, EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

6.2 mm / 80 mm / 56 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
DEK-OE- 5DC/ 5DC/100KHZ-G1)	2964542	10	

Technical data			
1	2		
0.5 -	0.8 -		
1.2	1.2		
≥ 0.5	≥ 0.8		
≤ 0.3	≤ 0.4		
8	8		
1	1		
2	2		
100	100		
Yellow	LED Protection against polarity reversal. Surge protection		

14 V DC ... 30 V DC 50 mA 15 mA \leq 2.2 V DC 3-conductor push-pull, ground referenced Surge protection

2.5 kV AC -20°C ... 60°C IEC 60664, EN 50178, IEC 62103 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$ 6.2 mm / 80 mm / 56 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
DEK-OE- 5DC/ 24DC/100KHZ-G1) DEK-OE- 24DC/ 24DC/100KHZ-G1)	2964555 2964348	10 10

Electronic sensor terminal block for **NAMUR** proximity sensors

The EIK 1-SVN 24-P electronic sensor terminal block from Phoenix Contact converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

- Monitoring of initiator side for short circuits or strand breaks
- Suitable resistance circuit to enable monitoring of mechanical switches (see application 2)
- LED error display
- Status display (high signal) via green LED
- 24 V/50 mA digital output
- Bridging and marking with standard terminal accessories.

Notes:

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material

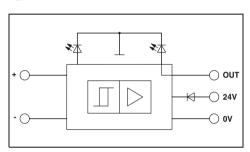
1) EMC: Class A product, see page 571





For inductive proximity sensors according to NAMUR

PG



Input supply nominal voltage U_{VN}

Ripple

Current consumption I_{lmax}

Input circuit

Control circuit

Non-load voltage

Switching hysteresis

Max. output current I_{Omax}

Residual voltage U_R with I_{Omax}

Ambient temperature (operation)

Transmission frequency (INPUT/OUTPUT)

Pollution degree / Surge voltage category Screw connection solid / stranded / AWG

Internal resistance

Output protection

Output voltage $U_{\rm O}$

Output protection

Input pulse length

Input pause length

Standards/regulations

General data

Signal output

Switching points in accordance with EN 60947-5-6:

Technical data

18.5 V DC ... 28.8 V DC (U_{VN}, see derating curve)

according to DIN 19240

70 mA (at 50 mA output current) Green LED, Polarity protection diode

8.2 V DC ±10%

≥ 2.1 mA (In conductive state)

≤ 1.2 mA (In blocking state)

6.3 mA ... 10 mA (in the event of a short-circuit) 0 mA ... 0.35 mA (In the event of a wire break)

Approx. 0.2 mA

Approx. 1 kΩ

visual short-circuit and wire break control with LED (red), 12 V Zener

diode

50 mA

≤ 1.5 V (U_R)

≤ 100 mV (In conductive state)

(U_{VN} - U_R;in blocking state)

36 V Zener diode as freewheeling diode

-25°C ... 50°C

1 kHz ≥ 0.5 ms

≥ 0.5 ms

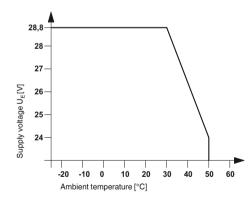
IEC 60664, EN 61000-6-2, EN 61000-6-4

W/H/D

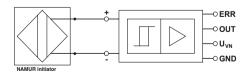
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

6.2 mm / 80 mm / 56 mm

Derating curve for EIK 1-SVN 24 P



Application 1



Application 2

UKK 5-2R/NAMUR -O ERR 1k -o out 10k -≎U_{VN} -O GND Limit switch

Description

Dimensions

Switching amplifier electronic terminal block, for inductive proximity initiators as per NAMUR, with light indicators for sensor signal and faults

Terminal block, with three through contacts, for mounting on NS 35..

Double-level terminal block, with pre-assembled resistors

Insertion bridge

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
EIK1-SVN-24P¹)	2940799	10	

Accessories				
DIKD 1,5	2715979	50		
UKK 5-2R/NAMUR	2941662	50		
EBDIK Ordering data at DEK-REL				

DEK-TR/INV inverter module

The Phoenix Contact DEK-TR/INV inverter module inverts the signals of ground switching NPN transistor outputs into positive switching PNP outputs, and vice versa (see application example).

Supply voltage Continuous current

Leakage current

Residual voltage drop

NPN input/PNP output Switch-on threshold

Switch-off threshold

Switch-off threshold

Standards/regulations

Ambient temperature (operation)

Pollution degree / Surge voltage category

Screw connection solid / stranded / AWG

Min. limit values Max. limit values

Control circuit Switch-on threshold

Min. limit values

Max. limit values

General data

Dimensions

Description Inverter module

Max. transmission frequency

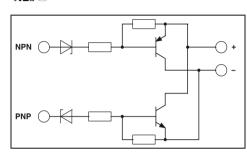
Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material See Catalog 5





SN US 🕑



Technical data

20 V DC ... 30 V DC (U_V)

200 mA < 1 V

< 1 mA

15 kHz

 $< 5 \text{ V (at U}_{V} = 24 \text{ V}; < (U_{V} - 19 \text{ V}))$ $> 15 \text{ V} (\text{at U}_{\text{V}} = 24 \text{ V}; > (U_{\text{V}} - 9 \text{ V}))$

26 V (at $U_V = 24 \text{ V}$; $U_V + 2 \text{ V}$)

> 19 V < 9 V

-2 V

W/H/D

26 V (at $U_V = 24 \text{ V}$; $U_V + 2 \text{ V}$)

-20°C ... 50°C IEC 60664

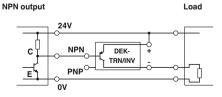
Basic insulation

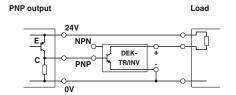
2/11

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

0.2 (1111) 60 (1111) 50 (1111)			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
DEK-TR/INV	2964319	10	

Connection examples:





Hybrid relay modules

With its integrated transistor level, the hybrid relay module is able to amplify weak input signals. This serves as the basis for reliable relay operation.

The advantages:

- Low control current (terminal B), typedependent as of 0.5 mA
- Type-dependent positive or negative control current
- Integrated input and interference suppression circuit
- Safe isolation according to DIN EN 50178 between coil and contact

Notes:

Type of housing: Polycarbonate fiber reinforced PC-F, color: green.

Marking systems and mounting material See Catalog 5

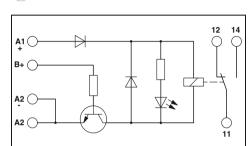
For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.

1) EMC: Class A product, see page 571



Positive switching hybrid relay





Input data	
Relay supply voltage U _N ±10%	[V DC]
Min. control voltage	[V DC]
Max. control voltage	[V DC]
Min. control current	[mA]
Max. control current	[mA]
Typ. input current at U _N	[mA]
Response/release time at U _N	[ms]
Input protection:	
Output data	
Contact type	
Contact material	
Max. switching voltage	

Limiting continuous current Max, inrush current Max. interrupting rating, ohmic load

24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 250 V AC

General data

Test voltage (winding / contact) Ambient temperature (operation) Mechanical service life Standards/regulations

Pollution degree/surge voltage category Connection data solid / stranded / AWG

Dimensions W/H/D

			lechn
1	2	3	
24	24	24	
2.7	5	15	
5.25	13.2	35	
2.6	0.5	0.5	
7.7	1	1	
21	21	21	
9/10	9/10	9/10	

Yellow LED, Protection against polarity reversal, freewheeling diode

ical data

Single contact, 1-PDT AaNi 250 V AC/DC 5 A 8 A 120 W 60 W

50 W 50 W 80 W 1250 VA

4 kV AC (50 Hz, 1 min.) -20°C ... 50°C Approx. 5 x 107 cycles IEC 60664, EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 22.5 mm / 75 mm / 62.5 mm

Description Nominal control voltage								
Relay module with miniature power contact relay with integrated NPN transistor control, for low control currents								
	1	5 V DC						

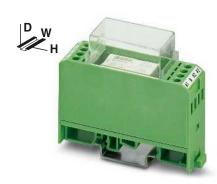
12 V DC 24 V DC

Relay module with miniature power contact relay with integrated PNP transistor control, for low control currents

> 1 5 V DC 2 12 V DC 3 24 V DC

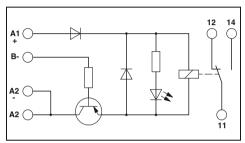
Equipment marker		

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
EMG 22-REL/KSR-G 24/TRN 5 ¹) EMG 22-REL/KSR-G 24/TRN12 ¹) EMG 22-REL/KSR-G 24/TRN35 ¹)	2949787 2952363 2952350	10 10 10					
Accessories							
EMG-GKS 12	2947035	50					



Negative switching hybrid relay





	Technical data												
1	2	3											
24	24	24											
-2.4	-6.9	-17.5											
-5.25	-13.2	-38.5											
1.2	0.6	0.6											
1.7	1	1.4											
21	21	21											
9/10	9/10	9/10											

Yellow LED, Protection against polarity reversal, freewheeling diode

Single contact, 1-PDT AgNi 250 V AC/DC

5 A

8 A

120 W 60 W

50 W

50 W

80 W 1250 VA

4 kV AC (50 Hz, 1 min.)

-20°C ... 50°C Approx. 5 x 10⁷ cycles

IEC 60664, EN 50178, IEC 62103

2/III

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

22.5 mm / 75 mm / 62.5 mm									
Ordering data									
Туре	Order No.	Pcs. / Pkt.							
EMG 22-REL/KSR-G 24/TRP 51)	2949790	10							
EMG 22-REL/KSR-G 24/TRP121)	2952156	10							
EMG 22-REL/KSR-G 24/TRP351)	2952169	10							
Accessories	Accessories								
EMG-GKS 12	2947035	50							



System cabling for controllers

Wiring I/O modules with individual wires is an extremely time-consuming process. Wiring errors and tedious troubleshooting cannot be ruled out.

Interface cabling reduces assembly costs by using plug-in components to carry out wiring quickly, clearly, and without errors.

The new interface modules in the VIP -VARIOFACE Professional series, which feature a modern housing design, offer the following advantages:

- Space-saving
- Vibration resistant up to 5g thanks to metal feet
- Reliable connection technology, either with screw or push-in connections
- Wide range of marking options VIP modules are available for both product segments:

VARIOFACE system cabling is a cabling concept that has been specially developed to allow connection to the I/O modules of a wide range of automation devices.

The VIP series is rounded off by new front adapters with encapsulated system cables for the SIMATIC S7 300.

VARIOFACE wiring interfaces are suitable for universal use. Various VIP - VARIOFACE Professional modules with a 1:1 connection from a high-position plug-in connector to a different connection technology are available. The encapsulated system cables provide an effective and efficient means of establishing a connection to a control device with protection against polarity reversal.

A variety of potential distributors are available for splitting the control and operating voltage.

Pront adapter For ABB S800 I/O For Allen-Bradley, ControlLogix, PLC 5, SLC 500, and PlantScape For GE Fanuc RX3i and Series 90-30 For Honeywell C300 Series CI/O and PlantScape For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-500 For Siemens SIMATIC® S7-57 For Siemens SIMATIC® S7-800 For Siem	Product range overview	
Front adapter For ABB S800 I/O For Allen-Bradley, ControlLogix, PLC 5, SLC 500, and PlantScape For Emerson DeltaV For GE Fanuc RX3i and Series 90-30 For Honeywell C300 Series CI/O and PlantScape For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Mitsubishi A1S and C200H For Phoenix Contact Axioline and Inline For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter ### 8 adapter ### 8 adapter ### 8 adapter ### 8 adapter ### 8 adapter ### 8 adapter ### 8 adapter ### 9 Adapter #	Introduction to VARIOFACE system cabling	418
For ABB S800 I/O For Allen-Bradley, ControlLogix, PLC 5, SLC 500, and PlantScape For Emerson DeltaV For GE Fanuc RX3i and Series 90-30 For Honeywell C300 Series CI/O and PlantScape For Honeywell C300 Series CI/O and PlantScape For Omron CJ1, CS1, and C200H For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-57 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter W8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with flat-ribbon cable plug-in connectors VIP modules with flat-ribbon cable plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with distributors Active interface modules For relay couplers/optocouplers For solid-state relays 55	Overview of VARIOFACE system cabling	420
For Allen-Bradley, ControlLogix, PLC 5, SLC 500, and PlantScape For Emerson DeltaV For Emerson DeltaV For GE Fanuc RX3i and Series 90-30 For Honeywell C300 Series CI/O and PlantScape For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-1500 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 For Siemens SIMATIC® S7-400 For Yokogawa CS3000 R3 For Siemens SIMATIC® S7-400 For Siemens SIMA	Front adapter	
ControlLogix, PLC 5, SLC 500, and PlantScape for Emerson DeltaV for GE Fanuc RX3i and Series 90-30 for GE Fanuc RX3i and Series 90-30 for Honeywell C300 Series CI/O and PlantScape for Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 44 for Omron CJ1, CS1, and C200H for Phoenix Contact Axioline and Inline for Schneider Electric MODICON® for Siemens SIMATIC® 57-300 for Siemens SIMATIC® 57-300 for Siemens SIMATIC® 57-400 for Siemens SIMATIC® 55-57 conversion for Yokogawa CS3000 R3 fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter (8 adapter feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Passive universal interface modules VIP modules with D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors With DIN strips With Strips With Strips With Blug-in connectors With COMBICON connectors VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays	For Allen Bredley	422
For Emerson DeltaV For GE Fanuc RX3i and Series 90-30 For Honeywell C300 Series CI/O and PlantScape For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Siemens SIMATIC® S7-400 For Siemens SIMATIC® For Siemens Siemens For Siemens Siemens For		424
For Honeywell C300 Series CI/O and PlantScape For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter Foed-through terminal blocks Relays/solid-state relays Forss-reference list Forsiemens Binder ARIOFACE wiring interface Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors	For Emerson DeltaV	432
For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200 44-For Omron CJ1, CS1, and C200H 44-For Omron CJ1, CS1, and C200H 44-For Phoenix Contact Axioline and Inline 45-For Schneider Electric MODICON® 46-For Siemens SIMATIC® S7-300 45-For Siemens SIMATIC® S7-1500 45-For Siemens SIMATIC® S7-400 46-For Siemens SIMATIC® S7-400 47-For Siemens SIMATIC® S7-400 48-For Siemens SIMATIC® S7-87 conversion 49-For Yokogawa CS3000 R3 40-For Yokogawa CS3000 R3 40-For Yokogawa CS3000 R3 41-Formination boards With passive transfer 41-Formination boards With passive transfer 42-Formination boards With passive transfer 43-Formination boards With passive transfer 44-Formination boards With passive transfer 48-Fored-through terminal blocks 48-Belays/solid-state relays 49-PLC-INTERFACE via V8 adapter 48-Belays/solid-state relays 49-PLC-INTERFACE via V8 adapter 48-Belays/solid-state relays 49-PLC-INTERFACE via V8 adapter 40-PLC-INTERFACE via V8 adapter 41-PLC-INTERFACE via V8 adapter 42-PLC-INTERFACE via V8 adapter 43-PLC-INTERFACE via V8 adapter 44-PLC-INTERFACE via V8 adapter 45-PLC-INTERFACE via V8 adapter 46-PLC-INTERFACE via V8 adapter 47-PLC-INTERFACE via V8 adapter 48-PLC-INTERFACE v	For GE Fanuc RX3i and Series 90-30	436
For Omron CJ1, CS1, and C200H For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter //8 adapter For Siedens	For Honeywell C300 Series CI/O and PlantScape	438
For Phoenix Contact Axioline and Inline For Schneider Electric MODICON® 44 For Schneider Electric MODICON® 45 For Siemens SIMATIC® S7-300 45 For Siemens SIMATIC® S7-1500 50r Siemens SIMATIC® S7-400 45 For Siemens SIMATIC® S7-400 45 For Siemens SIMATIC® S7-57 For Siemens SIMATIC® S7-800 45 For Siemens SIMATIC® S7-800 46 For Yokogawa CS3000 R3 46 Fermination boards With passive transfer With relay 49 PLC-INTERFACE via V8 adapter 48 Relays/solid-state relays 20 Forss-reference list 48 Forstem cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface 52 Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with high-density D-SUB plug-in connectors 53 With DIN strips With RJ45 plug-in connectors With RJ45 plug-in connectors With RJ45 plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 55		440
For Schneider Electric MODICON® For Siemens SIMATIC® S7-300 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter Wa adapter Foed-through terminal blocks Relays/solid-state relays Cross-reference list For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With passive transfer With relay PLC-INTERFACE via V8 adapter Wa adapter Foed-through terminal blocks Relays/solid-state relays Cross-reference list For Siemens Simanus For For Siemens Siemens		442
For Siemens SIMATIC® S7-1500 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa C53000 R3 Fermination boards With passive transfer With passive transfer With relay PLC-INTERFACE via V8 adapter //8 adapter Foed-through terminal blocks Relays/solid-state relays System cables With flat-ribbon cable and D-SUB plug-in connectors Solintroduction to VARIOFACE wiring interface Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with plug-in connectors VIP modules with distributors Solid-state relays	For Schneider Electric MODICON®	445
For Siemens SIMATIC® S7-400 For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with dign-density D-SUB plug-	For Siemens SIMATIC® S7-300	450
For Siemens SIMATIC® S5-S7 conversion For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter //8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Passive universal interface modules //IP modules with flat-ribbon cable plug-in connectors //IP modules with D-SUB plug-in connectors //IP modules with D-SUB plug-in connectors //IP modules with high-density D-SUB plug-in connectors //IP modules with high-density D-SUB plug-in connectors //IP modules with plat-ribbon cable plug-in connectors //IP potential distributors	For Siemens SIMATIC® S7-1500	456
For Yokogawa CS3000 R3 Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter Wa adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Deverview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For relay couplers/optocouplers For relay couplers/optocouplers For relay couplers/optocouplers For solid-state relays	For Siemens SIMATIC® S7-400	458
Fermination boards With passive transfer With relay PLC-INTERFACE via V8 adapter /8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Diverview of VIP - VARIOFACE Professional Passive universal interface modules /IP modules with flat-ribbon cable plug-in connectors /IP modules with D-SUB plug-in connectors /IP modules with high-density D-SUB plug-in connectors /IP plug-in connectors /IP modules with distributors Static Density D-SUB plug-in connectors /IP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 55		,
With passive transfer With relay PLC-INTERFACE via V8 adapter //8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Diverview of VIP - VARIOFACE Professional Passive universal interface modules //IP modules with flat-ribbon cable plug-in connectors //IP modules with D-SUB plug-in connectors //IP modules with high-density D-SUB plug-in connectors //IP modules with blug-in connectors //IP podules with high-density D-SUB plug-in connectors //IP potential distributors //IP potential distributors //IP potential distributors //IP potential distributors //IP consolid-state relays		400
With relay PLC-INTERFACE via V8 adapter //8 adapter		
PLC-INTERFACE via V8 adapter /8 adapter	·	470
/8 adapter Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Overview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 53 24 25 26 27 28 28 29 20 20 20 20 20 20 20 20 20	With relay	490
Feed-through terminal blocks Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Overview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 52 53 54 65 67 67 67 67 67 67 67 67 67	PLC-INTERFACE via V8 adapter	
Relays/solid-state relays Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Overview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 32 48 48 48 48 48 48 48 48 48 4	V8 adapter	484
Cross-reference list System cables With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Overview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 50 51 52 53 54 55 55 56 57 58 58 58 58 59 59 50 50 50 50 50 50 50 50	Feed-through terminal blocks	486
With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Overview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays	•	320
With flat-ribbon cable and D-SUB plug-in connectors Introduction to VARIOFACE wiring interface Diverview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays	Cross-reference list	488
Introduction to VARIOFACE wiring interface Diverview of VIP - VARIOFACE Professional Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIR modules with high-density D-SUB plug-in connectors VIR DIN strips Vith DIN strips Vith ELCO plug-in connectors Vith RJ45 plug-in connectors Vith COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays	System cables	
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Passive universal interface modules VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors Vith DIN strips Vith ELCO plug-in connectors Vith RJ45 plug-in connectors Vith COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays	Introduction to VARIOFACE wiring interface	520
VIP modules with flat-ribbon cable plug-in connectors VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors Vith DIN strips Vith ELCO plug-in connectors Vith RJ45 plug-in connectors Vith COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 52 53 54 54 54 55 56 57 58 58 59 50 50 50 50 50 50 50 50 50	Overview of VIP - VARIOFACE Professional	522
VIP modules with D-SUB plug-in connectors VIP modules with high-density D-SUB plug-in connectors VIIP modules with high-density D-SUB plug-in connectors VIIIP modules with high-density D-SUB plug-in connectors VIIIP plug-in connectors VIIIP plug-in connectors VIIIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 53 54 Connectors 54 Connectors 55 Connectors 56 Connectors 57 Connectors 58 Connectors 59 Connectors 59 Connectors 50 Connectors 50 Connectors 50 Connectors 50 Connectors 51 Connectors 52 Connectors 53 Connectors 54 Connectors 55 Connectors 56 Connectors 57 Connectors 58 Connectors 58 Connectors 59 Connectors 50 Connectors 51 Connectors 52 Connectors 53 Connectors 54 Connectors 55 Connectors 55 Connectors 56 Connectors 57 Connectors 57 Connectors 58 Connectors 58 Connectors 58 Connectors 58 Connectors 58 Connectors 59 Connectors 59 Connectors 50 Co	Passive universal interface modules	
VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 53 54 54 55 55 56 57 58 58 59 50 50 50 50 50 50 50 50 50	VIP modules with flat-ribbon cable plug-in connectors	524
VIP modules with high-density D-SUB plug-in connectors With DIN strips With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 53 54 54 55 55 56 57 58 58 59 50 50 50 50 50 50 50 50 50	VIP modules with D-SUB plug-in connectors	532
With ELCO plug-in connectors With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 54	VIP modules with high-density D-SUB plug-in connectors	539
With RJ45 plug-in connectors With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 54	With DIN strips	540
With COMBICON connection VIP potential distributors Active interface modules For relay couplers/optocouplers For solid-state relays 54 54 55 55 55 55 56 57 58 58 58 58 58 58 58 58 58	With ELCO plug-in connectors	542
Active interface modules For relay couplers/optocouplers For solid-state relays 54 55 55	, , ,	546
Active interface modules For relay couplers/optocouplers For solid-state relays 55		54 <i>1</i> 548
For relay couplers/optocouplers 55 For solid-state relays 55	<u> </u>	340
For solid-state relays 55		
·	For relay couplers/optocouplers	550
A CONTRACTOR (MOINTE ORTOCOURIONS)	For solid-state relays Accessories (relays, optocouplers)	553 554



A large part of the costs incurred in automation systems today results from the cabling for the actuators and signaling units. On top of this, machines and systems are becoming more and more complex, which means that the cabling costs for the input and output stations are also steadily on the increase. In addition to cabling material costs, the costs associated with planning, assembly, startup, and documentation must also be considered.

VARIOFACE system cabling is a system concept that reduces manufacturing costs through fast, error-free, and uniform wiring of the input and output signals of a PLC.

The system design comprises three components:

- VARIOFACE front adapters
- VARIOFACE system cables
- VARIOFACE termination board

VARIOFACE system cabling is available for controllers from:

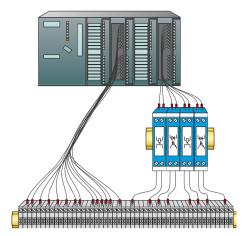
- ABB
- Allen-Bradley
- Emerson
- Honeywell
- GE Fanuc
- Mitsubishi Electric
- OMRON
- Schneider Electric
- Siemens
- Yokogawa
- Phoenix Contact

VIP - VARIOFACE Professional

The new front adapters with encapsulated system cables for the S7 300 and new compact termination boards make the system cabling even more robust. VARIOFACE Professional means:

New front adapters

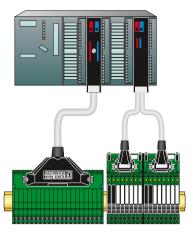
- Optimized housing concept
- Power supplied via PCB terminal blocks
- Plug-in bridges for electrical isolation
- Directly connected system cables with encapsulated plugs New termination boards
- Space saving
- Vibration resistant up to 5g
- Optional marking
- New housing design



The conventional wiring of input and output cards of programmable logic controls requires a lot of time.

Signals are transferred from the control system to modular terminal blocks or coupling modules such as relays or optocouplers by means of single conductor wiring.

This requires a complex wiring process. At the same time, errors in wiring are always possible with this connection method. Wiring errors are often only noticed when the system is put into operation and they then cause additional costs.



Wiring with the system cabling considerably reduces the assembly time and guarantees protection against polarity reversal.

Front adapters with an integrated pin strip (IEC 60603-13) are plugged onto the PLC I/O cards. They replace connection technologies such as those involving a screw or crimp connection.

The controller boards are simply snapped onto the DIN rail instead of modular terminal blocks or coupling modules. On the control side they also have a multi-position pin

The controller boards are connected to the front adapters using multi-position and pre-assembled system cables.

Actuators and sensors from the field level are connected to the termination boards by means of screw or spring-cage connections or knife disconnect terminal blocks. The termination boards are marked on the field side according to the application, so that the signals can be clearly assigned.



The configuration cross-reference list (a quick reference guide to the VARIOFACE system components) is extremely useful when selecting the required components. What's more, matching components can be configured using the INTERFACE search assistant.

See www.phoenixcontact.net/products.

Rationalize your application with the aid of VARIOFACE system cabling:

- Easy planning with configuration cross-reference list or online selector
- Cost reductions thanks to time-saving wiring
- Fault minimization through protection against polarity reversal
- Easy maintenance thanks to modular system components

Product overview of VARIOFACE system cabling

			Controlle	er								
			АВВ		Allen-Bradley	,	Emerson	GE FA	NUC	Hone	eywell	
Sy	stem component	Version	S800 I/O	Control Logix	PLC 5	SLC 500	DeltaV	RX3i	90-30	C300 CI/O, ML 200 series	PlantScape	
			Page	Page	Page	Page	Page	Page	Page	Page	Page	
Front adapters			Not required	424	426	428	Not required	436	437	438	424	
System cables		Standard	512	504	504	504	506	504	504	512	504	
Systen		Controller- specific	423			430	432			441		
		Passive Standard	470	470	470	470	470	470	470	439	470	
	Sandan Sandan	Passive Controller- specific	422	473		429	433					
Termination boards		Active Standard	490	490	490	490	490	490	490	490	490	
Terminati		V8 adapter/ feed-through terminal block	484	484	484	484	484	484	484	484	484	
		Relay/ optocoupler	320	320	320	320	320	320	320	320	320	
		MINI Analog system adapter										
		MINI Analog										

Mitsubishi	OMRON CJ1	Phoenix Contact	Schne	eider		Sien	nens		Yokogawa
MELSEC A, A1S, Q, L	CS1, CQM1, C200H	Axioline Inline	TSX Qantum	M340	S7 300	S7 1500	S7 400	S5 to S7 conversion	Centum CS3000
Page	Page	Page	Page	Page	Page	Page	Page	Page	Page
Not required	Not required	444	445	446	448	Not required	458	459	Not required
		504	504	504	504		504		
440	442			447	453	456			466
470	470	470	470	470	470	470	470		
			473		472		472		468
490	490	490	490	490	490	490	490		
484	484	484	484	484	484	484	484		484
320	320	320	320	320	320	320	320		320
					94				94
					92				92

ABB S800 I/O Termination boards with knife disconnection

The ABB S800 I/O system offers the possibility of realizing the process wiring with D-SUB plug-in connectors. ABB TU 812 Compact MTU are available for this purpose.

The FLKM-D25SUB/B/KDS3-MT/... modules are connected to the I/O modules using assembled D-SUB cables (refer to "System cables" chapter).

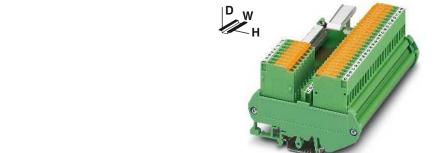
In addition to screw connection with knife disconnection for every channel and ABB S800-specific labeling, the modules have the following features:

- Eight negative terminals with knife disconnection (TU810)
- Eight positive terminals with knife disconnection (TU810/P)
- For each channel, there is a positive and negative terminal with knife disconnection (TU830)

Passive interface modules can also be used for signal transmission (e.g., VIP-3/SC/D25SUB/F, 2315188), see page 533.

Connectable I/O modules

Card type	FLKM-D25SUB
Digital input	DI 810 DI 811 DI 814 DI 830 DI 831 DI 885
Digital output	DO 810 DO 814
Analog input	AI 810 AI 820 AI 830 AI 835
Analog output	AO 810 AO 820



Field level

126.5 mm

247.5 mm

H/D

Interface module with knife disconnect terminal blocks

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method

- S800 I/O input modules

- S800 I/O universal module

Control system level Connection data solid / stranded / AWG

Dimensions

Module width No. of Description pos. VARIOFACE module, with knife disconnect terminal blocks for: - S800 I/O output modules 126.5 mm

25

25

Technical data

50 V AC/DC 2 A 4 A (8 A L1-/L2-) 1.4 kV -20°C ... 50°C Any DIN EN 50178, IEC 62103 Screw connection with disconnect knife D-SUB socket strip 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 90 mm / 61 mm

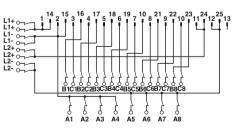
Ordering data							
Туре	Order No.	Pcs. / Pkt.					
FLKM-D25 SUB/B/KDS3-MT/TU810	2304513	1					
FLKM-D25 SUB/B/KDS3-MT/TU810/P	2304539	1					
FLKM-D25 SUB/B/KDS3-MT/TU830	2304526	1					



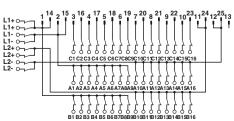
Explanation:

Flat-ribbon cable strip Connection to I/O card

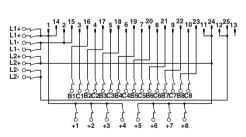
Screw terminal blocks for separate supply



FLKM-D25 SUB/B/KDS3-MT/TU810 connection scheme



FLKM-D25 SUB/B/KDS3-MT/TU830 connection scheme



FLKM-D25 SUB/B/KDS3-MT/TU810/P connection scheme

ABB S800 I/O System cable

The ABB S800 I/O system offers the possibility of realizing the process wiring with D-SUB plug-in connectors. ABB TU 812 Compact MTU are available for this purpose.

The CABLE-D25SUB/B/2X14/.../TU812 system cables convert from a D-SUB socket strip to two flat-ribbon cable plugs. Therefore, all 8-channel controller boards of the system cabling can be connected to \$800 I/O modules. Two controller boards are used per module.



System cable

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Ambient temperature (operation)

Assembly

Conductor cross section

Conductor structure: stranded wires / material

Outside diameter

25 -position

Technical data

< 50 V AC / 60 V DC

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG - / 0.14 mm² 7 / Cu tin-plated

6.3 mm

Color code and pin assignment CABLE-D25SUB/B/2X14...TU812

D-SUB connector 25-pos.	FLK 14 1. Connector	FLK 14 2. Connector	Conductor color
1	9		Gray
2	10		White
3	1		Black
4	3		Red
5	5		Yellow
6	7		Blue
7		1	Black
8		3	Red
9		5	Yellow
10		7	Blue
11		9	Orange
12		10	White
13	NC	NC	-
14	11		White-black
15	12		White-brown
16	2		Brown
17	4		Orange
18	6		Green
19	8	_	Violet
20		2	Brown
21		4	Orange
22		6	Green
23		8	Violet
24		11	White-black
25		12	White-brown

			Ordering dat	а	
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
VARIOFACE system cable, for S800 I/O, socket strip and two 14-pos. flat-ribbon callengths					
	25 25 25 25	1 m 2 m 3 m 5 m	CABLE-D25SUB/B/2X14/100/TU812 CABLE-D25SUB/B/2X14/200/TU812 CABLE-D25SUB/B/2X14/300/TU812 CABLE-D25SUB/B/2X14/500/TU812	2304649 2304652 2304665 2304678	1 1 1
VARIOFACE system cable for S800 I/O, socket strip and two 14-pos. flat-ribbon callengths					
	25		CABLE-D25SUB/B/2X14/TU812/	2304681	1

Ordering example for system cable:

- Cable for ABB S800, 12.75 m long

Quantity Order No. Length [m]1) 2304681 1 12.75 1) min. 0.20 m

Allen-Bradley ControlLogix, Honeywell PlantScape Front adapter

I/O modules with 32 channels or with this design

The front adapters are pushed into the tall 1756-TBE covers (not supplied as standard, original accessories must be ordered directly from manufacturer) of the controller. A 50-pos. system cable can connect a maximum of 32 channels to the field level.

Perfectly-fitting VARIOFACE termination boards round off this system concept.

Notes:

Front adapters can also be used without cover.

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products

Max. perm. operating voltage

Ambient temperature (operation)

Ambient temperature (storage/transport)

Connection data solid / stranded / AWG

VARIOFACE front adapters, for ControlLogix:

- A maximum of 1 x 32 channels can be connected

Max. permissible current

Standards/regulations

Description

- IB 32 input board



32-channel front adapter with 50-pos. FLK strip

2U **/P** 3

Technical data

< 50 V AC / 60 V DC

1 A (per path)

8 A (per connection, supply via separate power supply)

-20°C ... 50°C

-20°C ... 70°C

No. of pos

50

50

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16 IEC 60664 / IEC 60664 / IEC 60664

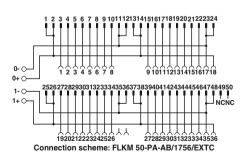
Ordering data		
Order No.	Pcs. / Pkt.	
2302735	1	
2302748	1	
	Order No.	

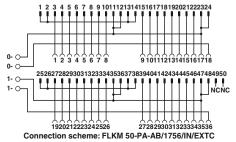
Front adapters for I/O modules of Allen-Bradley ControlLogix and Honeywell PlantScape au-

tomation devices

Card type	FLKM 50-PA-AB/1756/EXTC
Digital input	1756-IA 16 I* or TC-TDK 161* 1756-IB 16 D* or TC-TDX 161* 1756-IB 16 I* or TC-TDJ 161* 1756-IH 16 I*
Digital output	1756-OB 32 or TC-ODD 321
Analog input	1756-IF 8* 1756-IF 16 I* or TC-IAH 161* 1756-IF 8H* or TC-HAI 081*
Counter	1756-HSC*
Servo	1756-M02 AE*
Card type	FLKM 50-PA-AB/1756/IN/EXTC
Digital input	1756-IB 32 or TC-IDD 321

* Only in conjunction with VIP-2/SC/FLK50/AB-1756, Order No. 2322317. There must be no voltage supply at the front adapter. Risk of short circuit!





Explanation:

Flat-ribbon cable strip

Connection to I/O card

Screw terminal blocks for separate supply

Allen-Bradley ControlLogix, Honeywell PlantScape Front adapter

I/O modules with 16 channels or with this design

The front adapters are pushed into the tall 1756-TBE covers (not supplied as standard, original accessories must be ordered directly from manufacturer) of the controller. Two 14-pos. system cables are used to connect up to 2 x 8 channels to the field level.

Perfectly-fitting VARIOFACE termination boards round off this system concept.

Front adapters can also be used without cover.

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



16-channel front adapter with two 14-pos. FLK strips

c**91**0s

Technical data

Max. perm. operating voltage Max. permissible current

Ambient temperature (operation) Ambient temperature (storage/transport) Connection data solid / stranded / AWG

VARIOFACE front adapters, for ControlLogix:

- Up to 2 x 8 channels can be connected

- IF6 I input card (only suitable for measuring

current; no power terminals on adapter)

- IA 16, IB 16, IC 16, IN 16 input card

Standards/regulations

Description

< 50 V AC / 60 V DC

1 A (per path)

8 A (per connection, supply via separate power supply)

-20°C ... 50°C -20°C ... 70°C

No. of pos.

14

14

14

0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16

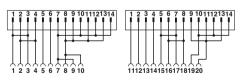
IEC 60664 / IEC 60664 / IEC 60664

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 14-PA-AB/1756/EXTC FLKM 14-PA-AB/1756/IN/EXTC FLKM 14-PA-AB/1756/IF6I/EXTC	2302861 2302874 2901037	1 1

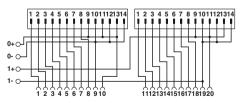
Front adapter for I/O modules of Allen Bradley ControlLogix and Honeywell PlantScape automation devices

Card type	FLKM 14-PA-AB/1756/EXTC
Digital input	1756-IA 8 D** or TC-IDX 081**
Digital output	1756-OB 16 E
Analog input	1756-IF 6 CIS** 1756-IF 6 I** or TC-IAH 061** 1756-IR 6 I** or TC-IXR 061** 1756-IT 6 I** or TC-IXL 061**
Analog output	1756-OF 4 I** 1756-OF 6 CI** or TC-OAH 061** 1756-OF 6 VI** or TC-OAV 061** 1756-OF 8** or TC-OAV 081** 1756-OF 8 H**
Switch	1756-PLS**
Card type	FLKM 14-PA-AB/1756/IN/EXTC
Digital input	1756-IN 16** 1756-IA 16 or TC-IDA 161** 1756-IB 16 1756-IC 16**
Card type	FLKM 14-PA-AB/1756/IF6I/EXTC
Analog input	IF6I**

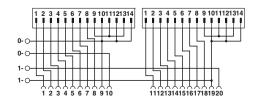
** Only in conjunction with VIP-2/SC/2FLK14/AB-1756, Order No.: 2322333. There must be no voltage supply at the front adapter. Risk of short



Connection scheme: FLKM 14-PA-AB/1756/IF6I/EXTC



Connection scheme: FLKM 14-PA-AB/1756/EXTC



Connection scheme: FLKM 14-PA-AB/1756/IN/EXTC

Flat-ribbon cable strip

Connection to I/O card Screw terminal blocks for separate supply

Allen-Bradley, PLC 5 series 1771 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

Up to 32 channels are connected via 50-pos. system cables.

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapter for Allen-Bradley PLC 5, 1771

2 su **12** s

Technical data

< 50 V AC / 60 V DC

1 A (per path)

2 A (Per Byte, for supply via connector)

-20°C ... 50°C

-20°C ... 70°C

IEC 60664 / IEC 60664 / IEC 60664

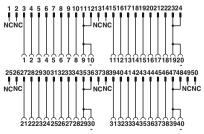
Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 50-PA-AB/IBN	2289816	2
FLKM 50-PA-AB/OBN	2289829	2

Max. perm. operating voltage Max. permissible current Max. perm. total current

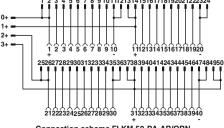
Ambient temperature (operation) Ambient temperature (storage/transport)

Standards/regulations

Description	No. of pos.
VARIOFACE front adapters, for Allen-Bradley PLC 5,	1771
- IBN 32 channels input - OBN 32 channels output	50 50



Connection scheme FLKM 50-PA-AB/IBN



Connection scheme FLKM 50-PA-AB/OBN

Explanation:

Flat-ribbon cable strip Connection to I/O card

Screw terminal blocks for separate supply

Allen-Bradley SLC 500 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

- The FLKM 14-PA-SLC500... adapters connect max. 2 x 8 channels via two 14-pos. system cables. Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.
- With the FLKM50-PA-SLC500 OUT/2A front adapters, the FLKM 50/16/SLC500 termination board and 50-pos. system cables, the VARIOFACE system cabling can also be coupled to the OA16 and OW16 power output cards.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapter for SLC 500 1746, 2 x 8 channels can be connected

P) 211 (P)

Max. perm. operating voltage Max. permissible current Max. perm. total current

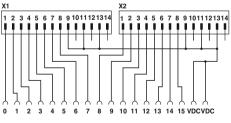
Ambient temperature (operation) Ambient temperature (storage/transport) Mounting position

Standards/regulations

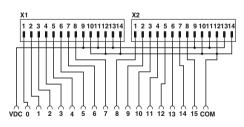
Technical data	
FLKM 14-PA < 50 V AC / 60 V DC	FLKM 50-PA < 50 V AC / 60 V DC
1 A (per path) 2 A (Per Byte, for supply via connector)	2 A (per path) 7 A (Per Byte, for supply via connector)
-20°C 50°C -20°C 70°C Any IEC 60664 / IEC 60664 /	-20°C 50°C -20°C 70°C Any IEC 60664 / IEC 60664 / IEC 60664

Description	No. of pos.
VARIOFACE front adapter, 2 x 8 channels can be	connected for
Allen-Bradley SLC 500 for:	
- 1746 OB16, OV16, OG16 and IG16	14
- 1746 IA16, IB16, ITB16 and IN16	14
- 1746 IV16 and IVT16	14
VARIOFACE front adapter, 1 x 16 channels can be connected for Allen-Bradley SLC 500 1746 OA16 and OW16	
	50

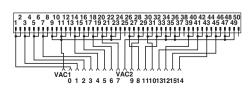
IEC 00004	IEC 00004	
Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 14-PA-SLC500/OUT FLKM 14-PA-SLC500/IN FLKM 14-PA-SLC500/IN/M	2293459 2293462 2293475	1 1 1
FLKM 50-PA-SLC500/OUT/2A	2293446	1



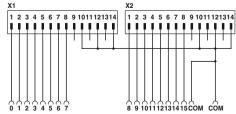
Connection scheme FLKM 14-PA-SLC500/IN/M



Connection scheme FLKM 14-PA-SLC500/OUT



Connection scheme FLKM 50-PA-SLC500/OUT/2A



Connection scheme FLKM 14-PA-SLC500/IN

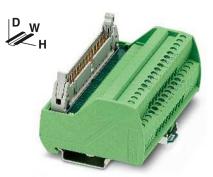
Explanation:

Flat-ribbon cable strip Connection to I/O card Screw terminal blocks for separate supply

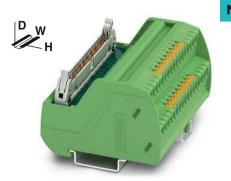
VIP termination board for Allen-Bradley SLC 500, 2 A output cards

The VIP-2/.../FLK50/16/SLC500 VARIO-FACE Professional (VIP) module has been designed specifically for OA16 and OW16 output modules. When used in conjunction with the FLKM 50-PA-SLC500/OUT/2A front adapter, currents up to 2 A per channel can be transferred with the system cabling.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No, 0811862) and mounting material, see Catalog 5.



VARIOFACE termination board for 16 channels with screw connection



VARIOFACE termination board for 16 channels with push-in connection

c**PL**us

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

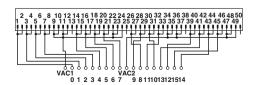
Connection data solid / stranded / AWG

Dimensions

i ecnnicai data	i ecnnicai d
120 V AC/DC	120 V AC/DC
1 A	1 A
2 A (per channel)	2 A (per channel)
-20°C 50°C	-20°C 50°C
Any	Any
IEC 60664, DIN EN 50178, IEC 62103	EN 50178,
Screw connection	Push-in connection
IDC/FLK pin strip (2.54 mm)	IDC/FLK pin strip (2.54 mm)
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12	0.14 2.5 mm ² / 0.14 2.5 mm ² / 26 -
65.5 mm / 56 mm	72.1 mm / 56 mm

Description	No. of pos.	Module width W		
VARIOFACE controller board, for transfer of max. 16 channels, only in connection with FLKM 50-PA-SLC500 OUT/2A				
- with screw connection - with push-in connection	50	90.8 mm 92.7 mm		

Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VIP-2/SC/FLK50/16/SLC500	2322320	1			
			VIP-2/PT/FLK50/16/SLC500	2904287	1



Allen-Bradley SLC 500 System cable for 32 channels

The 32-channel I/O cards of the SLC 500 are connected using 40-pos. plug-in connectors (already integrated into the I/O modules). Passive interface modules (-3/SC/FLK40, etc.) are connected to the I/O cards using the FLK 40/EZ-**DR/.../SLC** system cables.

32 channels are split into 4x8 channels using the FLK 40/4X14/EZ-DR/... system

The following 8-channel system cabling modules can be coupled:

- OB32 and IB32 passive and active modules plus V8 adapt-
- OV32 and IV32 passive modules without status indicator

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products

Max. perm. operating voltage Max. perm. current carrying capacity per path Ambient temperature (operation) Assembly

Conductor cross section Conductor structure: stranded wires / material Outside diameter

40 -position



32-channel I/O cards of the SLC 500 (OB32, OV32, IB32, IV32)



Technical data

< 50 V AC / 60 V DC

10 mm

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

Description	No. of pos.	Cable length	7	
Assembled round cables, with two 40-pos. socket strips in fixed lengths (50 cm steps) for connection with 32-channel I/O cards of the SLC 500				
	40	0.5 m	F	
	40	1 m	F	
	40	1.5 m	-	
	40	2 m	ı	
	40	3 m	F	
Round cable sets, for connection to Allen-Bradley SLC500, OB32 and IB32, with one 40-pos. socket strip and four 14-pos. socket strips, for splitting max. 32 channels into 4 x 8 channels.				
for OB32	40	0.5 m		
	40	1 m		
	40	2 m		
	40	3 m		
for IB32	40	0.5 m		
	40	1 m		
	40	2 m		
	40	3 m		

Ordering data				
Туре	Order No.	Pcs./ Pkt.		
FLK 40/EZ-DR/ 50/SLC FLK 40/EZ-DR/ 100/SLC FLK 40/EZ-DR/ 150/SLC FLK 40/EZ-DR/ 200/SLC FLK 40/EZ-DR/ 300/SLC	2294610 2294623 2294636 2294649 2294652	1 1 1 1 1		



System cable for splitting max. 32 channels into 4 x 8 channels (OB32, IB32)



Technical data

< 50 V AC / 60 V DC

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

 $AWG~26\,/\,0.14~mm^2$ 7 / Cu tin-plated

7.8 mm				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLK 40/4Y44/F7 DD/ 50/0D00	0000700			
FLK 40/4X14/EZ-DR/ 50/OB32 FLK 40/4X14/EZ-DR/ 100/OB32	2296786 2298483	1		
FLK 40/4X14/EZ-DR/ 200/OB32	2298522	1		
FLK 40/4X14/EZ-DR/ 300/OB32	2298535	1		
FLK 40/4X14/EZ-DR/ 50/IB32	2296812	1		
FLK 40/4X14/EZ-DR/ 100/IB32	2296825	1		
FLK 40/4X14/EZ-DR/ 200/IB32	2296838	1		
FLK 40/4X14/EZ-DR/ 300/IB32	2296841	1		

Emerson DeltaV System cable

The DeltaV system allows you to install the process wiring through "Mass termination blocks" (MTB) using flat-ribbon cable connectors. Besides the 10-, 16-, and 20-pos. system cables of system cabling (refer to the System cables chapter), the following system-specific lines are also avail-

- FLK 16/14/DV-OUT/..., for digital assemblies with 16-pos. MTB for connection to PLC-INTERFACE
- FLK 16/14/DV-IN/..., for digital assemblies with 16-pos. MTB for connection to **PLC-INTERFACE**
- FLK 20/2FLK14/EZ-DR/..., for digital assemblies with 40-pos. MTB for connection to PLC-INTERFACE
- FLK 16/24/DV-AI/EZ-DR/..., for analog assemblies with 24-pos. MTB
- FLK 50/2FLK20/EZ-DR/.../DV system cables are specifically designed for 32-channel I/O modules with 40-pin MTB for the purpose of connecting I/O modules to 32-channel VARIOFACE interface modules



System cable for DeltaV

Technical data

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section Outside diameter

Variable cable length

16 -position 20 -position 24 -position 20 -position < 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm²

6.8 mm

	Ordering data
10.3 mm	
6.5 mm	
7.6 mm	

			Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
System cable , for 16-pos. "mass termina 16-pos. and a 14-pos. flat-ribbon cable pl PLC-INTERFACE					
	16	0.3 m	FLK 16/14/DV-OUT/ 30	2304348	1
	16	0.5 m	FLK 16/14/DV-OUT/ 50	2304351	1
	16	1 m	FLK 16/14/DV-OUT/100	2300575	1
	16	2 m	FLK 16/14/DV-OUT/200	2300588	1
	16	3 m	FLK 16/14/DV-OUT/300	2304364	1
Variable cable length	16		FLK 16-14-DV-OUT/	2304377	1
System cable, for 16-pos. "mass termina 16-pos. and a 14-pos. flat-ribbon cable pl PLC-INTERFACE					
	16	0.5 m	FLK 16/14/DV-IN/ 50	2304393	1
	16	1 m	FLK 16/14/DV-IN/100	2300559	1
	16	2 m	FLK 16/14/DV-IN/200	2300562	1
	16	3 m	FLK 16/14/DV-IN/300	2304403	1
Variable cable length	16 16	4 m	FLK 16/14/DV-IN/400 FLK 16-14-DV-IN/	2305185 2304416	1
System cable, for 40-pos. (2 x 20) "mass a 20-pos. and two 14-pos. flat-ribbon cab connection with PLC-INTERFACE (two ca 32-channel I/O card)	le plugs for				
	20	1 m	FLK 20/2FLK14/EZ-DR/100/KONFEK	2298470	1
	20	2 m	FLK 20/2FLK14/EZ-DR/200/KONFEK	2298438	1
	20	3 m	FLK 20/2FLK14/EZ-DR/300/KONFEK	2300818	1
Variable cable length	20		FLK 20/2FLK14/EZ-DR/	2304487	1
System cable, for 24-pos. "mass termina 24-pos. and a 16-pos. flat-ribbon cable pl UM-DELTAV/ modules					
	24	0.3 m	FLK 16/24/DV-AI/EZ-DR/ 30	2304319	1
	24	0.5 m	FLK 16/24/DV-AI/EZ-DR/ 50	2304296	1
	24	1 m	FLK 16/24/DV-AI/EZ-DR/100	2301134	1
	24	2 m	FLK 16/24/DV-AI/EZ-DR/200	2301545	1
	24	3 m	FLK 16/24/DV-AI/EZ-DR/300	2304322	1
Variable cable length	24		FLK 16-24-DV-AI-EZ-DR/	2304335	1
System cable, for 40-pos. "mass termina 20-pos. and one 50-pos. flat-ribbon cable 32-channel interface modules					
	20	0.5 m	FLK 50/2FLK20/EZ-DR/ 50/DV	2304872	1
	20	1 m	FLK 50/2FLK20/EZ-DR/ 100/DV	2304898	1
	20	2 m	FLK 50/2FLK20/EZ-DR/ 200/DV	2304908	1
	20	3 m	FLK 50/2FLK20/EZ-DR/ 300/DV	2304911	1
	20	6 m	FLK 50/2FLK20/EZ-DR/ 600/DV	2304937	1
	20	8 m	FLK 50/2FLK20/EZ-DR/ 800/DV	2304940	1
	20	10 m	FLK 50/2FLK20/EZ-DR/1000/DV	2304953	1

FLK 50-2FLK20-EZ-DR-DV/...

2304966

20



Emerson DeltaV Controller board for eight channels

These system-specific interface modules for DeltaV assemblies are used in combination with the respective system cables. The controller board is connected to 8-channel modules through "mass termination blocks" with flat-ribbon cable connection.

FLKM 16/DV

- Universal module
- 1:1 connection

FLKM 16/AI/DV

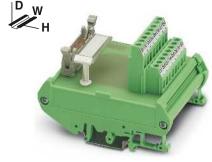
- 1:1 connection
- Separate equipotential terminals per channel

FLKM 16/AO/SI/DV

- 1:1 connection
- Fuse 5 x 20, 50 mA T, IEC60127-2/3 per

FLKM 16/DI/SI/LA/DV

- 1:1 connection
- Fuse 5 x 20, 50 mA T, IEC60127-2/3 per channel
- LED status indicator per signal path



Interface module for 8 channels

Technical data

Max. perm. operating voltage Max. perm. current (per branch)

Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Control system level

Connection data solid / stranded / AWG

FLKM 16//DV < 50 V AC 1 A (per signal path)	FLKM 16//DV < 50 V AC 50 mA (In delivered state, with one 50 mA fuse, max. 1 A permitted)
0.8 kV	0.8 kV
-20°C 50°C	-20°C 50°C
Any	Any
IEC 60664, DIN EN 50178, IEC 63	2103
Screw connection	Screw connection
IDC/ELK pip etrip (2.54 mm)	IDC/ELK nin etrin (2.54 mm)

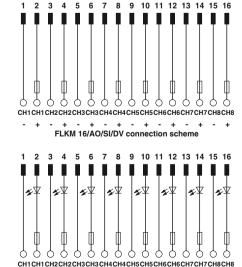
IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm)

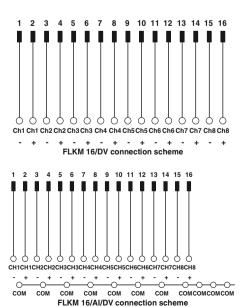
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 90 mm / 68 mm

Field level

Description	No. of pos.	Module width W
Interface module, with 1:1 connection		
	16	45 mm
Interface module, with 1:1 connection and potential terminal blocks per channel	d separate	Э
	16	57 mm
Interface module, with fuses per channel		
	16	90 mm
Interface module, with LED and fuses per	channel	
	16	90 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 16/DV	2304432	1	
FLKM 16/AI/DV	2304429	1	
FLKM 16/AO/SI/DV	2304445	1	
FLKM 16/DI/SI/LA/DV	2304458	1	





FLKM 16/DI/SI/LA/DV connection scheme

Emerson DeltaV Controller board for 32 channels

These system-specific interface modules for DeltaV assemblies are used in combination with the FLK 50/2FLK20/EZ-DR/.../DV system cables. The controller board is connected to 32-channel modules through 40-pos. "mass termination blocks" with flatribbon cable connection.

FLKM 50/32M/DV

- Can be used for 32-channel input and output cards
- Two-conductor connection with a separate negative terminal per channel

FLKM 50/32M/IN/LA/DV

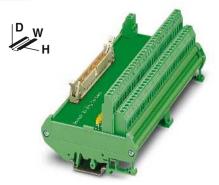
- Can be used for 32-channel input modules
- LED status display per channel
- Two-conductor connection with a separate negative terminal per channel (Dry Contact)

Max. perm. operating voltage Max. perm. current (per branch) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method Field level Control system level

Connection data solid / stranded / AWG

Description	No. of pos.	Module width W
VARIOFACE interface modules,	for 32-channel I/C) modules:
- Input/Output - Input with LED per signal	50 50	169 mm 169 mm

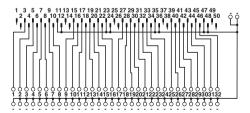


Interface module with two-conductor connection method for DeltaV

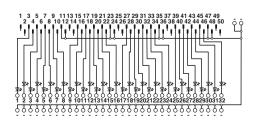
Technic	al data
FLKM 50/32M/DV < 50 V AC	FLKM 50/32M/IN/LA/DV 30 V DC
1 A	1 A
0.8 kV -20°C 50°C	0.8 kV -20°C 50°C
Any IEC 60664. DIN EN 50178. IEC 62	Any
Screw connection	Screw connection
IDC/FLK nin etrin (2.54 mm)	IDC/FLK nin strin (2.54 mm)

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 90 mm / 68 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 50/32M/DV	2304869	1	
FLKM 50/32M/IN/LA/DV	2304856	1	



FLKM 50/32M/DV connection scheme



FLKM 50/32M/IN/LA/DV connection scheme

Emerson DeltaV Controller boards with fuses for 8 channels

These system-specific interface modules for DeltaV assemblies are used in combination with the respective system cables. The controller board is connected to 8-channel modules through 16-pos. or 24-pos. "mass termination blocks" with flat-ribbon cable connection.

UM-DELTA V/D/SI

- Fuse per channel
- Separate equipotential terminals per channel

UM-DELTA V/D/SI

- Fuse per channel
- Separate equipotential terminals per channel
- Knife disconnection for each channel

UM-DELTA V/D/SI/BFI/TP

- Fuse and LED status indicator per channel
- Separate equipotential terminals per channel

UM-DELTA V/D/SI

- Fuse and LED status indicator per channel
- Separate equipotential terminals per channel
- Knife disconnection for each channel

Max. perm. operating voltage

Max. perm. current (per branch)

Ambient temperature (operation) Mounting position Standards/regulations Connection method

- Fuses and knife disconnect

- Fuses and fuse failure display

disconnect terminal blocks

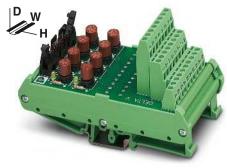
- Fuses, fuse failure display, and knife

- Fuses

terminal blocks

Connection data solid / stranded / AWG

Dimensions No. of Module width Description Interface modules for 16-pos. and 24-pos. "mass termination blocks" with:



Interface module with fuses for 16-pos. and 24-pos. "mass termination blocks"

. PL us

Technical data

24 V DC

Field level

61 mm

61 mm

61 mm

61 mm

Control system level

16

16

16

16

(in as-supplied state, with one 50 mAF fuse, max. 1 A permitted)

-20°C ... 50°C

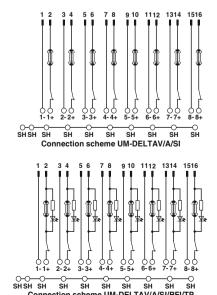
IEC 60664, DIN EN 50178, IEC 62103

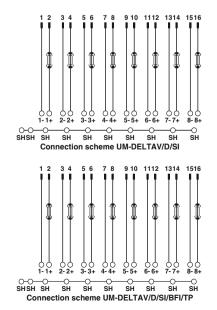
Screw connection IDC/FLK pin strip (2.54 mm)

 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

126 mm / 71 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
UM-DELTA V/D/SI UM-DELTA V/D/SI/BFI/TP UM-DELTA V/A/SI UM-DELTA V/A/SI/BFI/TP	5603255 5603257 5603256 5603258	1 1 1	





Flat-ribbon cable strip Connection to I/O card

Screw terminal blocks for separate supply

GE Fanuc/RX3i Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

- Transfer of max. 32 channels over one 50-pos. system cable
- Can be plugged onto I/O modules
- Connection via suitable VARIOFACE termination boards

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapter for GE Fanuc RX3i

Technical data

Max. perm. operating voltage Max. permissible current

Ambient temperature (operation) Ambient temperature (storage/transport)

Standards/regulations

Mounting position

Description	No. of pos.
VARIOFACE front adapter, for PACSystems RX3i,	
For digital output and analog modules	50
For digital input modules	50

< 50 V AC / 60 V DC

1 A (per path)

8 A (per connection, supply via separate power supply)

-20°C ... 50°C -20°C ... 70°C

Any
DIN EN 50178 / DIN EN 50178 / DIN EN 50178

BIN EN CONTO / BIN EN CONTO / BIN EN CONTO			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 50-PA-GE/TKFC/RXI	2321473	1	
FLKM 50-PA-GE/TKFC/RXI/IN	2321486	1	

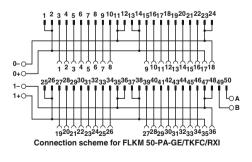
Front adapter for I/O modules of RX3i series

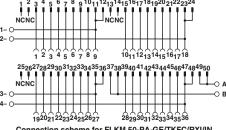
Card type	FLKM 50-PA/GE/TKFC/RXI
Digital output	IC 694 MDL 754
Analog	IC 695 ALG 608* IC 695 ALG 616* IC 695 ALG 626* IC 695 ALG 629* IC 695 ALG 704* IC 695 ALG 708* IC 695 ALG 728*

Card type	FLKM 50-PA/GE/TKFC/RXI/IN
Digital input	IC 694 MDL 660

Explanation:

Flat-ribbon cable strip Connection to I/O card Screw terminal blocks for separate supply





Connection scheme for FLKM 50-PA-GE/TKFC/RXI/IN

Only in connection with VIP-3/SC/FLK50, Order No. 2315081. No voltage may be supplied through the slip-on connections on the front adapter.

GE-FANUC, series 90-30 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

Up to 2 x 8 channels are connected via two 14-pos. system cables.

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapter for GE-FANUC series 90-30

SN US 🕑

Technical data

Max. perm. operating voltage Max. permissible current

Max. perm. total current

Ambient temperature (operation) Ambient temperature (storage/transport)

Mounting position Standards/regulations < 50 V AC / 60 V DC

1 A (per path)

4 A (per connection, supply via separate power supply)

3 A (Per Byte, for supply via connector)

-20°C ... 50°C -20°C ... 70°C

Any

IEC 60664 / IEC 60664 / IEC 60664

Description	No. of pos.	
VARIOFACE front adapter, for 90-30 series, max. 2 x 8 channels can be connected, digital output		
	14	
VARIOFACE front adapter, for 90-30 series, max. 2 x 8 channels can be connected, digital input		
	14	

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 14-PA/GE/DO	2290009	2
FLKM 14-PA/GE/DI	2290038	5

Card type	FLKM 14-PA/GE/

Front adapter for 90-30 series I/O modules

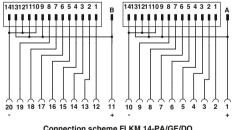
Card type	FLKM 14-PA/GE/DO
Digital output	IC 693 MDL 732
	IC 693 MDL 733*
	IC 693 MDL 740
	IC 693 MDL 741*
	IC 693 MDL 742
Analog	IC 693 ALG 220* IC 693 ALG 221* IC 693 ALG 222* IC 693 ALG 222* IC 693 ALG 390* IC 693 ALG 391* IC 693 ALG 392* IC 693 ALG 442*

Card type	FLKM 14-PA/GE/DI
Digital input	IC 693 MDL 241
	IC 693 MDL 634
	IC 693 MDL 645
	IC 693 MDL 646

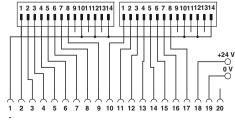
Only in conjunction with VIP-2/SC/2FLK14(1-20)/S7, Order No.: 2315230 and UM 45-2FLK14/ZFKDS/S7, Order No.: 2965156. All wire bridges (DR) on the adapter must be disconnected. There must be no voltage supply at the front adapter (flowing via the slip-on connections)!

Explanation:

Flat-ribbon cable strip Connection to I/O card Screw terminal blocks for separate supply



Connection scheme FLKM 14-PA/GE/DO



Connection scheme FLKM 14-PA/GE/DI

Honeywell C300, Series C I/O Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

FLKM-PA-D37/HW/DIO/C300

- Front adapter with D-SUB plug-in connector
- Connection of a maximum of 16 digital channels
- Specifically for digital I/O cards

FLKM-PA-D37/HW/AN/C300

- Front adapter with D-SUB plug-in connector
- Connection of analog modules

FLKM-PA-2D15/HW/.../C300

- Front adapter with two 15-pos. D-SUB plug-in connectors
- Connection of a maximum of 2 x 8 digital inputs/outputs per adapter
- Specifically for connecting PLC-V8/D15.../OUT or PLC-V8/D15.../IN

Front adapters for I/O modules of the C300 series, C I/O series

Card type	FLKM-PA-D37/HW/DIO/C300
Digital input	TDIL 11* TDIL 01*
Digital output	TDOB 11* TDOB 01*

Card type	FLKM-PA-D37/HW/AN/C300
Analog input	TAIX 01** TAIX 11**
Analog output	TAOX 01** TAOX 11**

Card type	FLKM-PA-2D15/HW/DO/C300
Digital output	TDOB 01*
	TDOB 11*

FLKM-PA-2D15/HW/DI/C300
TDIL 01* TDIL 11*

^{*} Two front adapters are required for each module.

Plug-in connector Connection to I/O card

Screw terminal blocks for separate supply

For matching system cable fitted with D-SUB socket strip at both ends, see page $513\,$



Honeywell C300 front adapter

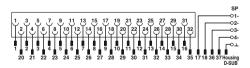
Max. perm. operating voltage Max. permissible current Ambient temperature (operation) Ambient temperature (storage/transport) Mounting position Standards/regulations

Description	No. of pos.
VARIOFACE front adapter for C I/O series, with one D-SUB pin strip	
- For digital I/O modules	37
- For analog I/O modules	37
VARIOFACE front adapter for C I/O series, with two D-SUB pin strips	
- For digital output modules	15
- For digital input modules	15

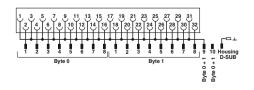
Technical data

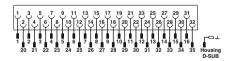
24 V DC 1 A (per path) -20°C ... 50°C -20°C ... 70°C DIN EN 50178 / DIN EN 50178

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
FLKM-PA-D37/HW/DIO/C300 FLKM-PA-D37/HW/AN/C300	2901423 2900622	1 1				
FLKM-PA-2D15/HW/DO/C300 FLKM-PA-2D15/HW/DI/C300	2900924 2901879	1				

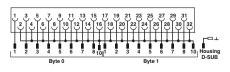








Connection scheme: FLKM-PA-D37/HW/DIO/C300



FLKM-PA-2D15/HW/DI/C300 connection scheme

Connection scheme: FLKM-PA-2D15/HW/DO/C300

^{**} For three-conductor operation (channels 13 - 16) of input modules: only in conjunction with VIP-3/SC/D37SUB/M/HW/C300, Order No. 2900675.

Honeywell C300, Series C I/O interface modules

These VARIOFACE modules are used in combination with 37-pos. D-SUB cables and the relevant front adapters. The three module versions are available with screw or push-in connection technology.

VIP-2/.../D37SUB/M

- In conjunction with FLKM-PA-D37/HW/C300 or FLKM-PA-D37/HW/AN/C300 front adapter
- Universal module
- Field connection via double-level terminal blocks

VIP-2/.../D37SUB/M/SO

- In conjunction with FLKM-PA-D37/HW/C300 front adapter
- System-specific labeling
- Field connection via double-level terminal blocks

VIP-3/.../D37SUB/M/HW/C300

- In conjunction with FLKM-PA- D37/HW/AN/C300 front adapter
- System-specific labeling
- For TAIX01, TAIX11 analog input modules
- Field connection via three-level terminal blocks

Notes:

Max. perm. operating voltage Max. perm. current (per branch)

Mounting position Standards/regulations

Connection method

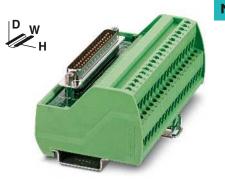
Dimensions

Ambient temperature (operation)

Screw connection solid / stranded / AWG

Push-in connection solid/stranded/AWG

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No., 0811862) and mounting material, see Catalog 5.



37-pos. with screw or push-in connection

. \$1 us

D-SUB connection

Modul

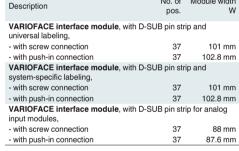
No. of

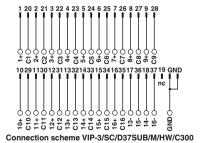
H/D

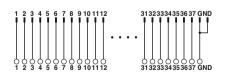
Technical data					
VIP-2/	VIP-3/C300				
125 V AC/DC	125 V AC/DC				
2 A	2 A				
-20°C 50°C	-20°C 50°C				
Any	Any				
DIN EN 50178,					
D-SUB pin strip	D-SUB pin strip				
72.1 mm / 46.6 mm	75.8 mm / 63 mm				
0.2 4 mm ² / 0.2 2.5 mi	m² / 24 - 12				
0.14 4 mm ² / 0.14 2.5	mm ² / 26 - 14				

le width W	Туре
101 mm 2.8 mm	VIP-2/SC/D37 VIP-2/PT/D37
101 mm 2.8 mm	VIP-2/SC/D37
nalog 88 mm	VIP-3/SC/D3
7 6 mm	VIP-3/PT/D37

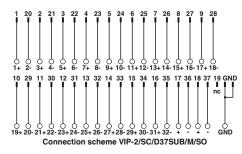
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
VIP-2/SC/D37SUB/M VIP-2/PT/D37SUB/M VIP-2/SC/D37SUB/M/SO	2900676 2904277 2900786	1 1				
VIP-2/PT/D37SUB/M/SO	2904278	1				
VIP-3/SC/D37SUB/M/HW/C300	2900675	1				
VIP-3/PT/D37SUB/M/HW/C300	2904276	1				







Connection scheme VIP-2/SC/D37SUB/M



Mitsubishi Electric MELSEC A, A1S, and Q System cable

For 32-/64-channel I/O boards with 37-pos. D-SUB plug-in connectors. System cables are available for connecting 1 x 32 channels or 4 x 8 channels.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products

Max. perm. operating voltage

Ambient temperature (operation)

Max. conductor resistance

Conductor cross section

Outside diameter

Max. perm. current carrying capacity per path

Conductor structure: stranded wires / material



System cable, D-SUB socket strip to FLK, number of positions: 37 on 50



Splitting cable, D-SUB socket strip to FLK, number of positions: 37 on 4 x 14

Technical data

c**91** us

Technical data

< 50 V AC / 60 V DC 0.16 Ω/m

-20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

c**91** us

< 50 V AC / 60 V DC

0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

		37-pos.	10.5 mm			6.3 mm		
			Ordering data		Ordering data			
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable for output modu MELSEC A1S Y81, and MELSE								
	37	0.5 m	FLK 50/EZ-DR/D37SUB/ 50/Y81P-O	2302599	1	CABLE-D37-M2,5/4X14/50/Y81P-O	2302476	1
	37	1 m	FLK 50/EZ-DR/D37SUB/100/Y81P-O	2302609	1	CABLE-D37-M2,5/4X14/100/Y81P-O	2302489	1
	37	2 m	FLK 50/EZ-DR/D37SUB/200/Y81P-O	2302612	1	CABLE-D37-M2,5/4X14/200/Y81P-O	2302492	1
	37	3 m	FLK 50/EZ-DR/D37SUB/300/Y81P-O	2302638	1	CABLE-D37-M2,5/4X14/300/Y81P-O	2302502	1
Round cable, same as before,	however in variable l	engths						
	37		FLK 50-EZ-DR-D37SUB-Y81P-O/	2302625	1	CABLE-D37-M2,5-4X14-Y81P-O/	2302696	1
Round cable for input module A1S X81, and MELSEC A AX82								
	37	0.5 m	FLK 50/EZ-DR/D37SUB/ 50/X81-I	2302641	1	CABLE-D37-M2,5/4X14/50/X81-I	2302515	1
	37	1 m	FLK 50/EZ-DR/D37SUB/100/X81-I	2302654	1	CABLE-D37-M2,5/4X14/100/X81-I	2302528	1
	37	2 m	FLK 50/EZ-DR/D37SUB/200/X81-I	2302667	1	CABLE-D37-M2,5/4X14/200/X81-I	2302531	1
	37	3 m	FLK 50/EZ-DR/D37SUB/300/X81-I	2302670	1	CABLE-D37-M2,5/4X14/300/X81-I	2302544	1
Round cable, same as before,	however in variable l	engths						
	37		FLK 50-EZ-DR-D37SUB-X81-I/	2302683	1	CABLE-D37-M2,5-4X14-X81-I/	2302706	1

Ordering example for system cable:

- Cable for MELSEC Q Y81P, 12.75 m long

Quantity Order No. Length [m]1) 2302625 12.75 1 1) min. 0.20 m

Ordering example for splitting cable:

- Cable for MELSEC Q Y81P, 11.00 m long

Quantity Order No. Length [m]1) 2302696 11.00

1) min. 0.20 m

Mitsubishi Electric MELSEC L/Q and Honeywell ML 200 System cables

These system cables are plugged onto the I/O cards that are connected using Fujitsu plug-in connectors.

CABLE-FCN40/1X50/...

- Signal transmission of 32 channels

CABLE-FCN40/4X14/...

- Splitting up 32 channels into 4 x 8 channels

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Fujitsu FCN plug-in connector to flat-ribbon cable, number of positions: 40 on 50



Fujitsu plug-in connector to flat-ribbon cable, number of positions: 40 on 4 x 14

Max. perm. operating voltage
Max. perm. current carrying capacity per path
Max. conductor resistance
Ambient temperature (operation)
Conductor cross section
Conductor structure: stranded wires / material

Technical data	Technical data
< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
1 A	1 A
0.16 Ω/m	0.16 Ω/m
-20°C 50°C	-20°C 50°C
AWG 26 / 0.14 mm ²	AWG 26 / 0.14 mm ²
7 / Cu tin-plated	7 / Cu tin-plated

			Ordering data			Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable in variable lengths fo Mitsubishi Melsec L LX41C4, LX42C4 (common positiv LY41NT1P, LY42NT1P, LY41PT1F Mitsubishi Melsec Q QX41, QX41-S1, QX42, QX42-S1 QX71 and QX72 (common positive QY41P, QY42P, QY71, QH42P Honeywell ML 200 2MLQ-TR4A, 2MLQ-TR8A, 2MLQ-	ve connection to B0 P, LY42PT1P e connection to B01	, B02)	CABLE-FCN40/1X50/ 0,5M/IM/MEL	2903468	1			
	40	1 m	CABLE-FCN40/1X50/ 1,0M/IM/MEL	2903469	1			
	40	2 m	CABLE-FCN40/1X50/ 2,0M/IM/MEL	2903470	1			
	40	3 m	CABLE-FCN40/1X50/ 3,0M/IM/MEL	2903471	1			
	40	4 m	CABLE-FCN40/1X50/ 4,0M/IM/MEL	2903472	1			
	40	6 m	CABLE-FCN40/1X50/ 6,0M/IM/MEL	2903473	1			
	40 40	8 m 10 m	CABLE-FCN40/1X50/ 8,0M/IM/MEL	2903474 2903475	1			
Round cable in variable lengths for Mitsubishi Melsec L		10111	CABLE-FCN40/1X50/10,0M/IM/MEL	2903475	1			
LX41C4 and LX42C4 (common ne Mitsubishi Melsec Q QX71 and QX72 (common negativ QX82, QX82-S1 Honeywell ML 200 2MLI-D24A, 2MLI-D28B, 2MLF-SC (common negative connection to B Round cable in variable lengths for Mitsubishi Melsec L	DEA 801, B02) 40 40 40 40 40 40 40 40 40	•	CABLE-FCN40/1X50/ 0,5M/IP/MEL CABLE-FCN40/1X50/ 1,0M/IP/MEL CABLE-FCN40/1X50/ 2,0M/IP/MEL CABLE-FCN40/1X50/ 3,0M/IP/MEL CABLE-FCN40/1X50/ 4,0M/IP/MEL CABLE-FCN40/1X50/ 6,0M/IP/MEL CABLE-FCN40/1X50/ 8,0M/IP/MEL CABLE-FCN40/1X50/ 8,0M/IP/MEL CABLE-FCN40/1X50/ 10,0M/IP/MEL	2903476 2903477 2903478 2903479 2903480 2903481 2903482 2903483	1 1 1 1 1 1 1			
LX41C4 and LX42C4 (common po LY41NT1P, LY42NT1P, LY41PT1F Mitsubishi Melsec Q QX41, QX41-S1, QX42, QX42-S1 QY41P (24 V), QY42P (24 V), QH4 Honeywell ML 200 2MLQ-TR4A, 2MLQ-TR8A, 2MLQ-	P, LY42PT1P 42P (24 V)							
ZIVILG-1 HHA, ZIVILG-1 HOA, ZIVILG-	-1 N4B, ZWLQ-1 N6 40	0.5 m				CABLE-FCN40/4X14/ 0,5M/IM/MEL	2903502	1
	40	1 m				CABLE-FCN40/4X14/ 1,0M/IM/MEL	2903503	1
	40	2 m				CABLE-FCN40/4X14/ 2,0M/IM/MEL	2903504	1
	40	3 m				CABLE-FCN40/4X14/ 3,0M/IM/MEL	2903505	1
	40	4 m				CABLE-FCN40/4X14/ 4,0M/IM/MEL	2903506	1
	40	6 m				CABLE-FCN40/4X14/ 6,0M/IM/MEL	2903507	1
	40	8 m				CABLE-FCN40/4X14/ 8,0M/IM/MEL	2903508	1
	40	10 m				CABLE-FCN40/4X14/10,0M/IM/MEL	2903509	1

OMRON CJ1, CS1, CQM1, and C200H System cable

These system cables are plugged onto the I/O cards that are connected using Fujitsu plug-in connectors.

FLK 50/EZ-DR/...

- Signal transmission of 32 channels

CABLE-FCN40...

- Splitting up 32 channels into 4 x 8 channels

CABLE-FCN24...

- Splitting up 16 channels into 2 x 8 channels



Fujitsu FCN plug-in connector to flat-ribbon cable, number of positions: 40 on 50



Fujitsu FCN plug-in connector to flat-ribbon cable, number of positions: 40 on 4 x 14 or 24 on 2 x 14

Technical data

c**91** us

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section Conductor structure: stranded wires / material Technical data

< 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

c**91** us

< 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

			Ordering data		Ordering data			
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable in variable lengths for CJ1: OD231, OD261 CS1, C200H: OD218, OD219 CQM1: OD213								
	40	1 m	FLK 50/EZ-DR/FCN40/100/OMR-OUT	2304144	1	CABLE-FCN40/4X14/100/OMR-OUT	2304186	1
	40	2 m	FLK 50/EZ-DR/FCN40/200/OMR-OUT	2304157	1	CABLE-FCN40/4X14/200/OMR-OUT	2304199	1
Round cable, same as before, however in		engths						
	40		FLK 50-EZ-DR-FCN40-OMR-OUT/	2302829	1	CABLE-FCN40-4X14-OMR-OUT/	2302832	1
Round cable in variable lengths for CJ1: ID231, ID261 CS1 and C200H: ID111, ID216, ID217, CQM1: ID213; ID214;ID112								
	40	1 m	FLK 50/EZ-DR/FCN40/100/OMR-IN	2304160	1	CABLE-FCN40/4X14/100/OMR-IN	2304209	1
	40	2 m	FLK 50/EZ-DR/FCN40/200/OMR-IN	2304173	1	CABLE-FCN40/4X14/200/OMR-IN	2304212	1
Round cable, same as before, however in	variable l	engths						
	40		FLK 50-EZ-DR-FCN40-OMR-IN/	2302803	1	CABLE-FCN40-4X14-OMR-IN/	2302816	1
Round cable in variable lengths for CS1, C200H: OD215, MD115 (only output) MD215 (only output)	,							
	24	1 m				CABLE-FCN24/2X14/100/OMR-OUT	2304225	1
	24	2 m				CABLE-FCN24/2X14/200/OMR-OUT	2304238	1
Round cable, same as before, however in	variable l	engths						
	24					CABLE-FCN24-2X14-OMR-OUT/	2302858	1
Round cable in variable lengths for CS1, C200H: ID215, MD115 (only input), MD215 (only input)								
	24	1 m				CABLE-FCN24/2X14/100/OMR-IN	2304241	1
	24	2 m				CABLE-FCN24/2X14/200/OMR-IN	2304254	1
Round cable, same as before, however in	variable I 24	engths				CABLE-FCN24-2X14-OMR-IN/	2302845	1

Ordering example for system cable:

- Cable for OMRON CJ1, ID231, 12.75 m long

Quantity Order No. Length [m]1)

2302803 12.75 1 1) min. 0.20 m

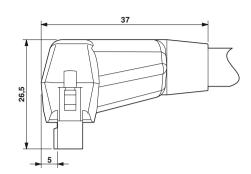
Phoenix Contact Axioline real-time I/O System cables

These cables have been specifically developed for connecting VARIOFACE termination boards to the Axioline realtime I/O system. The push-in technology on the I/O system ensures rapid connection.

The cables have the following features:

- 1:1 connection
- 14-pos. plug-in connector, molded
- 8 pre-assembled open ends, for connection to the Axioline realtime I/O system
- Transmission of groups of 8 channels
- Labeling field on plug Perfectly-fitting VARIOFACE termination boards round off this system concept.

The following modules cannot be coupled due to the larger outer contour of the molded connectors: UM 45-FLK14/ 8IM/ZFKDS/PLC, 2965211 UM 45-8RM/MR-G24/1/PLC, 2962900





System cable for 8 channels

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance

Ambient temperature (operation) Assembly

Conductor cross section Conductor structure: stranded wires / material Outside diameter

Technical data

< 50 V AC / 60 V DC

0.16 Ω/m

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG - / 0.14 mm² 7 / Cu tin-plated

6.4 mm

14 -position

Description	No. of pos.	Cable length
Round cable with an open end (8 inc	lividual wires)	
	14	0.5 m
	14	1 m
	14	1.5 m
	14	2 m
	14	2.5 m
	14	3 m
	14	4 m
	14	6 m

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
VIP-CAB-FLK14/AXIO/0,14/0,5M VIP-CAB-FLK14/AXIO/0,14/1,0M VIP-CAB-FLK14/AXIO/0,14/1,5M VIP-CAB-FLK14/AXIO/0,14/2,0M VIP-CAB-FLK14/AXIO/0,14/2,5M VIP-CAB-FLK14/AXIO/0,14/3,0M VIP-CAB-FLK14/AXIO/0,14/4,0M	2901604 2901605 2901606 2901607 2901608 2901609 2901610	1 1 1 1 1 1			



System cabling for controllers

VARIOFACE system cabling

Phoenix Contact Inline Front adapters

The front adapters are used to connect pre-assembled system cables directly to Inline. Front adapters are simply plugged into the relevant Inline modules. Three connection options are available:

- Transfer of 8 channels via a 14-pos. system cable
- Transmission of 2 x 8 channels over two 14-pos. system cables
- Transmission of 4 x 8 channels over four 14-pos. system cables Perfectly-fitting VARIOFACE termination boards round off this system concept.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapters for Inline

Max. perm. operating voltage Max. permissible current Ambient temperature (operation) Ambient temperature (storage/transport) Mounting position Standards/regulations

Description	No. of pos.	Туре
VARIOFACE front adapter, for 8-channel Inline modu	lles	
Input: IB IL 24 D I8/HD-PAC Output: IB IL 24 DO 8/HD-PAC		FLKM 14-PA-INLINE/DIO8
VARIOFACE front adapter, for 16-channel Inline mod	lules	
Input: IB IL 24 DI 16 Output: IB IL 24 DO 16		FLKM 14-PA-INLINE/IN16 FLKM 14-PA-INLINE/OUT16
VARIOFACE front adapter, for 32-channel Inline mod	lules	
Input: IB IL 24 DI 32/HD and Output: IB IL 24 DO 32/HD		FLKM 14-PA-INLINE/32

Technical data

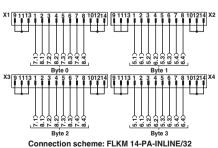
< 50 V AC / 60 V DC 1 A (per path) -20°C ... 50°C -20°C ... 70°C Any IEC 60664 / IEC 60664 / IEC 60664

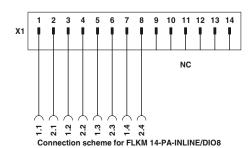
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKM 14-PA-INLINE/DIO8	2900889	1		
FI KM 14-PA-INI INF/IN16	2302751	1		

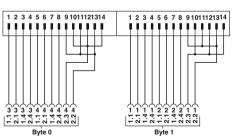
2302764

2302777

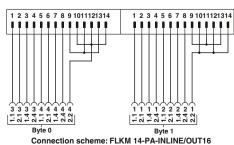








Connection scheme: FLKM 14-PA-INLINE/IN16



Explanation:

Flat-ribbon cable strip Connection to I/O card

Screw terminal blocks for separate supply

Schneider Electric MODICON® TSX Quantum Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules. There are two connection possibilities available:

- Transfer of max. 32 channels over one 50-pos. system cable
- Transmission of 4 x 8 channels over four 14-pos. system cables

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products

Max. perm. operating voltage

Ambient temperature (operation) Ambient temperature (storage/transport)

1 x 32 channels can be connected

4 x 8 channels can be connected

VARIOFACE front adapter, for MODICON® TSX Quantum.

VARIOFACE front adapter, for MODICON® TSX Quantum,

Max. permissible current

Mounting position Standards/regulations

Description



Front adapter for **MODICON TSX Quantum**

. SN us 🕝

Technical data

< 50 V AC / 60 V DC

1 A (per path)

4 A (per connection, supply via separate power supply)

-20°C ... 50°C -20°C ... 70°C

No. of pos.

14

DIN EN 50178 / DIN EN 50178 / DIN EN 50178

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
FLKM 50-PA-MODI-TSX/Q	2294306	1			
FLKM 50/ 4-FLK14/PA-MODI-TSX/Q	2294416	1			

Front adapter for I/O modules of MODICON® TSX Quantum automation devices

Card type	FLKM 50-PA-MODI-TSX/Q
Digital input	DDI 353 DDI 841* DDI 853 DAI 340* DAI 353** DAI 440* DAI 453**
Digital output	DDO 353
Digital input/output	DDM 390*
Analog input	ACI 030° ACI 040° ATI 030° ARI 030° AVI 030°
Analog output	ACO 020* ACO 130* AVO 020*
Analog input/output	AMM 090*
Counter	ECH 105* EHC 202*

- Only in conjunction with VIP-2/SC/FLK50/MODI-TSX/Q, Order No. 2322304.
- ** Only in conjunction with passive termination boards without LED

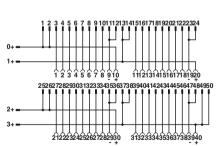
Card type	FLKM 50/4-FLK14/PA-MODI-TSX/Q
Digital input	DDI 353
	DDI 853
	DAI 353**
	DAI 453**
Digital output	DDO 353

** Only in conjunction with passive termination boards without

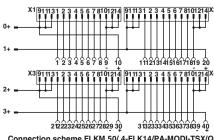
Explanation:

Flat-ribbon cable strip Connection to I/O card

Screw terminal blocks for separate supply



Connection scheme FLKM 50-PA-MODI-TSX/Q



Connection scheme FLKM 50/ 4-FLK14/PA-MODI-TSX/Q

Schneider Electric MODICON® M340 Front adapter

Pre-assembled system cables are connected directly to the 16-channel I/O modules using the front adapter. The adapters connect 2 x 8 channels of the controller via two 14-pos. system cables.

Tailor-made VARIOFACE termination boards with a variety of functions and connection options are available for connection to field level and round off this system concept.



Technical data

Max. perm. operating voltage Max. permissible current Max. perm. total current

Ambient temperature (operation) Ambient temperature (storage/transport)

VARIOFACE front adapter, for MODICON® M340 with two FLK

Mounting position

Description

pin strips

Standards/regulations

< 50 V AC / 60 V DC

1 A (per path)

3 A (Per system cable when supplying from the module side) 10 A (When supplying via the front adapter)

-20°C ... 60°C -20°C ... 60°C Any **DIN EN 50178**

No. of pos.

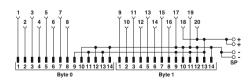
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FI KM 14-PA-MODI/M340	2903208	1	

Front adapter for MODICON C340 series I/O modules

Card type	FLKM 14-PA-MODI/M340
Digital input	BMX DDI1602 BMX DDI1603 BMX DAI1602 BMX DAI1603
Digital output	BMX DDO1602 BMX DDO1612

Assignment table

Contacts of front adapter/ controller	Plug-in connector (byte 0)	Plug-in connector (byte 1)
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9		1
10		2
11		3
12		4
13		5
14		6
15		7
16		8
17	10, 12, 14 (-)	10, 12, 14 (-)
18	9, 11, 13 (+)	9, 11, 13 (+)
19	10, 12, 14 (-)	10, 12, 14 (-)
20	9, 11, 13 (+)	9, 11, 13 (+)



Connection scheme FLKM 14-PA-MODI/M340

Schneider Electric MODICON® M340 System cable

These system cables are plugged onto the I/O cards that are connected using Fujitsu plug-in connectors.

CABLE-FCN40/1X50/...

- Signal transmission of 32 channels

CABLE-FCN40/4X14/...

- Splitting up 32 channels into 4 x 8 channels

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Fujitsu FCN plug-in connector to flat-ribbon cable, number of positions: 40 on 50

Technical data



Fujitsu FCN plug-in connector to flat-ribbon cable, number of positions: 40 on 4 x 14

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section

Conductor structure: stranded wires / material

< 50 V AC / 60 V DC $0.16\,\Omega/m$ -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

Technical data < 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

			Ordering data			Ordering da	ta	
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable in variable lengths for BMX DDI 3202K, BMX DDI 6402K, BMX DD0 3202K, BMX DD0 6402K, BMX DDM 3202K								
	40	0.5 m	CABLE-FCN40/1X50/ 0,5M/M340	2321635	1	CABLE-FCN40/4X14/ 0,5M/M340	2321716	1
	40	1 m	CABLE-FCN40/1X50/ 1,0M/M340	2321648	1	CABLE-FCN40/4X14/ 1,0M/M340	2321729	1
	40	2 m	CABLE-FCN40/1X50/ 2,0M/M340	2321651	1	CABLE-FCN40/4X14/ 2,0M/M340	2321732	1
	40	3 m	CABLE-FCN40/1X50/ 3,0M/M340	2321664	1	CABLE-FCN40/4X14/ 3,0M/M340	2321745	1
	40	4 m	CABLE-FCN40/1X50/ 4,0M/M340	2321677	1	CABLE-FCN40/4X14/ 4,0M/M340	2321758	1
	40	6 m	CABLE-FCN40/1X50/ 6,0M/M340	2321680	1	CABLE-FCN40/4X14/ 6,0M/M340	2321761	1
	40	8 m	CABLE-FCN40/1X50/ 8,0M/M340	2321693	1	CABLE-FCN40/4X14/ 8,0M/M340	2321774	1
	40	10 m	CABLE-FCN40/1X50/10,0M/M340	2321703	1	CABLE-FCN40/4X14/10,0M/M340	2321787	1
	40	15 m	CABLE-FCN40/1X50/15,0M/M340	2903748	1	CABLE-FCN40/4X14/15,0M/M340	2903749	1

VIP - VARIOFACE Professional front adapters for SIMATIC S7-300

Three connection options are available:

- Transfer of max. 32 channels via two 50-pos. system cables (32-channel cards or this design)
- Transfer of 4 x 8 channels via two 14-pos. system cables (32-channel cards or this design)
- Transfer of 2 x 8 channels via two 14-pos. system cables (16-channel cards or this design)

The front adapters have the following features:

- Can be screwed with I/O module
- Voltage supply via terminal blocks with spring-cage double connection
- Encapsulated socket strips for module

Special lengths can be configured using separate order numbers.

Ordering example:

A front adapter with a connected 50-pos. system cable (32-channel cards), 12.75 m in length:

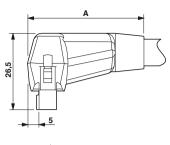
1 pcs. 2900885/12,75

Notes:

The following modules cannot be coupled due to the larger outer contour of the molded connectors UM 45-FLK14/ 8IM/ZFKDS/PLC, 2965211

UM 45-FLK50/32IM/ZFKDS/PLC, 2965224 UM 45- 8RM/MR-G24/1/PLC, 2962900 UM 45-16RM/MR-G24/1/PLC, 2962913

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



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37
42

Max. perm. operating voltage

Rated surge voltage

Outside diameter

Max. conductor resistance

Ambient temperature range

Standards/regulations

Connection method

Conductor cross section

Max. perm. current carrying capacity per path

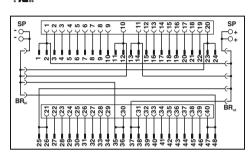
Max. perm. current (separate power supply)

Conductor structure: stranded wires / material



Front adapter with system cable 1 x 32 channels can be connected

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Technical data

< 50 V AC / 60 V DC

1 A (per path)

0.8 kV 0.16 O/m

AWG 26 / 0.14 mm²

7 / Cu tin-plated 10.3 mm

-20°C ... 50°C

IEC 60664, IEC 62103, DIN EN 50178

Can be plugged onto 40-pos. I/O modules / separate power supply through terminal blocks with spring-cage double connection

System cable

Front adapter

Flat-ribbon cable plug-in connector according to IEC 60603-13

Connection data solid / stranded / AWG

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Description	Cable length
VIP VARIOFACE front adapter, with connected s SIMATIC S7 300	system cables for
	0.5 m
	1 m
	1.5 m
	2 m
	2.5 m
	3 m
	4 m
	5 m
	6 m
	7 m
	8 m
	10 m
VIP VARIOFACE front adapter, as above, in vari	iable lengths

Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
VIP-PA-FLK50/ 0,5M/S7 VIP-PA-FLK50/ 1,0M/S7 VIP-PA-FLK50/ 1,5M/S7 VIP-PA-FLK50/ 2,0M/S7 VIP-PA-FLK50/ 2,5M/S7 VIP-PA-FLK50/ 3,0M/S7 VIP-PA-FLK50/ 3,0M/S7 VIP-PA-FLK50/ 6,0M/S7 VIP-PA-FLK50/ 6,0M/S7 VIP-PA-FLK50/ 6,0M/S7 VIP-PA-FLK50/ 8,0M/S7 VIP-PA-FLK50/ 8,0M/S7 VIP-PA-FLK50/ 10,0M/S7	2322443 2322456 2322469 2321800 2322472 2322485 2322488 2322508 2322511 2322524 2322537 2322540	1 1 1 1 1 1 1 1 1 1
VIP-PA-FLK50-S7/	2900885	1

Front adapter for 32-channel cards of

SIMATIC® S7-300

Card type

Digital input

Digital output

Analog input

Analog output

Other modules

CPU

Digital input/output

VARIOFACE system cabling

VIP-PA-FLK50/...M/S7

6ES7 321-1BL00-0AA0

6ES7 322-1BL00-0AA0

6FS7 323-1BI 00-0AA0

6ES7 331-7PF01-0AB0* 6FS7 331-7PF11-0AB0* 6ES7 331-7NF00-0AB0* 6ES7 331-7NF10-0AB0* 6FS7 331-1KF01-0AB0* 6ES7 332-5HF00-0AB0*

312C, 313C, 314C, 313C-2PtP

6ES7 350-2AH01-0AE0*

313C-2DP, 314C-2DP, 314C-2PtP



Front adapter with system cable 4 x 8 channels can be connected



Front adapter with system cable

2 x 8 channels can be connected

Byte1

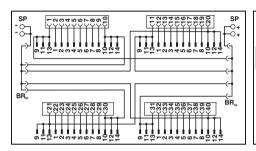
6ES7 357-4AH01-0AE0* Card type VIP-PA-FLK50/4X14/...M/S7

6ES7 321-1BL00-0AA0 Digital input 6ES7 322-1BL00-0AA0 Digital output Digital input/output 6ES7 323-1BL00-0AA0

313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP, 314C-2PtP

Only in conjunction with VIP-2/SC/FLK50 (1-40)/S7, Order No.: 2315243, UM 45-FLK50/ZFKDS/S7-300, Order No.: 2968111, FLKM 50/KDS3-MT/PPA/S7-300, Order No.: 2304490. All bridges (BR) at the adapter must be removed!

.**42**0



Technical data

< 50 V AC / 60 V DC 1 A (per path)

8 A

- 0 8 kV 0.16 O/m AWG 26 / 0.14 mm² 7 / Cu tin-plated
- 6.4 mm -20°C ... 50°C

Туре

IEC 60664, IEC 62103, DIN EN 50178

Can be plugged onto 40-pos. I/O modules / separate power supply through terminal blocks with spring-cage double connection

Ordering data

Order No.

2322553

2322566

2322579

2321910

2322582

2322595

2322605

2322618

2322621

2322634

2322647

2322650

2900886

Pkt

Flat-ribbon cable plug-in connector according to IEC 60603-13

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

VIP-PA-FLK50/4X14/ 0.5M/S7

VIP-PA-FLK50/4X14/ 1,0M/S7

VIP-PA-FLK50/4X14/ 1,5M/S7

VIP-PA-FLK50/4X14/ 2,0M/S7

VIP-PA-FLK50/4X14/ 2.5M/S7

VIP-PA-FLK50/4X14/ 3,0M/S7

VIP-PA-FLK50/4X14/ 4,0M/S7

VIP-PA-FLK50/4X14/ 5,0M/S7

VIP-PA-FLK50/4X14/ 6,0M/S7

VIP-PA-FLK50/4X14/ 7,0M/S7

VIP-PA-FLK50/4X14/ 8,0M/S7

VIP-PA-FLK50/4X14/10,0M/S7

VIP-PA-FLK50-4X14-S7/...

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16	CII	ш	Cai	u	aι	a

< 50 V AC / 60 V DC 1 A (per path)

. PL us

Byte0

0 8 kV 0.16 O/m AWG 26 / 0.14 mm² 7 / Cu tin-plated 6.4 mm -20°C ... 50°C

IEC 60664, IEC 62103, DIN EN 50178

Can be plugged onto 20-pos. I/O modules / separate power supply through terminal blocks with spring-cage double connection

Flat-ribbon cable plug-in connector according to IEC 60603-13

Oud auton data

0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
VIP-PA-FLK14/ 0,5M/S7 VIP-PA-FLK14/ 1,0M/S7 VIP-PA-FLK14/ 1,5M/S7 VIP-PA-FLK14/ 2,0M/S7 VIP-PA-FLK14/ 2,5M/S7 VIP-PA-FLK14/ 3,0M/S7 VIP-PA-FLK14/ 4,0M/S7 VIP-PA-FLK14/ 6,0M/S7 VIP-PA-FLK14/ 6,0M/S7 VIP-PA-FLK14/ 7,0M/S7 VIP-PA-FLK14/ 8,0M/S7	2322663 2322676 2322689 2321790 2322692 2322702 2322715 2322728 2322731 2322744 2322757	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
VIP-PA-FLK14/10,0M/S7 VIP-PA-FLK14-S7/	2322760	1

Front adapter for 16-channel cards of SIMATIC® S7-300

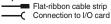
Card type	VIP-PA-FLK14/M/S7
Digital input	6ES7 321-1BH02-0AA0 6ES7 321-1BH10-0AA0 6ES7 321-1BH50-0AA0* 6ES7 321-7BH01-0AB0*
Digital output	6ES7 322-1BH01-0AA0 6ES7 322-1BH10-0AA0 6ES7 322-8BF00-0AB0*
Digital input/output	6ES7 323-1BH01-0AA0
Analog input	6ES7 331-7KF02-0AB0* 6ES7 331-7HF01-0AB0* 6ES7 331-7KB02-0AB0* 6ES7 331-7TF01-0AB0*
Analog output	6ES7 332-5HD01-0AB0* 6ES7 332-5HB01-0AB0* 6ES7 332-7ND02-0AB0*
Analog input/output	6ES7 334-0CE01-0AA0* 6ES7 334-0KE00-0AB0* 6ES7 335-7HG01-0AB0*
Other modules	6ES7 338-4BC01-0AB0* 6ES7 350-1AH03-0AE0* 6ES7 351-1AH01-0AE0* 6ES7 352-1AH02-0AE0* 6ES7 353-1AH01-0AE0* 6ES7 354-1AH01-0AE0* 6ES7 355-0VH10-0AE0* 6ES7 355-1VH10-0AE0*
* Only in conjunction with	

IP-2/SC/2FLK14 (1-20)S7, Order No.: 2315230 UM 45-2FLK14/ZFKDS/S7, Order No.: 2965156 FLKM-2FLK14/KDS 3-MT/PPA/S7, Order No.: 2295062 All bridges (BR) on the adapter must be disconnected.

Note:

The front adapters are non-isolated on delivery. Removal of the bridges can achieve electrical isolation (in groups of 8).

Explanation:



SP: Separate power terminals BRbl: Blue plug-in bridge BRrd: Red plug-in bridge

Siemens SIMATIC® S7-300 Front adapter

I/O modules with 32 channels or with this design

There are two connection possibilities available:

- Transfer of max. 32 channels over one 50-pos. system cable
- Transmission of 4 x 8 channels over four 14-pos. system cables

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

Front adapter for 32-channel cards of SIMATIC® S7-300

Card type	FLKM 50-PA-S300
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
Analog input	6ES7 331-7PF01-0AB0* 6ES7 331-7PF11-0AB0* 6ES7 331-7NF00-0AB0* 6ES7 331-7NF10-0AB0* 6ES7 331-1KF01-0AB0*
Analog output	6ES7 332-5HF00-0AB0*
СРИ	312C, 313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP, 314C-2PtP
Other modules	6ES7 350-2AH01-0AE0* 6ES7 357-4AH01-0AE0*
Card type	FLKM 50/4-FLK14/PA-S300
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
CPU	313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP, 314C-2Pt

Only in conjunction with VIP-2/SC/FLK50 (1-40)/S7, Order No.:2315243 UM 45-FLK50/ZFKDS/S7-300, Order No.: 2968111, FLKM 50/KDS3-MT/PPA/S7-300, Order No.: 2304490. All wire bridges (DR) on the adapter must be disconnected! There must be no voltage supply at the front adapter (flowing via the slip-on connections)!

The front adapters are non-isolated on delivery. Removal of the bridges can achieve electrical isolation (in groups of 8).

Explanation:

Flat-ribbon cable strip Connection to I/O card O Screw terminal blocks for separate supply

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products

Max. perm. operating voltage

Ambient temperature (operation)

Ambient temperature (storage/transport)

Max. permissible current

Max. perm. total current

Standards/regulations

Connection method



Front adapter for SIMATIC® S7-300, I/O cards with max. 32 channels

P) 211 (P)

Technical data

< 50 V AC / 60 V DC

1 A (per path)

8 A (per connection, supply via separate power supply (2.8 x 0.8 mm))

2 A (Per Byte, for supply via connector)

8 A (during supply via a separate bridged power supply)

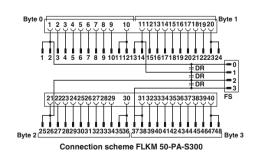
-20°C ... 50°C

-20°C ... 70°C

IEC 60664 / IEC 60664 / IEC 60664 IDC/FLK pin strip (2.54 mm)

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
FLKM 50-PA-S300 FLKM 50/4-FLK14/PA-S300	2294445 2296281	1 1			

Description No. of pos. VARIOFACE front adapters, for SIMATIC® S7-300 - 1 x 32 channels can be connected 50 - 4 x 8 channels can be connected 14



313233343536373839 DR

Connection scheme FLKM 50/4-FLK14/PA-S300

Siemens SIMATIC® S7-300 Front adapter

I/O modules with 16 channels or with this design

- Up to 2 x 8 channels are connected via two 14-pos. system cables.

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

Notes:

Suitable system cabling components can be configured in the INTERFACE search wizard. See www.phoenixcontact.net/products



Front adapter for SIMATIC® S7-300, I/O cards with max. 16 channels

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Technical data Max. perm. operating voltage < 50 V AC / 60 V DC Max. permissible current 1 A (per path) 8 A (per connection, supply via separate power supply (2.8 x 0.8 mm)) 2 A (Per Byte, for supply via connector) Max. perm. total current 8 A (during supply via a separate bridged power supply) Ambient temperature (operation) -20°C ... 50°C Ambient temperature (storage/transport) -20°C ... 70°C

Description	No. of pos.	Ту
VARIOFACE front adapters, for SIMATIC® S7-300		
- 2 x 8 channels can be connected	14	FL

Standards/regulations

Connection method

IDC/FLK pin strip (2.54 mm)			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 14-PA-S300	2299770	1	

IEC 60664 / IEC 60664 / IEC 60664

Front adapter for 16-channel cards of SIMATIC® S7-300

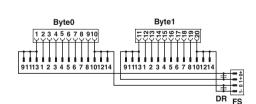
Card type	FLKM 14-PA-S300
Digital input	6ES7 321-1BH02-0AA0 6ES7 321-1BH10-0AA0 6ES7 321-1BH50-0AA0* 6ES7 321-7BH01-0AB0*
Digital output	6ES7 322-1BH01-0AA0 6ES7 322-1BH10-0AA0 6ES7 322-8BF00-0AB0*
Digital input/output	6ES7 323-1BH01-0AA0
Analog input	6ES7 331-7KF02-0AB0* 6ES7 331-7HF01-0AB0* 6ES7 331-7KB02-0AB0* 6ES7 331-7TF01-0AB0*
Analog output	6ES7 332-5HD01-0AB0* 6ES7 332-5HB01-0AB0* 6ES7 332-7ND02-0AB0*
Analog input/output	6ES7 334-0CE01-0AA0* 6ES7 334-0KE00-0AB0* 6ES7 335-7HG01-0AB0*
Other modules	6ES7 338-4BC01-0AB0* 6ES7 350-1AH03-0AE0* 6ES7 351-1AH01-0AE0* 6ES7 352-1AH02-0AE0* 6ES7 353-1AH01-0AE0* 6ES7 354-1AH01-0AE0* 6ES7 355-0VH10-0AE0* 6ES7 355-1VH10-0AE0*

Only in conjunction with VIP-2/SC/2FLK14 (1-20)/S7, Order No.: 2315230 UM 45-2FLK14/ZFKDS/S7, Order No.: 2965156 FLKM-2FLK14/KDS 3-MT/PPA/S7, Order No.: 2295062 All wire bridges (DR) on the adapter must be disconnected. There must be no voltage supply at the front adapter (flowing via the slip-on connections)!

The front adapters are non-isolated on delivery. Removal of the bridges can achieve electrical isolation (in groups of 8).

Explanation:

■ Flat-ribbon cable strip Connection to I/O card Screw terminal blocks for separate supply



Connection scheme FLKM 14-PA-S300

Siemens SIMATIC® S7-300 Front adapter for failsafe modules

The front adapters are coupled using 50-pos. system cables and convert the signals for passive modules.



Siemens SIMATIC S7-300 front adapter for failsafe I/O cards

30 V DC 1 A (per path) -20°C ... 50°C -20°C ... 70°C

EN 50178

Flat-ribbon cable plug-in connector according to IEC 60603-13

Technical data

Max. permissible current Max. perm. total current Ambient temperature (operation) Ambient temperature (storage/transport) Standards/regulations Connection method

Max. perm. operating voltage

Description	No. of pos.
VARIOFACE front adapter for failsafe I/O cards	
6ES7 326-1BK02-0AB0 6ES7 326-1RF00-0AB0 6ES7 336-1HE00-0AB0	50
VARIOFACE front adapter for failsafe I/O cards	
6ES7 326-2BF01-0AB0	50

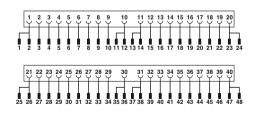
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKM 50-PA-S300/SO167	2307662	1		
FLKM 50-PA/DO326/S7-300	2321952	1		

Front adapter for I/O modules of SIMATIC® S7-300

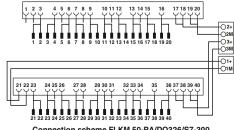
Card type	FLKM 50-PA-S300/SO167
Digital input	6ES7 326-1BK02-0AB0* 6ES7 326-1RF00-0AB0*1)
Analog input	6ES7 336-1HE00-0AB0*

Card type	FLKM 50-PA/DO326/S7-S300
Digital output	6ES7 326-2BF01-0AB0** 6ES7 326-2BF10-0AB0**

- * Only in conjunction with VIP-2/SC/FLK50 (1-40)/S7, Order No. 2315243, UM 45-FLK50/ZFKDS/S7-300, Order No. 2968111 FLKM 50/KDS3-MT/PPA/S7-300, Order No. 2304490.
- ** Only in conjunction with FLKM 50/DO326/S7-300, Order No. 2321965.
- 1) Not suitable for signals from the Ex area.



Connection scheme FLKM 50-PA-S300/SO167



Connection scheme FLKM 50-PA/DO326/S7-300

Explanation:

Flat-ribbon cable strip

Connection to I/O card

Screw terminal blocks for separate supply

Siemens SIMATIC S7 -300 System cables for 64-channel I/O cards

These system cables are plugged onto the 64-channel (2x32) I/O cards that are directly connected using plug-in connectors.

CABLE-FCN40/1X50/...

- Signal transmission of 1 x 32 channels
- System cable: 40-pos. plug-in connector on 50-pos. flat-ribbon cable strip

CABLE-FCN40/4X14/...

- Signal transmission of 4 x 8 channels
- Splitting cable: 40-pos. plug-in connector on four 14-pos. flat-ribbon cable strips



System cable

Technical data



Splitting cable

Technical data

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section

Conductor structure: stranded wires / material

< 50 V AC / 60 V DC $0.16\,\Omega/m$ -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

< 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

			Ordering data		Ordering dat	а		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable , for output module 6ES7 32 6ES7 322-1BP50-0AA0 (two cables per m		AA0 and						
	40	0.5 m	CABLE-FCN40/1X50/ 0,5M/S7-OUT	2321017	1	CABLE-FCN40/4X14/ 0,5M/S7-OUT	2321172	1
	40	1 m	CABLE-FCN40/1X50/ 1,0M/S7-OUT	2321020	1	CABLE-FCN40/4X14/ 1,0M/S7-OUT	2321185	1
	40	2 m	CABLE-FCN40/1X50/ 2,0M/S7-OUT	2321033	1	CABLE-FCN40/4X14/ 2,0M/S7-OUT	2321198	1
	40	3 m	CABLE-FCN40/1X50/ 3,0M/S7-OUT	2321046	1	CABLE-FCN40/4X14/ 3,0M/S7-OUT	2321208	1
	40	4 m	CABLE-FCN40/1X50/ 4,0M/S7-OUT	2321059	1	CABLE-FCN40/4X14/ 4,0M/S7-OUT	2321211	1
	40	6 m	CABLE-FCN40/1X50/ 6,0M/S7-OUT	2321062	1	CABLE-FCN40/4X14/ 6,0M/S7-OUT	2321224	1
	40	8 m	CABLE-FCN40/1X50/ 8,0M/S7-OUT	2321075	1	CABLE-FCN40/4X14/ 8,0M/S7-OUT	2321237	1
	40	10 m	CABLE-FCN40/1X50/10,0M/S7-OUT	2321088	1	CABLE-FCN40/4X14/10,0M/S7-OUT	2321240	1
Round cable , for input module 6ES7 321 (two cables per module). Plus-reading open the module								
	40	0.5 m	CABLE-FCN40/1X50/ 0,5M/S7-IN	2321091	1	CABLE-FCN40/4X14/ 0,5M/S7-IN	2321253	1
	40	1 m	CABLE-FCN40/1X50/ 1,0M/S7-IN	2321101	1	CABLE-FCN40/4X14/ 1,0M/S7-IN	2321266	1
	40	2 m	CABLE-FCN40/1X50/ 2,0M/S7-IN	2321114	1	CABLE-FCN40/4X14/ 2,0M/S7-IN	2321279	1
	40	3 m	CABLE-FCN40/1X50/ 3,0M/S7-IN	2321127	1	CABLE-FCN40/4X14/ 3,0M/S7-IN	2321282	1
	40	4 m	CABLE-FCN40/1X50/ 4,0M/S7-IN	2321130	1	CABLE-FCN40/4X14/ 4,0M/S7-IN	2321295	1
	40	6 m	CABLE-FCN40/1X50/ 6,0M/S7-IN	2321143	1	CABLE-FCN40/4X14/ 6,0M/S7-IN	2321305	1
	40	8 m	CABLE-FCN40/1X50/ 8,0M/S7-IN	2321156	1	CABLE-FCN40/4X14/ 8,0M/S7-IN	2321318	1
	40	10 m	CABLE-FCN40/1X50/10,0M/S7-IN	2321169	1	CABLE-FCN40/4X14/10,0M/S7-IN	2321321	1

Siemens SIMATIC® S7-300 Front adapter for MINI MCR

This front adapter is used exclusively for coupling the MINI MCR-SL-V8-FLK 16 A adapter. Changed analog standard signals can be transmitted with the help of these components.

Suitable isolators can be seen from page 66.

For suitable 16-pos. system cable (FLK 16/EZ-DR/...), refer to page 506.

Front adapter for analog cards of

SIMATIC® S7-300

Card type

Analog input

Analog output



Front adapter for SIMATIC® S7-300, 20-pos. analog I/O boards

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		Technical data
Max. perm. operating voltage Max. permissible current		FLKM 16-PA-S300/MINI-MCR 30 V AC/DC 50 mA (per path) 500 mA (per connection, supply via separate power supply)
Ambient temperature (operation)		-20°C 60°C
Ambient temperature (storage/transport) Standards/regulations		-20°C 70°C DIN EN 50178 / DIN EN 50178
Certification data		
Nominal voltage/current	CUL	-/-
Nominal voltage/current	UL	-/-

Description No. of pos VARIOFACE front adapter, for SIMATIC® S7-300, only in connection with MINI MCR-SL-V8-FLK 16-A

10	6
Assembled round cable, with two 16-pos. socket strips	
System adapter, for MINI analog modules with screw connection	

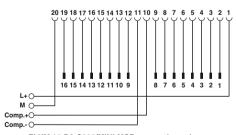
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKM 16-PA-S300/MINI-MCR	2314749	1		
Accessories				
FLK 16/EZ-DR/ 300/KONFEK	2299330	1		
MINI MCR-SL-V8-FLK 16-A	2811268	4		



FLKM 16-PA-S300/MINI-MCR

6ES7 331-7KF02-0AB0 6ES7 331-7KB02-0AB0

6ES7 331-7KB81-0AB0 6ES7 331-7TF00-0AB0 6ES7 332-8TF01-0AB0



FLKM 16-PA-S300/MINI-MCR connection scheme

Explanation:

- Flat-ribbon cable strip
- Connection to I/O card
- Screw terminal blocks for separate supply

Siemens SIMATIC® S7-300 Front adapter for MINI analog system cabling

The FLKM 16-PA-331-1KF/I/MINI-MCR front adapter is used for implementing system cabling in conjunction with the MINI Analog system adapter and a 16-pos. system cable FLK 16/EZ-DR/.../KONFEK; refer to page 506.

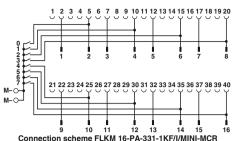
Instead of the conventional front plug, screw terminal blocks are used to snap this component onto the analog module.

The DIP switches can be used to connect "M-" connections to each other and to the central ground of the system.

The front adapter supports only current signals.

The front adapter is suitable for the following analog input card:

- 6ES7 331-1KF02-0AB0





Front adapter for SIMATIC® S7-300, 6ES7 331-1KF02-0AB0 analog I/O board

Technical data

Max. perm. operating voltage Max. permissible current Rated surge voltage / insulation Ambient temperature (operation) Ambient temperature (storage/transport) Standards/regulations

50 mA (per path) 0.5 kV / basic insulation -20°C ... 60°C -20°C ... 70°C

30 V AC/DC

DIN EN 50178 / DIN EN 50178

Description	No. of pos.
VARIOFACE front adapter, for SIMATIC® S7-300, on connection with MINI MCR-SL-V8-FLK 16-A	ly in
	10

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 16-PA- 331-1KF/I/MINI-MCR	2318237	1

Siemens SIMATIC® S7-300 Front adapter for MINI analog system cabling

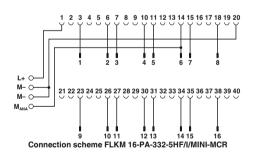
The FLKM 16-PA-332-5HF/I/MINI-MCR front adapter is used for implementing system cabling in conjunction with the MINI Analog system adapter and a 16-pos. system cable FLK 16/EZ-DR/.../KONFEK; refer to page 506.

Instead of the conventional front plug, screw terminal blocks are used to snap this component on to the analog module.

The front adapter supports only current signals.

The front adapter is suitable for the following analog output cards:

- 6ES7 332-5HF00-0AB0





Front adapter for SIMATIC® S7-300, 6ES7 332-5HF00-0AB0 analog I/O board

Technical data

Max. perm. operating voltage Max. permissible current

Rated surge voltage / insulation Ambient temperature (operation) Ambient temperature (storage/transport)

Standards/regulations

16

30 V AC/DC

Description No. of pos. VARIOFACE front adapter, for SIMATIC® S7-300, only in connection with MINI MCR-SL-V8-FLK 16-A

50 mA (per path) 500 mA (per connection, supply via separate power supply) 0.5 kV / basic insulation

-20°C ... 60°C -20°C ... 70°C DIN EN 50178 / DIN EN 50178

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM 16-PA- 332-5HF/I/MINI-MCR	2318240	1

Siemens SIMATIC® S7-1500 System cables for front plugs from the "TOP connect" series

These system cables are connected directly to Siemens "SIMATIC TOP connect" front plugs. A VARIOFACE front adapter is not required. The cables can be used to connect existing 8-channel Phoenix Contact termination boards.

- For passive signal transmission, e.g., VIP-2/SC/FLK14/PLC; Order No. 2315214, see page 470.
- For relay or solid-state relay connection via V8 adapters, e.g., PLC-V8/FLK14/OUT; Order No. 2295554, see page 369.

The system cables are available in the following versions:

- Unshielded
- Shielded
- Halogen-free
- Encapsulated plug-in connector Details regarding assignment to Siemens modules are provided with the system cable order numbers at www.phoenixcontact.net/products.



P 2u **/P** 3

Technical data

< 50 V AC / 60 V DC

0.16 Ω/m

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²

7 / Cu tin-plated

6.4 mm

Outside diameter	 -	Ordering da	nta	
		Ordering de	ııa	1
Description	Cable length	Туре	Order No.	Pcs. / Pkt.
Unshielded round cables , with one 16-pos. an socket strip in fixed lengths for transmitting 8 characteristics.				
	0.5 m	FLK 14/16/EZ-DR/ 50/S7	2293815	5
	1 m	FLK 14/16/EZ-DR/ 100/S7	2293828	1
	1.5 m	FLK 14/16/EZ-DR/ 150/S7	2293831	1
	2 m	FLK 14/16/EZ-DR/ 200/S7	2293844	1
	2.5 m	FLK 14/16/EZ-DR/ 250/S7	2293857	1
	3 m	FLK 14/16/EZ-DR/ 300/S7	2293860	1
	4 m	FLK 14/16/EZ-DR/ 400/S7	2293886	1
	5 m	FLK 14/16/EZ-DR/ 500/S7	2293899	1
	6 m	FLK 14/16/EZ-DR/ 600/S7	2293909	1
	7 m	FLK 14/16/EZ-DR/ 700/S7	2293912	1
	8 m	FLK 14/16/EZ-DR/ 800/S7	2293925	1
	9 m	FLK 14/16/EZ-DR/ 900/S7	2293938	1
	10 m	FLK 14/16/EZ-DR/1000/S7	2293941	1
Unshielded round cables, as above, but in var type "FLK EZ-DR/14U/C52/"	iable lengths of			
		FLK EZ-DR/	2295059	1
Shielded round cables, with one 16-pos. and o strip, for transmitting 8 channels in variable lengt "FLK EZ-DR-S/14S/C52/"				
Harbielded beleave for a second a 11 - 20	40	FLK EZ-DR-S//	2295046	1
Unshielded halogen-free round cables, with of one 14-pos. socket strip, for transmitting 8 channel lengths				

Max. perm. operating voltage Max. perm. current carrying capacity per path

Max. conductor resistance

Ambient temperature (operation)

Number of positions, control side Number of positions, module side Conductor cross section

Conductor structure: stranded wires / material

Outside diameter



Halogen-free (only the cable)



One encapsulated plug-in connector (on module side, 14-pos.)

Technical data

< 50 V AC / 60 V DC $0.16\,\Omega/m$

-20°C ... 50°C Insulation displacement, IEC 60352-4/DIN EN 60352-4

16

AWG 26 / 0.14 mm² 7 / Cu tin-plated 6.4 mm

Technical data

Ordering data

< 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

16

AWG 26 / 0.14 mm² 7 / Cu tin-plated 6.4 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLK 14/16/EZ-DR/HF/ 50/S7 FLK 14/16/EZ-DR/HF/ 100/S7 FLK 14/16/EZ-DR/HF/ 150/S7 FLK 14/16/EZ-DR/HF/ 200/S7	2296919 2296922 2296935 2296948	1 1 1	
FLK 14/16/EZ-DR/HF/ 250/S7 FLK 14/16/EZ-DR/HF/ 300/S7 FLK 14/16/EZ-DR/HF/ 400/S7 FLK 14/16/EZ-DR/HF/ 500/S7 FLK 14/16/EZ-DR/HF/ 600/S7	2296951 2296964 2904525 2304704 2904526	1 1 1 1	
FLK 14/16/EZ-DR/HF/ 800/S7 FLK 14/16/EZ-DR/HF/1000/S7	2904527 2904528	1	
FLK 14-16-EZ-DR-HF-S7/	2295693	1	

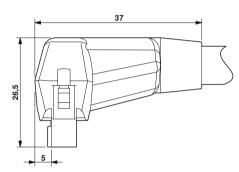
Ordering date		
Туре	Order No.	Pcs. / Pkt.
VIP-CAB-FLK14/16/0,5M/S7 VIP-CAB-FLK14/16/1,0M/S7 VIP-CAB-FLK14/16/1,5M/S7 VIP-CAB-FLK14/16/1,5M/S7 VIP-CAB-FLK14/16/2,5M/S7 VIP-CAB-FLK14/16/2,5M/S7 VIP-CAB-FLK14/16/3,0M/S7 VIP-CAB-FLK14/16/5,0M/S7 VIP-CAB-FLK14/16/6,0M/S7 VIP-CAB-FLK14/16/6,0M/S7	2904514 2904515 2904516 2904517 2904518 2904519 2904520 2904521 2904522 2904523	1 1 1 1 1 1 1 1
VIP-CAB-FLK14/16/10,0M/S7	2904524	1

Pin assignment and color code:

- FLK 14/16/EZ-DR/.../S7 FLK 14/16/EZ-DR/HF/.../S7
- VIP-CAB-FLK14/16/.../S7

14-pos. socket strip PIN	16-pos. socket strip PIN	Wire color
1	16	Black
2	14	Brown
3	12	Red
4	10	Orange
5	8	Yellow
6	6	Green
7	4	Blue
8	2	Violet
9	9	Gray
10	1	White
11	11	White-black
12	3	White-brown
13	13	White-red
14	5	White-orange
Not used	7	-
Not used	15	-

Encapsulated 14-pos. plug-in connector:



The following modules cannot be coupled due to the larger outer contour of the molded 14-pos. plug-in connector: UM 45-FLK14/ 8IM/ZFKDS/PLC, 2965211 UM 45- 8RM/MR-G24/1/PLC, 2962900

Ordering example for unshielded round cable: Unshielded round cable, assembled with

one 14-pos. and one 16-pos. socket strip, 12.70 m long Type: FLK EZ-DR /14U/C52/...

Quantity	Order No.	Length [m] 1)
1	2295059/14U/C52 /	12.70
		1) Min. 0.20 m

and 16-pos. socket strip at the other

Ordering example for shielded round cable:

Unshielded round cable, assembled with one 14-pos. and one 16-pos. socket strip, 13.20 m long Type: FLK EZ-DR-S /14S/C52/...

Quantity	Order No.	Length [m] 1)
1	2295046/14S/C52 /	13.20
		1) Min. 0.20 m

C52 = S7-1500 assembly with 14-pos. socket strip at one end and 16-pos. socket strip at the other

Ordering example for halogen-free round cable:

Halogen-free round cable, assembled with one 14-pos. and one 16-pos. socket strip, 15.50 m long Type: FLK 14-16-EZ-DR-HF-S7/...

Quantity		Order No.	Length [m] 1)		
	1	2295693	15.50		
			1) Min 0 20 m		

Siemens SIMATIC® S7-400 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

FLKM 50-PA-S400

- Transmission of max. 32 digital channels over one 50-pos. system cable.

FLKM 50/4-FLK14/PA-S400

- Transmission of max. 32 digital channels via one 14-pos. system cable.

Perfectly-fitting VARIOFACE termination boards with a variety of functions and connection possibilities round off this system concept.

FLKM 50-PA-S400 (3-48)

- Analog channels are connected via a 50-pos. system cable.

The 1:1 connection of the adapter means that corresponding 1:1 interface modules are connected here

Front adapter for I/O modules of the Siemens automation equipment SIMATIC® S7-400

Card type	FLKM 50-PA-S400
Digital input	6ES7 421-1BL01-0AA0 6ES7 421-7BH01-0AB0* 6ES7 421-7DH00-0AB0*
Digital output	6ES7 422-1BL00-0AA0 6ES7 422-7BL00-0AB0
Card type	FLKM 50/4-FLK14/PA-S400
Digital input	6ES7 421-1BL01-0AA0
Digital output	6ES7 422-1BL00-0AA0 6ES7 422-7BL00-0AB0
Card type	FLKM 50-PA-S400 (3-48)
Analog input	6ES7 431-0HH00-0AB0** 6ES7 431-1KF00-0AB0** 6ES7 431-1KF10-0AB0** 6ES7 431-1KF20-0AB0** 6ES7 431-7KF00-0AB0** 6ES7 431-7KF00-0AB0**
Analog output	6ES7 432-1HF00-0AB0**

* Only in connection with VIP-2/SC/FLK50/S7/A-S400, Order No.: 2322359 All wire bridges (DR) on the adapter must be disconnected.

Only in connection with VIP-3/SC/FLK50, Order No.: 2315081 UM 45-FLK 50/ZFKDS, Order No.: 2293585 UM 45-FLKS 50/ZFKDS, Order No.: 2968470

FLKM 50/KDS 3-MT/PPA/AN/PLC, Order No.: 2291587

Explanation:

Screw terminal blocks for separate supply



Front adapter for SIMATIC® S7-400

P) 211 (P)

Technical data

< 50 V AC / 60 V DC

1 A (per path)

8 A (per connection, supply via separate power supply)

2 A (Per Byte, for supply via connector)

8 A (during supply via a separate bridged power supply)

-20°C ... 50°C -20°C ... 70°C Anv

IEC 60664 / IEC 60664 / IEC 60664

Description	No. of pos.
VARIOFACE front adapter, for	
- SIMATIC® S7-400, 1 x 32 channels can be connected	50
- SIMATIC® S7-400, 4 x 8 channels can be connected	14
- SIMATIC® S7-400, only analog	50

Max. perm. operating voltage

Ambient temperature (operation)

Ambient temperature (storage/transport)

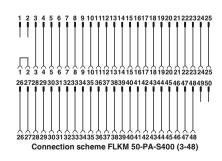
Max. permissible current

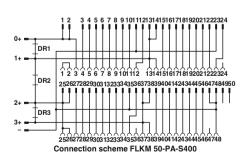
Max. perm. total current

Mounting position

Standards/regulations

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 50-PA-S400	2294500	2	
FLKM 50/ 4-FLK14/PA-S400	2294429	2	
FLKM 50-PA-S400(3-48)	2294908	2	





Connection scheme: FLKM 50/4-FLK14/PA-S400

Flat-ribbon cable strip Connection to I/O card

Siemens SIMATIC® S7-400 Adapter for conversion from S5-135/155 to S7-400

The FLKM S135/... adapters connect a SIMATIC® S5 connector wired with individual conductors directly to the SIMATIC® S7-400 basic card.

The SIMATIC® S5 connector is plugged directly onto an S7-400-I/O card with the help of an FFLKM S135/... intermediate adapter.

A new SIMATIC® S7-400 is installed in place of the SIMATIC® S5. The existing field wiring remains intact.

Attention:

The LEDs of the S7-400 module are hidden.



Adapter for Siemens SIMATIC® S5-135/S7-400

Max. perm. operating voltage
Max. permissible current

Test voltage (contact/contact)

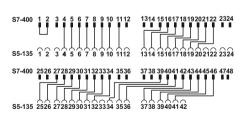
Ambient temperature (operation)
Mounting position
Standards/regulations

Technical data				
①	②	③	4	
24 V AC/DC	60 V DC	24 V DC	24 V AC/DC	
4 A (per path)	2 A (per path)	4 A (per path)	4 A (per path)	
500 V	1.25 kV	1.25 kV	1.25 kV	
(50 Hz, 1 min.)				
-20°C 50°C	-20°C 50°C	-20°C 50°C	-20°C 50°C	
Any	Any	Any	Any	

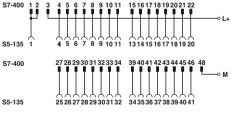
	· ·
	Digital
	6ES5 4
	6ES5 4
200	6ES5 4
	6ES5 4
-	

Description	No. of pos.
Digital IN 24 V from S5-135/155 to S7-400	
6ES5 420-4UA14 on 6ES7 421-1BL01-0AA0	1
6ES5 430-4UA14 on 6ES7 421-1BL01-0AA0	2
6ES5 431-4UA12 to 6ES7 421-7DH00-0AB0	3
6ES5 432-4UA12 on 6ES7 421-1BL01-0AA0	4

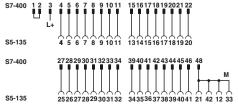
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKM S135/S400/SO120	2301723	1		
FLKM S135/S400/SO121	2301736	1		
FLKM S135-431-4UA/S400	2314846	1		
FLKM S135/S400/SO122	2301749	1		



FLKM S135-431-UA/S400 connection scheme



Connection scheme: FLKM S135/S400/SO120



Connection scheme: FLKM S135/S400/SO122



Connection scheme: FLKM S135/S400/SO121

Siemens SIMATIC® S7-400 Adapter for conversion from S5-135/155 to S7-400

The FLKM \$135/... adapters connect a SIMATIC® S5 connector wired with individual conductors directly to the SIMATIC® S7-400 basic card.

The SIMATIC® S5 connector is plugged directly onto an S7-400-I/O card to the help of an FFLKM \$135/... intermediate adapter.

A new SIMATIC® S7-400 is installed in place of the SIMATIC® S5. The existing field wiring remains intact.

Attention:

The LEDs of the S7-400 module are hidden.



Front adapter for SIMATIC S5-135/S7-400

Technical data

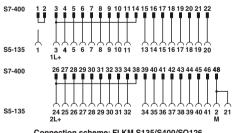
Max. perm. operating voltage Max. permissible current	
Test voltage (contact/contact)	
Ambient temperature (operation) Mounting position Standards/regulations	

ription I	No. of pos.	Туре			Order	No.	Pcs. / Pkt.	
			Orderir	ng data	а			
dards/regulations			, uny	7 ti i y		7 u i y		
ent temperature (operation) nting position		-20°C 50°C	-20°C 50°C	-20°C	,	,	50°C	
voltage (contact/contact)		1.5 kV (50 Hz, 1 min.)	500 V (50 Hz, 1 min.)	1.25 kV (50 Hz,		500 V (50 Hz	, 1 min.)	
permissible current		4 A (per path)	4 A (per path)	4 A (per		4 A (p	er path)	

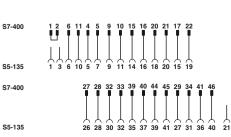


Description	No. of pos.
Digital IN 120/230 V UC from S5-135/155 to S7-	•
2.323,255 . 23 110111 00 100,100 10 07	
6ES5 436-4UA12 to 6ES7 421-1FH20-0AA0	1
Digital OUT 24 V from S5-135/155 to S7-400	
6ES5 441-4UA12 to 6ES7 422-1BL00-0AA0	2
6ES5 451-4UA14 to 6ES7 422-1BL00-0AA0	3
Digital OUT 24 V DC / 2 A from S5-135/155 to S	7-400
6ES5 453-4UA12 to 6ES7 422-1HH00-0AA0	4

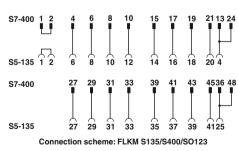
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM \$135/\$400/\$O123	2301752	1	
FLKM S135/S400/SO125 FLKM S135/S400/SO126	2301778 2301781	1	
FLKM S135/S400/SO127	2301794	1	

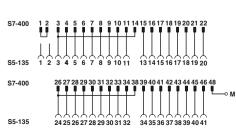


Connection scheme: FLKM S135/S400/SO126



Connection scheme: FLKM S135/S400/SO127





Connection scheme: FLKM S135/S400/SO125

Siemens SIMATIC® S7-400 Adapter for conversion from S5-135/155 to S7-400

The FLKM S135/... adapters connect a SIMATIC® S5 connector wired with individual conductors directly to the SIMATIC® S7-400 basic card.

The SIMATIC® S5 connector is plugged directly onto an S7-400-I/O card to the help of an FFLKM S135/... intermediate adapter.

A new SIMATIC® S7-400 is installed in place of the SIMATIC® S5. The existing field wiring remains intact.

Attention:

The LEDs of the S7-400 module are hidden.



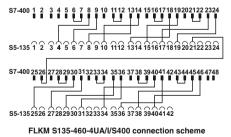
Adapter for Siemens SIMATIC® S5-135/S7-400

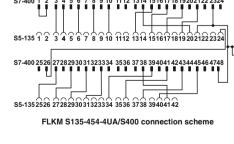
Max. perm. operating voltage Max. permissible current
Test voltage (contact/contact)
Ambient temperature (operation) Mounting position Standards/regulations

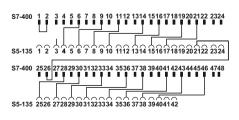
Technical data				
①	②	③	④	
24 V DC	230 V AC	24 V DC	24 V DC	
4 A (per path)				
1.25 kV	1.5 kV	500 V	500 V	
(50 Hz, 1 min.)				
-20°C 50°C	-20°C 50°C	-20°C 50°C	-20°C 50°C	
Vertical	Vertical	Vertical	Vertical	

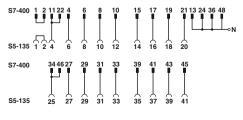
Description No. of po	s. '
Digital OUT 24 V DC / 2 A from S5-135/155 to S7-400	
6ES5 454-4UA14 to 6ES7 422-1BH11-0AA0	1
Digital OUT 230 V UC / 2 A from S5-135/155 to S7-400	
6ES5 456-4UA12 to 6ES7 422-1FH00-0AA0	2
Analog IN (only current measurement) from S5-135/155 to S7-40)0
6ES5 460-4UA13 to 6ES7 431-1KF00-0AB0	3
Analog IN (only voltage measurement) from S5-135/155 to S7-40	00
6ES5 460-4UA13 to 6ES7 431-1KF00-0AB0 (4

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM S135-454-4UA/S400	2314859	1	
FLKM S135/S400/SO124	2301765	1	
FLKM S135-460-4UA/I/S400	2314613	1	
FLKM S135-460-4UA/U/S400	2314862	1	









Connection scheme: FLKM S135-460-4UA/U/S400

Connection scheme: FLKM S135/S400/SO124

Siemens SIMATIC® S7-400 Adapter for conversion from S5-135/155 to S7-400

The FLKM S135/... adapters connect a SIMATIC® S5 connector wired with individual conductors directly to the SIMATIC® S7-400 basic card.

The SIMATIC® S5 connector is plugged directly onto an S7-400-I/O card to the help of an FFLKM S135/... intermediate adapter.

A new SIMATIC® S7-400 is installed in place of the SIMATIC® S5. The existing field wiring remains intact.

Attention:

The LEDs of the S7-400 module are hidden.



Adapter for Siemens SIMATIC® S5-135/S7-400

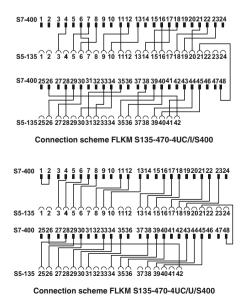
Max. perm. operating voltage Max. permissible current
Test voltage (contact/contact)
Ambient temperature (operation) Mounting position Standards/regulations

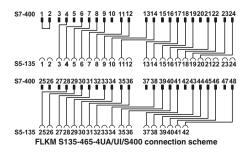
Technical data					
①	②	③	④		
24 V DC	24 V DC	24 V DC	24 V DC		
2 A (per path)	4 A (per path)	4 A (per path)	4 A (per path)		
500 V	500 V	500 V	500 V		
(50 Hz, 1 min.)					
-20°C 50°C	-20°C 50°C	-20°C 50°C	-20°C 50°C		
Any	Any	Any	Any		
	Ordering data				

				THE STATE OF	
		476			
	No.			II.	
I CA	and the second s				
1968	111		4		
460	144			H	
1100	50.0			18	
188	100	HE			
110	100			19	
100	Cart.			Lagran III	-
110	THE STATE OF THE S	78	7		
1000	8 3		2		

Description	No. of pos.
Analog IN (only Pt 100) from S5-135/155 to S7-40	00
6ES5 465-4UA13 to 6ES7 431-7KF10-0AB0	1
Analog IN (only current and voltage measureme	nt) from
S5-135/155 to S7-400 6ES5 465-4UA13 to 6ES7 431-0HH00-0AB0 6ES5 465-4UA13 to 6ES7 431-7QH00-0AB0	2
Analog OUT (only current output) from S5-135/1	55 to S7-400
6ES5 470-4UA13 to 6ES7 432-1HF00-0AB0 6ES5 470-4UC13 to 6ES7 432-1HF00-0AB0	3
Analog OUT (only voltage output) from S5-135/1	55 to S7-400
6ES5 470-4UA13 to 6ES7 432-1HF00-0AB0 6ES5 470-4UB13 to 6ES7 432-1HF00-0AB0 6ES5 470-4UC13 to 6ES7 432-1HF00-0AB0	4
3253 476 436 18 18 3267 49E-1111 00-0AB0	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM S135-465-4UA/T/S400	2314875	1	
FLKM \$135-465-4UA/UI/\$400	2314888	1	
FLKM \$135-470-4UC/I/\$400	2314626	1	
FLKM \$135-470-4UC/U/\$400	2314891	1	





FLKM S135-465-4UA/T/S400 connection scheme

S5-135 2526 2728 2930 31323334 3536 3738 39404142

S5-135 1 2

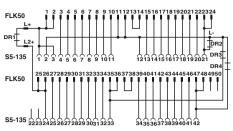
Siemens SIMATIC® S7-300 Adapter for conversion from S5-135/155 to S7-300

S5-S7 adapters connect the S5-135 front adapters wired with individual wires to the I/O modules of the S7.

With the help of the FLKM S135/S7/FLK50 converter module, the signals of the S5-135 front adapter can be converted to a 50-pos. strip. A 50-pos. system cable FLK 50/EZ-DR/.../KONFEK and a front adapter for the SIMATIC® S7 (FLKM 50-PA-S300) now connect the signals with the I/O module.

Notes:

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



FLKM S135/S7/FLK50/PLC connection scheme

Converter for Siemens SIMATIC® S5-135 to 50-pos. FLK strip.

Technical data

50 V AC/DC 1 A (per path) -20°C ... 50°C -20°C ... 70°C Any

DIN EN 50178 / DIN EN 50178

wax. perm. operating voltage
Max. permissible current
Ambient temperature (operation)
Ambient temperature (storage/transport)
Mounting position
Standards/regulations

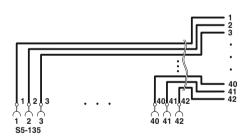
Description	
Digital IN or OUT 24 V DC from S5-135 to S7-300	
IN 6ES5 420-4UA14 to 6ES7 321-1BL00-0AA0 6ES5 430-4UA14 to 6ES7 321-1BL00-0AA0 OUT	
6ES5 441-4UA14 to 6ES7 322-1BL00-0AA0 6ES5 451-4UA14 to 6ES7 322-1BL00-0AA0	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM \$135/\$7/FLK50/PLC	2314736	1	

Startup adapter for extending the existing S5-135/155 field wiring.

All signals of the existing S5-135 wiring 3 or 5 are extended with the help of the universal commissioning adapters. The open cable end can be connected to various controllers such as S7-400 or S7-300. This means that the existing field wiring of S5-135 can communicate with the new controller for test purposes. Since the new control unit is temporarily arranged before the control cabinet, the original status of the system can be restored if required.

If the system functions with the new controller without problems, the S5-135 can now be replaced.





Technical data

Max. perm. operating voltage
Max. permissible current
Ambient temperature (operation)
Ambient temperature (storage/transport)
Mounting position

Standards/regulations

Description	
Connection of all S5-135 connections (1 to 42) at the open cable end	

250 V AC/DC 6 A (per path) -20°C ... 80°C

EN 60664-1

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLVM OVER/40V6 7F/6 OM/OF	0045007	_
FLKM S135/42X0,75/3,0M/OE FLKM S135/42X0,75/5,0M/OE	2315007 2318017	1

Siemens SIMATIC® S7-400 Adapter for conversion from S5-115 to S7-400

The FLKM S115/... adapters connect a SIMATIC® S5 connector wired with individual conductors directly to the SIMATIC® S7-400 basic card.

The SIMATIC® S5 connector is plugged directly onto an S7-400-I/O card to the help of an FFLKM S115/... intermediate adapter.

A new SIMATIC® S7-400 is installed in place of the SIMATIC® S5. The existing field wiring remains intact.

Attention:

Due to the geometry, it is only possible to use every second slot. The LEDs of the S7-400 module are hidden by the S5-115 adapter.



Adapter for Siemens SIMATIC® S5-115/S7-400

Max. perm. operating voltage Max. permissible current

Ambient temperature (operation) Ambient temperature (storage/transport) Mounting position Standards/regulations

6ES5 465-7LA13 to 6ES7 431-7QH00-0AB0

Description
Digital IN or OUT 24 V DC from S5-115 to S7-400
•
IN
6ES5 420-7LA11 to 6ES7 421-1BL01-0AA0
6ES5 430-7LA11 to 6ES7 421-1BL01-0AA0
OUT
6ES5 441-7LA11 to 6ES7 422-1BL00-0AA0
6ES5 451-7LA11 to 6ES7 422-1BL00-0AA0
Digital OUT 24 V DC from S5-115 to S7-400
6ES5 454-7LA12 to 6ES7 422-1BH11-0AA0
Analog IN (only current and voltage measurement) from
S5-115 to S7-400
6ES5 465-7LA13 to 6ES7 431-0HH00-0AB0

Technical data

24 V AC/DC

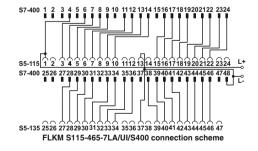
4 A (per path)

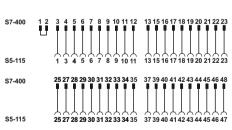
4 A (per connection, supply via separate power supply)

-20°C ... 50°C -20°C ... 70°C Vertical

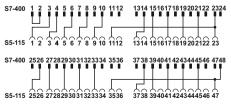
DIN EN 50178 / DIN EN 50178

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM S115/S400/SO155	2307248	1
FLKM S115-454-7LA/S400	2314901	1
FLKM S115-465-7LA/UI/S400	2314914	1





Connection scheme: FLKM S115/S400/SO155



FLKM S115-454-7LA/S400 connection scheme

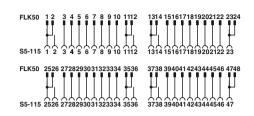
Siemens SIMATIC® S7-300 Adapter for conversion from S5-115 to S7-300

S5-S7 adapters connect the S5-115 front adapters wired with individual wires to the I/O modules of S7-300.

With the aid of the FLKM S115/S7/FLK50/SO137 converter module. the signals of the S5-115 front adapter can be converted to a 50-pos. strip. A 50-pos. system cable FLK 50/EZ-DR/.../KONFEK and a front adapter for the SIMATIC® S7 (FLKM 50-PA-S300) now connect the signals with the I/O module.

Notes:

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



Connection scheme: FLKM S115/S7/FLK50/PLC/S0137



Converter for Siemens SIMATIC® S5-115 to 50-pos. FLK strip.

Technical data

Max. perm. operating voltage Max. permissible current Max. perm. total current Ambient temperature (operation) Ambient temperature (storage/transport) Standards/regulations

2 A (per byte) -20°C ... 50°C -20°C ... 70°C

24 V AC/DC

1 A (per path)

DIN EN 50178 / DIN EN 50178

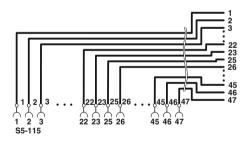
Description
Digital IN or OUT 24 V DC from S5-115 through converters, system cables, and front adapters to S7-300
IN
6ES5 420-7LA11 on 6ES7 321-1BL00-0AA0
6ES5 420-7LA11 on 6ES7 321-1BL00-0AA0 6ES5 430-7LA11 on 6ES7 321-1BL00-0AA0
6ES5 430-7LA11 on 6ES7 321-1BL00-0AA0

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM S115/S7/FLK50/PLC/S0137	2306294	1

Commissioning adapters for extending the existing S5-115 field wiring

All signals of the existing S5-115 wiring 3 or 5 are extended with the help of the universal commissioning adapters. The open cable end can be connected to various controllers such as S7-400 or S7-300. This means that the existing field wiring of S5-115 can communicate with the new controller for test purposes. Since the new control unit is temporarily arranged before the control cabinet, the original status of the system can be restored if required.

If the system functions with the new controller without problems, the S5-115 can now be replaced.





Max. perm. operating voltage Max. permissible current Ambient temperature (operation) Ambient temperature (storage/transport) Mounting position

Standards/regulations

250 V AC/DC 6 A (per path) -20°C ... 50°C -20°C ... 80°C EN 60664-1

Description	
Connection of all Stopen cable end	5-115 connections (1 to 23, 25 to 47) at the

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKM S115/47X0,75/3,0M/OE	2314985	1
FLKM S115/47X0,75/5,0M/OE	2314998	1

Technical data

YOKOGAWA Centum CS3000 R3 System cable

These shielded system cables for digital (50-pos.) and analog (40-pos.) I/O modules are connected directly to the modules. An intermediate adapter is not required. Features:

- Molded plug-in connector
- Can be screwed
- Lateral cable outlet of the I/O module
- KS/AKB-compatible plug-in connectors on the module side



Technical data

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Max. conductor resistance Ambient temperature (operation) Conductor cross section

Conductor structure: stranded wires / material

Outside diameter

50 -position 40 -position 30 V DC 500 mA 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

11 mm

11 mm

Ordering data No. of Pcs. / Cable length Order No. Description Type 50-pos. YUC cables, for digital I/O modules 50 2 m FLK 50-PA/EZ-DR/KS/ 200/YUC 2314299 50 FLK 50-PA/EZ-DR/KS/ 300/YUC 2314309 3 m 50 4 m FLK 50-PA/EZ-DR/KS/ 400/YUC 2314312 50 FLK 50-PA/EZ-DR/KS/ 500/YUC 2321499 5 m FLK 50-PA/EZ-DR/KS/ 600/YUC 2314927 50 6 m FLK 50-PA/EZ-DR/KS/ 700/YUC 2321509 50 7 m 2314930 50 8 m FLK 50-PA/EZ-DR/KS/ 800/YUC 50 FLK 50-PA/EZ-DR/KS/ 900/YUC 2321512 9 m FLK 50-PA/EZ-DR/KS/1000/YUC 2314325 50 10 m FLK 50-PA/EZ-DR/KS/1100/YUC 2321389 50 11 m 50 FLK 50-PA/EZ-DR/KS/1200/YUC 2321525 12 m 50 FLK 50-PA/FZ-DR/KS/1300/YUC 2321392 13 m 50 FLK 50-PA/EZ-DR/KS/1400/YUC 2321402 14 m 2314338 50 15 m FLK 50-PA/EZ-DR/KS/1500/YUC 50 16 m FLK 50-PA/EZ-DR/KS/1600/YUC 2321538 50 17 m FLK 50-PA/EZ-DR/KS/1700/YUC 2321541 50 18 m FLK 50-PA/EZ-DR/KS/1800/YUC 2321554 50 19 m FLK 50-PA/EZ-DR/KS/1900/YUC 2321567 50 20 m FLK 50-PA/EZ-DR/KS/2000/YUC 2314503 50 25 m FLK 50-PA/EZ-DR/KS/2500/YUC 2314516 30 m FLK 50-PA/EZ-DR/KS/3000/YUC 2314529 40-pos. YUC cables, for analog I/O modules FLK 40-PA/EZ-DR/KS/ 100/YUC 2322786 40 1 m 40 2 m FLK 40-PA/EZ-DR/KS/ 200/YUC 2314341 2314354 40 3 m FLK 40-PA/EZ-DR/KS/ 300/YUC 40 4 m FLK 40-PA/EZ-DR/KS/ 400/YUC 2314367 40 5 m FLK 40-PA/EZ-DR/KS/ 500/YUC 2321570 40 6 m FLK 40-PA/EZ-DR/KS/ 600/YUC 2314943 40 7 m FLK 40-PA/EZ-DR/KS/ 700/YUC 2321583 40 8 m FLK 40-PA/EZ-DR/KS/ 800/YUC 2314956 40 9 m FLK 40-PA/EZ-DR/KS/ 900/YUC 2321415 40 10 m FLK 40-PA/EZ-DR/KS/1000/YUC 2314370 40 FLK 40-PA/EZ-DR/KS/1100/YUC 2321428 11 m 40 12 m FLK 40-PA/EZ-DR/KS/1200/YUC 2321431 40 FLK 40-PA/EZ-DR/KS/1300/YUC 2321444 13 m 40 FLK 40-PA/EZ-DR/KS/1400/YUC 2321457 14 m 40 15 m FLK 40-PA/EZ-DR/KS/1500/YUC 2314383 40 FLK 40-PA/EZ-DR/KS/1600/YUC 2321596 16 m 40 17 m FLK 40-PA/EZ-DR/KS/1700/YUC 2321606 40 18 m FLK 40-PA/EZ-DR/KS/1800/YUC 2321619 40 19 m FLK 40-PA/EZ-DR/KS/1900/YUC 2321622 40 FLK 40-PA/EZ-DR/KS/2000/YUC 2314532 20 m 40 FLK 40-PA/EZ-DR/KS/2500/YUC 2314545 25 m FLK 40-PA/EZ-DR/KS/3000/YUC 40 2314558 30 m

YOKOGAWA Centum CS3000 R3 System cable

These system cables for digital I/O modules are connected directly to the modules. An intermediate adapter is not required.

- Lateral cable outlet of the I/O module
- Four 14-pos. plug-in connectors on the module side for connection of four 8-channel VARIOFACE modules of the system cabling



Technical data

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section Outside diameter

500 mA 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm²

30 V DC

50 -position 11 mm

			Ordering date	ta	
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
System cable for digital I/O mod VARIOFACE modules	ules for coupling fou	ır 8-channel			
	50	2 m	CABLE-50/4FLK14/ 2,0M/YUC	2314655	1
	50	4 m	CABLE-50/4FLK14/ 4,0M/YUC	2314671	1
	50	6 m	CABLE-50/4FLK14/ 6,0M/YUC	2318978	1
	50	10 m	CABLE-50/4FLK14/10,0M/YUC	2314684	1
	50	15 m	CABLE-50/4FLK14/15,0M/YUC	2322773	1
	50	20 m	CABLE-50/4FLK14/20,0M/YUC	2314778	1

YOKOGAWA Centum CS3000 R3 System cable for MINI analog system cabling

The Yokogawa CABLE-

40/2FLK16/.../YUC system cable makes it possible to connect 16 MINI analog modules to a Yokogawa control system. In conjunction with two MINI analog MINI MCR-SL-V8-FLK-16-A system adapters, the Yokogawa system cable provides a simple and economical "Plug and Play" solution.

The system cable is plugged directly into the Yokogawa module. Two 16-pos. flat-ribbon cable plug-in connectors are provided for connecting the module to the MINI analog system adapters.

The system cable in conjunction with 4-conductor measuring transducers is suitable for the following analog cards:

- AAI 141
- AAI 143



Technical data

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Conductor cross section Conductor structure: stranded wires / material Outside diameter

40 -position 11 mm

30 V DC 500 mA 0.16 Ω/m -20°C ... 50°C AWG 26 / 0.14 mm² 7 / Cu tin-plated

			Ordering date	Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	
System cable , for analog I/O modules for MINI analog system adapters	r coupling t	wo 8-channel				
	40	2 m	CABLE-40/2FLK16/ 2,0M/YUC	2321334	1	
	40	4 m	CABLE-40/2FLK16/ 4,0M/YUC	2321347	1	
	40	10 m	CABLE-40/2FLK16/10,0M/YUC	2321350	1	
	40	15 m	CABLE-40/2FLK16/15,0M/YUC	2321376	1	
	40	20 m	CABLE-40/2FLK16/20,0M/YUC	2321363	1	

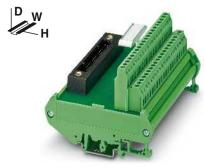
YOKOGAWA Centum CS3000 R3 Controller boards

These modules are connected to the I/O modules through the YUC system cable.

FLKM-KS40/YCS:

- For analog modules
- Universal interface module with 40 connection terminal blocks For more cabling solutions for Yokogawa:

www.phoenixcontact.com



Passive interface modules

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Test voltage (contact/contact) Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

Connection data solid / stranded / AWG Dimensions

500 V (50 Hz, 1 min.) -20°C ... 50°C Any DIN EN 50178, Screw connection Yokogawa KS-compatible

24 V AC/DC ±10%

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 90 mm / 68 mm

Ordering data		
⁻ уре	Order No.	Pcs. / Pkt.
FLKM-KS40/YCS	2314642	1

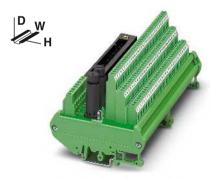
No. of Module width Description pos. Controller board, for analog I/O modules 40 112 mm **F**

YOKOGAWA Centum CS3000 R3 **Controller boards**

These modules are connected to the I/O modules through the YUC system cable.

FLKMS-KS50/32IM/YCS:

- For digital modules ADV 151 and ADV 551
- Three-conductor connection (signal, plus, minus)
- Redundant voltage supply (fuse IEC 127-2, 5×20 , 2 A) For more cabling solutions for Yokogawa: www.phoenixcontact.com



Passive interface modules

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Test voltage (contact/contact) Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

50

Connection data solid / stranded / AWG

Dimensions

H/D

174 mm

No. of Module width Description pos. Controller board, for digital I/O modules ADV 151 and ADV 551

24 V AC/DC ±10% 500 V (50 Hz, 1 min.) -20°C ... 50°C Any DIN EN 50178, Screw connection Yokogawa KS-compatible 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 90 mm / 81 mm

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKMS-KS50/32IM/YCS	2314451	1		

YOKOGAWA Centum CS3000 R3 Controller boards

These modules are connected to the analog I/O modules through the 40-pos. YUC system cable.

The modules are designed for redundant signal transmission (two plug-in connectors in parallel). A separate connection to the HART multiplexer is possible.

FLKM-KS40/AO16/YCS

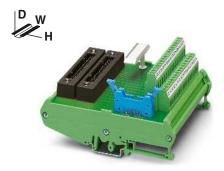
- For analog module AAI 543

FLKMS-KS40/SI/AI16/YCS

- For analog modules AAI 141 and AAI 143 (operation of modules in the 4-conductor mode)
- Transfer of 16 channels with separate positive and negative connections
- 16 plug-in fuses (IEC 127-2, 5 x 20, 0.1 A) per positive supply and LED status indicator
- Redundant voltage supply (fuse IEC 127-2, 5×20 , 2 A)

FLKMS-KS40/AI/YCS

- For analog modules AAI 141 and AAI 143 (operation of modules in the 4-conductor mode)
- Transfer of 16 channels with separate positive and negative connections
- Redundant voltage supply (fuse IEC 127-2, 5×20 , 2 A) For more cabling solutions for Yokogawa: www.phoenixcontact.com



Interface modules for analog I/O modules

Max. perm. operating voltage Max. perm. current (per branch) Test voltage (contact/contact) Ambient temperature (operation) Mounting position Standards/regulations Connection method

Connection data solid / stranded / AWG Dimensions

Field level Control system level

H/D

Description	No. of pos.	Module width W
Controller board, for analog output mod	dules AAI 54	-3
	40	108 mm

Controller board, with fuses and LED, for analog input modules AAI 141 and AAI 143 214 mm Controller board, for analog input modules AAI 141 and AAI 143, without fuses and LED 40 214 mm Technical data

24 V DC ±10% 100 mA 500 V (50 Hz, 1 min.) -20°C ... 50°C Anv DIN EN 50178, Screw connection Yokogawa KS-compatible 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 126 mm / 68 mm

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
FLKM-KS40/AO16/YCS	2314260	1		
FLKMS-KS40/SI/AI16/YCS	2314273	1		
FLKMS-KS40/AI/YCS	2314286	1		

VIP termination boards for 8 channels

These VIP - VARIOFACE Professional modules are used in combination with 14-pos. system cables and the relevant front adapters.

Features:

- Byte-wise labeling
- For digital I/O modules
- Optionally with LED.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.



Passive interface modules for input/output with screw connection

Technical data

24 V DC

VIP-2/.../FLK14/LED/PLC



Passive interface modules for input/output with push-in connection

Technical data

VIP-2/.../FLK14/LED/PLC

@ .**91**...s

VIP-2/.../FLK14/PLC

60 V AC/DC

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position

Standards/regulations Connection method Field level Control system level

Connection data solid / stranded / AWG Dimensions

1 A 1 A 0.6 kV 0.6 kV -20°C ... 50°C -20°C ... 50°C Any Any IEC 60664, DIN EN 50178, IEC 62103

Screw connection Screw connection IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm)

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 65.5 mm / 56 mm

60 V AC/DC 24 V DC 1 A 3 A 0.6 kV 0.6 kV -20°C ... 50°C -20°C ... 50°C Any Any IEC 60664, DIN EN 50178, IEC 62103 Push-in connection Push-in connection IDC/FLK pin strip (2.54 mm)

IDC/FLK pin strip (2.54 mm)

0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

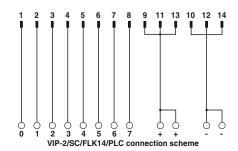
72.1 mm / 56 mm

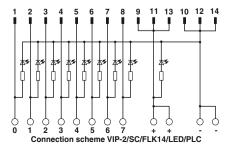
VIP-2/.../FLK14/PLC

Description	No. of pos.	Module width W	
VARIOFACE interface module, for eight	ht channels,		
- with screw connection - with push-in connection	14 14	39.8 mm 41.9 mm	
VARIOFACE interface module, for eight channels with light indicator,			
- with screw connection	14	39.8 mm	
- with push-in connection	14	41.9 mm	

Ordering data		
Туре	Order No.	Pcs. / Pkt.
VIP-2/SC/FLK14/PLC	2315214	1
VIP-2/SC/FLK14/LED/PLC	2322249	1

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
VIP-2/PT/FLK14/PLC	2903801	1		
VIP-2/PT/FLK14/LED/PLC	2904279	1		





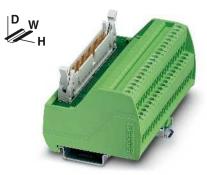
VIP termination boards for 32 channels

These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters.

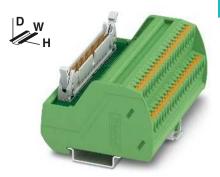
Features:

- Byte-wise labeling
- For digital I/O modules
- Optionally with LED.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No, 0811862) and mounting material, see Catalog 5.



Passive interface modules for input/output with screw connection



Passive interface modules for input/output with push-in connection

⊕ 2**91** ∪s

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

Connection data solid / stranded / AWG

Dimensions H/D

Technical data				
VIP-2//FLK50/PLC 60 V AC/DC 1 A 2 A (per byte) 0.6 kV -20°C 50°C Any IEC 60664, DIN EN 50178, IEC Screw connection IDC/FLK pin strip (2.54 mm)	VIP-2//FLK50/LED/PLC 24 V DC 1 A 2 A (per byte) 0.6 kV -20°C 50°C Any 62103 Screw connection IDC/FLK pin strip (2.54 mm)			

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 65.5 mm / 56 mm

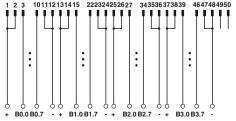
Technical data		
VIP-2//FLK50/PLC	VIP-2//FLK50/LED/PLC	
60 V AC/DC	24 V DC	
1 A	1 A	
2 A (per byte)	2 A (per byte)	
0.6 kV	0.6 kV	
-20°C 50°C	-20°C 50°C	
Any	Any	
IEC 60664, DIN EN 50	178, IEC 62103	
Push-in connection	Push-in connection	
IDC/FLK pin strip (2.54	mm) IDC/FLK pin strip (2.54 mm)	

0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 72.1 mm / 56 mm

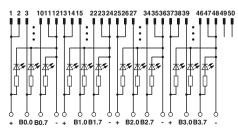
Description	No. of pos.	Module width W
VARIOFACE interface module, for	32 channels,	
- with screw connection	50	106.1 mm
- with push-in connection	50	107.9 mm
VARIOFACE interface module , for light indicator,	32 channels wit	h
- with screw connection	50	106.1 mm
- with push-in connection	50	107.9 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	Т
VIP-2/SC/FLK50/PLC	2315227	1	VI
VIP-2/SC/FLK50/LED/PLC	2322252	1	VI

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-2/PT/FLK50/PLC	2903803	1	
VIP-2/PT/FLK50/LED/PLC	2904280	1	



VIP-2/SC/FLK50/PLC connection scheme



Connection scheme VIP-2/SC/FLK50/LED/PLC

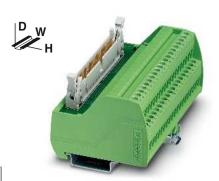
VIP termination boards for SIMATIC® S7

These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters for SIMATIC® S7.

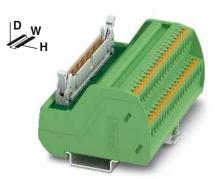
Features:

- Numerical marking
- Specifically for S7-300 or S7-400

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.



Passive interface modules for input/output, with SIMATIC®-specific marking and screw connection



Passive interface modules for input/output, with SIMATIC®-specific marking and push-in connection

Technical data

@ .**91**...s

60 V AC/DC

-20°C ... 50°C

Screw connection

65.5 mm / 56 mm

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

0.6 kV

Max. perm. operating voltage Max. perm. current (per branch) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method

Connection data solid / stranded / AWG Dimensions

Field level Control system level

H/D

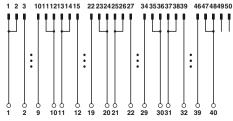
Technical data IEC 60664, DIN EN 50178, IEC 62103 IDC/FLK pin strip (2.54 mm)

60 V AC/DC 1 A 0.6 kV -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 Push-in connection IDC/FLK pin strip (2.54 mm) 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 72.1 mm / 56 mm

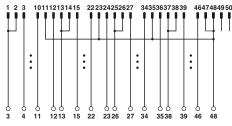
Description	No. of pos.	Module width W
VARIOFACE interface module, with SIMATIC® S7-300-specific marking from	m 1 to 40	
- with screw connection	50	106.1 mm
- with push-in connection	50	107.9 mm
VARIOFACE interface module, with SIMATIC® S7-400-specific marking from	m 3 to 48	
- with screw connection	50	106.1 mm
- with push-in connection	50	107.9 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
VIP-2/SC/FLK50 (1-40) /S7	2315243	1
VIP-2/SC/FLK50/S7/A-S400	2322359	1

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-2/PT/FLK50 (1-40) /S7	2903804	1	
VIP-2/PT/FLK50/S7/A-S400	2904289	1	



Connection scheme VIP-2/.../FLK50 (1-40) /S7



Connection scheme VIP-2/.../FLK50/S7/A-S400

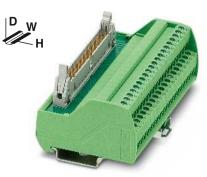
VIP termination boards for **MODICON® TSX Quantum and** Allen-Bradley ControlLogix

These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters.

Features:

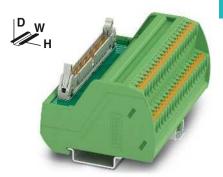
- Specific marking
- Specifically for MODICON TSX Quantum or ControlLogix

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.



Passive interface modules for input/output, with specific marking and screw connection

Technical data



Passive interface modules for input/output, with specific marking and push-in connection

Technical data

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Max. perm. operating voltage Max. perm. current (per branch) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

Connection data solid / stranded / AWG

Dimensions

V AC/DC	
A	
6 kV	
0°C 50°C	
ny	
C 60664 DIN EN 60170 IEC 60100	

IEC 60664, DIN EN 50178, IEC 62103 Screw connection IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

65.5 mm / 56 mm

H/D

6	60 V AC/DC
	1 A
(0.6 kV
	-20°C 50°C
1	Any
1	EC 60664, DIN EN 50178, IEC 62103
ı	Push-in connection

IDC/FLK pin strip (2.54 mm) 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 72.1 mm / 56 mm

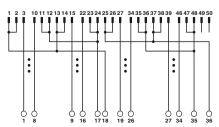
Description	No. of pos.	Module width W
VARIOFACE interface module, with		
MODICON® TSX Quantum-specific ma	rking from 1 t	to 40
- with screw connection	50	106.1 mm
- with push-in connection	50	107.9 mm
VARIOFACE interface module, with ControlLogix-specific marking from 1 to	36	
- with screw connection	50	95.9 mm
- with push-in connection	50	97.7 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
VIP-2/SC/FLK50/MODI-TSX/Q	2322304	1
VIP-2/SC/FLK50/AB-1756	2322317	1

72.1 mm/ 50 mm			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-2/PT/FLK50/MODI-TSX/Q	2904285	1	
VIP-2/PT/FLK50/AB-1756	2904286	1	



Connection scheme VIP-2/.../FLK50/MODI-TSX/Q



Connection scheme VIP-2/.../FLK50/AB-1756

VIP termination boards for Siemens SIMATIC® S7-300

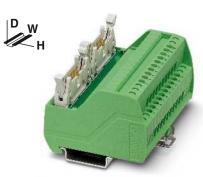
These VIP - VARIOFACE Professional modules are used in combination with two 14-pos. system cables and the relevant front adapters for Siemens SIMATIC® S7-300.

Features:

- Numerical labeling (1-20)
- Specifically for S7 300.

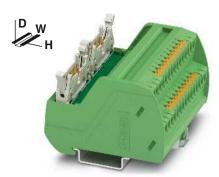
Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No, 0811862) and mounting material, see Catalog 5.



Passive interface modules for SIMATIC® S7-300 with screw connection

Technical data



Passive interface modules for SIMATIC® S7-300 with push-in connection

Technical data

60 V AC/DC

-20°C ... 50°C

1 A

0.6 kV

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Max. perm. operating voltage Max. perm. current (per branch) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method Field level Control system level

Connection data solid / stranded / AWG H/D Dimensions

60 V AC/DC 0.6 kV -20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 65.5 mm / 56 mm

VIP-2/SC/2FLK14 (1-20) /S7

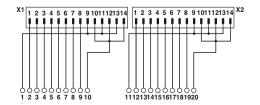
IEC 60664, DIN EN 50178, IEC 62103 Push-in connection IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm) 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 72.1 mm / 56 mm Ordering data Pcs./ Order No. Туре

2315230

1

Description	No. of pos.	Module width W
VARIOFACE interface module, with SIMATIC® S7-300-specific marking for		
- with screw connection	14	80.6 mm
- with push-in connection	14	82.5 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
VIP-2/PT/2FLK14 (1-20) /S7	2903802	1



VIP termination boards for Allen-Bradley

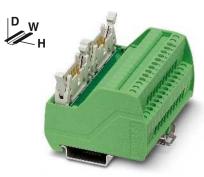
These VIP - VARIOFACE Professional modules are used in combination with two 14-pos. system cables and the relevant front adapters for Allen-Bradley.

Features:

- Numerical labeling (1-20)
- Specifically for ControlLogix.

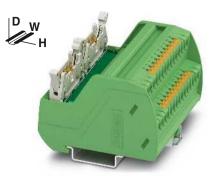
Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No, 0811862) and mounting material, see Catalog 5.



Passive interface modules for Allen-Bradley ControlLogix with screw connection

Technical data



Passive interface modules for Allen-Bradley ControlLogix with push-in connection

c**91** us

Max. perm. operating voltage Max. perm. current (per branch) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

H/D

Connection data solid / stranded / AWG

Dimensions

60 V AC/DC
1 A
0.6 kV
-20°C 50°C
Any
IEC 60664, DIN EN 50178, IEC 62103
Corou connection

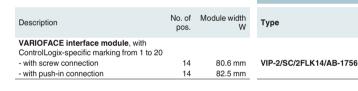
ΙΕ Screw connection IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 65.5 mm / 56 mm

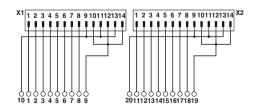
Ordering data Order Technical data

1 A 0.6 kV -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 Push-in connection IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 72.1 mm / 56 mm

60 V AC/DC

		Ordering data			
Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
2322333	1	VIP-2/PT/2FLK14/AB-1756	2904288	1	





Connection scheme VIP-2/.../2FLK14/AB-1756

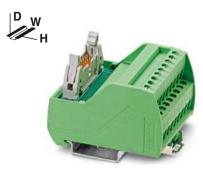
VIP termination boards with 2-conductor connection technology for 8 channels

These VIP VARIOFACE modules are used in combination with 14-pos. system cables and the relevant front adapters.

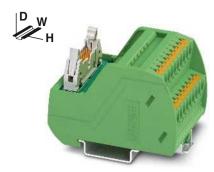
Features:

- Byte-wise labeling
- For digital I/O modules
- Negative or positive connection per sig-

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.



Passive interface modules with screw connection



Passive interface modules with push-in connection

c**91** us

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position

Standards/regulations Connection method

Connection data solid / stranded / AWG

Dimensions

Field level Control system level

H/D

Technical data

3 A (per byte) 0.6 kV

60 V DC

-20°C ... 50°C

Any

IEC 60664, DIN EN 50178, IEC 62103 Screw connection

IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

65.5 mm / 56 mm

Technical data

60 V DC 1 A

3 A (per byte) 0.6 kV

-20°C ... 50°C

Any

IEC 60664, DIN EN 50178, IEC 62103

Push-in connection

IDC/FLK pin strip (2.54 mm)

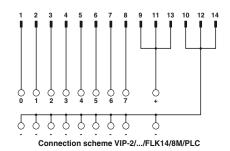
0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14

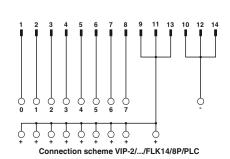
72.1 mm / 56 mm

Description	No. of M pos.	odule width W
VARIOFACE interface module, for ei additional terminal block per signal for		
- with screw connection - with push-in connection	14 14	50 mm 52 mm
VARIOFACE interface module, for ei additional terminal block per signal for		
- with screw connection - with push-in connection	14 14	50 mm 52 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-2/SC/FLK14/8M/PLC	2322281	1	
VIP-2/SC/FLK14/8P/PLC	2322294	1	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-2/PT/FLK14/8M/PLC	2904283	1	
VIP-2/PT/FLK14/8P/PLC	2904284	1	





Termination boards with 2-conductor connection technology for 32 channels

These VARIOFACE modules are used in combination with 50-pos. system cables and the relevant front adapters.

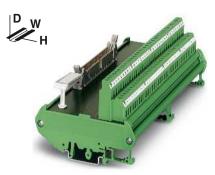
The following module types with 2-conductor connection technology are available:

FLKM 50/32M/PLC

- Byte-wise labeling
- For digital I/O modules
- Negative connection for each signal.

FLKM 50/32P/PLC

- Byte-wise labeling
- For digital I/O modules
- Positive connection per signal.



Passive interface modules with screw connection



60 V DC

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Field level Control system level

H/D

Connection data solid / stranded / AWG

Dimensions

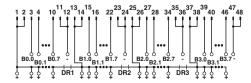
8 A (per byte) 0.8 kV -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103

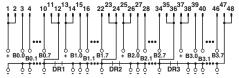
Screw connection IDC/FLK pin strip (2.54 mm) 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

90 mm / 68 mm

Description	No. of pos.	Module width W
VARIOFACE interface module, for 32 of additional terminal block per signal for a of a distribution of the signal for a distribution		
VARIOFACE interface module, for 32 of additional terminal block per signal for a of	channels, ea	ach with an
	50	192 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
FLKM 50/32M/PLC	2289719	1	
FLKM 50/32P/PLC	2291121	1	





For additional information, visit www.phoenixcontact.net/products

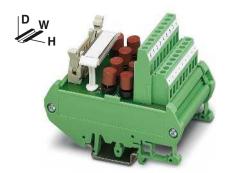
Termination boards with fuses with 2-conductor connection method

These VARIOFACE modules are used in combination with 14- or 50-pos. system cables and the relevant front adapters.

The following module types with fuses and 2-conductor connection technology are available:

FLKM 14/8M/SI/PLC (for 8 channels) FLKM 50/32M/SI/PLC (for 32 channels)

- Byte-wise labeling
- Can be used for digital I/O modules
- Plug-in fuse (IEC 127-3, 1AF) per signal path (F1)
- Plug-in fuse (IEC 127-3, 2AF) per voltage supply (F2)
- Negative connection for each signal.



Passive fuse modules for 8 or 32 channels

IDC/FLK pin strip (2.54 mm)

2294490

Pcs. / Pkt.



Technical data FLKM 14/8M/SI/PLC FLKM 50/32M/PLC Max. perm. operating voltage 60 V DC 60 V DC 1 A 2 A (per byte) 0.8 kV 0.8 kV -20°C ... 50°C -20°C ... 50°C Any Any IEC 60664, DIN EN 50178, IEC 62103 Field level Screw connection Screw connection

192 mm

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 H/D 90 mm / 68 mm

FLKM 50/32M/SI/PLC

IDC/FLK pin strip (2.54 mm)

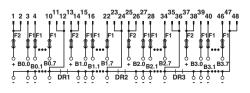
Ordering data Order No. Type FLKM 14/8M/SI/PLC 2294487

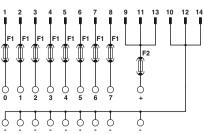
Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method Control system level

Connection data solid / stranded / AWG Dimensions

Description	No. of pos.	Module width W
VARIOFACE module, for eight channel	ls, each with	an additional
terminal block and fuse per signal, (common minus potential)		
	14	57 mm
VARIOFACE module, for 32 channels, each with an additional		
terminal block and fuse per signal, (common minus potential)		





Connection scheme: FLKM 14/8M/SI/PLC

VIP initiator modules for 8 channels

These VIP - VARIOFACE Professional modules are used in combination with 14-pos. system cables and the relevant front adapters.

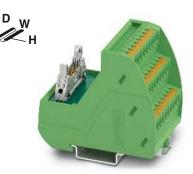
Features:

- Byte-wise labeling
- For digital I/O modules
- Positive and negative connection per
- Optionally with LED.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.



Initiator modules with screw connection



Initiator modules with push-in connection

c**91** us

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position

Standards/regulations Connection method

Connection data solid / stranded / AWG

Dimensions

Field level Control system level

H/D

Module width Description No. of pos. VARIOFACE initiator module, for connecting 8 PNP initiators, with an additional positive and negative terminal block each per signal

- with screw connection 52.3 mm - with push-in connection 14 52 mm

VARIOFACE initiator module with LED, for connecting 8 PNP initiators, with an additional positive and negative terminal block

- with screw connection	14	52.3 mm
- with push-in connection	14	52 mm

Technical data				
VIP-3/SC/FLK14/8IM/PLC	VIP-3/SC/FLK14/8IM/LED/PLC			
60 V DC	24 V DC			
1 A	1 A			
3 A	3 A			
0.6 kV	0.6 kV			
-20°C 50°C	-20°C 50°C			
Any	Any			
IEC 60664, DIN EN 50178, IEC 62	2103			
Screw connection	Screw connection			
IDC/FLK pin strip (2.54 mm)	IDC/FLK pin strip (2.54 mm)			

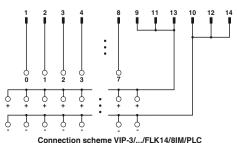
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

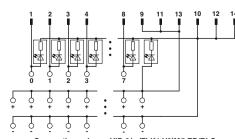
69 mm / 62 mm

Technical data				
VIP-3/PT/FLK14/8IM/PLC	VIP-3/PT/FLK14/8IM/LED/PL			
60 V DC	24 V DC			
1 A	1 A			
3 A	3 A			
0.6 kV	0.6 kV			
-20°C 50°C	-20°C 50°C			
Any	Any			
IEC 60664, DIN EN 50178, IEC	62103			
Push-in connection	Push-in connection			
IDC/FLK pin strip (2.54 mm)	IDC/FLK pin strip (2.54 mm)			

0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 75.8 mm / 63 mm

OO IIIIII OE IIIIII			70.0 111117 00 111111		
Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VIP-3/SC/FLK14/8IM/PLC	2322278	1	VIP-3/PT/FLK14/8IM/PLC	2904282	1
VIP-3/SC/FLK14/8IM/LED/PLC	2322265	1	VIP-3/PT/FLK14/8IM/LED/PLC	2904281	1
VIII -0/00/11 ERT-4/01/11/LEB/11 EO	2022203	'	VIP-3/PT/FLK14/8IM/LED/PLC	2904281	1





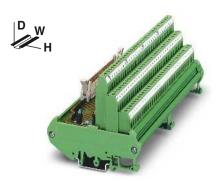
Connection scheme VIP-3/.../FLK14/8IM/LED/PLC

Initiator modules for 32 channels

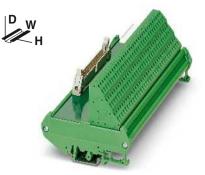
These VARIOFACE modules are used in combination with 50-pos. system cables and the relevant front adapters for digital I/O modules.

Features:

- Byte-wise labeling
- Positive and negative connection per
- Optionally with LED



Initiator modules for 32 channels, with screw connection



Initiator modules for 32 channels, with spring-cage connection

-91 us 🕝

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Status indication Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Connection data solid / stranded / AWG

Dimensions

Field level Control system level

H/D

Technical data		
50/32 IM	50/32 IM/LA	
60 V DC	20 V DC (up to 30 V DC	
1 A	1 A	
2 A (per byte)	2 A (per byte)	
No	LED	
0.8 kV	0.8 kV	
-20°C 50°C	-20°C 50°C	
Any	Any	
IEC 60664, DIN EN 50178,	IEC 62103	

Screw connection Screw connection IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm)

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

90 mm / 81 mm

Technical data		
60 V DC		
1 A		
2 A (per byte)		
-		
0.6 kV		
-20°C 50°C		

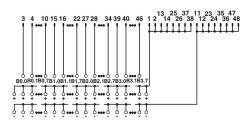
Anv DIN EN 50178, Spring-cage connection IDC/FLK pin strip (2.54 mm)

0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 12 90 mm / 73.5 mm

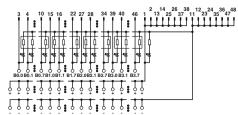
Description	No. of pos.	Module width W
VARIOFACE initiator module, f	or connection of 32	PNP initiators
	50	180 mm
VARIOFACE initiator module, s indicator	ame as before, how	ever with light
	50	180 mm
VARIOFACE initiator module, for connection of 32 PNP initiators		
	50	180 mm

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKMS 50/32IM/PLC	2284523	1
FLKMS 50/32IM/LA/PLC	2284510	1

Ordering data		
Туре	Order No.	Pcs. / Pkt.
FLKMS 50/32IM/ZFKDS/PLC	2901389	1



Connection scheme: FLKMS 50/32IM/PLC. ...50/32IM/ZFKDS/PLC



FLKMS 50/32IM/LA/PLC connection scheme

COMPACT-LINE initiator modules with spring-cage connection

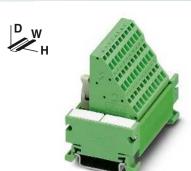
These VARIOFACE modules are used in combination with 14- and 50-pos. system cables and the relevant front adapters.

The following COMPACT-LINE initiator modules are available:

UM 45-FLK14/8IM/.../PLC (for 8 channels) **UM 45-FLK 50/32IM/.../PLC** (for 32 channels)

- Byte-wise labeling
- Can be used for digital I/O modules
- Positive and negative connection for every signal

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



Sensor modules for 8 or 32 channels With spring-cage connection

Technical data



Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position

Standards/regulations Connection method

Field level Control system level

Connection data solid / stranded / AWG Dimensions

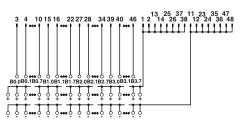
UM 45-FLK 14//PLC	UM 45-FLK 50//PLC
60 V DC	60 V DC
1 A	1 A
3 A	2 A (per byte)
0.8 kV	0.8 kV
-20°C 50°C	-20°C 50°C
Any	Any
IEC 60664, DIN EN 50178, IEC	62103
Spring-cage connection	Spring-cage connection
IDO/ELI/ (0.54)	IDO/ELIZation attitut (O.E.4 access)

IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm)

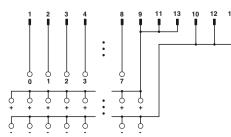
0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 14 45 mm / 61 mm

Description	No. of pos.	Module width W		
VARIOFACE-COMPACT-LINE initiator module, for connection of eight PNP initiators				
	14	75 mm		
VARIOFACE-COMPACT-LINE initiator module, for connection of 32 PNP initiators				
	50	197 mm		

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
UM 45-FLK14/ 8IM/ZFKDS/PLC	2965211	1	
UM 45-FLK50/32IM/ZFKDS/PLC	2965224	1	



UM 45-FLK50/32IM/ZFKDS/PLC connection scheme



UM 45-FLK14/8IM/ZFKDS/PLC connection scheme

Controller boards with knife disconnect terminal blocks

These VARIOFACE modules with knife disconnection and test connection for each signal (2 or 2.3 mm Ø test plug) are used in combination with the respective front adapters.

FLKM14/KDS3-MT/PPA/PLC (for 8 channels) FLKM 50/KDS3-MT/PPA/PLC (for 32 channels)

- Byte-wise labeling
- Can be used for digital I/O modules

FLKM-2FLK14/KDS3-MT/PPA/S7

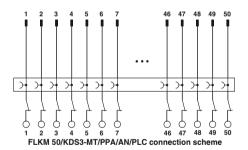
- Numerical labeling (1-20)
- Specially for S7-300 (in conjunction with the front adapter FLKM 14-PA-S300, Order No.: 2299770)

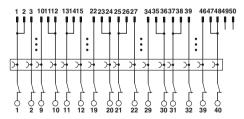
FLKM 50/KDS3-MT/PPA/7-300

- Numerical labeling (1-40)
- Specially for S7-300 (in conjunction with the front adapter FLKM 50-PA-S300, Order No.: 2294445).

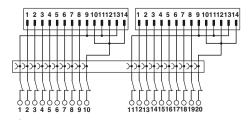
FLKM 50/KDS3-MT/PPA/AN/PLC

- Numerical labeling (1-50)
- Specially for S7-400 (in conjunction with the front adapter FLKM 50-PA-S400 (3-48) Order No.: 2294908).





FLKM 50/KDS3-MT/PPA/S7-300 connection scheme



FLKM-2FLK14/KDS3-MT/PPA/S7 connection scheme

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations

Connection method

Control system level

Connection data solid / stranded / AWG Dimensions

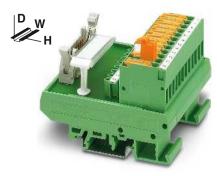
No. of Module width Description pos.

VARIOFACE interface module, for eight channels, with knife disconnect terminal blocks and test sockets to the field and the system VARIOFACE interface module, for 32 channels, with knife disconnect terminal blocks and test sockets to the field and the system VARIOFACE interface module, for SIMATIC S7-300 with SIMATIC-specific labeling (1-20), knife disconnect terminal blocks, and test sockets to the field and the system

14 113 mm VARIOFACE interface module, same as before, however, with SIMATIC-specific labeling (1-40)

VARIOFACE interface module, same as before, however, for SIMATIC S7-400 with SIMATIC-specific labeling (3-48)

259 mm



Passive interface modules for 8 or 32 channels with knife disconnect terminal blocks



Field level

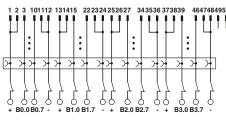
H/D

Technical data FLKM...14/KDS 3-MT... FLKM 50/KDS 3-MT... 60 V DC 60 V DC 1 A 2 A (per byte) 0.8 kV 0.8 kV -20°C ... 50°C -20°C ... 50°C Any Any IEC 60664, DIN EN 50178, IEC 62103 Screw connection with Screw connection with disconnect knife

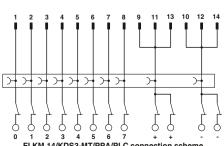
IDC/FLK pin strip (2.54 mm) IDC/FLK pin strip (2.54 mm)

 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

77 mm / 61 mm		
Ordering data	a	
Туре	Order No.	Pcs. / Pkt.
FLKM 14/KDS3-MT/PPA/PLC	2290423	1
FLKM 50/KDS3-MT/PPA/PLC	2290614	1
FLKM-2FLK14/KDS3-MT/PPA/S7	2295062	1
FLKM 50/KDS3-MT/PPA/S7-300	2304490	1
FLKM 50/KDS3-MT/PPA/AN/PLC	2291587	1



FLKM 50/KDS3-MT/PPA/PLC connection scheme



A/PLC connection scheme

Simulation module with switches

These VARIOFACE modules enable simple simulation of the control and peripheral hardware for 8 signals.

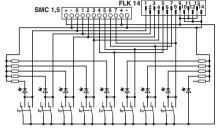
The UM 45-DI/DO/S/LA/SIM8 switch module is assembled for signal transmission with COMBICON screw connector for single-conductor wiring. Alternatively, connection to the PLC system cabling is established through a 14-pos. flat-ribbon cable pin strip. Connection to the front adapters of the PLC system cabling is established through 14-pos. system cables with socket strips.

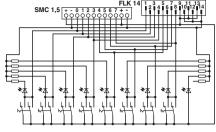
Each signal path is allocated an LED which signals the "high active" signal state. The supply voltage to the modules is signaled via a green LED.

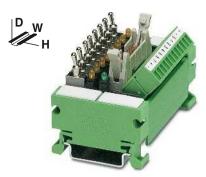
Type of housing:

Terminal blocks: Polyamide PA non-reinforced, color: green. Housing: PVC

Marking systems and mounting material See Catalog 5







Switch module

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position

Standards/regulations

Connection data solid / stranded / AWG

H/D Dimensions

Description	No. of pos.	Module width W
VARIOFACE switch module for simulati	ion	

75 mm

1 A 8 A (+, - terminal block) 0.8 kV -20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16 45 mm / 51 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
UM 45-DI/DO/S/LA/SIM8	2968205	1	

Simulation module for display

These VARIOFACE modules enable simple simulation of the control and peripheral hardware for 8 signals.

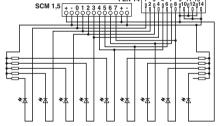
The UM 45-DO/LA/SIM8 display module is assembled for signal transmission with COMBICON screw connector for singleconductor wiring. Alternatively, connection to the PLC system cabling is established through a 14-pos. flat-ribbon cable pin strip. Connection to the front adapters of the PLC system cabling is established through 14-pos. system cables with socket strips.

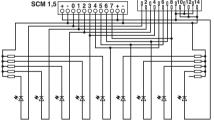
Each signal path is allocated an LED which signals the "high active" signal state. The supply voltage to the modules is signaled via a green LED.

Type of housing:

Terminal blocks: Polyamide PA non-reinforced, color: green. Housing: PVC

Marking systems and mounting material See Catalog 5

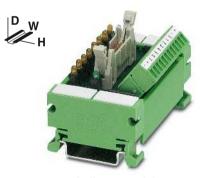




Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection data solid / stranded / AWG

Dimensions

Module width No. of Description VARIOFACE display module, for simulation



Indicator module

Technical data

24 V DC 8 A (+, - terminal block) 0.8 kV -20°C ... 50°C

H/D

75 mm

IEC 60664, DIN EN 50178, IEC 62103 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16 45 mm / 51 mm

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UM 45-DO/LA/SIM8 2968195 1				

Adapter for PLC-INTERFACE (6.2 mm)

PLC-V8/... are the VARIOFACE adapters connecting the eight slim 6.2 mm PLC-INTERFACE modules to the VARIOFACE system cabling:

- Can be plugged into the bridge shafts of eight aligned PLC-INTERFACE modules
- Freely definable configuration with relays, optocouplers, and passive feed-through terminal blocks
- With D-SUB connection as an option for universal connections

For cross-reference list with matching PLC-INTERFACE modules,



VARIOFACE adapter for 6.2 mm PLC-INTERFACE

(I) (I) (I) (II)

24 V DC ±25%

-40°C ... 70°C

1 A (per signal path)

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Standards/regulations

Connection method

Connection data solid / stranded / AWG Dimensions

Power supply

H/D

Screw connection Signal level IDC/FLK pin strip (2.54 mm)

0.8 kV

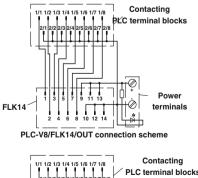
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

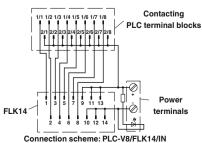
IEC 60664, DIN EN 50178, IEC 62103

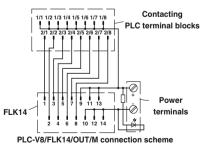
100 mm / 94 mm

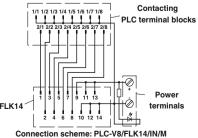
Description	No. of pos.	Module width W		
V8 adapter, for 8 PLC interfaces (6.2 mm), with FLK connection, for PLC system cabling, positive switching				
OUTPUT	14	49.6 mm		
INPUT	14	49.6 mm		
V8 adapter, for 8 PLC interfaces (6.2 mm), with FLK connection, for PLC system cabling, negative switching				
OUTPUT	14	49.6 mm		
INPUT	14	49.6 mm		
V8 output adapter , for 8 PLC interfaces (6 15-pos. D-SUB connection	6.2 mm), v	vith		
Pin strip	15	49.6 mm		
Socket strip	15	49.6 mm		
V8 input adapter, for 8 PLC interfaces (6.2 mm), with 15-pos. D-SUB connection				
Pin strip	15	49.6 mm		
Socket strip	15	49.6 mm		

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
PLC-V8/FLK14/OUT	2295554	1		
PLC-V8/FLK14/IN	2296553	1		
PLC-V8/FLK14/OUT/M	2304102	1		
PLC-V8/FLK14/IN/M	2304115	1		
PLC-V8/D15S/OUT	2296058	1		
PLC-V8/D15B/OUT	2296061	1		
PLC-V8/D15S/IN	2296074	1		
PLC-V8/D15B/IN	2296087	1		









Adapter for PLC-INTERFACE (14 mm)

PLC-V8L/... are the VARIOFACE adapters connecting the eight 14 mm PLC-INTERFACE modules (2 PDT, HC, and IC types) to the system cabling:

- Can be plugged into the bridge shafts of eight aligned PLC-INTERFACE modules
- Freely selectable assembly with relays or optocouplers

For cross-reference list with matching PLC-INTERFACE modules, see page 488



VARIOFACE adapter for 14 mm PLC-INTERFACE



24 V DC ±25%

Technical data

Max. perm. operating voltage Max. perm. current (per branch) Max total current (voltage supply) Rated surge voltage Ambient temperature (operation) Mounting position Standards/regulations Connection method

Connection data solid / stranded / AWG

Dimensions

Power supply Signal level

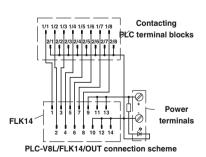
H/D

1 A (per signal path) 0.8 kV -40°C ... 70°C Any IEC 60664, DIN EN 50178, IEC 62103 Screw connection IDC/FLK pin strip (2.54 mm)

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 100 mm / 94 mm

		Ordering data	a	
No. of Mod pos.	ule width W	Туре	Order No.	Pcs. / Pkt.
LC interfaces (14 mm), with PLC system cabling, positive switch i	ing			
14 1	12.3 mm	PLC-V8L/FLK14/OUT	2299660	1
LC interfaces (14 mm), with PLC system cabling, negative switch	ing			
14 1	12.3 mm	PLC-V8L/FLK14/OUT/M	2304306	1

Description V8 adapter, for 8 PL FLK connection, for V8 adapter, for 8 PL FLK connection, for



Contacting 1/1 1/2 1/3 1/4 1/5 1/6 1/7 1/8 **PLC** terminal blocks Power terminals PLC-V8L/FLK14/OUT/M connection scheme

Feed-through terminal blocks for **PLC-INTERFACE**

The VARIOFACE PLC-VT terminals are passive feed-through terminal blocks, with the same shape as the 6.2 mm slim relay and PLC-INTERFACE optocoupler interfaces. This makes it possible to implement 8-channel interface blocks for the system cabling, which can be adapted to a bit for the particular application. For individual requirements, the relay, optocoupler or the PLC-VT terminal blocks for passive signal transmission can be combined as needed.

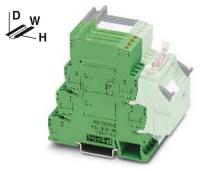
PLC-VT PLC-VT/LA

- Can be combined with PLC-INTERFACE universal series
- Signal path with additional potential level for free assignment (two-conductor connection)
- Optionally with LED

Max. perm. operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations Connection data solid / stranded / AWG

Dimensions

Description	No. of pos.	Module width W	
VARIOFACE feed-through terminal block (two-conductor			
connection), for PLC-INTERFACE university	sai series		
		6.2 mm	
VARIOFACE feed-through terminal blo	ock, same a	as before,	
however, with 24 V DC light indicator			
		6.2 mm	



VARIOFACE feed-through terminal blocks for **PLC-INTERFACE** universal series



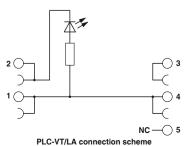
H/D

Technical data				
PLC-VT max. 250 V AC/DC 6 A (per signal conductor) -40°C 70°C Any	PLC-VT/LA 24 V DC 6 A (per signal conductor) -40°C 70°C Any			
DIN EN 50178, IEC 62103 0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12				
80 mm / 94 mm				

00 111117 04 111111			
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PLC-VT	2296870	10	
PLC-VT/LA	2296854	10	



PLC-VT connection scheme

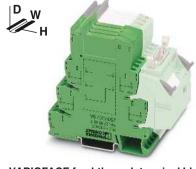


Feed-through terminal blocks for **PLC-INTERFACE**

The VARIOFACE PLC-VT terminals are passive feed-through terminal blocks, with the same shape as the 6.2 mm slim relay and PLC-INTERFACE optocoupler interfaces. This makes it possible to implement 8-channel interface blocks for the system cabling, which can be adapted to a bit for the particular application. For individual requirements, the relay, optocoupler or the PLC-VT terminal blocks for passive signal transmission can be combined as needed.

PLC-VT/ACT PLC-VT/ACT/LA

- Can be combined with PLC-INTERFACE actuator series
- Signal path with two additional potential levels for free assignment (three-conductor connection)
- Optionally with LED The system connection is made via the PLC-V8 adapter.



VARIOFACE feed-through terminal blocks for **PLC-INTERFACE** actuator series

.**S.L**us (P.] (EL

80 mm / 94 mm

6.2 mm

Technical data PLC-VT/AKT PLC-VT/AKT/LA max. 250 V AC/DC 24 V DC 6 A (per signal conductor) 6 A (per signal conductor) -40°C ... 70°C -40°C ... 70°C DIN EN 50178, IEC 62103 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

No. of Module width Description pos VARIOFACE feed-through terminal block (three-conductor connection), for PLC-INTERFACE actuator series 6.2 mm VARIOFACE feed-through terminal block, same as before,

Max. perm. operating voltage

Max. perm. current (per branch)

Ambient temperature (operation)

Connection data solid / stranded / AWG

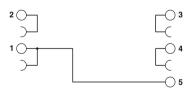
however, with 24 V DC light indicator

Mounting position

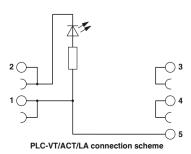
Dimensions

Standards/regulations

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
PLC-VT/ACT	2295567	10	
PLC-VT/ACT/LA	2296867	10	



PLC-VT/ACT connection scheme



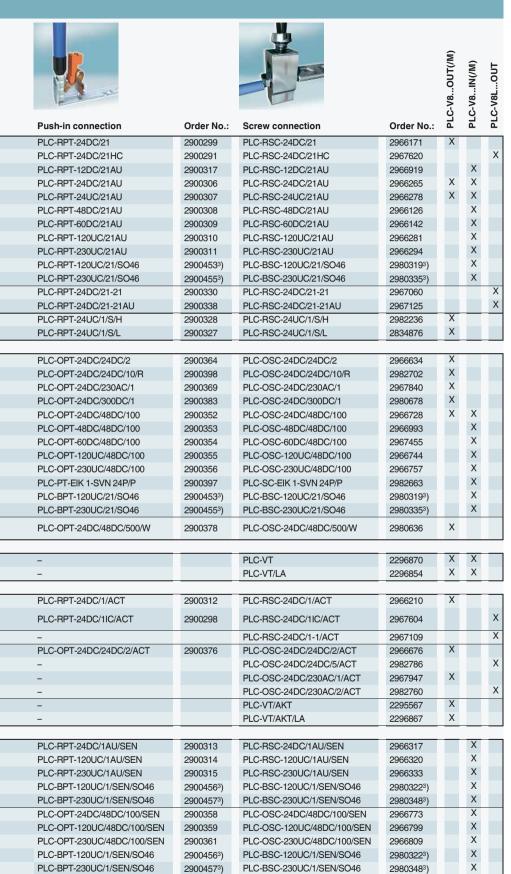
Cross-reference list for PLC-V8 adapters with matching PLC-INTERFACE modules

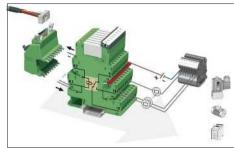
Series



Function	Contact	Input	Output	Page	Spring-cage connection	Order No.:
		24 V DC	250 V AC/DC / 6 A	322	PLC-RSP-24DC/21	2966472
		24 V DC	250 V AC/DC / 10 A	333	PLC-RSP-24DC/21HC	2912277
		12 V DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-12DC/21AU	2967442
		24 V DC			PLC-RSP-24DC/21AU	2966540
			30 V AC/36 V DC / 50 mA	323		2966553
	4 DDT	24 V AC/DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-24UC/21AU	
	1 PDT	48 V DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-48DC/21AU	2966566
Relay		60 V DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-60DC/21AU	2966579
		120 V AC/DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-120UC/21AU	2966582
		230 V AC/DC	30 V AC/36 V DC / 50 mA	323	PLC-RSP-230UC/21AU	2966647
		120 V AC	30 V AC/36 V DC / 50 mA1)	334	PLC-BSP-120UC/21/SO46	29803513)
		230 V AC	30 V AC/36 V DC / 50 mA1)	334	PLC-BSP-230UC/21/SO46	29803773)
	2 PDTs	24 V DC	250 V AC/DC / 6 A	323	PLC-RSP-24DC/21-21	2912507
	21013	24 V DC	30 V AC/DC / 50 mA	323	PLC-RSP-24DC/21-21AU	2912578
Deleviousitele	1 N/O contest	24 V AC/DC	250 V AC/DC / 6 A	350	PLC-RSP-24UC/1/S/H	2982249
Relay switch	1 N/O contact	24 V AC/DC	250 V AC/DC / 6 A	350	PLC-RSP-24UC/1/S/L	2834889
		24 V DC	24 V DC / 3 A	325	PLC-OSP-24DC/24DC/2	2967471
		24 V DC	24 V DC / 10 A	353	PLC-OSP-24DC/24DC/10/R	2982715
		24 V DC	250 V AC / 0.75 A	325	PLC-OSP-24DC/230AC/1	2967895
		24 V DC	300 V DC / 1 A	352	PLC-OSP-24DC/300DC/1	2980830
		24 V DC	48 V DC / 100 mA	324	PLC-OSP-24DC/48DC/100	2967549
	1 N/O contest electronic	48 V DC	48 V DC / 100 mA	324	PLC-OSP-48DC/48DC/100	2967743
Optocoupler	1 N/O contact, electronic	60 V DC	48 V DC / 100 mA	324	PLC-OSP-60DC/48DC/100	2967756
Optocouplei		120 V AC/DC	48 V DC / 100 mA	324	PLC-OSP-120UC/48DC/100	2967552
		230 V AC/DC	48 V DC / 100 mA	324	PLC-OSP-230UC/48DC/100	2967565
		NAMUR	24 V DC / 50 mA	364	PLC-SP-EIK 1-SVN 24P/P	2982676
		120 V AC	48 V DC / 100 mA ²)	334	PLC-BSP-120UC/21/SO46	2980351 ³)
		230 V AC	48 V DC / 100 mA ²)	334	PLC-BSP-230UC/21/SO46	2980377 ³)
	1 PDT, electronic	24 V DC	48 V DC / 0.5 A	353	PLC-OSP-24DC/48DC/500/W	2980649
	TT D1, electronic	24 V DO	40 V DO7 0.3 A	000	1 EO-OS1 -24DO/40DO/300/VV	2900049
		250 V AC/DC	250 V AC/DC	486		
Feed-through	-				-	
		24 V DC	24 V DC	486	-	
		24 V DC	250 V AC/DC / 6 A	326	PLC-RSP-24DC/1/ACT	2967345
	1 N/O contact		250 V AC/DC / 10 A			
Relay		24 V DC	(80 A; 20 ms)	332	PLC-RSP-24DC/1IC/ACT	2912413
	2 N/O contacts	24 V DC	250 V AC/DC / 6 A	327	-	
	2 N/O contacts	24 V DC 24 V DC		327 327	PLC-OSP-24DC/24DC/2/ACT	2967507
Ontonomics			250 V AC/DC / 6 A		PLC-OSP-24DC/24DC/2/ACT	2967507
Optocoupler	2 N/O contacts 1 N/O contact, electronic	24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A	327		2967507
Optocoupler		24 V DC 24 V DC	250 V AC/DC/6 A 24 V DC/3 A 24 V DC/5 A	327 328		2967507
		24 V DC 24 V DC 24 V DC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A	327 328 327 328		2967507
Optocoupler Feed-through		24 V DC 24 V DC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A	327 328 327		2967507
		24 V DC 24 V DC 24 V DC 24 V DC 250 V AC/DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC	327 328 327 328 487	-	2967507
		24 V DC 24 V DC 24 V DC 24 V DC 250 V AC/DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC	327 328 327 328 487	-	2967507
		24 V DC 24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC	327 328 327 328 487 487	- - - -	
		24 V DC 24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA	327 328 327 328 487 487		2967374
Feed-through	1 N/O contact, electronic	24 V DC 24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 120 V AC/DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA	327 328 327 328 487 487 330 330	PLC-RSP-24DC/1AU/SEN PLC-RSP-120UC/1AU/SEN	2967374 2967390
Feed-through	1 N/O contact, electronic	24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 24 V DC 120 V AC/DC 230 V AC/DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA	327 328 327 328 487 487 330 330 330	PLC-RSP-24DC/1AU/SEN PLC-RSP-120UC/1AU/SEN PLC-RSP-230UC/1AU/SEN	2967374 2967390 2967413
Feed-through	1 N/O contact, electronic	24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 220 V AC/DC 230 V AC/DC 230 V AC/DC 230 V AC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA ¹) 30 V AC/36 V DC / 50 mA ¹)	327 328 327 328 487 487 330 330 330 335 335	PLC-RSP-24DC/1AU/SEN PLC-RSP-120UC/1AU/SEN PLC-RSP-230UC/1AU/SEN PLC-BSP-120UC/1/SEN/SO46 PLC-BSP-230UC/1/SEN/SO46	2967374 2967390 2967413 2980364 ³)
Feed-through	1 N/O contact, electronic	24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 220 V AC/DC 230 V AC/DC 230 V AC 230 V AC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA ¹) 30 V AC/36 V DC / 50 mA ¹)	327 328 327 328 487 487 330 330 330 335 335 331		2967374 2967390 2967413 2980364 ³) 2980380 ³) 2967578
Feed-through Relay	1 N/O contact, electronic - 1 N/O contact	24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 22 V DC 120 V AC/DC 120 V AC 230 V AC 230 V AC 24 V DC 120 V AC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 48 V DC / 100 mA 48 V DC / 100 mA	327 328 327 328 487 487 330 330 330 335 335 331 331		2967374 2967390 2967413 2980364 ³) 2980380 ³) 2967578 2967581
Feed-through	1 N/O contact, electronic	24 V DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 250 V AC/DC 24 V DC 24 V DC 220 V AC/DC 230 V AC/DC 230 V AC 230 V AC 24 V DC	250 V AC/DC / 6 A 24 V DC / 3 A 24 V DC / 5 A 250 V AC / 0.75 A 250 V AC / 2 A 250 V AC/DC 24 V DC 30 V AC/36 V DC / 50 mA 30 V AC/36 V DC / 50 mA ¹) 30 V AC/36 V DC / 50 mA ¹)	327 328 327 328 487 487 330 330 330 335 335 331		2967374 2967390 2967413 2980364 ³) 2980380 ³) 2967578

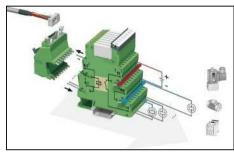
Plug-in miniature relay insert: REL-MR-60DC/21AU, 2961134
 Plug-in solid-state relay insert: OPT-60DC/48DC/100, 2966621
 PLC-...SO46 is supplied as a basic terminal block with filter, but without relay or solid-state relay.
 Cannot be combined with the universal series (within a byte)





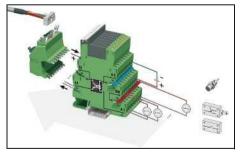
PLC universal series

The universal series of products can be used as either input or output interfaces. Each product consists of a basic terminal block with a plug-in miniature relay (PDT contact) or a plug-in solid-state relay.



PLC actuator series

When used as an interface between the PLC and actuators, such as motors, contactors or solenoid valves, only one N/O contact function is normally required. In such cases, the PLC...ACT output interface is used. All actuator connections, including the load return line, are connected directly. This eliminates the need for additional output terminal blocks.



PLC sensor series

When used as an interface between the PLC and sensors, such as proximity switches, limit switches or auxiliary contacts, only one N/O contact function is normally required. In such cases, the PLC...SEN input interface is used. All sensor connections, including the supply voltage for the sensors/switches, are connected directly. This eliminates the need for additional modular terminal blocks.

COMPACT-LINE output modules with relays, one N/O contact

These VARIOFACE Compact Line output modules are used in combination with the respective front adapters.

Like the front adapters, the modules are connected via 14-pos. or 50-pos. system cables. The following features characterize these relay modules:

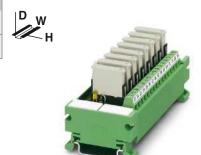
- Plug-in miniature relays, each with an N/O contact
- Universal applications from 1 mA to 3 A continuous current through 2-layer double contact with hard gold plating
- Low construction height of only 45 mm
- LED status display for each signal path and supply voltage
- Freewheeling and reverse polarity protection diode for each signal path.

With the 32-channel version, the system cable is connected to the UM 45-16RM/MR-G24/1/PLC 16-channel base module. The UM 45-16RM/MR-G24/1/E/PLC output extension module with a further 16 channels is coupled to the base module via a 20-pos. flat-ribbon cable (length: 10 cm).

Notes:

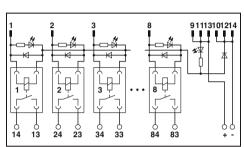
The connection cable between the base and the extension

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



Output module with eight miniature relays, 1 N/O contact





Coil side	
Operating voltage U _N	
Typ. input current at U _N	
Typ. response time at U _N	
Typ. release time at U _N	
Input circuit	
Status display/channel	
Connection method	
No. of pos.	
Contact side	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Max. inrush current	
Limiting continuous current	
Min. switching current	
Max. interrupting rating:	24 V DC
	48 V DC

60 V DC 110 V DC 50 W 250 V AC 750 VA

Connection method Connection data solid / stranded / AWG

Test voltage Ambient temperature (operation) Nominal operating mode

General data

Mechanical service life Standards/regulations Mounting position

Plug-in miniature relays

Mounting Dimensions Technical data

24 V DC 6.5 mA 5 ms 15 ms

Freewheeling diode, Protection against polarity reversal

IDC/FLK pin strip (2.54 mm)

1 N/O contact (double contact) AgNi, 5 µm hard gold-plated 250 V AC / 125 V DC 5 A

3 A 1 mA 72 W 60 W 50 W

> Screw connection $0.14 \dots 1.5 \, \text{mm}^2 \, / \, 0.14 \dots 1.5 \, \text{mm}^2 \, / \, 26 - 14$

2 kV AC (50 Hz, 1 min.) -20°C ... 50°C 100% operating factor

IEC 60664, DIN EN 50178, IEC 62103

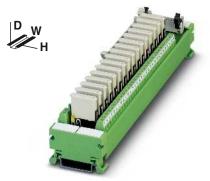
H/D

2 x 107 cycles

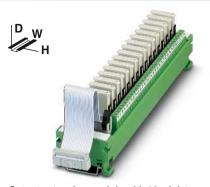
In rows with zero spacing 45 mm / 50 mm

Description	Module width W
VARIOFACE COMPACT LINE output module, for	
24 V DC (including relays)	
- With 8 miniature relays	103
- With 16 miniature relays	215
VARIOFACE COMPACT LINE output extension in 24 V DC (including relays)	nodule, for
- With 16 miniature relays	200

Ordering data		
Туре	Order No.	Pcs. / Pkt.
UM 45- 8RM/MR-G24/1/PLC	2962900	1
Accessories		
REL-MR-G 24/1	2961037	8



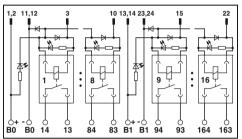
Output base module with 16 miniature relays, 1 N/O contact

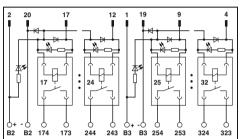


Output extension module with 16 miniature relays, one N/O contact

PG







Technical data
24 V DC
6.5 mA
5 ms
15 ms
Freewheeling diode, Protection against polarity reversal
Yellow LED
IDC/FLK pin strip (2.54 mm)
50
1 N/O contest (devible contest)

1 N/O contact (double contact) AgNi, 5 µm hard gold-plated 250 V AC / 125 V DC 5 V 5 A 3 A 1 mA 72 W 60 W 50 W 50 W 750 VA Screw connection 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 14 2 kV (50 Hz, 1 min.)

-20°C ... 50°C 100% operating factor 2 x 107 cycles IEC 60664, DIN EN 50178, IEC 62103 In rows with zero spacing 45 mm / 50 mm

Technical	data

24 V DC 6.5 mA 5 ms 15 ms Freewheeling diode, Protection against polarity reversal Yellow LED IDC/FLK pin strip (2.54 mm) 20

1 N/O contact (double contact) AgNi, 5 µm hard gold-plated 250 V AC / 125 V DC 5 A 3 A 1 mA 72 W 60 W 50 W 50 W 750 VA Screw connection 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 14

2 kV (50 Hz, 1 min.) -20°C ... 50°C 100% operating factor 2 x 107 cycles IEC 60664, DIN EN 50178, IEC 62103 In rows with zero spacing

45 mm / 50 mm

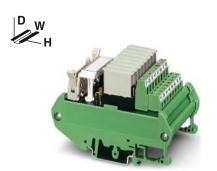
45 11111/ 50 111111		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
UM 45-16RM/MR-G24/1/PLC	2962913	1
Accessories		
REL-MR-G 24/1	2961037	8

Ordering data		
Туре	Order No.	Pcs. / Pkt.
UM 45-16RM/MR-G24/1/E/PLC	2962926	1
Accessories		
REL-MR-G 24/1	2961037	8

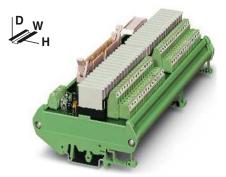
Output modules with relays, one N/O contact

These VARIOFACE output modules are used in combination with the respective front adapters.

- Plug-in miniature relays, each with an N/O contact
- Universal applications from 1 mA to 3 A continuous current through 2-layer double contact with hard gold plating
- Slim construction widths of only 55 mm (8 channels) or 202 mm (32 channels)
- LED status display for each signal path and supply voltage
- Freewheeling and reverse polarity protection diode for each signal path.



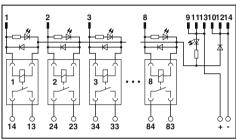
Output module with eight miniature relays, 1 N/O contact

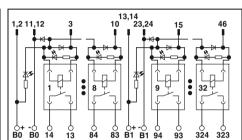


Output modules with 32 miniature relays, 1 N/O contact

20 su **12** s

c**SN**us 🖭





Coil side	
Operating voltage U _N	
Typ. input current at U _N	
Typ. response time at U _N	
Typ. release time at U_N	
Input circuit	
Status display/channel	
Connection method	
No. of pos.	
Contact side	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Max. inrush current	
Limiting continuous current	
Min. switching current	
Max. interrupting rating:	24 V DC
	48 V DC
	60 V DC
	110 V DC
	250 V AC
Connection method	
Connection data solid / stranded / AWG	
General data	
Test voltage	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Standards/regulations	
Mounting position	
Mounting	11.15
Dimensions	H/D

	Technical data
	24 V DC 6.5 mA 5 ms 15 ms Freewheeling diode, Protection against polarity reversal Yellow LED IDC/FLK pin strip (2.54 mm)
/ DC / DC / DC / DC / DC / AC	1 N/O contact (double contact) AgNi, 5 µm hard gold-plated 250 V AC / 125 V DC 5 V 5 A 3 A 1 mA 72 W 60 W 50 W 50 W 750 VA Screw connection 0.14 1.5 mm² / 0.14 1.5 mm² / 26 - 14
	014/40
H/D_	3 kV AC -20°C 50°C 100% operating factor 2 x 107 cycles IEC 60664, DIN EN 50178, IEC 62103 Any In rows with zero spacing 90 mm / 58 mm
	Ordering data

Technical data	
24 V DC 6.5 mA 5 ms 15 ms Freewheeling diode, Protection against polarity reversal Yellow LED IDC/FLK pin strip (2.54 mm) 50	
1 N/O contact (double contact) AgNi, 5 µm hard gold-plated 250 V AC / 125 V DC 5 V 5 A 3 A 1 mA 72 W 60 W 50 W 50 W 50 W 50 W 50 W 750 VA Screw connection 0.14 1.5 mm² / 0.14 1.5 mm² / 26 - 16	
3 kV AC -20°C 50°C 100% operating factor 2 x 107 cycles	

Description	Module width W
VARIOFACE output module , with 8 miniation 24 V DC (including relays)	ture relays, plugged in,
	56
VARIOFACE output module, with 32 miniature relays, plugged in, for 24 V DC (including relays)	
	202
	_
Plug-in miniature relays	

90 mm / 58 mm		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
UMK- 8 RM/MR-G24/ 1/PLC	2979469	1
Accessories		
Accessories		
REL-MR-G 24/1	2961037	8

90 mm / 58 mm		
Ordering data		
Туре	Order No.	Pcs. / Pkt.
UMK-32 RM/MR-G24/1/PLC	2979472	1
Accessories		
REL-MR-G 24/1	2961037	8

IEC 60664, DIN EN 50178, IEC 62103

In rows with zero spacing

Output modules with relay, 1 PDT

These VARIOFACE output modules are used in combination with the respective front adapters.

Like the front adapters, the modules are connected via 14-pos. or 50-pos. system cables. The following features characterize these relay modules:

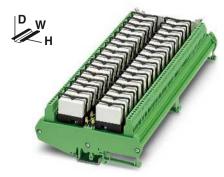
- Plug-in miniature relays, each with a PDT contact
- Slim construction widths of only 80 mm (8 channels) or 271 mm (32 channels)
- LED status display for each signal path and supply voltage
- Freewheeling diode for each signal path



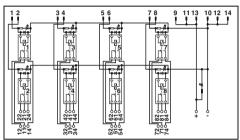
1) EMC: Class A product, see page 571



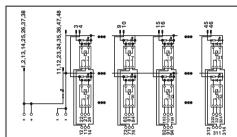
Output module with eight miniature relays, 1 PDT



Output module with 32 miniature relays, 1 PDT



Technical data



Coil side	
Operating voltage U _N	
Typ. input current at U _N	
Typ. response time at U _N	
Typ. release time at U _N	
Input circuit	
Status display/channel	
Connection method	
No. of pos.	
Contact side	
Contact type Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Min. switching current	
Max. interrupting rating:	24 V DC
	48 V DC
	60 V DC
	110 V DC
	220 V DC
	250 V AC
Connection method	
Connection data solid / stranded / AWG	
General data	
Test voltage	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Standards/regulations	
Mounting position Mounting	
Dimensions	H/D

Description	Module width W
VARIOFACE output module, with 8 miniatu for 24 V DC (including relays)	ire relays, plugged in,
VARIOFACE output module, with 32 miniate for 24 V DC (including relays)	
	271
Plug-in miniature relays	

24 V DC 18 mA 8 ms 10 ms Freewheeling diode Yellow LED IDC/FLK pin strip (2.54 mm) 14	24 18 8 19 F Y IE
Single contact, 1-PDT AgNi 250 V AC/DC 12 V AC/DC 5 A 100 mA 120 W 58 W 48 W 50 W 80 W 1250 VA Screw connection	S A 2: 1: 5: 5: 4: 5: 8: 8: 1: S
0.2 4 mm² / 0.2 2.5 mm² / 24 - 12 2.5 kV (50 Hz, 1 min.) -20°C 50°C 100% operating factor	2. -2
0 - 407 1	_

AgNi		
250 V AC/DC		
12 V AC/DC		
5 A		
100 mA		
120 W		
58 W		
48 W		
50 W		
80 W		
1250 VA		
Screw connection		
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12		
2.5 kV (50 Hz, 1 min.)		
-20°C 50°C		
100% operating factor		
3 x 10 ⁷ cycles		
IEC 60664, DIN EN 50178, IEC 62103		
Any		
In rows with zero spacing		
123 mm / 68 mm		
Ordering data	а	
Ordering dat	u	
Tuno	Order No.	Pcs./
Туре	Order No.	Pkt.

Accessories

UM- 8 RM/RT-G24/21/PLC

REL-MR- 24DC/21HC

Technical data
24 V DC 18 mA 8 ms 10 ms Freewheeling diode Yellow LED IDC/FLK pin strip (2.54 mm) 50
Single contact, 1-PDT AgNi 250 V AC/DC 12 V AC/DC 5 A 100 mA 120 W 58 W 48 W 50 W 80 W 1250 VA Screw connection 0.2 4 mm² / 0.2 2.5 mm² / 24 - 12
2.5 kV (50 Hz, 1 min.) -20°C 50°C 100% operating factor 3 x 10 ⁷ cycles IEC 60664, DIN EN 50178, IEC 62103

	Ordering dat	а	
Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
1			
	UM-32 RM/RT-G24/21/PLC ¹)	2968373	1
	Accessories	;	
10	REL-MR- 24DC/21HC	2961312	10

In rows with zero spacing 123 mm / 68 mm

2968386

2961312

Output modules with relay, 1 PDT

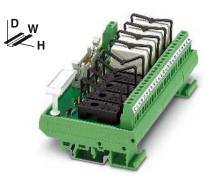
These VARIOFACE output modules are used in combination with the respective front adapters.

Like the front adapters, the modules are connected via 14-pos. or 50-pos. system cables. The following features characterize these relay modules:

- Plug-in miniature relays, each with a PDT contact
- LED status display for each signal path and supply voltage
- Freewheeling and reverse polarity protection diode for each signal path.

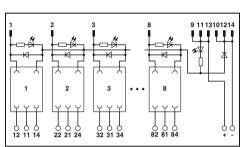
With the 32-channel version, the system cable is connected to the 16-channel UMK-16R.../KSR-G24/21/PLC base module. The UMK-16R.../KSR-G24/21/E/PLC output extension module with a further 16 channels is coupled to the base module via a 20-pos. flat-ribbon cable (length: 10 cm).

The connection cable between the base and the extension modules is delivered with the extension unit.



Output module with eight miniature relays, 1 PDT





Coil side

Operating voltage U_N

Input circuit

Operating voltage display

Status display/channel Connection method

No. of pos.

Contact side

Contact type

Max. switching voltage

Limiting continuous current

Connection method

Connection data solid / stranded / AWG

General data

Test voltage

Ambient temperature (operation)

Standards/regulations

Plug-in miniature relays

Mounting position Mounting

Dimensions

H/D

Technical data

24 V DC ±10%

Freewheeling diode, Protection against polarity reversal Green LED

Yellow LED

IDC/FLK pin strip (2.54 mm)

1 PDT

250 V AC/DC

5 A

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz. 1 min.)

-20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103

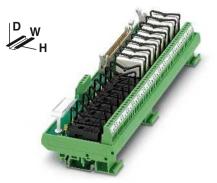
Any

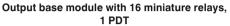
In rows with zero spacing

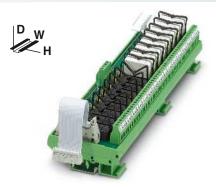
77 mm / 59 mm

Description Module widt
V
VARIOFACE output module, with 8 miniature relays, plugged in, for 24 V DC (including relays)
13
VARIOFACE output module, with plug-in bases for eight miniature relays, for 24 V DC (without relays)
13
VARIOFACE output module, with 16 miniature relays, plugged in for 24 V DC (base module, including relays)
25
VARIOFACE output module, with plug-in bases for 16 miniature relays, for 24 V DC (base module, without relays)
25
VARIOFACE output extension module, with 16 miniature relays plugged in, for 24 V DC (including relays)
25:
VARIOFACE output extension module, with plug-in bases for 16 miniature relays, for 24 V DC (without relays)

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
UMK- 8 RM/KSR-G 24/21/PLC	2979485	1
UMK- 8 RELS/KSR-G24/21/PLC	2974914	1
Accessories		
REL-MR- 24DC/21HC	2961312	10

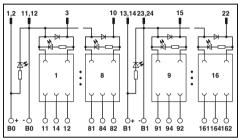


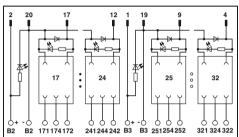




Output extension module with 16 miniature relays, 1 PDT







Technical data

24 V DC ±10%

Freewheeling diode, Protection against polarity reversal

Green LED Yellow LED

IDC/FLK pin strip (2.54 mm)

1 PDT

250 V AC/DC 5 A

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.)

-20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103

In rows with zero spacing

Technical data

24 V DC ±10%

Freewheeling diode, Protection against polarity reversal

Green LED Yellow LED

.(U).

IDC/FLK pin strip (2.54 mm)

1 PDT

250 V AC/DC

5 A

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.)

-20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103

Any In rows with zero spacing

77 mm / 59 mm			77 mm / 59 mm		
Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UMK-16 RM/KSR-G 24/21/PLC	2979498	1			
UMK-16 RELS/KSR-G24/21/PLC	2974901	1			
			UMK-16 RM/KSR-G 24/21/E/PLC	2979508	1
			UMK-16 RELS/KSR-G24/21/E/PLC	2974891	1
Accessories	3		Accessorie	S	
REL-MR- 24DC/21HC	2961312	10	REL-MR- 24DC/21HC	2961312	10

Output module for relays

- 2 PDTs
- 1 PDT with disconnect terminal blocks

These VARIOFACE output modules are used in combination with the respective front adapters.

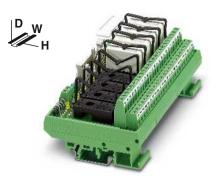
8 channels are controlled via 14-pos. cables. All modules feature the following:

- Plug-in miniature relays
- LED status indicator and freewheeling diode per signal path
- Supply voltage indicator (LED)
- Polarity protection diode

With the 32-channel version (1 PDT with knife disconnect terminal blocks), the 50-pos. system cable is connected to the base module with 16 channels.

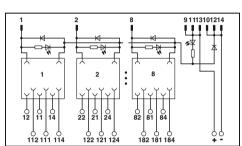
The output extension module with a further 16 channels is coupled to the base module via a 20-pos. flat-ribbon cable (length: 10 cm).

The connection cable between the base and the extension modules is delivered with the extension unit.



Output module for 8 miniature relays, 2 PDTs





	Technical data
 241470	

Operating voltage U_N Input circuit

Operating voltage display

Status display/channel

Connection method No. of pos.

Contact side

Coil side

Contact type

Max. switching voltage Limiting continuous current

Connection method

Connection data solid / stranded / AWG

General data

Test voltage

Ambient temperature (operation) Standards/regulations

Mounting position

Mounting

2 PDT 250 V AC/DC Screw connection 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 14

2.5 kV AC

Freewheeling diode

IDC/FLK pin strip (2.54 mm)

Green LED

Yellow LED

-20°C ... 50°C

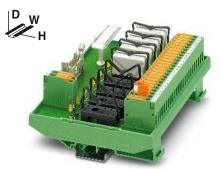
IEC 60664, DIN EN 50178, IEC 62103

Pcs /

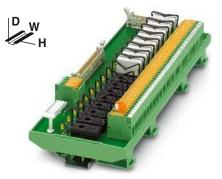
10

In rows with zero spacing

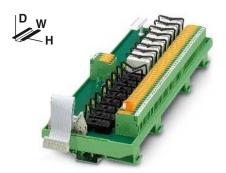
Dimensions	H/D	77 mm / 59 mm	
		Ordering date	ta
Description	Module width W	Туре	Order No.
VARIOFACE output module, with plug-in bases for eight miniature relays, for 24 V DC, each with two PD1 (without relays)	Гѕ		
	135	UMK- 8 RELS/KSR-G24/21-21/PLC	2976187
VARIOFACE output module, with plug-in bases for 8 miniature relays, for 24 V DC and knife disconnect to blocks, each with 1 PDT (without relays)			
VARIOFACE output module, with plug-in bases for 16 miniature relays, for 24 V DC and knife disconnect blocks, each with 1 PDT (without relays)	145 terminal		
	285		
VARIOFACE output extension module, with plug-ir 16 miniature relays, for 24 V DC and knife disconnect blocks, each with 1 PDT (without relays)	bases for		
	285		
		Accessories	S
Plug-in miniature relays		REL-MR- 24DC/21-21	2961192



Output module for 8 miniature relays with knife/disconnect terminal blocks, 1 PDT

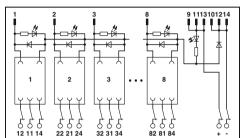


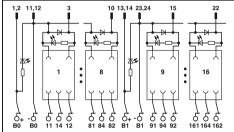
Output module for 16 miniature relays with knife/disconnect terminal blocks, 1 PDT



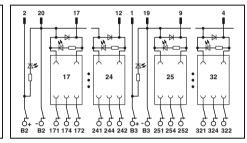
Output extension module for 16 miniature relays with knife/disconnect terminal blocks, 1 PDT







Technical data



Technical data

Technical data
24 V DC Freewheeling diode, Protection against polarity reversal Green LED Yellow LED IDC/FLK pin strip (2.54 mm) 14
1 PDT 250 V AC/DC 5 A Screw connection with disconnect knife 0.2 4 mm² / 0.2 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 In rows with zero spacing 111.5 mm / 59 mm

24 V DC Freewheeling diode Green LED Yellow LED IDC/FLK pin strip (2.54 mm) 1 PDT

PG

250 V AC/DC Screw connection with disconnect knife 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 2.5 kV (50 Hz, 1 min.)

IEC 60664, DIN EN 50178, IEC 62103 Any In rows with zero spacing 111.5 mm / 59 mm

-20°C ... 50°C

24 V DC
Freewheeling diode
Green LED
Yellow LED
IDC/FLK pin strip (2.54 mm)
20

P

1 PDT 250 V AC/DC Screw connection with disconnect knife 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 Any In rows with zero spacing 111.5 mm / 59 mm

Ordering data			Ordering date	ta		Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UM- 8 RELS/KSR-G24/21/MT/PLC	2962463	1						
			UM-16 RELS/KSR-G24/21/MT/PLC	2962382	1			
						UM-16 RELS/KSR-G24/21/E/MT/PLC	2962379	1
Accessories			Accessories	S		Accessories		
REL-MR- 24DC/21-21	2961192	10	REL-MR- 24DC/21-21	2961192	10	REL-MR- 24DC/21-21	2961192	10

Output modules with relays, 1 PDT with detectable manual operation

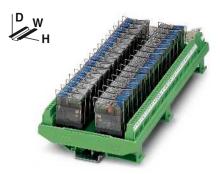
These VARIOFACE output modules are used in combination with the respective front adapters.

The modules are connected via a 14- or 50-pos. system cable. These relay modules offer the following features:

- Plug-in miniature relays each with a PDT contact and detectable manual operation
- Slim design width of just 92 mm (8 channels) or 285 mm (32 channels)
- LED status indicator and freewheeling diode per signal path (integrated in relay)
- Supply voltage indicator (LED)

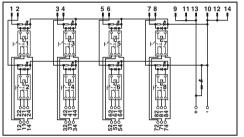


Output module with 8 miniature relays, 1 PDT with detectable manual operation



Output module with 32 miniature relays, 1 PDT with detectable manual operation





Technical data

+ 0	720 830 52 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	989 (100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1
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		reominar at
Coil side		
Operating voltage U _N		24 V DC
Typ. input current at U _N		18 mA
Typ. response time at U _N		9 ms
Typ. release time at U _N		6 ms
Input circuit		Freewheeling diode (integrated in relay)
Status display/channel		Yellow LED (integrated in relay)
Connection method		Flat-ribbon cable plug-in connector acco
No. of pos.		14
Contact side		
Contact type		Single contact, 1-PDT
Contact material		AgNi
Max. switching voltage		250 V AC/DC
Min. switching voltage		12 V AC/DC
Limiting continuous current		5 A
Min. switching current		100 mA
Max. interrupting rating:	24 V DC	120 W
	48 V DC	62 W
	60 V DC	42 W
	110 V DC	55 W
	220 V DC	66 W
	250 V AC	1250 VA
Connection method		Screw connection
Connection data solid / stranded / AWG		0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12
General data		
Rated insulation voltage		260 V AC
Rated surge voltage		4 kV
Pollution degree / Surge voltage category		2/111
Ambient temperature (operation)		-20°C 50°C
Nominal operating mode		100% operating factor
Mechanical service life		5 x 10 ⁶ cycles
Standards/regulations		DIN EN 50178
Mounting position		Any
Mounting		In rows with zero spacing
Dimensions	H/D	111 mm / 64 mm
		Ordering da

Yellow LED (integrated in relay) Flat-ribbon cable plug-in connector according to IEC 60603-13
14
Single contact, 1-PDT
AgNi
250 V AC/DC
12 V AC/DC 5 A
5 A 100 mA
120 W
62 W
42 W
55 W
66 W
1250 VA
Screw connection
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12
260 V AC 4 kV
2/III
-20°C 50°C
100% operating factor
5 x 10 ⁶ cycles
DIN EN 50178
Any
In rows with zero spacing
111 mm / 64 mm

+ 0	120 220 220 220 220 220 220 220 220 220	775 885 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	910 000 000 000 000 000 000 000 000 000	315 State of the s
	Тес	hnical d	ata	
24 V DC				
18 mA				

9 ms

Freewheeling diode (integrated in relay)

Yellow LED (integrated in relay)

In rows with zero spacing

Single contact, 1-PDT AgNi 250 V AC/DC 12 V AC/DC 5 A 100 mA 120 W 62 W 42 W 55 W 66 W 1250 VA Screw connection
0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12
260 V AC 4 kV 2 / III -20°C 50°C 100% operating factor 5 x 10° cycles DIN EN 50178

Flat-ribbon cable plug-in connector according to IEC 60603-13

Description	Module width W
VARIOFACE output module, with for 24 V DC (including relays)	8 miniature relays, plugged in,
, , , , , , ,	92
VARIOFACE output module, with a for 24 V DC (including relays)	32 miniature relays, plugged in,
	285
Plug-in miniature nower relays y	with nower contacts

111 mm / 64 mm				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UM- 8RM/KSR-G24/21/MS/PLC1)	2900890	1		
Accessories	,			
REL-MR- 24DC/21HC/MS	2987888	10		

111 mm / 64 mm				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UM-32RM/KSR-G24/21/MS/PLC ¹)	2900891	1		
Accessories	;			
REL-MR- 24DC/21HC/MS	2987888	10		

Output modules with relays, 1 PDT with or without manual operation and fuses

These VARIOFACE output modules are used in combination with the respective front adapters.

The modules are connected via a 14-pos. system cable. These relay modules offer the following features:

- Plug-in miniature relays each with a PDT contact with or without manual opera-
- Fuse per output circuit as short-circuit protection
- Slim design width of just 127 mm
- LED status indicator and freewheeling diode per signal path
- Supply voltage indicator (LED)
- Polarity protection diode



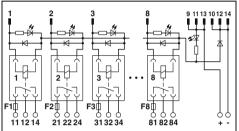
1) EMC: Class A product, see page 571



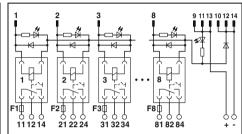
Output module with 8 miniature relays, 1 PDT and fuse per output circuit



Output module with 8 miniature relays, 1 PDT with detectable manual operation and fuse per output circuit



Technical data



Coil side	
Operating voltage U _N	
Typ. input current at U _N	
Typ. response time at U _N	
Typ. release time at U _N	
Input circuit	
Status display/channel	
Connection method	
No. of pos.	
Contact side	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Output fuse	
Limiting continuous current	
Min. switching current	
Max. interrupting rating:	24 V DC
	48 V DC
	60 V DC
	110 V DC
	220 V DC
	250 V AC
Connection method	
Connection data solid / stranded / AWG	
General data	
Rated insulation voltage	
Rated surge voltage	
Pollution degree / Surge voltage category	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Standards/regulations	
Mounting position	
Mounting	
Dimensions	H/D

	24 V DC 17 mA 8 ms 10 ms Freewheeling diode Yellow LED Flat-ribbon cable plug-in connector according to IEC 60603-13
	17
24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 250 V AC	Single contact, 1-PDT AgNi 250 V AC/DC 12 V AC/DC 4 A 5x20 fuse (slow-blow) 3.9 A (observe derating) 100 mA 93 W 58 W 48 W 50 W 80 W 975 VA Screw connection 0.2 4 mm² / 0.2 2.5 mm² / 24 - 12
	260 V AC 4 kV 2 / III -20°C 50°C

100% operating factor 3 x 107 cycles DIN EN 50178

In rows with zero spacing

<u>-</u>	11 12 14 21 22 24 31 32 34 81 82 84 +-
	Technical data
	24 V DC 18 mA 9 ms 6 ms Freewheeling diode (integrated in relay) Yellow LED (integrated in relay) Flat-ribbon cable plug-in connector according to IEC 60603-13
	14
	Single contact, 1-PDT AgNi 250 V AC/DC 12 V AC/DC 4 A 5x20 fuse (slow-blow) 3.9 A (observe derating) 100 mA 93 W 62 W 42 W 55 W 66 W 975 VA Screw connection 0.2 4 mm²/0.2 2.5 mm²/24 - 12
	260 V AC 4 kV 2 / III -20°C 50°C 100% operating factor 5 x 10° cycles DIN EN 50178

Description	Module width W
VARIOFACE output module, with 8 miniature for 24 V DC (including relays)	relays, plugged in,
	127
Plug-in miniature relays	

111 mm / 60 mm						
Ordering data						
Туре	Order No.	Pcs. / Pkt.				
UM- 8RM/KSR-G24/21/SI/PLC ¹)	2900892	1				
Accessories						
REL-MR- 24DC/21HC	2961312	10				

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
UM- 8RM/KSR-G24/21/MS/SI/PLC¹)	2900893	1				
Accessories						
REL-MR- 24DC/21HC/MS	2987888	10				

In rows with zero spacing

111 mm / 64 mm

VIP - VARIOFACE Professional system cables with flat-ribbon connectors

- 1:1 connection
- 10- to 20-pos.
- Plug-in connectors as per IEC 60603-13
- In the desired lengths
- Individual serial number

Note:

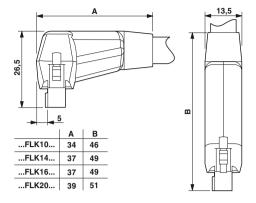
Due to the enlarged outer contour of the molded plug-in connectors, module types with UM45 profile and three-level terminal blocks cannot be connected with the VIP-CAB-FLK... system cable.

The following module types (10- to 50pos.) can be connected.

For example, for 20 positions:

- VIP-2/SC/FLK 20
- VIP-2/SC/FLK20/LED
- FLKM 20/ZFKDS
- UM45-FLK 20/ZFKDS (double-level connection)

The VIP-CAB-FLK... system cables are not suitable for front adapters (see the dimensional drawing).



not shielded

2U **/P** 3

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Max. conductor resistance Ambient temperature (operation) Assembly

Conductor cross section Outside diameter

10 -position 14 -position 16 -position 20 -position Technical data

< 50 V AC / 60 V DC

0.16 Ω/m -20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²

6.1 mm 6.4 mm 6.8 mm 7.6 mm

			Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
Round cable, with two molded socket strips					
	10 10 10 10 10 10 10	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK10/0,14/0,5M VIP-CAB-FLK10/0,14/1,0M VIP-CAB-FLK10/0,14/1,5M VIP-CAB-FLK10/0,14/2,0M VIP-CAB-FLK10/0,14/3,0M VIP-CAB-FLK10/0,14/4,0M VIP-CAB-FLK10/0,14/6,0M	2318305 2318318 2318321 2318334 2318347 2318350 2318363	1 1 1 1 1 1
Round cable , same as before, in variable let (minimum ordering quantity five pieces)	ngths				
December 19 19 19 19 19 19 19 19 19 19 19 19 19	10		VIP-CAB-FLK10-0,14/	2318376	1
Round cable, with two molded socket strips	14 14 14 14 14 14	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK14/0,14/0,5M VIP-CAB-FLK14/0,14/1,0M VIP-CAB-FLK14/0,14/1,5M VIP-CAB-FLK14/0,14/2,0M VIP-CAB-FLK14/0,14/2,0M VIP-CAB-FLK14/0,14/4,0M VIP-CAB-FLK14/0,14/6,0M	2318389 2318392 2318402 2318415 2318428 2318431 2318444	1 1 1 1 1 1
Round cable, same as before, in variable le (minimum ordering quantity five pieces)	ngths		VIP-CAB-FLK14-0,14/	2318457	1
Round cable, with two molded socket strips	16 16 16 16 16 16	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK16/0,14/0,5M VIP-CAB-FLK16/0,14/1,0M VIP-CAB-FLK16/0,14/1,5M VIP-CAB-FLK16/0,14/2,0M VIP-CAB-FLK16/0,14/3,0M VIP-CAB-FLK16/0,14/4,0M VIP-CAB-FLK16/0,14/6,0M	2318460 2318473 2318486 2318499 2318509 2318512 2318525	1 1 1 1 1 1
Round cable, same as before, in variable let (minimum ordering quantity five pieces)		5	VIP-CAB-FLK16-0,14/	2318538	1
Round cable, with two molded socket strips					
	20 20 20 20 20 20 20 20	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK20/0,14/0,5M VIP-CAB-FLK20/0,14/1,0M VIP-CAB-FLK20/0,14/1,5M VIP-CAB-FLK20/0,14/2,0M VIP-CAB-FLK20/0,14/3,0M VIP-CAB-FLK20/0,14/4,0M VIP-CAB-FLK20/0,14/6,0M	2318541 2318554 2318567 2318570 2318583 2318596 2318606	1 1 1 1 1 1
Round cable, same as before, in variable le (minimum ordering quantity five pieces)			VIP-CAB-FLK20-0,14/	2318619	1

Ordering example for system cable:

- 10-pos. cable, 7.6 m long

Order No.

Quantity

2318376 7.6 Min. 0.5 m Max. 100.0 m Step width

Length [m]

VIP - VARIOFACE Professional system cables with flat-ribbon plug-in connectors

- 1:1 connection
- 26- to 50-pos.
- Plug-in connectors as per IEC 60603-13
- In the desired lengths
- Individual serial number

Note:

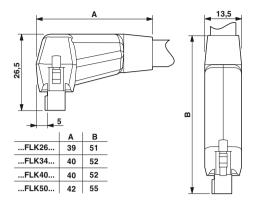
Due to the enlarged outer contour of the molded connectors, module types with UM45 profile and three-level terminal blocks cannot be connected with the VIP-CAB-FLK... system cable.

The following module types (10- to 50pos.) can be connected.

For example, for 20 positions:

- VIP-2/SC/FLK 20
- VIP-2/SC/FLK20/LED
- FLKM 20/ZFKDS
- UM45-FLK 20/ZFKDS (double-level connection)

The VIP-CAB-FLK... system cables are not suitable for front adapters (see the dimensional drawing).





.**91** us

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Max. conductor resistance

Ambient temperature (operation)

Conductor cross section

Outside diameter

26 -position 34 -position

50 -position

40 -position

Technical data

< 50 V AC / 60 V DC

0.16 Ω/m

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²

8.3 mm 8.7 mm 9.9 mm 10.3 mm

			Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
Round cable, with two molded socket strip	s				
	26 26 26 26 26 26 26 26	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK26/0,14/0,5M VIP-CAB-FLK26/0,14/1,0M VIP-CAB-FLK26/0,14/1,5M VIP-CAB-FLK26/0,14/2,0M VIP-CAB-FLK26/0,14/3,0M VIP-CAB-FLK26/0,14/4,0M VIP-CAB-FLK26/0,14/4,0M	2318622 2318635 2318648 2318651 2318664 2318677 2318680	1 1 1 1 1 1
Round cable, same as before, in variable (minimum ordering quantity five pieces)	engths 26		VIP-CAB-FLK26-0,14/	2318693	1
Round cable, with two molded socket strip			3/12 1 2/12/11	_0.3000	
	34 34 34 34 34 34	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK34/0,14/0,5M VIP-CAB-FLK34/0,14/1,0M VIP-CAB-FLK34/0,14/1,5M VIP-CAB-FLK34/0,14/2,0M VIP-CAB-FLK34/0,14/3,0M VIP-CAB-FLK34/0,14/4,0M VIP-CAB-FLK34/0,14/4,0M	2318703 2318716 2318729 2318732 2318745 2318758 2318761	1 1 1 1 1 1
Round cable , same as before, in variable (minimum ordering quantity five pieces)	engths				
(minimum ordering quantity live pieces)	34		VIP-CAB-FLK34-0,14/	2318774	1
Round cable, with two molded socket strip					-
Round cable, same as before, in variable	40 40 40 40 40 40 40 40 engths	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK40/0,14/0,5M VIP-CAB-FLK40/0,14/1,0M VIP-CAB-FLK40/0,14/1,5M VIP-CAB-FLK40/0,14/2,0M VIP-CAB-FLK40/0,14/3,0M VIP-CAB-FLK40/0,14/4,0M VIP-CAB-FLK40/0,14/6,0M	2318787 2318790 2318800 2318813 2318826 2318839 2318842	1 1 1 1 1 1
(minimum ordering quantity five pieces)	40		VID CAR ELVAD 0.14/	0010055	
Round cable, with two molded socket strip	40 os		VIP-CAB-FLK40-0,14/	2318855	1
	50 50 50 50 50 50 50	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	VIP-CAB-FLK50/0,14/0,5M VIP-CAB-FLK50/0,14/1,0M VIP-CAB-FLK50/0,14/1,5M VIP-CAB-FLK50/0,14/2,0M VIP-CAB-FLK50/0,14/3,0M VIP-CAB-FLK50/0,14/4,0M VIP-CAB-FLK50/0,14/4,0M	2318868 2318871 2318884 2318897 2318907 2318910 2318923	1 1 1 1 1 1
Round cable, same as before, in variable (minimum ordering quantity five pieces)	engths 50		VIP-CAB-FLK50-0,14/	2318936	1

Ordering example for system cable: - 26-pos. cable, 12.6 m long Quantity Order No. Length [m] 2318693 12.6 Min.

Max.

Step width

0.5 m

100.0 m

System cabling for controllers

VARIOFACE system cabling

System cable with a flat-ribbon cable plug-in connector and an open end

- 1:1 connection
- 10-, 14-, and 16-pos.
- Plug-in connectors as per IEC 60603-13
- Open end at the other end

The individual wires at the open end are labeled (1, 2, 3, 4, ...) and equipped with a ferrule.

In the case of molded connectors, please observe the dimensional drawing and note, see page 500



Molded plug-in connectors, not shielded



not shielded

c**91** us

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Max. conductor resistance

Ambient temperature (operation)

Assembly

Conductor cross section

Conductor structure: stranded wires / material

Outside diameter

10 -position 14 -position 16 -position

Technical data < 50 V AC / 60 V DC

0.16 Ω/m -20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

6.1 mm 6.4 mm 6.5 mm Technical data

< 50 V AC / 60 V DC

0.16 Ω/m -20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

6.1 mm 6.4 mm 6.5 mm

			Ordering data			Ordering data		
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable with an open end								
	10	0.5 m				CABLE-FLK10/OE/0,14/ 0,5M	2904073	1
	10	1 m				CABLE-FLK10/OE/0,14/ 1,0M	2904074	1
	10	1.5 m				CABLE-FLK10/OE/0,14/ 1,5M	2904075	1
	10	2 m				CABLE-FLK10/OE/0,14/ 2,0M	2904076	1
	10	2.5 m				CABLE-FLK10/OE/0,14/ 2,5M	2904077	1
	10	3 m				CABLE-FLK10/OE/0,14/ 3,0M	2904078	1
	10	4 m				CABLE-FLK10/OE/0,14/ 4,0M	2904079	1
	10	6 m				CABLE-FLK10/OE/0,14/ 6,0M	2904080	1
	10	8 m				CABLE-FLK10/OE/0,14/ 8,0M	2904081	1
	10	10 m				CABLE-FLK10/OE/0,14/10,0M	2904082	1
Round cable, same as before, ho	owever in variable l	engths						
	10					CABLE-FLK10-OE-0,14/	2904331	1
Round cable with an open end								
	14	0.5 m	VIP-CAB-FLK14/FR/OE/0,14/0,5M	2900122	1	CABLE-FLK14/OE/0,14/ 50	2305761	1
	14	1 m	VIP-CAB-FLK14/FR/OE/0,14/1,0M	2900123	1	CABLE-FLK14/OE/0,14/ 100	2305253	1
	14	1.5 m	VIP-CAB-FLK14/FR/OE/0,14/1,5M	2900125	1	CABLE-FLK14/OE/0,14/ 150	2305266	1
	14	2 m	VIP-CAB-FLK14/FR/OE/0,14/2,0M	2900126	1	CABLE-FLK14/OE/0,14/ 200	2305279	1
	14	2.5 m				CABLE-FLK14/OE/0,14/ 250	2305282	1
	14	3 m	VIP-CAB-FLK14/FR/OE/0,14/3,0M	2900127	1	CABLE-FLK14/OE/0,14/ 300	2305295	1
	14	4 m	VIP-CAB-FLK14/FR/OE/0,14/4,0M	2900128	1	CABLE-FLK14/OE/0,14/ 400	2305774	1
	14	6 m	VIP-CAB-FLK14/FR/OE/0,14/6,0M	2900129	1	CABLE-FLK14/OE/0,14/ 600	2305787	1
	14	8 m				CABLE-FLK14/OE/0,14/ 800	2305790	1
	14	10 m				CABLE-FLK14/OE/0,14/1000	2305800	1
Round cable, same as before, ho	owever in variable l	engths						
	14					CABLE-FLK14/OE/0,14/	2305732	1
Round cable with an open end								
	16	0.5 m	VIP-CAB-FLK16/FR/OE/0,14/0,5M	2900130	1	CABLE-FLK16/OE/0,14/ 0,5M	2318127	1
	16	1 m	VIP-CAB-FLK16/FR/OE/0,14/1,0M	2900131	1	CABLE-FLK16/OE/0,14/ 1,0M	2318130	1
	16	1.5 m	VIP-CAB-FLK16/FR/OE/0,14/1,5M	2900132	1	CABLE-FLK16/OE/0,14/ 1,5M	2318143	1
	16	2 m	VIP-CAB-FLK16/FR/OE/0,14/2,0M	2900133	1	CABLE-FLK16/OE/0,14/ 2,0M	2318156	1
	16	2.5 m				CABLE-FLK16/OE/0,14/ 2,5M	2318169	1
	16	3 m	VIP-CAB-FLK16/FR/OE/0,14/3,0M	2900134	1	CABLE-FLK16/OE/0,14/ 3,0M	2318172	1
	16	4 m	VIP-CAB-FLK16/FR/OE/0,14/4,0M	2900135	1	CABLE-FLK16/OE/0,14/ 4,0M	2318185	1
	16	6 m	VIP-CAB-FLK16/FR/OE/0,14/6,0M	2900136	1	CABLE-FLK16/OE/0,14/ 6,0M	2318198	1
	16	8 m				CABLE-FLK16/OE/0,14/ 8,0M	2318208	1
	16	10 m				CABLE-FLK16/OE/0,14/10,0M	2318211	1
Round cable, same as before, ho		engths						
	16					CABLE-FLK16/OE/0,14/	2318224	1

System cable with a flat-ribbon cable plug-in connector and an open end

- 1:1 connection
- 20- and 50-pos.
- Plug-in connectors as per IEC 60603-13
- Open end at the other end

The individual wires at the open end are labeled (1, 2, 3, 4, ...) and equipped with a ferrule.

Notes:

In the case of molded connectors, please observe the dimensional drawing and note, see page 500



Molded plug-in connectors, not shielded

Technical data



not shielded

c**91**us

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Assembly

Conductor cross section Conductor structure: stranded wires / material Outside diameter

20 -position 50 -position

< 50 V AC / 60 V DC $0.16\,\Omega/m$ -20°C ... 50°C Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²

7 / Cu tin-plated

7.6 mm 10.3 mm

Technical data < 50 V AC / 60 V DC 0.16 Ω/m -20°C ... 50°C Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

7.6 mm 10.3 mm

		50 -position	10.3 mm			10.3 mm		
			Ordering da	ita		Ordering of	lata	
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable with an open end								
	20	0.5 m	VIP-CAB-FLK20/FR/OE/0,14/0,5M	2900138	1	CABLE-FLK20/OE/0,14/ 50	2305826	1
	20	1 m	VIP-CAB-FLK20/FR/OE/0,14/1,0M	2900139	1	CABLE-FLK20/OE/0,14/ 100	2305305	1
	20	1.5 m	VIP-CAB-FLK20/FR/OE/0,14/1,5M	2900141	1	CABLE-FLK20/OE/0,14/ 150	2305318	1
	20	2 m	VIP-CAB-FLK20/FR/OE/0,14/2,0M	2900142	1	CABLE-FLK20/OE/0,14/ 200	2305321	1
	20	2.5 m				CABLE-FLK20/OE/0,14/ 250	2305334	1
	20	3 m	VIP-CAB-FLK20/FR/OE/0,14/3,0M	2900143	1	CABLE-FLK20/OE/0,14/ 300	2305347	1
	20	4 m	VIP-CAB-FLK20/FR/OE/0,14/4,0M	2900144	1	CABLE-FLK20/OE/0,14/ 400	2305839	1
	20	6 m	VIP-CAB-FLK20/FR/OE/0,14/6,0M	2900145	1	CABLE-FLK20/OE/0,14/ 600	2305842	1
	20	8 m				CABLE-FLK20/OE/0,14/ 800	2305855	1
	20	10 m				CABLE-FLK20/OE/0,14/1000	2305868	1
Round cable, same as before, howe	ver in variable l	lengths						
	20					CABLE-FLK20/OE/0,14/	2305745	1
Round cable with an open end								
	50	0.5 m	VIP-CAB-FLK50/FR/OE/0,14/0,5M	2900146	1	CABLE-FLK50/OE/0,14/ 50	2305871	1
	50	1 m	VIP-CAB-FLK50/FR/OE/0,14/1,0M	2900147	1	CABLE-FLK50/OE/0,14/ 100	2305350	1
	50	1.5 m	VIP-CAB-FLK50/FR/OE/0,14/1,5M	2900148	1	CABLE-FLK50/OE/0,14/ 150	2305363	1
	50	2 m	VIP-CAB-FLK50/FR/OE/0,14/2,0M	2900149	1	CABLE-FLK50/OE/0,14/ 200	2305376	1
	50	2.5 m				CABLE-FLK50/OE/0,14/ 250	2305389	1
	50	3 m	VIP-CAB-FLK50/FR/OE/0,14/3,0M	2900150	1	CABLE-FLK50/OE/0,14/ 300	2305392	1
	50	4 m	VIP-CAB-FLK50/FR/OE/0,14/4,0M	2900151	1	CABLE-FLK50/OE/0,14/ 400	2305884	1
	50	6 m	VIP-CAB-FLK50/FR/OE/0,14/6,0M	2900152	1	CABLE-FLK50/OE/0,14/ 600	2305897	1
	50	8 m				CABLE-FLK50/OE/0,14/ 800	2305907	1
	50	10 m				CABLE-FLK50/OE/0,14/1000	2305910	1
Round cable, same as before, howe	ver in variable l	lengths						
	50					CABLE-FLK50/OE/0,14/	2305758	1

System cable with flat-ribbon cable plug-in connector

Standard lengths

Round cable sets are used to connect the PLC front adapters to the corresponding VARIOFACE controller boards.

The following versions are available with 14 and 50 positions:

- Not shielded
- Shielded
- Halogen-free

Plug-in connector strips are fitted on both sides of the cables in accordance with IEC 60603-13/DIN 41651 (1:1 connection).

In case of shielded cables, a cable end with a ferrule is additionally provided as a shield connection (length: approx. 0.5 m; cable H05V-K 1 mm², black).

Special lengths are defined using an order key, refer to page 510.



not shielded



Technical data

< 50 V AC / 60 V DC

0.16 Ω/m

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

6.4 mm 10.3 mm

14 -position 50 -position

Max. perm. operating voltage

Ambient temperature (operation)

Max. conductor resistance

Conductor cross section

Outside diameter

Shield Assembly

Max. perm. current carrying capacity per path

Conductor structure: stranded wires / material

	50 -position	10.3 mm		
		Ordering dat	а	
Description No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.
Assembled round cables¹), with two 14-pos. sockelengths, for transfer of eight channels among other to				
14	0.3 m	FLK 14/EZ-DR/ 30/KONFEK	2295729	5
14	0.5 m	FLK 14/EZ-DR/ 50/KONFEK	2288901	5
14	1 m	FLK 14/EZ-DR/ 100/KONFEK	2288914	1
14	1.5 m	FLK 14/EZ-DR/ 150/KONFEK	2288927	1
14	2 m	FLK 14/EZ-DR/ 200/KONFEK	2288930	1
14	2.5 m	FLK 14/EZ-DR/ 250/KONFEK	2288943	1
14	3 m	FLK 14/EZ-DR/ 300/KONFEK	2288956	1
14	3.5 m	FLK 14/EZ-DR/ 350/KONFEK	2288969	1
14 14	4 m	FLK 14/EZ-DR/ 400/KONFEK	2288972	1 1
14	4.5 m 5 m	FLK 14/EZ-DR/ 450/KONFEK FLK 14/EZ-DR/ 500/KONFEK	2290847 2290834	1
14	5.5 m	FLK 14/EZ-DR/ 550/KONFEK	2290850	1
14	5.5 m	FLK 14/EZ-DR/ 600/KONFEK	2290863	1
14	7 m	TER 14/EE BIY 000/ROM ER	2230000	
14	8 m	FLK 14/EZ-DR/ 800/KONFEK	2299563	1
14	10 m	FLK 14/EZ-DR/1000/KONFEK	2299576	1
Assembled round cables ²), with two 50-pos. sockelengths, for transfer of 32 channels among other thir				
50	0.5 m	FLK 50/EZ-DR/ 50/KONFEK	2289065	5
50	1 m	FLK 50/EZ-DR/ 100/KONFEK	2289078	1
50	1.5 m	FLK 50/EZ-DR/ 150/KONFEK	2289081	1
50	2 m	FLK 50/EZ-DR/ 200/KONFEK	2289094	1
50	2.5 m	FLK 50/EZ-DR/ 250/KONFEK	2289104	1
50	3 m	FLK 50/EZ-DR/ 300/KONFEK	2289117	1
50	3.5 m	FLK 50/EZ-DR/ 350/KONFEK	2289120	1
50	4 m	FLK 50/EZ-DR/ 400/KONFEK	2289133	1
50	4.5 m	FLK 50/EZ-DR/ 450/KONFEK	2289573	1
50 50	5 m 5.5 m	FLK 50/EZ-DR/ 500/KONFEK FLK 50/EZ-DR/ 550/KONFEK	2289586 2289599	1
50	5.5 III 6 m	FLK 50/EZ-DR/ 550/KONFEK	2289599	1
50	6.5 m	FLK 50/EZ-DR/ 600/KONFEK	2289612	1
50	0.5 III 7 m	FLK 50/EZ-DR/ 650/KONFEK	2289625	1
50	7.5 m	FLK 50/EZ-DR/ 750/KONFEK	2289638	1
50	7.5 m	FLK 50/EZ-DR/ 800/KONFEK	2289641	1
50	8.5 m	FLK 50/EZ-DR/ 850/KONFEK	2289654	1
50	9 m	FLK 50/EZ-DR/ 900/KONFEK	2289667	1
50	9.5 m	FLK 50/EZ-DR/ 950/KONFEK	2289670	1
50	10 m	FLK 50/EZ-DR/1000/KONFEK	2289683	1

System cabling for controllers

VARIOFACE system cabling



Shielded



Halogen-free (only the cable)



Applied for: cUL / UL

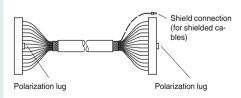
Technical data	Technical data
< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
1 A	1 A
0.16 Ω/m	0.16 Ω/m
-20°C 50°C	-20°C 50°C
Tinned copper-braided shield, approx. 85% covering	-
Insulation displacement, IEC 60352-4/DIN EN 60352-4	Insulation displacement, IEC 60352-4/DIN EN 60352-4
AWG 26 / 0.14 mm ²	AWG 26 / 0.14 mm ²
7 / Cu tin-plated	7 / Cu tin-plated
6.7 mm	6.4 mm
11 mm	10.3 mm
Ordering data	Ordering data

Ordering dat	а		Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
FLK 14/EZ-DR/ 50/KONFEK/S FLK 14/EZ-DR/ 100/KONFEK/S FLK 14/EZ-DR/ 150/KONFEK/S FLK 14/EZ-DR/ 200/KONFEK/S FLK 14/EZ-DR/ 300/KONFEK/S	2296977 2296980 2296993 2297002 2299013	1 1 1 1	FLK 14/EZ-DR/HF/ 50/KONFEK FLK 14/EZ-DR/HF/ 100/KONFEK FLK 14/EZ-DR/HF/ 150/KONFEK FLK 14/EZ-DR/HF/ 200/KONFEK FLK 14/EZ-DR/HF/ 250/KONFEK FLK 14/EZ-DR/HF/ 300/KONFEK	2305952 2305965 2305978 2305981 2305994 2304759	1 1 1 1 1
FLK 14/EZ-DR/ 400/KONFEK/S	2299026	1	FLK 14/EZ-DR/HF/ 400/KONFEK	2304762	1
			FLK 14/EZ-DR/HF/ 500/KONFEK	2304717	1
FLK 14/EZ-DR/ 600/KONFEK/S FLK 14/EZ-DR/ 800/KONFEK/S	2299039 2299042	1	FLK 14/EZ-DR/HF/ 600/KONFEK FLK 14/EZ-DR/HF/ 700/KONFEK FLK 14/EZ-DR/HF/ 800/KONFEK	2306003 2314011 2314024	1 1 1
FLK 14/EZ-DR/1000/KONFEK/S	2299055	1	FLK 14/EZ-DR/HF/1000/KONFEK	2314037	1
FLK 50/EZ-DR/ 50/KONFEK/S FLK 50/EZ-DR/ 100/KONFEK/S	2299097 2299107	1	CABLE-FLK50/0,14/HF/ 0,5M CABLE-FLK50/0,14/HF/ 1,0M	2314134 2314147	1
FLK 50/EZ-DR/ 150/KONFEK/S FLK 50/EZ-DR/ 200/KONFEK/S	2299110 2299123	1 1	CABLE-FLK50/0,14/HF/ 1,5M CABLE-FLK50/0,14/HF/ 2,0M	2314150 2314163	1 1
FLK 50/EZ-DR/ 300/KONFEK/S	2299136	1	CABLE-FLK50/0,14/HF/ 2,5M CABLE-FLK50/0,14/HF/ 3,0M	2314176 2314189	1
FLK 50/EZ-DR/ 400/KONFEK/S	2299149	1	CABLE-FLK50/0,14/HF/ 4,0M	2314192	1
			CABLE-FLK50/0,14/HF/ 5,0M	2314202	1
FLK 50/EZ-DR/ 600/KONFEK/S	2299152	1	CABLE-FLK50/0,14/HF/ 6,0M	2314215	1
ELV FOIEZ DD/ 000/WONEEW/O	0000405		CABLE-FLK50/0,14/HF/ 7,0M	2314228	1
FLK 50/EZ-DR/ 800/KONFEK/S	2299165	1	CABLE-FLK50/0,14/HF/ 8,0M	2314231	1
FLK 50/EZ-DR/1000/KONFEK/S	2299178	1	CABLE-FLK50/0,14/HF/10,0M	2314244	1

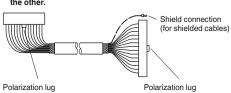
Color code of system cables

No. of wires	PIN	Wire color
	1	Black
	2	Brown
	3	Red
	4	Orange
	5	Yellow
	6	Green
	7	Blue
	8	Violet
	9	Gray
10-pos.	10	White
. o poo.	— ii	White-black
	12	White-brown
	13	White-red
14-pos.	14	White-red White-orange
14 poo.	15	White-yellow
16-pos.	16	White-green
10 pos.	— 10 — 17	White-blue
	18	White-bide White-violet
	19	White-gray
20 200	20	Brown-black
20-pos.	20 21	Brown-red
	22	
	23	Brown-orange
	23 24	Brown-yellow
	25	Brown-green Brown-blue
00	26 26	Brown-violet
26-pos.	26 27	
	28	Brown-gray Brown-white
	28 29	
	30	Green-black Green-brown
	31	
		Green-red
	32	Green-orange
04	33	Green-blue
34-pos.	34	Green-violet
	35	Green-gray
	36	Green-white
	37	Yellow-black
	38	Yellow-brown
10	39	Yellow-red
40-pos.	40	Yellow-orange
	41	Yellow-blue
	42	Yellow-violet
	43	Yellow-gray
	44	Yellow-white
	45	Gray-black
	46	Gray-brown
	47	Gray-red
	48	Gray-orange
	49	Gray-yellow
50-pos.	50	Gray-green

1) Socket strips assembled straight at both ends.



²) Socket strips assembled straight at one end and angled at the other.



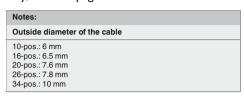
System cable with flat-ribbon cable plug-in connector

Standard lengths

Pre-assembled round cables to couple the VARIOFACE interface modules.

Plug-in connector strips are fitted on both sides of the cables in accordance with IEC 60603-13/DIN 41651 (1:1 connection).

Special lengths are defined using an order key, refer to page 510.



Max. perm. operating voltage

Ambient temperature (operation)

Max. conductor resistance

Conductor cross section

Assembly

Max. perm. current carrying capacity per path

Conductor structure: stranded wires / material



not shielded

P

Applied for: cUL / UL

Technical data

< 50 V AC / 60 V DC

0.16 Ω/m

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²

7 / Cu tin-plated

			Ordering data			
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	
Round cable ¹), with two socket strips	10 10 10 10 10 10 10	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m	FLK 10/EZ-DR/ 50/KONFEK FLK 10/EZ-DR/ 100/KONFEK FLK 10/EZ-DR/ 150/KONFEK FLK 10/EZ-DR/ 200/KONFEK FLK 10/EZ-DR/ 300/KONFEK FLK 10/EZ-DR/ 400/KONFEK FLK 10/EZ-DR/ 600/KONFEK FLK 10/EZ-DR/ 500/KONFEK FLK 10/EZ-DR/ 800/KONFEK	2299204 2299217 2299220 2299233 2299246 2299259 2299262 2299275	1 1 1 1 1 1 1	
Round cable ¹), with two socket strips	10 16 16 16 16 16 16 16 16 16	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m	FLK 10/EZ-DR/1000/KONFEK FLK 16/EZ-DR/ 50/KONFEK FLK 16/EZ-DR/ 100/KONFEK FLK 16/EZ-DR/ 150/KONFEK FLK 16/EZ-DR/ 200/KONFEK FLK 16/EZ-DR/ 300/KONFEK FLK 16/EZ-DR/ 600/KONFEK FLK 16/EZ-DR/ 800/KONFEK FLK 16/EZ-DR/ 800/KONFEK FLK 16/EZ-DR/ 1000/KONFEK FLK 16/EZ-DR/ 1000/KONFEK	2299288 2299291 2299301 2299314 2299327 2299330 2299343 2299356 2299369 2299372	1 1 1 1 1 1 1 1 1	
Round cable ¹), with two socket strips	20 20 20 20 20 20 20 20 20 20	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m 10 m	FLK 20/EZ-DR/ 50KONFEK FLK 20/EZ-DR/ 100KONFEK FLK 20/EZ-DR/ 150KONFEK FLK 20/EZ-DR/ 200KONFEK FLK 20/EZ-DR/ 300KONFEK FLK 20/EZ-DR/ 400KONFEK FLK 20/EZ-DR/ 600KONFEK FLK 20/EZ-DR/ 800KONFEK FLK 20/EZ-DR/ 1000KONFEK FLK 20/EZ-DR/ 1000KONFEK	2296391 2296401 2296472 2296485 2296508 2296508 2296511 2296524 2296537	1 1 1 1 1 1 1 1	
Round cable ¹), with two socket strips	26 26 26 26 26 26 26 26 26	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m 10 m	FLK 26/EZ-DR/ 50/KONFEK FLK 26/EZ-DR/ 100/KONFEK FLK 26/EZ-DR/ 150/KONFEK FLK 26/EZ-DR/ 200/KONFEK FLK 26/EZ-DR/ 300/KONFEK FLK 26/EZ-DR/ 400/KONFEK FLK 26/EZ-DR/ 600/KONFEK FLK 26/EZ-DR/ 800/KONFEK FLK 26/EZ-DR/ 1000/KONFEK	2299385 2299398 2299408 2299411 2299424 2299437 2299440 2299453 2299466	1 1 1 1 1 1 1 1	
Round cable ¹), with two socket strips	34 34 34 34 34 34 34 34	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m 10 m	FLK 34/EZ-DR/ 50/KONFEK FLK 34/EZ-DR/ 100/KONFEK FLK 34/EZ-DR/ 150/KONFEK FLK 34/EZ-DR/ 200/KONFEK FLK 34/EZ-DR/ 300/KONFEK FLK 34/EZ-DR/ 600/KONFEK FLK 34/EZ-DR/ 800/KONFEK FLK 34/EZ-DR/ 800/KONFEK FLK 34/EZ-DR/ 1000/KONFEK	2299479 2299482 2299495 2299505 2299518 2299521 2299534 2299547 2299550	1 1 1 1 1 1 1 1	

System cable with flat-ribbon cable plug-in connector

Standard lengths

Round cable sets are used to connect the PLC front adapters to the corresponding VARIOFACE controller boards.

Plug-in connector strips are fitted on both sides of the cables in accordance with IEC 60603-13/DIN 41651 (1:1 connection).

Special lengths are defined using an order key, refer to page 510.



not shielded



Max. perm. operating voltage

Description

Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Assembly

Conductor cross section Conductor structure: stranded wires / material

Round cable²), with two socket strips

Outside diameter

Technical data

< 50 V AC / 60 V DC $0.16\,\Omega/m$

-20°C ... 50°C

Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm² 7 / Cu tin-plated

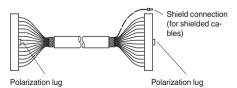
40 -

pos.

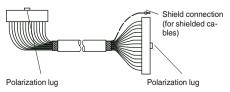
-position	9.9 n
-position	9.9 r

	Ordering date	Ordering data								
Cable length	Туре	Order No.	Pcs. / Pkt.							
0.5 m 1 m 1.5 m 2 m 2.5 m 3 m 3.5 m 4 m 6 m	FLK 40/EZ-DR/ 50/KONFEK FLK 40/EZ-DR/ 100/KONFEK FLK 40/EZ-DR/ 150/KONFEK FLK 40/EZ-DR/ 200/KONFEK FLK 40/EZ-DR/ 250/KONFEK FLK 40/EZ-DR/ 300/KONFEK FLK 40/EZ-DR/ 350/KONFEK FLK 40/EZ-DR/ 400/KONFEK FLK 40/EZ-DR/ 400/KONFEK FLK 40/EZ-DR/ 600/KONFEK	2288985 2288998 2289007 2289010 2289023 2289036 2289049 2289052 2299589	5 1 1 1 1 1 1							
8 m 10 m	FLK 40/EZ-DR/ 800/KONFEK FLK 40/EZ-DR/1000/KONFEK	2299592 2299602	1 1							

1) Socket strips assembled straight at both ends.



2) Socket strips assembled straight at one end and angled at the other.



System cable with flat-ribbon cable plug-in connector

The FLK 50... types are plugged onto the VARIOFACE front adapters for 32 channels and make it possible to split the channels into 4 x 8 channels. All 8-channel VARIOFACE modules and the PLC-V8 adapters for PLC-INTERFACE can therefore be connected.

In case of shielded cables, a cable end with a ferrule is additionally provided as a shield connection (length: approx. 0.5 m; cable H05V-K 1 mm², black).



Splitting cable unshielded 50 positions on 4 x 14



Splitting cable shielded 50 positions on 4 x 14

SNus 🕑

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Shield

Assembly

Conductor cross section Conductor structure: stranded wires / material Number of connectors on the module side Outside diameter

50 -position 6.3 mm

Technical data Technical data < 50 V AC / 60 V DC < 50 V AC / 60 V DC 0.16 Ω/m 0.16 Ω/m -20°C ... 50°C -20°C ... 50°C Tinned copper-braided shield, approx. 85% covering Insulation displacement, IEC 60352-4/DIN EN 60352-4 Insulation displacement, IEC 60352-4/DIN EN 60352-4 AWG 26 / 0.14 mm² AWG 26 / 0.14 mm² 7 / Cu tin-plated 7 / Cu tin-plated

			O
Description	No. of pos.	Cable length	Туре
Round cable sets, for connection cabling, with a 50-pos. socket strip for splitting max. 32 channels into 4	and four 14-pos.		
	50	0.5 m	FLK 50/4X14/EZ-DR/ 50/
	50	1 m	FLK 50/4X14/EZ-DR/ 100
	50	1.5 m	FLK 50/4X14/EZ-DR/ 150
	50	2 m	FLK 50/4X14/EZ-DR/ 200
	50	2.5 m	FLK 50/4X14/EZ-DR/ 250
	50	3 m	FLK 50/4X14/EZ-DR/ 300
	50	4 m	FLK 50/4X14/EZ-DR/ 400
	50	6 m	FLK 50/4X14/EZ-DR/ 600
	50	8 m	FLK 50/4X14/EZ-DR/ 800
	50	10 m	FLK 50/4X14/EZ-DR/100
Assembled round cables, same lengths	as before, howeve	er in variable	
_	50		FLK 50-4X14-EZ-DR
Assembled round cables, same a in variable lengths	as before, howeve	r shielded and	
	50		

Ordering data			Ordering data					
	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.			
DR/ 50/KONFEK	2296689	1						
DR/ 100/KONFEK	2296692	1						
DR/ 150/KONFEK	2296702	1						
DR/ 200/KONFEK	2296715	1						
DR/ 250/KONFEK	2305402	1						
DR/ 300/KONFEK	2296728	1						
DR/ 400/KONFEK	2296731	1						
DR/ 600/KONFEK	2296744	1						
DR/ 800/KONFEK	2296757	1						
DR/1000/KONFEK	2296773	1						
DR	2302405	1						
			FLK 50-4X14-EZ-DR-S	2302447	1			

6.3 mm

Ordering example for system cable:

- Unshielded splitting cable 12.75 m long

Quantity	Order No.	Length [m]1)
1	2302405	12.75
		1) min. 0.30 m
- Shielded splitting of	able 11.00 m long	
Quantity	Order No.	Length [m]1)
1	2302447	11.00
		1) min. 0.30 m

System cable with flat-ribbon cable plug-in connector

Special lengths

Pre-assembled round cables for connecting, e.g., PLC front adapters to the corresponding VARIOFACE termination boards. The cables are assembled with plug-in connector strips at both ends according to IEC 60603-13/DIN 41651. For shielded cables, a cable end with ferrule is available additionally as a shielded connection (length: approx. 0.5) m; cable: H05V-K 1 mm², black).

The order key for special lengths is described using three features.

The order of the features is as follows:

- Cable type
- Assembly
- Length in meters

There are two order keys, one for unshielded round cables, FLK EZ-DR/.../..., and one

for shielded round cables.

FLK EZ-DR-S/.../.... To ensure clear specification when ordering, the features are described in detail below:

Cable type

This specifies the number of individual cables within the specific cable.

Assembly

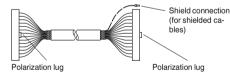
- None.
 - the cable is not assembled at either end;
- 10-pos. socket strip at both ends, the cable is assembled with 10-pos. plug-in connectors at both ends (1:1 connection);
- 14-pos. socket strip at both ends, the cable is assembled with 14-pos. plug-in connectors at both ends

- (1:1 connection); and so on up to 50-pos. socket strip at both ends, the cable is assembled with 50-pos. plug-in connectors at both ends (1:1 connection);
- 14-pos. socket strip at one end, 16-pos. socket strip at one end, the cable is assembled with a 14-pos. plug-in connector at one end and a 16pos. plug-in connector at the other end (for SIMATIC S7; no 1:1 connection).

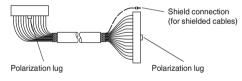
Features of permissible assemblies:

Cable type		Unshielded round cables FLK EZ-DR//						Shielded round cables FLK EZ-DR-S//				
Assembly	10-pos.	14-pos.	16-pos.	20-pos.	26-pos.	34-pos.	40-pos.	50-pos.	14-pos.	16-pos.	40-pos.	50-pos.
No assembly	10U/C00/	14U/C00/	16U/C00/	20U/C00/	26U/C00/	34U/C00/	40U/C00/	50U/C00/	14S/C00/	16S/C00/	40S/C00/	50S/C00/
10-pos. socket strip at both ends	10U/C55/1)											
14-pos. socket strip at both ends		14U/C23/1)							14S/C23/1)			
16-pos. socket strip at both ends			16U/C58/1)							16S/C58/1)		
20-pos. socket strip at both ends				20U/C61/1)								
26-pos. socket strip at both ends					26U/C63/1)							
34-pos. socket strip at both ends						34U/C65/1)						
40-pos. socket strip at both ends							40U/C30/3)				40S/C30/3)	
50-pos. socket strip at both ends								50U/C38/2)				50S/C38/ ²
14-pos. socket strip at one end; 16-pos. socket strip at one end		14U/C52/ ¹)							14S/C52/ ¹)			

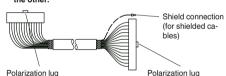
1) Socket strips assembled straight at both ends.



2) Socket strips assembled straight at one end and angled at the other

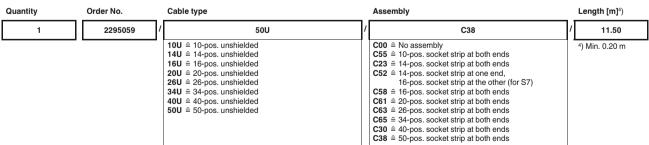


3) Socket strips assembled straight at one end and angled at the other.



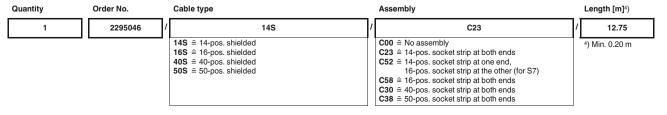
Ordering example for unshielded round cable:

- Unshielded 50-pos. round cable, assembled with two 50-pos. socket strips, 11.5 m long



Ordering example for shielded round cable:

- Shielded 14-pos. round cable, assembled with two 14-pos. socket strips, 12.75 m long







shielded



Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Shield

Conductor cross section

Conductor structure: stranded wires / material

Description	No. of pos.	Cable length
Unshielded round cables, as abo type "FLK EZ-DR/14U/C52/"	ve, but in variable	e lengths of

Technical data	Technical data
< 50 V AC / 60 V DC 1 A 0.16 Ω/m -20°C 50°C	< 50 V AC / 60 V DC 1 A 0.16 Ω /m -20°C 50°C Tinned copper-braided shield, approx. 85% covering
AWG 26 / 0.14 mm ² 7 / Cu tin-plated	AWG 26 / 0.14 mm ² 7 / Cu tin-plated

Ordering dat	а		Ordering data				
Туре	Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs. / Pkt.		
FLK EZ-DR/	2295059	1	FLK EZ-DR-S//	2295046	1		

System cable with **D-SUB** socket and pin strip

Standard lengths

Shielded round cable sets to connect the control level with the corresponding VARIOFACE interface modules.

Assembly with D-SUB strips as per IEC 60807-2/DIN 41652, (1:1 connection).

- D-SUB socket strip on one side and D-SUB pin strip on the other
- D-SUB sockets on both sides
- D-SUB pin strips on both sides
- Cable exit: straight
- Screw connection: 2 UNC 4-40 screws. Special lengths and assembly versions are defined using an order key, refer to page 514.



Socket at one end and pin strip at the other



12.5 mm

Technical data Max. perm. operating voltage 125 V AC/DC Max. perm. current carrying capacity per path Max. conductor resistance 0.09 Ω/m Ambient temperature (operation) -20°C ... 50°C Tinned copper-braided shield, approx. 85% covering > 200 Insertion/withdrawal cycles Conductor cross section AWG 24 / 0.25 mm² Outside diameter 9 -position 7.5 mm 15 -position 25 -position 10.5 mm

37 -position

	50 -position	ion 13.5 mm				
		Ordering data				
Description No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.		
Shielded round cable, fitted with two D-SUB strips, numbers of positions and lengths	various					
9 9 9 9 9	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	CABLE-D 9SUB/B/S/ 50/KONFEK/S CABLE-D 9SUB/B/S/100/KONFEK/S CABLE-D 9SUB/B/S/150/KONFEK/S CABLE-D 9SUB/B/S/200/KONFEK/S CABLE-D 9SUB/B/S/300/KONFEK/S CABLE-D 9SUB/B/S/400/KONFEK/S CABLE-D 9SUB/B/S/600/KONFEK/S	2299987 2299990 2300009 2302010 2302023 2302036 2302049	1 1 1 1 1		
15 15 15 15 15 15 15	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	CABLE-D15SUB/B/S/ 50/KONFEK/S CABLE-D15SUB/B/S/100/KONFEK/S CABLE-D15SUB/B/S/150/KONFEK/S CABLE-D15SUB/B/S/200/KONFEK/S CABLE-D15SUB/B/S/300/KONFEK/S CABLE-D15SUB/B/S/400/KONFEK/S CABLE-D15SUB/B/S/600/KONFEK/S	2302052 2302065 2302078 2302081 2302094 2302104 2302117	1 1 1 1 1 1		
25 25 25 25 25 25 25 25 25	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	CABLE-D25SUB/B/S/ 50/KONFEK/S CABLE-D25SUB/B/S/100/KONFEK/S CABLE-D25SUB/B/S/150/KONFEK/S CABLE-D25SUB/B/S/200/KONFEK/S CABLE-D25SUB/B/S/300/KONFEK/S CABLE-D25SUB/B/S/400/KONFEK/S CABLE-D25SUB/B/S/400/KONFEK/S CABLE-D25SUB/B/S/400/KONFEK/S	2302120 2302133 2302146 2302159 2302162 2302175 2302188	1 1 1 1 1 1		
37 37 37 37 37 37 37 37 37 37	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m 8 m 10 m 15 m 20 m	CABLE-D37SUB/B/S/ 50/KONFEK/S CABLE-D37SUB/B/S/100/KONFEK/S CABLE-D37SUB/B/S/150/KONFEK/S CABLE-D37SUB/B/S/200/KONFEK/S CABLE-D37SUB/B/S/300/KONFEK/S CABLE-D37SUB/B/S/400/KONFEK/S CABLE-D37SUB/B/S/600/KONFEK/S	2302191 2302201 2302214 2302227 2302230 2302243 2302256	1 1 1 1 1 1		
50 50 50 50 50 50 50	0.5 m 1 m 1.5 m 2 m 3 m 4 m 6 m	CABLE-D50SUB/B/S/ 50/KONFEK/S CABLE-D50SUB/B/S/100/KONFEK/S CABLE-D50SUB/B/S/150/KONFEK/S CABLE-D50SUB/B/S/200/KONFEK/S CABLE-D50SUB/B/S/300/KONFEK/S CABLE-D50SUB/B/S/400/KONFEK/S CABLE-D50SUB/B/S/600/KONFEK/S	2302269 2302272 2302285 2302298 2302308 2302311 2302324	1 1 1 1 1 1		

Color code of the system cables CABLE-D...SUB/...



Socket strip at both ends

c**91** us



Pin strip at both ends **Technical data**

Technical data	Technical data				
125 V AC/DC	125 V AC/DC				
2 A	2 A				
0.09 Ω/m	0.09 Ω/m				
-20°C 50°C	-20°C 50°C				
Tinned copper-braided shield, approx. 85% covering	Tinned copper-braided shield, approx. 85% covering				
> 200	> 200				
AWG 24 / 0.25 mm ²	AWG 24 / 0.25 mm ²				
7.5 mm	7.5 mm				
9 mm	9 mm				
10.5 mm	10.5 mm				
12 mm	12 mm				
13.5 mm	13.5 mm				

c**91**0s

Ordering dat	а		Ordering data				
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs./ Pkt.		
CABLE-D 9SUB/B/B/100/KONFEK/S	2305415	1	CABLE-D 9SUB/S/S/100/KONFEK/S	2305570	1		
CABLE-D 9SUB/B/B/200/KONFEK/S CABLE-D 9SUB/B/B/300/KONFEK/S	2305428 2305431	1	CABLE-D 9SUB/S/S/200/KONFEK/S CABLE-D 9SUB/S/S/300/KONFEK/S	2305583 2305596	1 1		
CABLE-D15SUB/B/B/100/KONFEK/S CABLE-D15SUB/B/B/200/KONFEK/S CABLE-D15SUB/B/B/300/KONFEK/S	2305444 2305457 2305460	1 1 1	CABLE-D15SUB/S/S/100/KONFEK/S CABLE-D15SUB/S/S/200/KONFEK/S CABLE-D15SUB/S/S/300/KONFEK/S	2305606 2305619 2305622	1 1 1		
CABLE-D25SUB/B/B/100/KONFEK/S CABLE-D25SUB/B/B/200/KONFEK/S CABLE-D25SUB/B/B/300/KONFEK/S	2305473 2305486 2305499	1 1 1	CABLE-D25SUB/S/S/100/KONFEK/S CABLE-D25SUB/S/S/200/KONFEK/S CABLE-D25SUB/S/S/300/KONFEK/S	2305635 2305648 2305651	1 1 1		
CABLE-D37SUB/B/B/ 100/KONFEK/S CABLE-D37SUB/B/B/ 200/KONFEK/S CABLE-D37SUB/B/B/ 300/KONFEK/S CABLE-D37SUB/B/B/ 400/KONFEK/S CABLE-D37SUB/B/B/ 600/KONFEK/S CABLE-D37SUB/B/B/ 1000/KONFEK/S CABLE-D37SUB/B/B/1000/KONFEK/S CABLE-D37SUB/B/B/1500/KONFEK/S CABLE-D37SUB/B/B/1500/KONFEK/S CABLE-D37SUB/B/B/1500/KONFEK/S	2305509 2305512 2305525 2900759 2900760 2900761 2900762 2900763 2900764	1 1 1 1 1 1 1 1	CABLE-D37SUB/S/S/100/KONFEK/S CABLE-D37SUB/S/S/200/KONFEK/S CABLE-D37SUB/S/S/300/KONFEK/S	2305664 2305677 2305680	1 1 1		
CABLE-D50SUB/B/B/100/KONFEK/S CABLE-D50SUB/B/B/200/KONFEK/S CABLE-D50SUB/B/B/300/KONFEK/S	2305541 2305554 2305567	1 1 1	CABLE-D50SUB/S/S/100/KONFEK/S CABLE-D50SUB/S/S/200/KONFEK/S CABLE-D50SUB/S/S/300/KONFEK/S	2305693 2305703 2305716	1 1 1		

No. of wires	PIN	Wire color
	1	white
	2	brown
	3	green
	4	yellow
	5	gray
	6	pink
	7	blue
i.	8	red
9-pos.	9	black
	10	violet
	11	gray-pink
	12	red-blue
	13	white-green
1.	14	brown-green
15-pos.	15	white-yellow
	16	yellow-brown
	17	white-gray
	18	gray-brown
	19	white-pink
	20	pink-brown
	21	white-blue
	22	brown-blue
	23	white-red
1	24	brown-red
25-pos.	25	white-black
	26	brown-black
	27	gray-green
	28	yellow-gray
	29	pink-green
	30	yellow-pink
	31	green-blue
	32	yellow-blue
	33	green-red
	34	yellow-red
	35	green-black
1	36	yellow-black
37-pos.	37	gray-blue
	38	pink-blue
	39	gray-red
	40	pink-red
	41	gray-black
	42	pink-black
	43 44	blue-black
		red-black
	45	white-brown-black
	46	yellow-green-black
	47	gray-pink-black
	48	blue-red-black
l=o	49	white-green-black
50-pos.	50	green-brown-black

System cable with D-SUB sockets and pin strip

Special lengths

Pre-assembled shielded round cables for connecting VARIOFACE termination boards. The cables are assembled with D-SUB strips in accordance with IEC 60807-2/DIN 41652.

The order key is defined by three features.

The features in the appropriate sequence are:

- Cable type
- Assembly
- Length in meters

There are three assembly variants of the shielded round cable:

- CABLE D-SUB-S/.../.../... D-SUB socket strip on one end and D-SUB pin strip on the other
- CABLE D-SUB-B-B-S/.../... D-SUB

- socket strip at both ends
- CABLE D-SUB-S-S-S/.../... D-SUB pin strip at both ends

The features necessary for clear identification of an order are described below:

Cable type

The number of individual cables within the cable is defined here

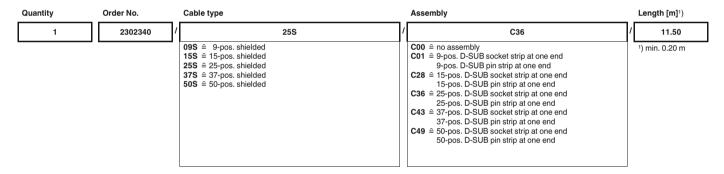
Assembly

- (example for CABLE D-SUB-S/.../...)
- None.
- the cable is not assembled at either end
- 9-pos. D-SUB socket strip at one end 9-pos. D-SUB pin strip at one end the cable connects (1:1) a 9-pos. D-SUB socket and pin strip

- 15-pos. D-SUB socket strip at one end 15-pos. D-SUB pin strip at one end the cable connects (1:1) a 15-pos. D-SUB socket and pin strip; or up to
- 50-pos. D-SUB socket strip at one end 50-pos. D-SUB pin strip at one end the cable connects (1:1) a 50-pos. D-SUB socket and pin strip.

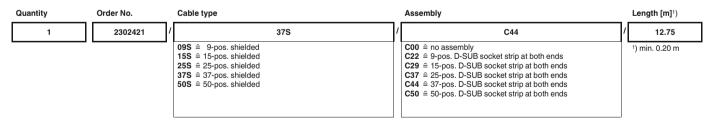
Sample order for round cable set assembled with pin strip on one side and socket strip on one side

- unshielded 25-pos. round cable set, assembled with one 25-pos. D-SUB socket strip and one 25-pos. D-SUB pin strip, 11.5 mm long



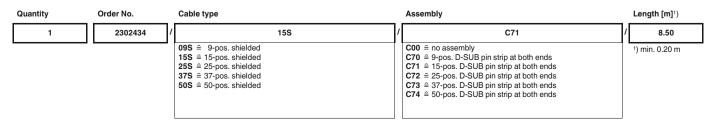
Sample order for round cable set assembled with socket strip at both ends

- Shielded 37-pos. round cable, assembled with two 37-pos. D-SUB socket strips, 12.75 m long



Sample order for round cable set assembled with pin strip at both ends

- Shielded 15-pos. round cable, assembled with two 15-pos. D-SUB pin strips, 8.5 m long





Shielded



Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation)

Shield

Insertion/withdrawal cycles

Conductor cross section

	\mathbf{a}	\sim	n	n		2	l a	•	to
a.		u	ш	ш	·	a	u	a	La

125 V AC/DC 0.09 Ω/m -20°C ... 50°C

Tinned copper-braided shield, approx. 85% covering

> 200

AWG 24 / 0.25 mm²

			Ordering data				
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.		
Assembled round cables, in variable le pin strip on one side and socket strip		е	CABLE D-SUB-S//	2302340	1		
Assembled round cables, in variable le socket strip on both sides	engths,		CABLE D-SUB-B-B-S//	2302421	1		
Assembled round cables, in variable le pin strip on both sides	engths,		CABLE D-SUB-S-S-S///	2302434	1		

System cable with D-SUB socket or pin strip and one open end

- 1:1 connection
- D-SUB socket or pin strip at one end
- Connector according to IEC 60807-2/DIN 41652
- Gland: 2 UNC 4-40 screws
- Open end at the other end
- Individual wire marking: 1, 2, 3, 4, etc.
- Individual wires fitted with ferrules
- Shield connection: H05V-K 1 mm² cable. black, 0.5 m in length



Socket strip at one end and open end at the other end

Technical data



Pin strip at one end and open end at the other end

Technical data

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation)

Insertion/withdrawal cycles Conductor cross section Outside diameter

9 -position 15 -position 25 -position

125 V AC/DC 0.09 Ω/m -20°C ... 50°C

Tinned copper-braided shield, approx. 85% covering

> 200 AWG 24 / 0.25 mm²

7.5 mm 9 mm 10.5 mm 125 V AC/DC 0.09 Ω/m -20°C ... 50°C

Tinned copper-braided shield, approx. 85% covering

> 200 AWG 24 / 0.25 mm²

7.5 mm 10.5 mm

		20 position				10.0 11111			
			Ordering data			Ordering data			
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
Round cable with an open end									
	9	0.5 m	CABLE-D- 9SUB/F/OE/0,25/S/0,5M	2926014	1	CABLE-D- 9SUB/M/OE/0,25/S/0,5M	2926360	1	
	9	1 m	CABLE-D- 9SUB/F/OE/0,25/S/1,0M	2926027	1	CABLE-D- 9SUB/M/OE/0,25/S/1,0M	2926373	1	
	9	1.5 m	CABLE-D- 9SUB/F/OE/0,25/S/1,5M	2926030	1	CABLE-D- 9SUB/M/OE/0,25/S/1,5M	2926386	1	
	9	2 m	CABLE-D- 9SUB/F/OE/0,25/S/2,0M	2926043	1	CABLE-D- 9SUB/M/OE/0,25/S/2,0M	2926399	1	
	9	3 m	CABLE-D- 9SUB/F/OE/0,25/S/3,0M	2926056	1	CABLE-D- 9SUB/M/OE/0,25/S/3,0M	2926409	1	
	9	4 m	CABLE-D- 9SUB/F/OE/0,25/S/4,0M	2926069	1	CABLE-D- 9SUB/M/OE/0,25/S/4,0M	2926412	1	
	9	6 m	CABLE-D- 9SUB/F/OE/0,25/S/6,0M	2926072	1	CABLE-D- 9SUB/M/OE/0,25/S/6,0M	2926425	1	
Round cable, same as before, how	vever in variable l	engths							
	9		CABLE-D- 9SUB-F-OE-0,25-S/	2900903	1	CABLE-D- 9SUB-M-OE-0,25-S/	2900909	1	
Round cable with an open end									
	15	0.5 m	CABLE-D-15SUB/F/OE/0,25/S/0,5M	2926085	1	CABLE-D-15SUB/M/OE/0,25/S/0,5M	2926438	1	
	15	1 m	CABLE-D-15SUB/F/OE/0,25/S/1,0M	2926098	1	CABLE-D-15SUB/M/OE/0,25/S/1,0M	2926441	1	
	15	1.5 m	CABLE-D-15SUB/F/OE/0,25/S/1,5M	2926108	1	CABLE-D-15SUB/M/OE/0,25/S/1,5M	2926454	1	
	15	2 m	CABLE-D-15SUB/F/OE/0,25/S/2,0M	2926111	1	CABLE-D-15SUB/M/OE/0,25/S/2,0M	2926467	1	
	15	3 m	CABLE-D-15SUB/F/OE/0,25/S/3,0M	2926124	1	CABLE-D-15SUB/M/OE/0,25/S/3,0M	2926470	1	
	15	4 m	CABLE-D-15SUB/F/OE/0,25/S/4,0M	2926137	1	CABLE-D-15SUB/M/OE/0,25/S/4,0M	2926483	1	
	15	6 m	CABLE-D-15SUB/F/OE/0,25/S/6,0M	2926140	1	CABLE-D-15SUB/M/OE/0,25/S/6,0M	2926496	1	
Round cable, same as before, how	vever in variable l	engths							
	15		CABLE-D-15SUB-F-OE-0,25-S/	2900905	1	CABLE-D-15SUB-M-OE-0,25-S/	2900910	1	
Round cable with an open end			·						
	25	0.5 m	CABLE-D-25SUB/F/OE/0,25/S/0,5M	2926153	1	CABLE-D-25SUB/M/OE/0,25/S/0,5M	2926506	1	
	25	1 m	CABLE-D-25SUB/F/OE/0,25/S/1,0M	2926166	1	CABLE-D-25SUB/M/OE/0,25/S/1,0M	2926519	1	
	25	1.5 m	CABLE-D-25SUB/F/OE/0,25/S/1,5M	2926179	1	CABLE-D-25SUB/M/OE/0,25/S/1,5M	2926522	1	
	25	2 m	CABLE-D-25SUB/F/OE/0,25/S/2,0M	2926182	1	CABLE-D-25SUB/M/OE/0,25/S/2,0M	2926535	1	
	25	3 m	CABLE-D-25SUB/F/OE/0,25/S/3,0M	2926195	1	CABLE-D-25SUB/M/OE/0,25/S/3,0M	2926548	1	
	25	4 m	CABLE-D-25SUB/F/OE/0,25/S/4,0M	2926205	1	CABLE-D-25SUB/M/OE/0,25/S/4,0M	2926551	1	
	25	6 m	CABLE-D-25SUB/F/OE/0,25/S/6,0M	2926218	1	CABLE-D-25SUB/M/OE/0,25/S/6,0M	2926564	1	
Round cable, same as before, how	vever in variable l								
, , , , , , , , , , , , , , , , , , , ,	25	<u> </u>	CABLE-D-25SUB-F-OE-0,25-S/	2900906	1	CABLE-D-25SUB-M-OE-0,25-S/	2900911	1	

Special lengths of D-SUB cable with open ends can be configured using separate order numbers.

Ordering example:

One system cable assembled with a 37-pos. D-SUB socket strip and one open end, 12.75 m in length:

1 pcs. 2900907/12,75



Socket strip at one end and open end at the other end

Technical data



Pin strip at one end and open end at the other end

Max. perm. operating voltage Max. perm. current carrying capacity per path Max. conductor resistance Ambient temperature (operation) Shield

Insertion/withdrawal cycles Conductor cross section Outside diameter

37 -position 50 -position

125 V AC/DC 0.09 Ω/m -20°C ... 50°C Tinned copper-braided shield, approx. 85% covering

> 200 $AWG\ 24\,/\,0.25\ mm^2$

12 mm 13.5 mm

Technical data 125 V AC/DC 0.09 Ω/m -20°C ... 50°C Tinned copper-braided shield, approx. 85% covering > 200 AWG 24 / 0.25 mm²

12 mm 13.5 mm

			Ordering data			Ordering dat	а	
Description	No. of pos.	Cable length	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
Round cable with an open end								
	37	0.5 m	CABLE-D-37SUB/F/OE/0,25/S/0,5M	2926221	1	CABLE-D-37SUB/M/OE/0,25/S/0,5M	2926577	1
	37	1 m	CABLE-D-37SUB/F/OE/0,25/S/1,0M	2926234	1	CABLE-D-37SUB/M/OE/0,25/S/1,0M	2926580	1
	37	1.5 m	CABLE-D-37SUB/F/OE/0,25/S/1,5M	2926247	1	CABLE-D-37SUB/M/OE/0,25/S/1,5M	2926593	1
	37	2 m	CABLE-D-37SUB/F/OE/0,25/S/2,0M	2926250	1	CABLE-D-37SUB/M/OE/0,25/S/2,0M	2926603	1
	37	3 m	CABLE-D-37SUB/F/OE/0,25/S/3,0M	2926263	1	CABLE-D-37SUB/M/OE/0,25/S/3,0M	2926616	1
	37	4 m	CABLE-D-37SUB/F/OE/0,25/S/4,0M	2926276	1	CABLE-D-37SUB/M/OE/0,25/S/4,0M	2926629	1
	37	6 m	CABLE-D-37SUB/F/OE/0,25/S/6,0M	2926289	1	CABLE-D-37SUB/M/OE/0,25/S/6,0M	2926632	1
Round cable, same as before, however	er in variable l	engths						
	37		CABLE-D-37SUB-F-OE-0,25-S/	2900907	1	CABLE-D-37SUB-M-OE-0,25-S/	2900912	1
Round cable with an open end								
	50	0.5 m	CABLE-D-50SUB/F/OE/0,25/S/0,5M	2926292	1	CABLE-D-50SUB/M/OE/0,25/S/0,5M	2926645	1
	50	1 m	CABLE-D-50SUB/F/OE/0,25/S/1,0M	2926302	1	CABLE-D-50SUB/M/OE/0,25/S/1,0M	2926658	1
	50	1.5 m	CABLE-D-50SUB/F/OE/0,25/S/1,5M	2926315	1	CABLE-D-50SUB/M/OE/0,25/S/1,5M	2926661	1
	50	2 m	CABLE-D-50SUB/F/OE/0,25/S/2,0M	2926328	1	CABLE-D-50SUB/M/OE/0,25/S/2,0M	2926674	1
	50	3 m	CABLE-D-50SUB/F/OE/0,25/S/3,0M	2926331	1	CABLE-D-50SUB/M/OE/0,25/S/3,0M	2926687	1
	50	4 m	CABLE-D-50SUB/F/OE/0,25/S/4,0M	2926344	1	CABLE-D-50SUB/M/OE/0,25/S/4,0M	2926690	1
	50	6 m	CABLE-D-50SUB/F/OE/0,25/S/6,0M	2926357	1	CABLE-D-50SUB/M/OE/0,25/S/6,0M	2926700	1
Round cable, same as before, however	ver in variable l	engths						
	50		CABLE-D-50SUB-F-OE-0,25-S/	2900908	1	CABLE-D-50SUB-M-OE-0,25-S/	2900913	1

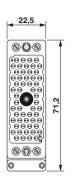
System cable with a 56-pos. ELCO/EDAC plug-in connector and an open end

Assembled system cable for connecting 56-pos. EDAC plug-in connectors from the 516 series or ELCO plug-in connectors from the 8016 series.

- Single-sided 516 series EDAC socket plug-in connectors
- Metal housing with lateral cable outlet
- Coding sockets in location 1 by default
- Open end at the other end
- Single wire marking:
 - 1, 2, 3, ... 53, 54, Y, Z (see pin assignment)
- Shield connection on both sides: H05V-K 1 mm² cable, black, length: 0.5 m

Notes:	
The system cables are designed specifically for the UMK-EC56/56-XOR (2975900) and UMK-EC56/56-XOL (2975890) modules.	
When using the UMK-EC56/FRONT 2,5V/R (2976161) or UMK-EC56/FRONT 2,5V/L (2976158) modules, the coding sockets must be adapted accordingly.	
Observe the module and system cable layouts.	

60,5 46,5 **(4) (a)**





56-pos. system cable

Max. perm. operating voltage

Max. perm. current carrying capacity per path

Max. conductor resistance

Ambient temperature (operation)

Conductor cross section

Conductor structure: stranded wires / material

Technical data

25 V AC / 60 V DC

0.056 Ω/m

-20°C ... 60°C

Tinned copper-braided shield, approx. 85% covering

AWG 22 / 0.34 mm²

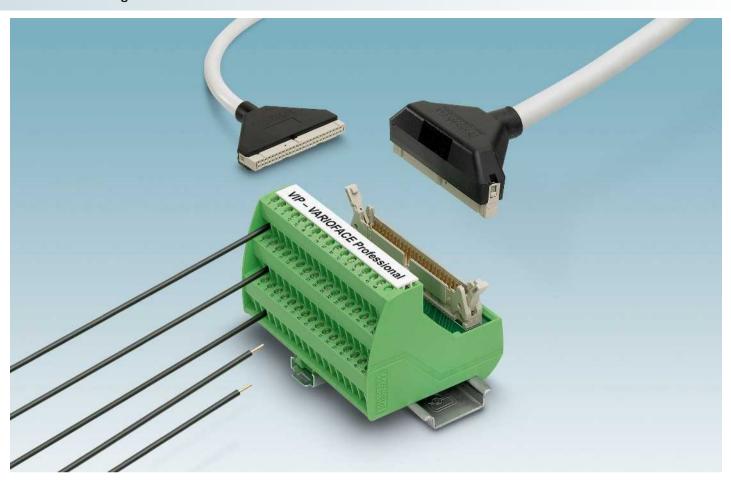
19 / Cu uninsulated

Pin	assignment	

Single wire marking	EDAC sock- et plug-in connector	Single wire marking	EDAC sock- et plug-in connector
Z	Z	31	m
1	A	32	n
2		33	p
2	B C	34	r
4	D	35	s
5	E	36	t
6	F	37	u
7	Н	38	v
8	J	39	w
9	K	40	x
10	L	41	у
11	M	42	Z
12	N	43	AA
13	P	44	BB
14	R	45	CC
15	S	46	DD
16	T	47	EE
17	U	48	FF
18	V	49	HH
19	W	50	JJ
20	X	51	KK
21	а	52	LL
22	b	53	MM
23	С	54	NN
24	d	Υ	Υ
25	е		
26	f		
27	h		
28	j		
29	k		
30	I		

Description	No. of pos.	Cable length
Shielded round cable, single-sided wi plug-in connector and an open end	th assembled	EDAC socket
	56	1 m
	56	2 m
	56	4 m
	56	6 m
	56	8 m
	56	10 m
	56	15 m
	56	20 m
Shielded round cable, as above, but i	n variable len	gths

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
CABLE-EC56/F/OE/0,34/S/ 1,0M CABLE-EC56/F/OE/0,34/S/ 2,0M CABLE-EC56/F/OE/0,34/S/ 4,0M CABLE-EC56/F/OE/0,34/S/ 6,0M CABLE-EC56/F/OE/0,34/S/ 10,0M CABLE-EC56/F/OE/0,34/S/10,0M CABLE-EC56/F/OE/0,34/S/15,0M CABLE-EC56/F/OE/0,34/S/20,0M	2903395 2903396 2903397 2903398 2903399 2903400 2903401 2903402	1 1 1 1 1 1 1
CABLE-EC56-F-OE-0,34-S/	2904025	1



VIP - VARIOFACE Professional - secure and reliable connections in even the tightest of spaces

Space is extremely valuable in the control cabinet. That is why the I/O of automation devices feature high-position plug-in connectors. To enable the individual wires of the sensor/actuator level to be connected to the automation interface in accordance with industry requirements, Phoenix Contact is now able to offer new interface modules and new system cables inside a professional and compact housing design. Thanks to the encapsulated system cables, the control and process levels can be connected safely and reliably in harsh industrial environments.

To allow all components to be supplied with power, potential distributors are available with the same housing design.

VARIOFACE Professional means:

New modules:

- Space-saving
- Vibration resistant thanks to metal foot
- Optional marking
- New housing design

New FLK system cables:

- Encapsulated FLK plug-in connectors
- Professional strain relief
- Robust design



VIP - VARIOFACE Professional interface modules

Interface modules with various connection technologies and designs are available for the widely-used FLK, D-SUB, and highdensity D-SUB plug-in connectors. Modules with a status indicator can be selected for operation monitoring purposes.



Interface module with ELCO or **DIN** plug-in connector

Modules with ELCO plug-in connectors exist for robust environments or where there are increased safety requirements.

Interface modules are also available for DIN strip types C, D, E, and F.



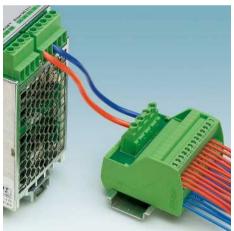
Relay/solid-state relay modules

The active modules are configured as a 4-channel, 8-channel, and 16-channel interface. Multi-channel modules exist for relay and signal/power optocouplers. These allow functions such as signal conditioning, electrical isolation, and power gain to be achieved.



System cables with encapsulated **FLK** or **D-SUB** plug-in connectors

Assembled FLK and D-SUB cables guarantee a reliable connection between the automation device and the module. 1 A (FLK cable) and 2 A (D-SUB cable) currents can be transmitted on each signal path thanks to the large conductor cross sections.

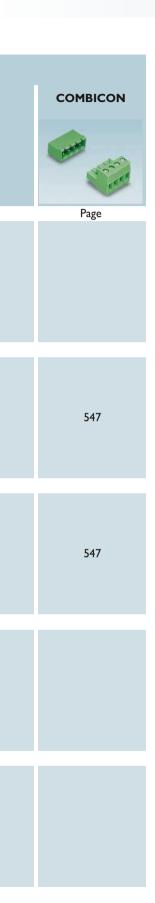


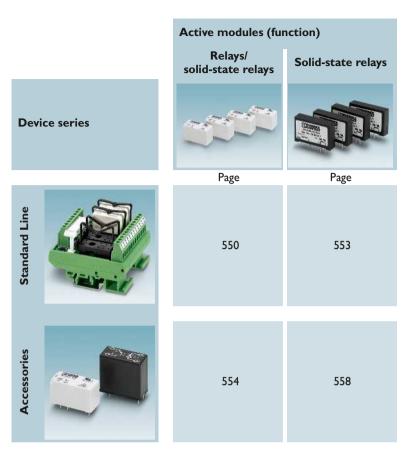
VIP - VARIOFACE Professional potential distributors

Designed for up to 250 V/30 V, the potential distributors can be used universally – for both operating voltage and control voltage distribution. Screw connections or springcage connection can be selected as required for the application.

Product overview for VIP - VARIOFACE Professional

		Passive modules (co	onnection technolog	у)			
		Flat-ribbon cable strip	D-SUB strip	DIN strip	ELCO strip	Potential distributor	
Device series		This is the state of the state				111111	
		Page	Page	Page	Page	Page	
VIP Line		524	532 539			548	
Standard Line				540	544		
Slim Line		528	536				
Feed-through modules		530	537				
Cables		500	512				





System cabling for controllers

VARIOFACE wiring interface

VIP - VARIOFACE Professional Modules with flat-ribbon cable plug-in connectors

- 1:1 connection
- 10- to 64-pos.
- Screw connection
- Metal foot
- As per IEC 60603-13
- Optional with status indicator Low and high engagement latches are supplied with all modules.

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.





10 to 20 positions with screw connection

(IP. 91) us

Operating voltage Max. perm. current (per branch) Ambient temperature (operation)

Mounting position Standards/regulations

Connection data solid / stranded / AWG

Dimensions

Technical data

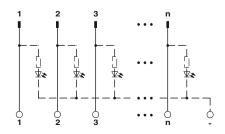
60 V AC/DC -20°C ... 50°C

Any

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

65.5 mm / 56 mm

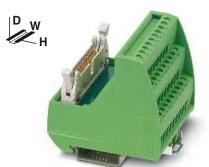
				Ordering data	d	
Description	No. of pos.	Module width W	Туре		Order No.	Pcs. / Pkt.
VARIOFACE module, with pin strip						
	10	34.70	VIP-2/SC/FLK10		2315010	1
	14	39.80	VIP-2/SC/FLK14		2315023	1
	16	45.00	VIP-2/SC/FLK16		2315036	1
VARIOFACE module, with pin strip and lig	20	55.10	VIP-2/SC/FLK20		2315049	1
VARIOFACE IIIOdule, Willi pili strip and lig	Jili iliulcai	.01				
	10	34.70				
	14	44.90				
	16	50.00				
	20	60.20				
VARIOFACE module, with pin strip						
	26	57.10				
	34	67.30				
	40	77.40				
	50 60	92.70 108.00				
	64	118.00				
VARIOFACE module, with pin strip and lig						
TAINOT AGE MOUNTE, WITH PIN OUTP AND IN	jiit iiialoa	.01				
	26	57.40				
	34	67.60				
	40	77.80				
	50	93.10				
	60	113.50				
	64	118.60				





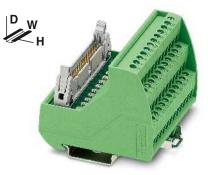


10 to 20 positions with screw connection and light indicator



26 to 64 positions with screw connection

Technical data



26 to 64 positions with screw connection and light indicator

Technical data

c**91** us

Technical data 24 V DC -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 65.5 mm / 56 mm

@ **.91**us

60 V AC/DC -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 69 mm / 62 mm

c**91**0s

24 V DC -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

05.5 (11111 05 (11111 6.60			69 11111 / 62 11111			69 Mill / 62 Mill			
Ordering dat	Ordering data			Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре		Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs./ Pkt.
		,							
VIP-2/SC/FLK10/LED VIP-2/SC/FLK14/LED VIP-2/SC/FLK16/LED	2322045 2322058 2322061	1 1							
VIP-2/SC/FLK20/LED	2322074	1							
			VIP-3/SC/FLK26 VIP-3/SC/FLK34		2315052 2315065	1			
			VIP-3/SC/FLK34 VIP-3/SC/FLK40 VIP-3/SC/FLK50		2315065 2315078 2315081	1			
			VIP-3/SC/FLK50 VIP-3/SC/FLK60 VIP-3/SC/FLK64		2315094 2315104	1			
			VII -0/00/I ER04		2010104				
							VIP-3/SC/FLK26/LED	2322087	1
							VIP-3/SC/FLK34/LED VIP-3/SC/FLK40/LED	2322090 2322100	1
							VIP-3/SC/FLK50/LED	2322113	1
							VIP-3/SC/FLK60/LED VIP-3/SC/FLK64/LED	2322126 2322139	1

VIP - VARIOFACE Professional Modules with flat-ribbon cable plug-in connectors

- 1:1 connection
- 10- to 64-pos.
- Push-in connection
- Metal foot
- As per IEC 60603-13
- Optional with status indicator Low and high engagement latches are supplied with all modules.

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.





10 to 20 positions with push-in connection

Operating voltage

Max. perm. current (per branch) Ambient temperature (operation)

Mounting position

Standards/regulations

Connection data solid / stranded / AWG

Dimensions

Technical data

60 V AC/DC

-20°C ... 50°C

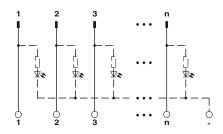
Any

IEC 60664, DIN EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

72.1 mm / 56 mm

			Ordering data	
Description No. of pos.	Module width W	Туре	Order No.	Pcs. / Pkt.
VARIOFACE module, with pin strip				
10	36.80	VIP-2/PT/FLK10	2903787	1
14	41.90	VIP-2/PT/FLK14	2903788	1
16	46.90	VIP-2/PT/FLK16	2903789	1
20	57.10	VIP-2/PT/FLK20	2903790	1
VARIOFACE module, with pin strip and light indica	tor			
40	00.00			
10	36.80			
14	41.90			
16 20	46.90 57.10			
VARIOFACE module, with pin strip	57.10			
VARIOFACE IIIodule, with pin strip	57.10			
34	67.30			
40	77.40			
50	92.70			
60	107.90			
64	118.10			
VARIOFACE module, with pin strip and light indica				
26	57.10			
34	67.30			
40	77.40			
50	92.70			
60	107.90			
64	118.10			



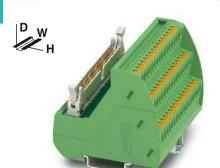
System cabling for controllers

VARIOFACE wiring interface

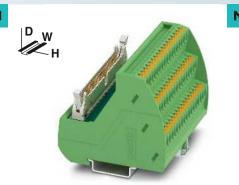




10 to 20 positions with push-in connection and light indicator



26 to 64 positions with push-in connection



26 to 64 positions with push-in connection and light indicator

recillical data	
4 V DC	
A	
20°C 50°C	
iny	
EC 60664, DIN EN 50178, IEC 62103	
.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14	
2.1 mm / 56 mm	

Technical data
60 V AC/DC
1 A
-20°C 50°C
Any
IEC 60664, DIN EN 50178, IEC 62103
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14
75.8 mm / 63 mm

rechnical data
24 V DC
1 A
-20°C 50°C
Any
IEC 60664, DIN EN 50178, IEC 62103
0.14 - 2.5 mm ² / 0.14 - 2.5 mm ² / 26 - 14
75.8 mm / 63 mm
Oudedon dete

Ordering data			Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VIP-2/PT/FLK10/LED VIP-2/PT/FLK14/LED VIP-2/PT/FLK16/LED VIP-2/PT/FLK20/LED	2904248 2904249 2904250 2904251	1 1 1						
			VIP-3/PT/FLK26 VIP-3/PT/FLK34 VIP-3/PT/FLK40 VIP-3/PT/FLK50 VIP-3/PT/FLK60 VIP-3/PT/FLK64	2903791 2903792 2903793 2903794 2903795 2903796	1 1 1 1 1			
						VIP-3/PT/FLK26/LED VIP-3/PT/FLK34/LED VIP-3/PT/FLK40/LED VIP-3/PT/FLK50/LED VIP-3/PT/FLK60/LED VIP-3/PT/FLK64/LED	2904252 2904253 2904254 2904255 2904256 2904257	1 1 1 1 1

SLIM-LINE modules for flat-ribbon cable plug-in connectors

VARIOFACE SLIM-LINE modules connect flat-ribbon cable plug-in connectors in accordance with IEC 60603-13/DIN 41651 to front connection terminal blocks.

The modules are provided with low and high engagement latches to protect the flatribbon cable plug-in connector against being accidentally released.





20 and 26-pos. with screw connection





34 to 50 positions with screw connection

Technical data



Operating voltage

Ambient temperature (operation) Mounting position Standards/regulations

Max. perm. current (per branch)

Screw connection solid / stranded / AWG

Dimensions

Technical data

< 50 V AC / 60 V DC 0.8 A (data valid for 100% coincidence factor)

-10°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

45 mm / 25 mm

D/W

P

< 50 V AC / 60 V DC

1 A (data valid for 100% coincidence factor)

-10°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 $0.2 \dots 4 \ \text{mm}^2 \, / \, 0.2 \dots 2.5 \ \text{mm}^2 \, / \, 24 \, \text{--} \, 12$

45 mm / 45 mm

Description	No. of pos.	Module height H
VARIOFACE-SLIM-LINE module, w	vith pin strip	
	20 26	177.00 217.00
VARIOFACE-SLIM-LINE module, w	vith pin strip	
	34	147.00
	40	167.00
	50	197.00

Ordering data					
Туре	Order No.	Pcs. / Pkt.			
UM 25-FLK20/FRONT/Q UM-25 FLK26/FRONT/Q	2959515 2959528	1 1			

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
UM 45-FLK34/FRONT/Q	2959531	1				
UM 45-FLK40/FRONT/Q UM 45-FLK50/FRONT/Q	2959544 2959557	1				

System cabling for controllers

VARIOFACE wiring interface

Panel feed-through modules for flat-ribbon cable plug-in connectors

VARIOFACE DFLK... panel feed-through modules connect the flat-ribbon cable plug-in connectors in accordance with IEC 60603-13/DIN 41651 to the screw connection terminal blocks.

These modules are suitable for mounting on a side panel with an appropriate housing cutout (see dimensioning table).

The modules are provided with low and high engagement latches to protect the flatribbon cable plug-in connector against being accidentally released.



16 to 50 positions with screw connection

Technical data

< 50 V AC / 60 V DC 1 A -20°C ... 50°C

Anv **DIN EN 50178**

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations Connection data solid / stranded / AWG

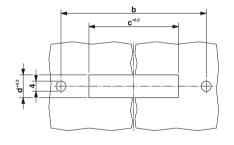
Description	No. of pos.	Module width W
VARIOFACE feed-through module	, with pin strip	
	16	39.00
	20	39.00
	26	39.00
	34	39.00
	40	39.00

50

39.00

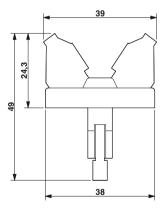
Ordering data						
Туре	Order No.	Pcs./ Pkt.				
DFLK 16	2280239	5				
DFLK 20	2280242	5				
DFLK 26	2280255	5				
DFLK 34	2280268	5				
DFLK 40	2280271	5				
DFLK 50	2280284	5				

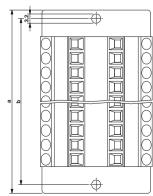
Dimensioning of the housing cutout



Туре	a	b	С	d
DFLK 16	58.4	52.5		9 + 0.2
DFLK 20	68.4	62.5		9 + 0.2
DFLK 26	83.4	77.5		9 + 0.2
DFLK 34	103.4	97.5	70.6 + 0.2	9 + 0.2
DFLK 40	128.4	122.5		9 + 0.2
DFLK 50	143.4	137.5		9 + 0.2

Dimensional drawing DFLK:





Feed-through modules for IDC/FLK plug-in connectors (pitch 2.54 mm) with spring-cage connection

- 1:1 connection
- 10- to 50-pos.
- Plug-in push-in spring-cage connection
- Plug-in connectors as per IEC 60603-13
- Short and long latches are supplied with the module
- Select housing cutout for side panel mounting according to dimensions table



With pin strip and push-in spring-cage connection

Technical data

< 50 V AC / 60 V DC

1 A

-20°C ... 50°C

Any

DIN EN 50178

0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12

Description	No. of pos.	Module width W
VARIOFACE feed-through mode	ule, with pin strip	
	10	36.50
	14	36.50
	16	36.50
	20	36.50
	26	36.50
	34	36.50
	40	36.50
	50	36.50

Ordering data						
Туре	Order No.	Pcs. / Pkt.				
DFLK 10/FKCT	2903034	1				
DFLK 14/FKCT	2903035	1				
DFLK 16/FKCT	2903036	1				
DFLK 20/FKCT	2903038	1				
DFLK 26/FKCT	2903039	1				
DFLK 34/FKCT	2903041	1				
DFLK 40/FKCT	2903042	1				
DFLK 50/FKCT	2903043	1				

Dimensioning of the housing cutout

Operating voltage

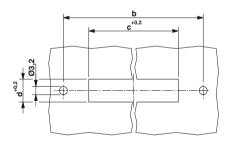
Mounting position

Standards/regulations

Max. perm. current (per branch)

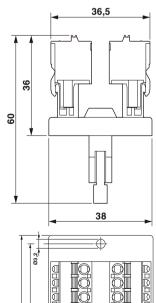
Ambient temperature (operation)

Connection data solid / stranded / AWG



Туре	а	b	С	d
DFLK 10/FKCT DFLK 14/FKCT DFLK 16/FKCT DFLK 20/FKCT	58.4 58.4 58.4 68.4	52.5 52.5 52.5 62.5	40.1 + 0.2	9+0.2 9+0.2 9+0.2 9+0.2
DFLK 26/FKCT DFLK 34/FKCT DFLK 40/FKCT DFLK 50/FKCT	83.4 103.4 128.4 143.4	77.5 97.5 122.5 137.5	63.0 + 0.2 70.6 + 0.2	9 + 0.2 9 + 0.2 9 + 0.2 9 + 0.2

Dimensional drawing DFLK...FKCT



System cabling for controllers

VARIOFACE wiring interface

VIP - VARIOFACE Professional Modules with D-SUB plug-in connectors

- 1:1 connection
- 9- to 50-pos.
- Screw connection
- Metal foot
- As per IEC 60807-2
- Optional with status indicator The D-SUB-4-40 UNC threads are guided directly onto a connection terminal block.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.





9 to 15 positions with screw connection

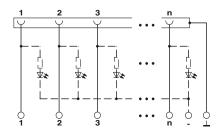
Technical data

(IP. 91) us

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Any Standards/regulations Connection data solid / stranded / AWG Dimensions

125 V AC/DC -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 65.5 mm / 45.1 mm

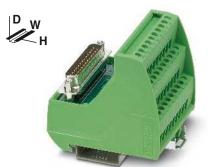
			Orderin	ng data	
Description	No. of pos.	Module width W	Туре	Order No.	Pcs. / Pkt.
VARIOFACE module, with D-SU	JB miniature pin stri	p			
	9 15	34.70 45.00	VIP-2/SC/D 9SUB/M VIP-2/SC/D15SUB/M	2315117 2315120	1 1
VARIOFACE module, with D-SU light indicator	JB miniature pin stri	p and			
	9 15	34.70 50.00			
VARIOFACE module, with D-SU					
	9 15	34.70 45.00	VIP-2/SC/D 9SUB/F VIP-2/SC/D15SUB/F	2315162 2315175	1
VARIOFACE module, with D-SU light indicator		·			
	9 15	34.70 50.00			
VARIOFACE module, with D-SU	JB miniature pin stri	р			
	25	57.40			
	37 50	72.70 98.20			
VARIOFACE module, with D-SU light indicator	JB miniature pin stri	p and			
	25	57.40			
	37 50	72.70 98.20			
VARIOFACE module, with D-SU	JB miniature socket	strip			
	25	57.40			
	37 50	72.70 98.20			
VARIOFACE module, with D-SU light indicator					
•	25	57.40			
	37 50	72.70 98.20			





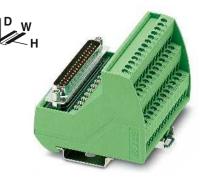


9 to 15 positions with screw connection and light indicator



25 to 50 positions with screw connection

Technical data



25 to 50 positions with screw connection and light indicator

Technical data

c**91** us

Technical data

24 V DC -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 65.5 mm / 45.1 mm

@ .**91**0 us

125 V AC/DC -20°C ... 50°C Any

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 69 mm / 62 mm

c**91**0s

24 V DC 2.5 A -20°C ... 50°C Any

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 69 mm / 62 mm

Ordering dat	Ordering data			Ordering data		Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VIP-2/SC/D 9SUB/M/LED VIP-2/SC/D15SUB/M/LED	2322142 2322155	1 1						
VIP-2/SC/D 9SUB/F/LED VIP-2/SC/D15SUB/F/LED	2322197 2322207	1 1						
			VIP-3/SC/D25SUB/M VIP-3/SC/D37SUB/M VIP-3/SC/D50SUB/M	2315133 2315146 2315159	1 1 1			
						VIP-3/SC/D25SUB/M/LED VIP-3/SC/D37SUB/M/LED VIP-3/SC/D50SUB/M/LED	2322168 2322171 2322184	1 1 1
			VIP-3/SC/D25SUB/F VIP-3/SC/D37SUB/F VIP-3/SC/D50SUB/F	2315188 2315191 2315201	1 1 1			
						VIP-3/SC/D25SUB/F/LED VIP-3/SC/D37SUB/F/LED VIP-3/SC/D50SUB/F/LED	2322210 2322223 2322236	1 1 1

VIP - VARIOFACE Professional Modules with D-SUB plug-in connectors

- 1:1 connection
- 9- to 50-pos.
- Push-in connection
- Metal foot
- As per IEC 60807-2
- Optional with status indicator The D-SUB-4-40 UNC threads are guided directly onto a connection terminal block.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.





9 to 15 positions with push-in connection

Operating voltage

Max. perm. current (per branch) Ambient temperature (operation)

Mounting position

Standards/regulations

Connection data solid / stranded / AWG

Dimensions

Technical data

125 V AC/DC

-20°C ... 50°C

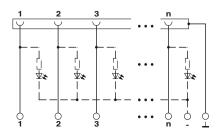
Any

IEC 60664, DIN EN 50178, IEC 62103

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

72.1 mm / 46.6 mm

			Ordering (data	
Description	No. of pos.	Module width W	Туре	Order No.	Pcs. / Pkt.
VARIOFACE module, with D-SUB miniat	ure pin stri	ip			
	9 15	36.80 46.90	VIP-2/PT/D 9SUB/M VIP-2/PT/D15SUB/M	2903777 2903779	1
VARIOFACE module, with D-SUB miniat light indicator	ure pin stri	p and			
iight indicator	9	36.80			
WARREST	15	52.00			
VARIOFACE module, with D-SUB miniat	ure socket	strip			
	9	36.80	VIP-2/PT/D 9SUB/F	2903778	1
VARIOTA OF the state of the D. O. I. D. or in its	15	46.90	VIP-2/PT/D15SUB/F	2903780	1
VARIOFACE module, with D-SUB miniat light indicator	ure socket	strip and			
	9	36.80			
VARIOFACE module, with D-SUB miniat	15 ura nin etri	52.00			
VALUE AGE MOULE, WILL B-GOD HIMIA	ure piir stri	P			
	25	57.10			
	37 50	72.30 97.70			
VARIOFACE module, with D-SUB miniat light indicator					
g	25	57.10			
	37	72.30			
VARIOFACE module, with D-SUB miniat	50 ure socket	97.70 strin			
VALUE AGE MICHAIC, WAT B GOD THIMAG	are sooner	. ourp			
	25	57.10			
	37 50	72.30 97.70			
VARIOFACE module, with D-SUB miniat light indicator					
, and the second	25	57.10			
	37	72.30			
	50	97.70			



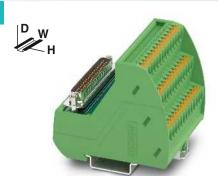
System cabling for controllers

VARIOFACE wiring interface

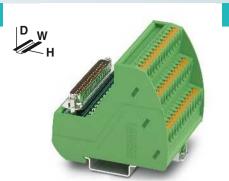




9 to 15 positions with push-in connection and light indicator



25 to 50 positions with push-in connection



25 to 50 positions with push-in connection and light indicator

Те	chnical data
24 V DC	
2 A	
-20°C 50°C	
Any	
IEC 60664, DIN EN 50178	, IEC 62103
0.14 - 2.5 mm ² / 0.14 - 2.5	mm² / 26 - 14
72.1 mm / 46.6 mm	

Technical data 125 V AC/DC -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 75.8 mm / 63 mm

Technical data 24 V DC -20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 75.8 mm / 63 mm

Ordering dat	ta		Ordering	ı data	Ordering data					
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.		
VIP-2/PT/D 9SUB/M/LED VIP-2/PT/D1SSUB/M/LED	2904258 2904259	1								
VIP-2/PT/D 9SUB/F/LED VIP-2/PT/D15SUB/F/LED	2904263 2904264	1								
			VIP-3/PT/D25SUB/M VIP-3/PT/D37SUB/M VIP-3/PT/D50SUB/M	2903781 2903783 2903785	1 1 1					
						VIP-3/PT/D25SUB/M/LED VIP-3/PT/D37SUB/M/LED VIP-3/PT/D50SUB/M/LED	2904260 2904261 2904262	1 1 1		
			VIP-3/PT/D25SUB/F VIP-3/PT/D37SUB/F VIP-3/PT/D50SUB/F	2903782 2903784 2903786	1 1 1					
						VIP-3/PT/D25SUB/F/LED VIP-3/PT/D37SUB/F/LED VIP-3/PT/D50SUB/F/LED	2904265 2904266 2904267	1 1 1		

System cabling for controllers

VARIOFACE wiring interface

SLIM-LINE modules for **D-subminiature plug-in connectors**

These VARIOFACE modules connect D-SUB strips with front connection terminal blocks in accordance with IEC 60807-2/DIN 41652.

To make the ground connection, the metallic plug shell (4-40 UNC thread) makes contact with a connection terminal block.





9 to 25 positions With screw connection



37 to 50 positions With screw connection



PG

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations Dimensions

Technical data 125 V AC/DC 2.5 A -10°C ... 50°C Any IEC 60664, IEC 60664 A, DIN VDE 0110, DIN VDE 0160 (in parts) 45 mm / 25 mm

Technical data 125 V AC/DC

-10°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 45 mm / 45 mm

			Ordering data			Ordering data			
Description	No. of pos.	Module height H	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
VARIOFACE-SLIM-LINE module, with D-SUB miniature pin strip									
	9	117.00	UM 25-D 9SUB/S/FRONT/Q	2959573	1				
	15	147.00	UM 25-D15SUB/S/FRONT/Q	2959599	1				
	25	217.00	UM 25-D25SUB/S/FRONT/Q	2959612	1				
VARIOFACE-SLIM-LINE module, with D-SUB miniature socket strip									
	9	117.00	UM 25-D 9SUB/B/FRONT/Q	2959560	1				
	15	147.00	UM 25-D15SUB/B/FRONT/Q	2959586	1				
	25	217.00	UM 25-D25SUB/B/FRONT/Q	2959609	1				
VARIOFACE-SLIM-LINE module, with D-SUB miniature pin strip									
	37	157.00				UM 45-D37SUB/S/FRONT/Q	2959638	1	
	50	187.00				UM 45-D50SUB/S/FRONT/Q	2959654	1	
VARIOFACE-SLIM-LINE module, with D-SUB miniature socket strip									
	37	157.00				UM 45-D37SUB/B/FRONT/Q	2959625	1	
	50	187.00				UM 45-D50SUB/B/FRONT/Q	2959641	1	

Feed-through modules for **D-SUB** miniature plug-in connectors with screw connection

- 1:1 connection
- 9- to 50-pos.
- Screw connection
- As per IEC 60807-2
- D-SUB 4-40 UNC thread
- 9- to 37-pos.: Separate ground tap
- 50-pos.: No ground tap



With D-subminiature pin strip



With D-subminiature socket strip

Technical data

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations

Connection data solid / stranded / AWG

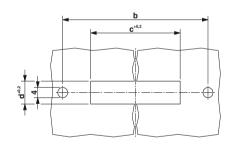
	Technical data
125 V AC/DC	
2.5 A	
-20°C 50°C	
Any	
DIN EN 50178	
0.2 - 4 mm ² / 0.2 - 2.5	mm² / 24 - 12

125 V AC/DC
2.5 A
-20°C 50°C
Any
DIN EN 50178
0.2 - 4 mm ² / 0.2 - 2.5 mm ² / 24 - 1

			Ordering data			Ordering data		
Description	No. of pos.	Module width W	Туре	Order No.	Pcs. / Pkt.	Туре	C	
VARIOFACE feed-through module, with D-subminiature plug-in connector								
	9	39.00	DFLK-D 9 SUB/S	2283870	5	DFLK-D 9 SUB/B		
	15	39.00	DFLK-D15 SUB/S	2280297	5	DFLK-D15 SUB/B		
	25	39.00	DFLK-D25 SUB/S	2280310	5	DFLK-D25 SUB/B		
	37	39.00	DFLK-D37 SUB/S	2280336	5	DFLK-D37 SUB/B		
	50	39.00	DFLK-D50 SUB/S	2291286	5	DFLK-D50 SUB/B		

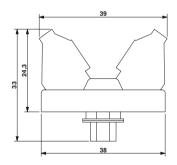
Ordering data			Ordering data			
ре	Order No.	Pcs./ Pkt.	Туре	Order No.	Pcs. / Pkt.	
		-	DEL V. D. O. O. U.D./D.		_	
LK-D 9 SUB/S	2283870	5	DFLK-D 9 SUB/B	2287135	5	
LK-D15 SUB/S	2280297	5	DFLK-D15 SUB/B	2280307	5	
LK-D25 SUB/S	2280310	5	DFLK-D25 SUB/B	2280323	5	
LK-D37 SUB/S	2280336	5	DFLK-D37 SUB/B	2280349	5	
LK-D50 SUB/S	2291286	5	DFLK-D50 SUB/B	2287669	5	

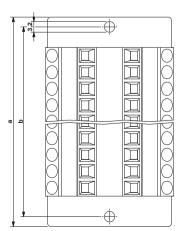
Dimensioning of the housing cutout



Туре	а	b	С	d
DFLK-D 9 SUB/S	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D 15 SUB/S	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D 25 SUB/S	83.4	77.5	54.2 + 0.2	13+0.2
DFLK-D 37 SUB/S	128.4	122.5	70.6 + 0.2	13+0.2
DFLK-D 50 SUB/S	143.4	137.5	67.8 + 0.2	15.8+0.2
DFLK-D 9 SUB/B	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D 15 SUB/B	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D 25 SUB/B	83.4	77.5	54.2 + 0.2	13+0.2
DFLK-D 37 SUB/B	128.4	122.5	70.6 + 0.2	13+0.2
DFLK-D 50 SUB/B	143.4	137.5	67.8 + 0.2	15.8+0.2

Dimensional drawing: DFLK-D...SUB:





Feed-through modules for **D-SUB** miniature plug-in connectors with push-in connection

- 1:1 connection
- 9- to 50-pos.
- Plug-in push-in spring-cage connection
- Plug-in connector according to IEC 60807-2
- D-SUB 4-40 UNC thread
- 9- to 37-pos. with separate ground tap
- 50-pos.: No ground tap
- Select housing cutout for side panel mounting according to dimensions table



With D-SUB pin strip and push-in connection

Technical data



With D-SUB socket strip and push-in connection

Operating voltage
Max. perm. current (per branch)
Ambient temperature (operation)
Mounting position
Standards/regulations

Connection data solid / stranded / AWG

10E V AC/DC

0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12

	Technical data
125 V AC/DC	
2.5 A	
-20°C 50°C	
Any	
DIN EN 50178	

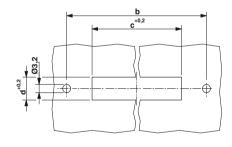
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12

Description	No. of pos.	Module width W
VARIOFACE feed-through module , with D-subminiature plug-in connector		
	9	36.50
	15	36.50
	25	36.50
	37	36.50
	50	36.50

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
DFLK-D 9 SUB/M/FKCT	2903052	1		
DFLK-D15 SUB/M/FKCT	2903054	1		
DFLK-D25 SUB/M/FKCT	2903055	1		
DFLK-D37 SUB/M/FKCT	2903056	1		
DFLK-D50 SUB/M/FKCT	2903058	1		

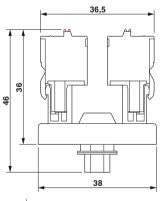
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
DFLK-D 9 SUB/F/FKCT DFLK-D15 SUB/F/FKCT DFLK-D25 SUB/F/FKCT DFLK-D37 SUB/F/FKCT DFLK-D50 SUB/F/FKCT	2903063 2903065 2903067 2903069 2903070	1 1 1 1		

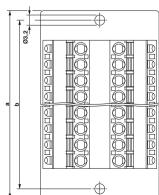
Dimensioning of the housing cutout



Туре	а	b	С	d
DFLK-D 9 SUB/M/FKCT	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D15 SUB/M/FKCT	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D25 SUB/M/FKCT	83.4	77.5	54.2 + 0.2	13+0.2
DFLK-D37 SUB/M/FKCT	128.4	122.5	70.6 + 0.2	13+0.2
DFLK-D50 SUB/M/FKCT	143.4	137.5	67.8 + 0.2	15.8+0.2
DFLK-D90 SUB/F/FKCT	58.4	52.5	40.2 + 0.2	13+0.2
DFLK-D15 SUB/F/FKCT	58.4	52.5	40.2 + 0.2	13 + 0.2
DFLK-D25 SUB/F/FKCT	83.4	77.5	54.2 + 0.2	13 + 0.2
DFLK-D37 SUB/F/FKCT	128.4	122.5	70.6 + 0.2	13 + 0.2
DFLK-D50 SUB/F/FKCT	143.4	137.5	67.8 + 0.2	15.8 + 0.2

Dimensional drawing DFLK-D...SUB...FKCT





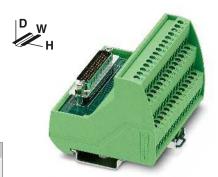
VIP - VARIOFACE Professional modules for high density D-SUB miniature plug-in connectors

- 1:1 connection
- 15- to 62-pos.
- Screw and push-in connection
- Metal foot

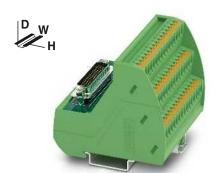
The D-SUB-4-40 UNC threads are guided directly onto a connection terminal block.

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.

1) Module with double-level terminal blocks



15 to 62 positions with screw connection



15 to 62 positions with push-in connection

c**91**us

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position

Connection data solid / stranded / AWG

Dimensions

Technical data 125 V AC/DC -20°C ... 50°C Any 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 69 mm / 62 mm

Technical data 125 V AC/DC -20°C ... 50°C 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 75.8 mm / 63 mm

Any

			Ordering data		Ordering data			
Description	No. of pos.	Module width W	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
VARIOFACE module, with D-SUB minia	ture pin stri	р						
With screw connection 1) With screw connection With screw connection With screw connection With push-in connection VARIOFACE module, with D-SUB minia	15 26 44 62 15 26 44 62 ture socket	44.90 52.30 82.90 113.50 46.90 52.00 82.50 113.00	VIP-2/SC/HD15SUB/M VIP-3/SC/HD26SUB/M VIP-3/SC/HD44SUB/M VIP-3/SC/HD62SUB/M	2322326 2322375 2322388 2322391	1 1 1 1	VIP-2/PT/HD15SUB/M VIP-3/PT/HD26SUB/M VIP-3/PT/HD44SUB/M VIP-3/PT/HD62SUB/M	2904268 2904269 2904270 2904271	1 1 1 1
With screw connection 1) With screw connection With screw connection With screw connection With push-in connection 1) With push-in connection With push-in connection With push-in connection	15 26 44 62 15 26 44 62	44.90 52.30 82.90 113.50 46.90 52.00 82.50 113.00	VIP-2/SC/HD15SUB/F VIP-3/SC/HD26SUB/F VIP-3/SC/HD44SUB/F VIP-3/SC/HD62SUB/F	2322401 2322414 2322427 2322430	1 1 1 1	VIP-2/PT/HD15SUB/F VIP-3/PT/HD26SUB/F VIP-3/PT/HD44SUB/F VIP-3/PT/HD62SUB/F	2904272 2904273 2904274 2904275	1 1 1 1

Modules for plug-in connectors IEC 60603/DIN 41612

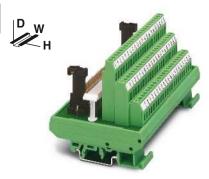
These VARIOFACE interface modules connect high-position plug-in connectors according to IEC 60603/DIN 41612 to screw connection terminal blocks.

The following VARIOFACE modules are available:

- UMK modules with double-level connection terminal blocks
- UMKS modules with three-level connection terminal blocks.

Notes:

For suitable cable housings, see the table on page 562



Design C. 64-position, a, c assembled



125 V AC/DC

Technical data

Operating voltage Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations

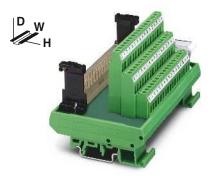
Connection data solid / stranded / AWG

Dimensions

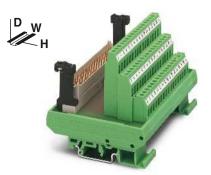
-20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 77 mm / 72 mm

No. of Module width Description pos. VARIOFACE module, C 64-pos., screw-on cable housing, with: VARIOFACE module, E 48-pos., screw-on cable housing, with: 48 123.80 VARIOFACE module, F 48-pos., screw-on cable housing, with: - Pin strip 48 112.50 VARIOFACE module, F 48-pos., snap-on cable housing, with: 48 112.50 VARIOFACE module, D 32-pos., screw-on cable housing, with: - Pin strip

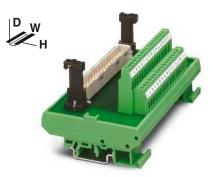
Ordering data					
Туре	Order No.	Pcs. / Pkt.			
UMKS- C64M-VS	2970565	1			



Design E, 48-position, a, c, e assembled



Design F, 48-position, z, b, d assembled



Design D, 32-position, a, c assembled



rechnical data
125 V AC/DC
4 A
-20°C 50°C
Any
IEC 60664, DIN EN 50178, IEC 62103
0.2 - 4 mm ² / 0.2 - 2.5 mm ² / 24 - 12
77 mm / 72 mm

P

Technical data 250 V AC -20°C ... 45°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 77 mm / 72 mm

Technical data

-20°C ... 50°C Any IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 77 mm / 62.5 mm

P

250 V AC/DC

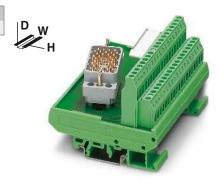
Ordering data			Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UMKS- E48M-VS	2970154	1						
			UMKS- F48M-VS	2970714	1			
			UMKS- F48M-VR	2970167	1			
						UMK- D32M-VS	2970060	1

Modules for ELCO plug-in connectors

These modules can be used to connect ELCO plug-in connectors of the 8016 series to screw connection terminal blocks.

The diagonal position of the ELCO plugin connector means that the wires leading out of the cable housing at the side can be led away without restricting neighboring modules.

Dimensional drawings and pin assignments, see page 562



38-pos.



Operating voltage

Max. perm. current (per branch)

Total current

Ambient temperature (operation)

Mounting position

Standards/regulations

Connection data solid / stranded / AWG

Dimensions

Technical data

25 V AC / 60 V DC

19 A (38 branches with 0.5 A each)

-20°C ... 40°C

Any

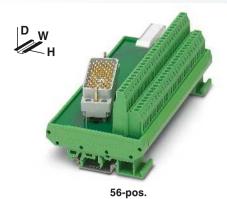
IEC 60664, DIN EN 50178, IEC 62103

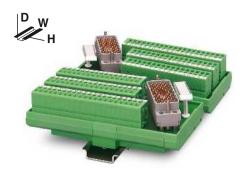
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

H / D 77 mm / 58.5 mm

Description	No. of pos.	Module width W	
VARIOFACE module, with:			
- Pin strip 8016 right	38	101.50	
- Pin strip 8016 left	38	101.50	
VARIOFACE module, with:			
- Pin strip 8016 right	56	157.50	
- Pin strip 8016 left	56	157.50	
VARIOFACE module, with:			
- Pin strip 8016 right	56	77.00	
- Pin strip 8016 left	56	77.00	
VARIOFACE module, with:			
- Pin strip 8016 right above	32	101.30	
- Pin strip 8016 right below	32	101.30	
- Pin strip 8016 left above	32	101.30	
- Pin strip 8016 left below	32	101.30	

Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
UMK- EC38/38-XOR UMK- EC38/38-XOL	2976297 2976284	1





56-pos., with front connection terminal blocks

32-pos.



	Technical data
125 V AC/DC 1.5 A	

28 A (56 branches with 0.5 A each) -20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 77 mm / 58.5 mm

P

Technical data

< 25 V AC / 30 V DC 28 A (56 branches with 0.5 A each) -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103

0.2 - 2.5 mm² / 0.2 - 1.5 mm² / 26 - 16

146.3 mm / 47.5 mm

P

Technical data

25 V AC / 60 V DC 32 A (32 branches with 1 A each) -20°C ... 40°C

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 77 mm / 58.5 mm

Ordering data			Ordering data			Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UMK- EC56/56-XOR UMK- EC56/56-XOL	2975900 2975890	1						
			UMK- EC56/FRONT 2,5V/R UMK- EC56/FRONT 2,5V/L	2976161 2976158	1			
						UMK- EC56/32-XOR UMK- EC56/32-XUR	2975858 2975777	1
						UMK- EC56/32-XOL UMK- EC56/32-XUL	2975764 2975780	1 1

Modules for ELCO plug-in connectors for use in Ex i circuits

The VARIOFACE modules connect ELCO plug-in connectors of the 8016 series to screw connection terminal blocks. The modules for ELCO connectors can be used as simple electrical equipment for applications in intrinsically safe circuits as per EN 60079-14. They fulfill the requirements of intrinsic safety as per EN 60079-11 (EN 50020) and can be used for various intrinsically safe circuits taking into account the pin configuration.

The voltage of an intrinsically safe circuit may not exceed 30 V. The voltage difference between two intrinsically safe circuits can be up to 60 V.

The modules are equipped with blue screw connection methods are clear labeling for intrinsically safe circuits.

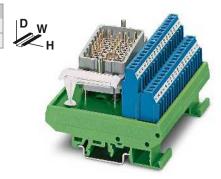
The arrangement of angled ELCO plug-in connectors makes it possible to lead the lines led out from the cable housing away from the adjacent modules without any negative effects.

For the disconnection of intrinsically safe and non-intrinsically safe circuits, a distance of at least 50 mm should be kept between the connection points using partition plates or spaces.

Notes:

Dimensional drawings and pin assignments, see page 563

Facts about explosion protection, see page 154



32-pos.

Operating voltage

Max. perm. current (per branch) Ambient temperature (operation) Mounting position Standards/regulations

VARIOFACE module, with: - Pin strip 8016 right

- Pin strip 8016 left

Connection data solid / stranded / AWG

No. of Module width Description pos. VARIOFACE module, with: - Pin strip 8016 right above 32 101.30 - Pin strip 8016 right below 32 101.30 - Pin strip 8016 left above 32 101.30 - Pin strip 8016 left above 32 101.30 VARIOFACE module, with: - Pin strip 8016 right 25 78.80 - Pin strip 8016 left 25 78.80

25

77.00

77.00

Technical data

max. 30 V DC (Max. voltage between two intrinsically safe circuits: 60 V DC) 500 mA

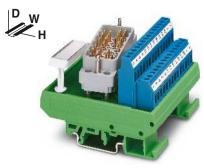
-20°C ... 50°C

DIN EN 60079-11

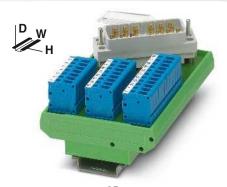
 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$

77 mm / 58.5 mm

Ordering data							
Туре	Order No.	Pcs. / Pkt.					
UMK- EC90/32/EX-XOR UMK- EC90/32/EX-XUR	2900109 2969068	1					
UMK- EC90/32/EX-XOL UMK- EC90/32/EX-XUL	2900110 2969071	1 1					







25-pos., with front connection terminal blocks

Technical data

max. 30 V DC (Max. voltage between two intrinsically safe circuits: 60 V DC) 500 mA

-20°C ... 50°C

DIN EN 60079-11 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

77 mm / 58.5 mm

Technical data

max. 30 V DC

(Max. voltage between two intrinsically safe circuits: 60 V DC)

500 mA

-20°C ... 50°C

DIN EN 60079-11 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14

112.5 mm / 52.5 mm

77 111117 00:0 111111			112.0 111117 02.0 11111			
Ordering da	ta	Ordering data				
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
UMK- EC56/25/EX -R UMK- EC56/25/EX -L	2900112 2900113	1				
			UMK- EC56/25/EX -FRONT 2,5V/R	2900114	1	

Modules with RJ45 plug-in connector

- 1:1 connection
- 8-positions, RJ45 connector
- Screw or push-in connection (direct plug-in technology)
- Connector housing led to separate connection terminal blocks

Notes:

Operating voltage Max. perm. current (per branch) Ambient temperature (operation)

Mounting position

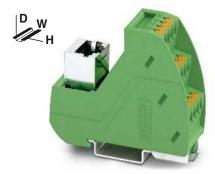
Standards/regulations

Connection data solid / stranded / AWG

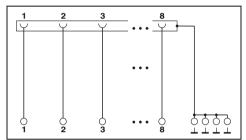
For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 5.

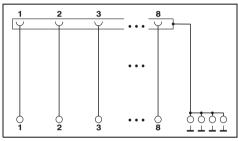


8-pos. with screw connection



8-pos. with push-in connection





Technical data

48 V AC/DC

-20°C ... 50°C

DIN EN 50178

 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$

69 mm / 62 mm

H/D

Т	ec	hn	iica	ıl d	ata

48 V AC/DC

-20°C ... 50°C

EN 50178

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

75.8 mm / 63 mm

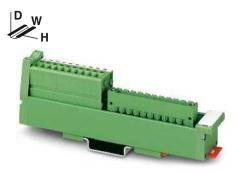
Description	No. of pos.	Module width W
VARIOFACE module, with RJ45 plu	ıg-in connector	
With screw connection	8	26.90
With push-in connection	8	26.60

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-3/SC/RJ45	2900701	1	

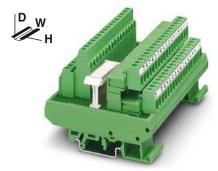
Ordering data			
Туре	Order No.	Pcs. / Pkt.	
VIP-3/PT/RJ45	2904290	1	

Modules with COMBICON connection

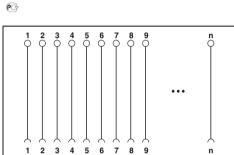
- The slim 10- and 18-pos. VARIOFACE SLIM-LINE modules connect the front connection terminal blocks to a COMBICON header. The corresponding COMBICON plugs (5.0 mm pitch) can be found in the COMBICON catalog PCB Connection Technique.
- The 32-pos. UMK-32 MDSTB/MKKDS 3/R module connects screw connection terminal blocks with coded COMBICON plug-in screw connectors.



10- and 18-pos. With screw connection



With screw connection



1 2	3 4	5 6 0 0	7 8 9 0 0 0	30	31 3 2
				•••	
1 2	3 4	1 5 6	7 8 9	30	31 3

Technical data

250 V AC/DC 2.5 A -10°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103

45 mm / 25 mm

77.00

Technical data

250 V AC/DC -20°C ... 50°C

P

IEC 60664, DIN EN 50178, IEC 62103

58.5 mm / 112.5 mm

Description	No. of pos.	Module height H	
VARIOFACE-SLIM-LINE module, (without a COMBICON plug-in conn		ON header	
	10 18	137.00 217.00	
VARIOFACE module, with COMBICON plug-in connector, coded			

Operating voltage Max. perm. current (per branch)

Mounting position

Standards/regulations Dimensions

Ambient temperature (operation)

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UM 25-10 MSTB/FRONT/Q UM 25-18 MSTB/FRONT/Q	2959803 2959502	1		

Ordering data				
Туре		Order No.	Pcs./ Pkt.	
UMK-32 MI	DSTB/MKKDS3/R	2970196	1	

Modules as compact potential distributors

The VIP-2/.../PDM... modules offer the following features:

- Two potential levels
- Separate supply
- Screw or push-in connection
- Consecutive labeling The UMK-PVB and UMK-PVB 6 modules have three or six potential levels.

Notes:

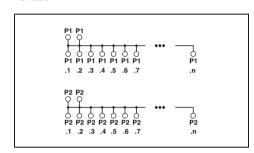
Marking systems and mounting material See Catalog 5





With screw connection and 2 potential levels

(F) . **91**0 us



Technical data

Operating voltage

Max. perm. current (per branch)

Total current

Ambient temperature (operation)

Mounting position

Standards/regulations

Supply connection data solid / stranded / AWG

Distribution connection data solid / stranded / AWG

Dimensions H/D 250 V AC/DC 15 A 30 A (Per potential) -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103

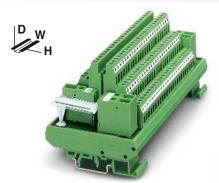
 $0.2 - 6 \, \text{mm}^2 / 0.2 - 4 \, \text{mm}^2 / 24 - 10$

 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$

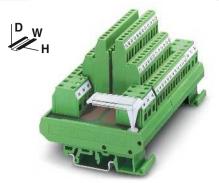
65.5 mm / 50 mm

			Ord	dering data	
Description	No. of pos.	Module width W	Туре	Order No.	Pcs./ Pkt.
VARIOFACE module , with two busbars (potential distribution, per potential:	P1, P2) for				
2 power terminal blocks/ 8 distributor terminal blocks		50.00	VIP-2/SC/PDM-2/16	2315256	1
2 power terminal blocks/ 12 distributor terminal blocks		70.40	VIP-2/SC/PDM-2/24	2315269	1
2 power terminal blocks/ 16 distributor terminal blocks		90.80	VIP-2/SC/PDM-2/32	2315272	1
2 power terminal blocks/ 24 distributor terminal blocks		131.50	VIP-2/SC/PDM-2/48	2903717	1
VARIOFACE module, with three busbars potential distribution, per potential:	(+, -, PE)	for			
(+) two power terminal blocks/48 distributor term (-) two power terminal blocks/24 distributor termi (PE) 2 power/72 distributor terminal blocks		168.80			
VARIOFACE module , with six busbars (Figure 1) potential distribution, per potential:	P1 to P6) fo	or			
2 power terminal blocks/ 12 distributor terminal blocks		123.80			
VARIOFACE module , with two busbars (potential distribution, per potential:	P1, P2) for				
2 power terminal blocks/ 8 distributor terminal blocks		41.90			
2 power terminal blocks/ 12 distributor terminal blocks		57.10			
2 power terminal blocks/ 16 distributor terminal blocks		67.30			
2 power terminal blocks/ 24 distributor terminal blocks		97.70			

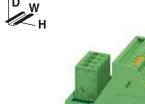




With screw connection and 3 potential levels

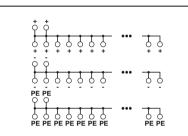


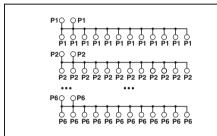
With screw connection and 6 potential levels

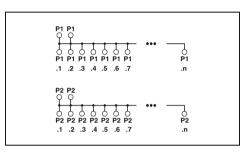


With push-in three-level connection and 2 potential levels









Technical data

250 V AC/DC 16 A 16 A (Per potential) -20°C ... 50°C IEC 60664, DIN EN 50178, IEC 62103 $0.5 - 6 \, \text{mm}^2 / 0.5 - 4 \, \text{mm}^2 / 20 - 10$

 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$

Technical data

250 V AC/DC 16 A 16 A (Per potential) -20°C ... 50°C

P

IEC 60664, DIN EN 50178, IEC 62103 0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10

 $0.2 - 4 \text{ mm}^2 / 0.2 - 2.5 \text{ mm}^2 / 24 - 12$

Technical data

250 V AC/DC 15 A 30 A (Per potential) -20°C ... 50°C

IEC 60664, DIN EN 50178, IEC 62103 0.25 - 6 mm² / 0.25 - 4 mm² / 24 - 10

 $0.14 - 2.5 \, \text{mm}^2 \, / \, 0.14 - 2.5 \, \text{mm}^2 \, / \, 26 - 14$

77 mm / 72 mm	77 mm / 72 mm 75.8 mm / 63 mm		77 mm / 72 mm 75.8					
Ordering data			0	rdering data		Ordering data		
Туре	Order No.	Pcs. / Pkt.	Туре	Order N	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UMK- PVB	2971302	1						
			UMK- PVB 6	297213	1			
						VID 0/DT/DDW 0/40		
						VIP-3/PT/PDM-2/16 VIP-3/PT/PDM-2/24	2903797 2903798	1
						VIP-3/PT/PDM-2/32	2903799	1
						VIP-3/PT/PDM-2/48	2903800	1

VARIOFACE modules for plug-in miniature relays and/or miniature solid-state relays

The UMK-... RM 4-, 8-, and 16-way relay or solid-state relay interfaces provide 4, 8 or 16 slots for standard electromechanical relays (REL-MR..., not REL-MR...MS) or optoelectronic relays (SIM-EI...). The connections between the I/O module and the electronics, as well as the process cabling, are implemented via screw connection terminal blocks.

Notes:

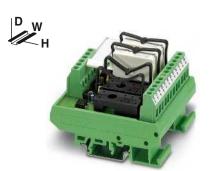
For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.

Other input voltages on request.

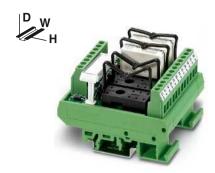
1) not with 230 V AC.

2) with 230 V AC glow lamp.

3) with 100 V DC and 230 V AC glow lamp.

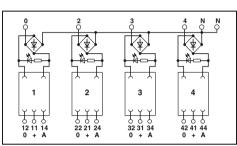


4-channel with bridge rectifier

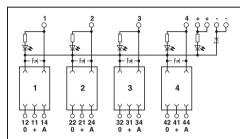


4-channel for relays with a PDT contact





Technical data



Cail	oido

Tolerance of the input voltage

Input circuit

Operating voltage display

Status display/channel

Connection method

Connection data solid / stranded / AWG

Contact side Contact type

Max. switching voltage Limiting continuous current

Connection method

Connection data solid / stranded / AWG

General data

Test voltage

Ambient temperature (operation)

Standards/regulations

Mounting position

Dimensions

±10% Bridge rectifier

Yellow I FD

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

1 PDT 250 V AC/DC 6 A

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C DIN VDE 0110

67.5 mm / 77 mm / 59 mm

Technical data

±10%

P

Freewheeling diode, Protection against polarity reversal

Yellow LED1)

Yellow LED2)

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 24

1 PDT 250 V AC/DC 5 A

Screw connection

0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C **DIN VDF 0110**

Any 67.5 mm / 77 mm / 59 mm

Description	Input voltage
VARIOFACE module, for four plug-in miniature relaminiature solid-state relays, with light indicator (with	

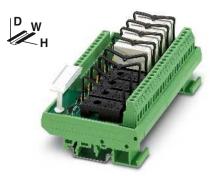
VARIOFACE module, for plug-in miniature relays or miniature solid-state relays, with light indicator (without relay)

> 5 V DC 12 V DC 24 V DC 48 V DC 110 V DC 230 V AC

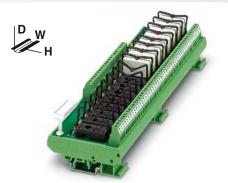
W/H/D

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UMK- 4 RM 24	2971344	1		

07.5 mm 77 mm ec / mm 2.10				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UMK- 4 RM 5DC	2972819	1		
UMK- 4 RM 12DC	2972822	1		
UMK- 4 RM 24DC	2972835	1		
UMK- 4 RM 60DC	2972851	1		
UMK- 4 RM110DC	2972864	1		
UMK- 4 RM230AC	2972880	1		

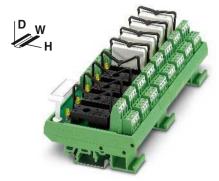


8-channel for relays with a PDT contact



16-channel for relays with a PDT contact

P

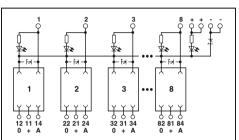


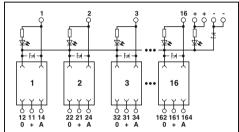
8-channel for relays with two PDT contacts

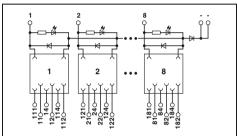
P

±10%









Technical data
±10% Freewheeling diode, Protection against polarity reversal Yellow LED³)
Yellow LED³)
Screw connection 0.2 4 mm² / 0.2 2.5 mm² / 24 - 24
1 PDT 250 V AC 5 A Screw connection 0.2 4 mm ² / 0.2 2.5 mm ² / 24 - 12
2.5 kV (50 Hz, 1 min.) -20°C 50°C

DIN VDE 0110 135 mm / 77 mm / 59 mm

12 11 14 0 + A	22 21 24 0 + A	32 31 34 0 + A	162 161 164 0 + A			
	Тес	hnical da	ita			
±10%						
Freewheeling Yellow LED ²)	Freewheeling diode, Protection against polarity reversal Yellow LED ²)					
Yellow LED2)						
Screw connection of the Screw		² / 24 - 24				
1 DDT						
1 PDT						

5 A Screw connection 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12 2.5 kV (50 Hz, 1 min.) -20°C ... 50°C DIN VDE 0110 Any 259 mm / 77 mm / 59 mm

250 V AC

12040-11-11-11-11-11-11-11-11-11-11-11-11-11	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1810+ 8 940- 8 8 940- 182040-	
Technical data			

Freewheeling diode, Protection against polarity reversal -
Yellow LED
Screw connection 0.14 1.5 mm ² / 0.14 1.5 mm ² / 26 - 26
2 PDT 250 V AC 5 A Screw connection 0.14 1.5 mm ² / 0.14 1.5 mm ² / 26 - 14
2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any 168.8 mm / 77 mm / 59 mm
0 1 1 1 1

Ordering data		Ordering dat	ata Ordering data		а			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
UMK- 8 RM 5DC/MKDS	2972893	1	UMK-16 RM 5DC/MKDS	2972974	1			
UMK- 8 RM 12DC/MKDS	2972903	1	UMK-16 RM 12DC/MKDS	2972987	1			
UMK- 8 RM24DC/MKDS	2972916	1	UMK-16 RM 24DC/MKDS	2972990	1	UMK- 8 RELS/KSR-24/21/21	2975722	1
UMK- 8 RM 60DC/MKDS	2972932	1	UMK-16 RM 60DC/MKDS	2973038	1			
UMK- 8 RM110DC/MKDS	2972945	1	UMK-16 RM110DC/MKDS	2973041	1			
UMK- 8 RM230AC/MKDS	2972961	1	UMK-16 RM230AC/MKDS	2973067	1			

VARIOFACE modules as interface for plug-in solid-state relays or digital I/O modules

The 1-, 4-, 8- or 16-time INTERFACE modules are the wiring interface and the coupling level in one unit. The connection to the interface module is established using screw connection technology.

Properties of the single interface:

- Status display
- Protection against polarity reversal in in-
- Surge protection in input
- Assembly option with solid-state relay for loads up to 350 V DC/1 A or 480 V AC/5 A

Properties of the 4-, 8-, and 16-time interfaces:

- Status display
- Integrated fuse for line protection
- Assembly option with solid-state relay or I/O modules

Notes:

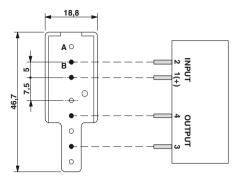
Type of housing:

Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.

Solid-state relays, see page 558



A = without metal R - with metal

Input data

Input voltage range

Input circuit

Status display/channel

Connection method

Connection data solid / stranded / AWG

Output data

Connection method

Connection data solid / stranded / AWG

General data

Ambient temperature (operation)

Standards/regulations

Mounting position

Mounting

Dimensions

Module width Description

Interface module, with plug-in base for one solid-state relay,

with locking clip

Interface module, with plug-in base for four solid-state relays,

with locking clip Microfuse: 250 V. 4 A

Interface module, with plug-in base for eight digital I/O modules.

Microfuse: 250 V, 4 A

Interface module, with plug-in base for eight solid-state relays, with locking clip

Microfuse: 250 V, 4 A

Interface module, with plug-in base for 16 digital I/O modules.

Microfuse: 250 V, 4 A

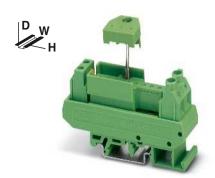
Interface module, with plug-in base for 16 solid-state relays, with locking clip

Microfuse: 250 V. 4 A

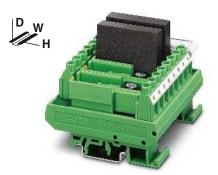
326.5

326.5

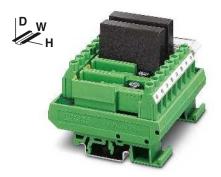
H/D



With light indicator

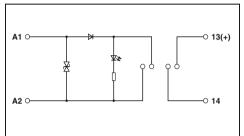


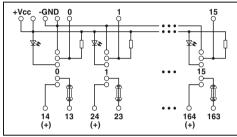
With light indicator and fuse, control logic negative switching



With light indicator and fuse, control logic positive switching







+Vcc	-GND 0	*	2	15
			• 000 200	15
	14 13 2 (+)	24 23 3 +) (+	4 33 -)	164 163 (+)

recnnicai	aata

4 V ... 32 V

Protection against polarity reversal, Surge protection

Yellow LED Screw connection

 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 12$

Screw connection

0.2 ... 6 mm² / 0.2 ... 4 mm² / 24 - 10

-20°C ... 60°C

DIN EN 50178

In rows with zero spacing

77 mm / 72 mm

Tachni	cal data
reciiii	cai uata

4 V ... 32 V

Yellow LED

Screw connection

 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 24$

Screw connection

0.2 ... 6 mm² / 0.2 ... 4 mm² / 24 - 10

-20°C ... 55°C

DIN VDE 0110b, Gr. C for 250 V DC, DIN VDE 0160

(in relevant parts)

In rows with zero spacing

77 mm / 72 mm

	*		
		2	15
14 13 (+)	24 23 34 (+) (+)		164 163 (+)

Technical data

4 V ... 32 V

SNus 🖭

Yellow LED

Screw connection

 $0.2 \dots 4 \, \text{mm}^2 \, / \, 0.2 \dots 2.5 \, \text{mm}^2 \, / \, 24 - 24$

Screw connection

0.2 ... 6 mm² / 0.2 ... 4 mm² / 24 - 10

DIN VDE 0110b, Gr. C for 250 V DC, DIN VDE 0160

(in relevant parts)

In rows with zero spacing 77 mm / 72 mm

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UMK- 1 OM-R/AMS	2983002	1		

Ordering data				
Туре	Order No.	Pcs. / Pkt.		
UMK- 4 OM-R/MF	2970882	1		
UMK- 8 OM/MF/MKDS	2972712	1		
UMK- 8 OM-R/MF/MKDS	2972738	1		
UMK-16 OM/MF/MKDS	2972754	1		
UMK-16 OM-R/MF/MKDS	2972770	1		

	77 111111 / 72 111111		
	Ordering data	а	
. /	Туре	Order No.	Pcs. / Pkt.
	UMK- 4 OM-R/MF/P	2972673	1
	UMK- 8 OM-R/MF/MKDS/P	2972699	1
	UMK-16 OM-R/MF/MKDS/P	2972796	1

REL-MR miniature relay

The robust relays are used as interface relays throughout process and production engineering.

The main features of these relays are their compact design, reliable electrical isolation, and compliance with the most important standards, as well as the number of variants.

Notes:

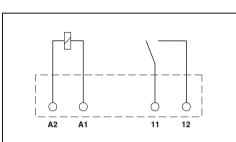
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For diagrams of operating voltage ranges, see page 344



1 N/O contact





Input data	
Permissible range (with reference to U _N)	
Permissible range (with reference to U _N)	
Typ. input current at U _N	[mA]
Typ. response time at U _N	[ms]
Typ. response time at U_N (depending on phase relation)	[ms]
Typ. release time at U _N	[ms]
Typ. release time at U_N (depending on phase relation)	[ms]
Output data	
Contact type	
Contact material	
Max. switching voltage	
Min. switching voltage	
Limiting continuous current	
Max. inrush current	
Max. interrupting rating, ohmic load	
	250 V AC
0 111	

Max. interrupting rating, ohmic load	
	250 V
General data	
Test voltage (winding / contact)	
Test voltage (contact/contact)	
Ambient temperature (operation)	
Nominal operating mode	
Mechanical service life	
Standards/regulations	
Mounting position/mounting	

imensions	W/H/D

Dimensions		W/H/D
		lancet college
Description		Input voltage U_N
		O_N
Plug-in miniature power relays		
with power contact	1	12 V DC
with power contact	2	24 V DC
with power contact	3	48 V DC
with power contact	4	60 V DC
with power contact	(5)	110 V DC
with power contact	6	230 V AC
Plug-in miniature power relays		
with gold contact	1	12 V DC
with gold contact	2	24 V DC
with gold contact	3	48 V DC
with gold contact	③ ④	60 V DC
with gold contact	(5)	110 V DC
with gold contact	6	230 V AC

	Technical data
(2
5	0.8 - 1.1 5 5
Double co	ontact, 1 N/O contact

2 kV AC (50 Hz, 1 min.)	
-	
-40°C 85°C	
100% operating factor	
Approx. 2 x 10 ⁷ cycles	
DINIVIDE 0440 JEO 055/DINIVIDE 04	OF (:

DIN VDE 0110, IEC 255/DIN VDE 0435 (in relevant parts)

5 mm / 23 mm / 17 mm

311111/2311111/17111111				
Ordering data				
Туре	Order No.	Pcs. / Pkt.		
REL-MR-G 24/1	2961037	8		



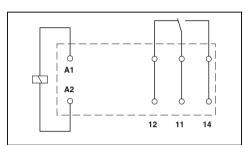
1 PDT for high continuous currents



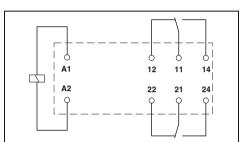
2 PDT

A (I)





Technical data



1	2	3	4	(5)	6	1
refer	to the dia	agram				refe
33	17	8.7	8.2	4.1	3	33
7	7	7	7	7		7
					3 - 12	
3	3	3	3	3		3

refer to	o the dia	gram			
33 7	17 7	8.7 7	8.2 7	4.1 7	3
					3 - 12
3	3	3	3	3	2 - 9

Single contact, 2-PDT

AgNi, hard gold-plated

30 V AC / 36 V DC

100 mV (at 10 mA)

50 mA

50 mA

Technical data

4

Single contact, 1-PDT Single contact, 1-PDT AgNi AgNi, hard gold-plated 250 V AC/DC 30 V AC / 36 V DC 12 V (at 10 mA) 100 mV (at 10 mA) 50 mA 30 A (300 ms) 50 mA 4000 VA

5 kV AC (50 Hz, 1 min.) -40°C ... 85°C 100% operating factor 3 x 107 cycles IEC 60664, EN 50178, IEC 62103

Any / Can be aligned without spacing (> 70° C ≥ 2.5 mm)

Any / Can be aligned without spacing (> 70° C ≥ 2.5 mm)

2-9

5 kV AC (50 Hz, 1 min.) 2.5 kV AC (50 Hz, 1 min.) -40°C ... 85°C 100% operating factor 3 x 107 cycles IEC 60664, EN 50178, IEC 62103

2 3

Single contact, 2-PDT

AgNi

250 V AC/DC

5 V (at 10 mA)

25 A (20 ms)

2000 VA

10.7 mm / 20 mm / 15.7 mm

12.7 mm / 29 mm / 15.7 mm			12.7 mm / 29 mm / 15.7 mm			
Ordering data			Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.	
REL-MR- 12DC/21HC REL-MR- 24DC/21HC REL-MR- 48DC/21HC REL-MR- 60DC/21HC REL-MR-110DC/21HC REL-MR-230AC/21HC	2961309 2961312 2834821 2961325 2961338 2961422	10 10 10 10 10 10	REL-MR- 12DC/21-21 REL-MR- 24DC/21-21 REL-MR- 48DC/21-21 REL-MR- 60DC/21-21 REL-MR-110DC/21-21 REL-MR-230AC/21-21	2961257 2961192 2834834 2961273 2961202 2961451	10 10 10 10 10	
REL-MR- 12DC/21HC AU REL-MR- 24DC/21HC AU REL-MR-110DC/21HC AU REL-MR-230AC/21HC AU	2961532 2961545 2961561 2961529	10 10 10	REL-MR- 12DC/21-21AU REL-MR- 24DC/21-21AU REL-MR- 48DC/21-21AU REL-MR- 60DC/21-21AU REL-MR-110DC/21-21AU REL-MR-230AC/21-21AU	2961299 2961215 2834847 2961286 2961228 2961480	10 10 10 10 10	

SIM-El miniature solid-state relay

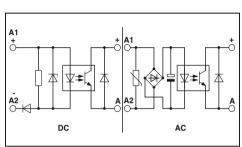
The SIM-EI miniature solid-state relays have connections compatible with commercially available miniature switching relays and are of the same shape.

The modules are used for floating conditioning of process signals as an alternative to electromechanical relays. Substituting mechanical relays for solid-state ones opens new possibilities for solving interface problems in a user-friendly way. The compatibility of the pins with the mechanical relay permits use of solid-state relays without any changes in the layout. The output of the solid-state relay is "high active" and designed as a 2- or 3-conductor output.



with DC voltage output max. = 100 mA





Technical data

Permissible range (with reference to U _N)	
Switching level with reference to U _N	1 signal ("H") 0 signal ("L")
Typ. input current at U _N	[mA
Transmission frequency f _{limit}	[Hz]
Input circuit AC	
Input circuit DC	
Output data	
Operating voltage range	
Limiting continuous current	
Residual voltage drop at "H"	
Max. inrush current	
Output circuit	
Output protection	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Standards/regulations	
Mounting position/mounting	
Dimensions	W/H/D

① ② ③ ④ ⑤ ⑤ ⑥ ⑦ ⑥ 0.9 - 0.9 - 0.9 - 0.9 - 0.9 - 0.9 - 0.9 - 0.9 - 0.9 - 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.								
1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	1	2	3	4	(5)	6	7	8
≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≤ 0.8 ≤ 0.05 ≤ 0.4 ≤ 0.4 ≤ 0.4 ≤ 0.25 ≤ 0.4 ≤ 0	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -
\$\leq\$ 0.35 \$\leq\$ 0.4 \$\leq\$ 0.4 \$\leq\$ 0.25 \$\leq\$ 0.4 \$\leq\$ 0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
5.4 5.7 5.1 6.8 2.4 2.6 2.1 2.1 600 600 600 600 300 300 3 3 Protection against polarity reversal. Surge protection Protection against polarity reversal 8 V DC 48 V DC 100 mA 1 V - 2-conductor, floating Protection against polarity reversal	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
600 600 600 600 300 300 3 Protection against polarity reversal, Surge protection Protection against polarity reversal 8 V DC 48 V DC 100 mA 1 V - 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.25	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
Protection against polarity reversal, Surge protection Protection against polarity reversal 8 V DC 48 V DC 100 mA 1 V - 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	5.4	5.7	5.1	6.8	2.4	2.6	2.1	2.1
Protection against polarity reversal 8 V DC 48 V DC 100 mA 1 V - 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	600	600	600	600	300	300	3	3
8 V DC 48 V DC 100 mA 1 V - 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	Protecti	ion agair	nst polari	ty reversa	al, Surge	protecti	on	
100 mA 1 V 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	Protecti	ion agair	nst polari	ty reversa	al			
100 mA 1 V 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing								
1 V - 2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	8 V DC	48 V	DC					
2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	100 mA	١						
2-conductor, floating Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	1 V							
Protection against polarity reversal 2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	-							
2.5 kV (50 Hz, 1 min.) -20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	2-cond	uctor, flo	ating					
-20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing	Protecti	ion agair	nst polari	ty reversa	al			
-20°C 50°C DIN VDE 0110 Any / Can be aligned with 2 mm spacing								
DIN VDE 0110 Any / Can be aligned with 2 mm spacing	2.5 kV ((50 Hz, 1	min.)					
Any / Can be aligned with 2 mm spacing	-20°C	50°C						
, ,	DIN VDE 0110							
, ,	Any / C	Any / Can be aligned with 2 mm spacing						
	13 mm	/ 29 mm	/ 25 mm		. 0			

Description	lı	nput voltage U _N
Solid-state relay, with protective circuit	t in the input and o	output circuit
48 V DC 60 V DC	① ② ③ ④ ⑤ ⑥	5 V DC 12 V DC 24 V DC 60 V DC 110 V DC 220 V DC 120 V AC 230 V AC

Plug-in base, for plug-in miniature relays or miniature solid-state relays,

for soldering onto the printed circuit board.

Retaining bracket, for miniature relay

- Plastic - Metal

- Plastic - Metal

Retaining bracket, for miniature solid-state relay

Ordering da	ia	
Туре	Order No.	Pcs. / Pkt.
SIM-EI- 5DC/48DC/100 SIM-EI- 12DC/48DC/100 SIM-EI- 24DC/48DC/100 SIM-EI- 60DC/48DC/100 SIM-EI-110DC/48DC/100 SIM-EI-220DC/48DC/100 SIM-EI-120AC/48DC/100 SIM-EI-230AC/48DC/100	2271057 2271060 2271073 2271086 2271099 2271109 2271112 2271125	10 10 10 10 10 10 10

Load current [A]	3 - 2 - 1 -		_	\	_	_	
	0 0	10		40 t temp		60 e [°C]	

Derating curve	for	SIM-EI-C	V-24	DC/24	DC/3

31W-L1-230AC/40DC/100	22/1123	10		
Accessories				
014 FR01		400		
SIM-ERSN	2271484	100		
SIM-ERSN-HB-KSR	2271468	10		
SIM-ERSN-HB-KSR/MET	2271497	10		
SIM-ERSN-HB-MR	2271471	10		
SIM-ERSN-HB-MR/MET	2271510	10		



with TTL logic level output, max. = 100 mA

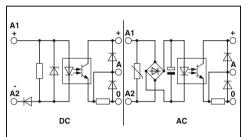


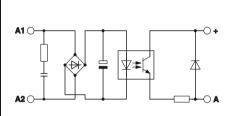
with DC voltage output Maximum = 100 mA, RC element in input

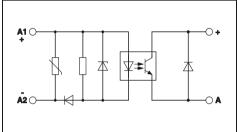


with DC voltage output max. = 3 A









Technical data							
1	2	3	4	(5)	6	7	8
0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -	0.9 -
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.25	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
5.4	5.7	5.1	4.7	2.4	2.6	2.1	2.1
4000	4000	4000	4000	1000	1000	3	3
_							

Protection against polarity reversal, Surge protection

Protection against polarity reversal

3 V DC ... 5.25 V DC 100 mA

0.3 V

3-conductor, ground-referenced

Protection against polarity reversal, Free running

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C DIN VDE 0110

Any / Can be aligned with 2 mm spacing

13 mm / 29 mm / 25 mm

Technical data		
	7	8
	0.9 - 1.1	0.9 - 1.1
	≥ 0.8	≥ 0.8
	≤ 0.4	≤ 0.4
	2.2	2.5
	3	3

RC element

8 V DC ... 48 V DC

100 mA 1 V

PG

2-conductor, floating

Protection against polarity reversal

2.5 kV (50 Hz, 1 min.) -20°C ... 50°C DIN VDE 0110

Any / Can be aligned with 2 mm spacing

13 mm / 29 mm / 25 mm

Ā20	A Y A
	Technical data
(3)	
	.8 -

3	
0.0	}-
1.2	2
≥0	0.8
≤ 0	0.4
7	
30	0

Protection against polarity reversal, Surge protection

3 V DC ... 33 V DC 3 A (see derating curve)

PG

≤ 200 mV 15 A (10 ms)

2-conductor, floating

Protection against polarity reversal, Surge protection

2.5 kV (50 Hz, 1 min.) -20°C ... 60°C

DIN VDE 0110

Any / Can be aligned with 2 mm spacing

13 mm / 29 mm / 25 mm

Type Order No. SIM-EI- 5DC/TTL/100 2271138 SIM-EI- 12DC/TTL/100 2271141 SIM-EI- 24DC/TTL/100 2271154 SIM-EI- 60DC/TTL/100 2271167 SIM-EI-110DC/TTL/100 2271170 SIM-EI-120DC/TTL/100 2271183 SIM-EI-120AC/TTL/100 2271196 SIM-EI-230AC/TTL/100 2271206	Ordering da	ta	
SIM-EI- 12DC/TTL/100 2271141 SIM-EI- 24DC/TTL/100 2271154 SIM-EI- 26DC/TTL/100 2271167 SIM-EI-110DC/TTL/100 2271170 SIM-EI-220DC/TTL/100 2271183 SIM-EI-120AC/TTL/100 2271196	Туре	Order No.	Pcs. / Pkt.
SIM-EI-230AC/TTL/100 2271206	SIM-EI- 12DC/TTL/100 SIM-EI- 24DC/TTL/100 SIM-EI- 60DC/TTL/100 SIM-EI-110DC/TTL/100 SIM-EI-220DC/TTL/100	2271141 2271154 2271167 2271170 2271183	10 10 10 10 10 10
Accessories			10

Туре	Order No.	Pcs. / Pkt.
SIM-EI-120AC/48DC/100/RC	2271439	10
SIM-EI-230AC/48DC/100/RC	2271426	10
A		

Ordering data

Ordering data	а	
Туре	Order No.	Pcs. / Pkt.
SIM-EI-OV- 24DC/ 24DC/3	2300096	10

SIM-EI-230AC/TTL/100	2271206	10
Accessories	}	
SIM-ERSN	2271484	100
SIM-ERSN-HB-KSR	2271468	10
SIM-ERSN-HB-KSR/MET	2271497	10
SIM-ERSN-HB-MR	2271471	10
SIM-ERSN-HB-MR/MET	2271510	10

SIM-EI-230AC/48DC/100/RC	22/1426	10	
Accessories	i		
SIM-ERSN	2271484	100	
SIM-ERSN-HB-KSR	2271468	10	
SIM-ERSN-HB-KSR/MET	2271497	10	
SIM-ERSN-HB-MR	2271471	10	
SIM-ERSN-HB-MR/MET	2271510	10	

Accessorie	s	
SIM-ERSN	2271484	100
SIM-ERSN-HB-KSR	2271468	10
SIM-ERSN-HB-KSR/MET	2271497	10
0114 EDON UD 14D		40
SIM-ERSN-HB-MR	2271471	10
SIM-ERSN-HB-MR/MET	2271510	10

OV solid-state relay

Solid-state relays for electrical isolation can be mounted directly on the printed circuit board as interfaces or plugged in using the SIM-AMS solder-in socket.

The solid-state relays are suitable for switching ohmic, capacitive or inductive loads. Relays for switching AC circuits have a zero voltage switch to switch the load on in the zero voltage crossing. It is switched off in the zero current crossing. The integrated RC element permits operation up to $\cos \phi = 0.5$.

Inductive DC loads must be equipped with a fast-acting freewheeling diode for semiconductor relay protection.

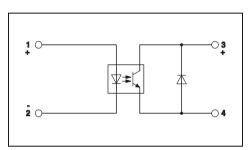
- Switching capacity up to 350 V DC/1 A, 60 V DC/4 A or 480 V AC/5 A
- No wear and tear even with high switching frequencies
- No contact bounce no movable parts
- No electromagnetic interference
- Electrically insulated housings
- Small dimensions
- High test voltage of 4 kV between control and load circuits

Notes:
For derating curves see page 564
For suitable bases, see page 560
1) Turn-on/off time at U.; Max. ½ period



with DC voltage output max. = 1 A

. FLL us



Innerst alata	
Input data	
Input voltage range	
Switching level	1 signal ("H") [V DC] ≥
	0 signal ("L") [V DC] ≤
Typ. input current at U _N	[mA]
Typ. switch-on time at U _N	[µs]
Typ. switch-off time at U _N	[μs]
Transmission frequency flimit	[Hz]
Output data	
Operating voltage range	
Periodic peak reverse voltage	
Limiting continuous current	
Min. load current	
Surge current	
Residual voltage drop at "H"	
Leakage current in off state	
Phase angle (cos φ)	
Max. load value	
Output protection	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Standards/regulations	
•	
Mounting position/mounting	
Dimensions	W/H/D

Description		Input voltage $U_{\rm N}$
Solid-state relay for signal amplification and the control and load circuits, can be plugged in in base SIM-AMS or with PCB connection for the PCB, Input: DC voltage Output: DC voltage	to the	solder-in plug-
	1	24 V DC
Solid-state relay, same as before, however Input: DC voltage Output: AC voltage		
	1	24 V DC

i echnicai data	
① 4.25 V DC 32 V DC 3.3 1 15 100 250 100	
1 V DC 350 V DC - 1 A (see derating curve) 1 mA 20 A (tp = 1 s) 0.5 V 100 μA Protection against polarity reversal	
4 kV (50 Hz, 1 min.) -20°C 80°C EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 55011 Any / Can be aligned with > 9 mm spacing 10.5 mm / 43 mm / 25.4 mm	

10.5 mm / 43 mm / 25.4 mm		
Ordering dat	а	
Туре	Order No.	Pcs. / Pkt.
OV-24DC/350DC/1	2982634	10

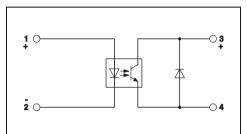


with DC voltage output max. = 4 A



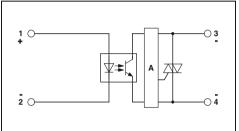
with AC voltage output max. = 5 A

c**91** us



c**91**0s

1



Technical data
①
4.25 V DC 32 V DC
3.3
1
15
100
250
100
1 V DC 60 V DC

4 A (see derating curve) 1 mA 25 A (tp = 1 s) 0.5 V 100 μΑ

Protection against polarity reversal

4 kV (50 Hz, 1 min.) -20°C ... 80°C EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 55011

Any / Can be aligned with > 20 mm spacing 10.5 mm / 43 mm / 25.4 mm

2 O	nnical data
-	
+	

4 V DC 32 V DC 3.5
1.2
10
25
12 V AC 530 V AC (45/65 Hz) 1000 V
5 A (see derating curve)
20 mA
80 A (tp = 20 ms)
1.2 V
< 1 mA
0.5
50 A ² s
-

4 kV (50 Hz, 1 min.) -20°C ... 70°C EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6 Any / Can be aligned with > 20 mm spacing 10.5 mm / 43 mm / 25.4 mm

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
OV-24DC/ 60DC/4	2982647	10	

Ordering data			
Туре	Order No.	Pcs. / Pkt.	
OV-24DC/480AC/5	2982650	10	

Solder-in socket for solid-state relays and I/O modules

Modern interface solutions for computer and electronic controls are increasingly being designed as I/O systems which are system-independent and individually mountable. Electrical isolation and signal conditioning are carried out using standard I/O modules. These are produced by various manufacturers in pin-compatible versions for different functions. The I/O modules are either soldered directly into the PCB or plugged into component sockets for quick interchanging.

SIM sockets facilitate the plugging of I/O modules considerably. All standard I/O modules and solid-state relays with up to eight connections can be plugged into the solder-in plug-in socket.

The I/O modules are securely fixed to the socket using fastening screws which are specific to the module. They are thereby protected against being accidentally released. Optocouplers, now also available in plug-in versions, are secured using the latch which is attached to the socket and which can be labeled. For better identification, each module plug position has its own marking panel on the socket.

The SIM socket has been designed so that it can be used on existing printed circuit boards without any layout modifications. Peripheral components such as LEDs or fuse resistors remain accessible to the user.

Notes:

Type of housing: Polyamide PA non-reinforced, color: green

Marking systems and mounting material See Catalog 5

For dimensional drawings and pin assignments, see page 564

1) Applies only to the sockets SIM-AMS 1, SIM-AMS 1-R and SIM-AMSC in connection with the standard I/O modules with the corresponding AC voltage output.



Plug-in base for solid-state relays

⊕ ₹3

Technical data

250 V AC / 380 V AC1)

5 A

B-STIFT

DIN VDE 0110b, Gr. C for 250 V DC

Ordering data	а		
Туре	Order No.	Pcs./ Pkt.	
SIM-AMS 1 SIM-AMS 2	2271015 2271028	10 10	
Accessories			
BN-TRK	2701404	100	

1051993

Nominal current

Standards/regulations

Description	No. of Module width pos. W
Plug-in base, for solid-state relay numbers of contacts, can be labeled	
Partial assembly	
Complete assembly	
Plug-in base, as above, however,	with locking clips for fastening
Partial assembly	
Complete assembly	
Plug-in base, for standard I/O mo company Opto 22, can be labeled	

Marker pin, made of white plastic, lettering area 7.5 x 4 mm, unprinted for self-marking with B-STIFT
Marker pen, not refillable, for manual labeling, line thickness 0.5 mm



Plug-in base for solid-state relays with locking clip



Plug-in base for I/O modules



@ **A**

Technical data	Technical data
250 V AC / 380 V AC¹)	250 V AC / 380 V AC¹)

5 A DIN VDE 0110b, Gr. C for 250 V DC		5 A DIN VDE 0110b, Gr. C for 250 V DC			
Ordering data		Ordering data			
Туре	Order No.	Pcs. / Pkt.	Туре	Order No.	Pcs. / Pkt.
SIM-AMS 1-R SIM-AMS 2-R	2271031 2271044	10 10			
			SIM-AMSC1	2271390	50
Accessories		Accessories			
BN-TRK	2701404	100	BN-TRK	2701404	100
B-STIFT	1051993	10	B-STIFT	1051993	10

Modules for IEC 60603/DIN 41612 plug-in connectors

Modules for ELCO plug-in connectors

Cable housing suitable for snap-lock mechanism:

Manufacturer	Type F 32- and 48-pos.
HARTING	Types "B" and "D"

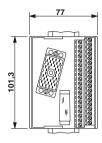
Cable housing suitable for screw locking:

Manufacturer	Type C, 64-pos.	Type D, 32-pos.	
ERNI	KSG 173	KSG 173	
AMP	826196-1	826196-1	

Cable housing suitable for screw locking:

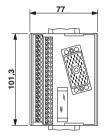
Manufacturer	Type E, 48-pos.	Type F, 32- and 48-pos.
ERNI	KSG 173	KSG 203
AMP	_	826198-1

Dimensional drawing for UMK-EC38/38-XOL

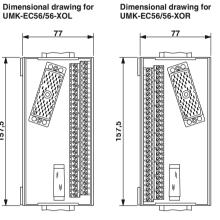


157,5

Dimensional drawing for UMK-EC38/38-XOR



Dimensional drawing for UMK-EC56/56-XOR



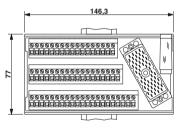
Pin assignment UMK-EC38/38...

Terminal block	Pin strip
1	Α
2	В
3	С
4	D
5	E
6	F
7	H
8	J
9	K
10	L
11	M
12	N
13	P
14	R S
15	
16 17	T U
18	V
19	W
20	X
21	Ŷ
22	Z
23	AA
24	BB
25	DD
26	EE
27	FF
28	HH
29	JJ
30	KK
31	LL
32	MM
33	NN
34	PP
35	RR
36	SS
37	TT
CC	CC

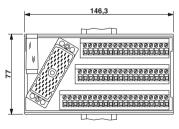
Pin assignment UMK-EC56/56...

Pin strip	Terminal block	Pin strip
A B C D E F H J K L M N P R S T U V W X Y Z A B D EE F H J K L M N P R S T C	Z 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 444 45 46 47 48 49 50 51 52 53 54 Y	ZABCDEFHJKLMNPRSTUVVXabcdefhjklmnprstuvwxyzABBCDEFFHJKLMNNY(shield)

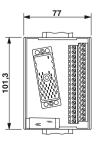
Dimensional drawing for UMK-EC56/FRONT 2,5V/R



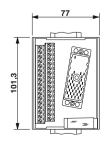
Dimensional drawing for UMK-EC56/FRONT 2,5V/L



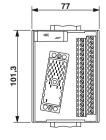
Dimensional drawing for UMK-EC56/32-XOL



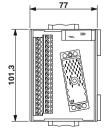
Dimensional drawing for UMK-EC56/32-XOR



Dimensional drawing for UMK-EC56/32-XUL



Dimensional drawing for UMK-EC56/32-XUR



Modules for ELCO plug-in connectors with protection type Ex i

Pin assignment UMK-EC56/FRONT 2,5V/...

Terminal

block

X 1

ELCO

plug

N.C.

A B

C D E F H

J K L M N P

RSTUVW

X a b

c d

e f

m

n

u

w x y z AA

ВВ CC EE FF HH JJ KK

MM NN Y (shield)

ELCO **Terminal** block plug ABCDEFH 2 4 5 6 7 8 J K 10 L M 11 12 13 14 15 NPRSTU 16 17 18

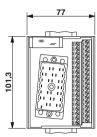
19 20 21

V W X Z a b c d

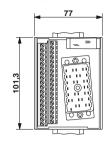
NN + Y

Pin assignment UMK-EC56/32-...

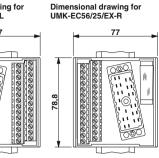
Dimensional drawing for UMK-EC90/32/EX-XUL



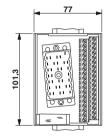
Dimensional drawing for UMK-EC90/32/EX-XUR



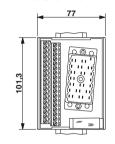
Dimensional drawing for UMK-EC56/25/EX-L



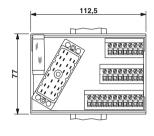
Dimensional drawing for UMK-EC90/32/EX-XOL



Dimensional drawing for UMK-EC90/32/EX-XOR



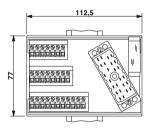
Dimensional drawing for UMK-EC 56/25/EX/FRONT 2,5 V/L



Pin assignment UMK-EC90/32/EX...

Terminal block	Pin strip	Channel
1	Н	1
2	J	<u>'</u>
3	L	2
4	М	
5	P	3
6	X	
7	Z	4
8	AA	
9	AC	5
10	AD	
11	AM	6
12	AN	
13	AR	7
14	AS	
15	AU	8
16	BC	
17	AZ	9
18	BA	
19 20	BJ	10
	BK	
21	BM	11
22	BN	
23	BR	12
24	BY	
25	CA	13
26	CB	
27	CD CE	14
28	CN	
29 30	CP	15
	CS	
31 32	CS	16
32	UI	
Υ	DS	

Dimensional drawing for UMK-EC 56/25/EX/FRONT 2,5 V/R



Pin assignment UMK-EC 56/25/EX/...

Terminal block	Pin strip	Channel		
1 2	C D	1		
3	E			
4	F	2		
5	N	3		
6	Р	0		
7	R	4		
8	S			
9	а	5		
10	b	•		
11	d	6		
12	j	0		
13	k	7		
14	1	,		
15	S	8		
16	t	0		
17	u	9		
18	V	9		
19	BB	10		
20	CC	10		
21	DD	11		
22	EE	11		
23	MM	12		
24	NN	12		
Υ	Υ			

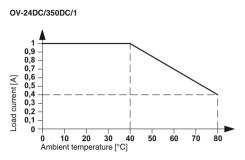
OV solid-state relays

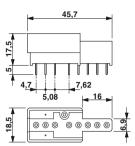
Solder-in SIM-AMS plug-in base for solid-state relays and I/O modules

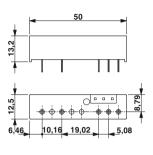
Load current depending on ambient temperature Operating time: 100% OT



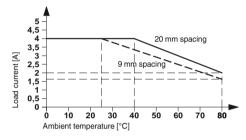
Dimensional drawing for SIM-AMSC:



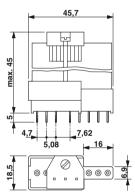




OV-24DC/60DC/4



Dimensional drawing for SIM-AMS...R:



Contacts in the SIM-AMSC plug-in base:

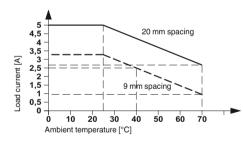


 With metal O Without metal

Note:

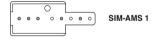
4th generation optocoupler, available from Opto 22.

OV-24DC/480AC/5

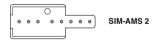


Contacts in the SIM-AMS plug-in base

Partial assembly for standard I/O modules



2. Complete assembly, e.g., for analog I/O modules



With metal

Without metal

System cabling for controllers

VARIOFACE wiring interface

Quality in quantity



Integrated management system

The aim of the Phoenix Contact integrated management system is to coordinate all the requirements regarding products, processes, and organization.

Statutory and regulatory requirements, as well as those of international standards and our customers, are met and, in some cases, even exceeded in all phases of the product lifecycle.

In the Phoenix Contact management system, the integration of quality, environmental protection, and safety in the workplace is monitored each year for conformance by internationally recognized independent bodies. Certification in accordance with international standards ISO 9001, ISO 14001, and BS OH-SAS 18001 is the result of our corporate philosophy of meeting the needs of our customers, staff, and environment as best as possible. They serve as the basis for innovative products with the familiar high Phoenix quality standard, actively practiced environmental protection, and responsibility in the field of occupational health and safety. Of course, we integrate all further requirements of standards, international approvals or special customer requirements into company processes.

This system provides a building block for the success of the Phoenix Contact Group and its products and services.

CE marking

The CE mark was introduced as an important instrument for the free movement of goods and services within the single European market. By attaching the mark to a product, the manufacturer confirms that it complies with all applicable European Union (EU) directives. EC directives describe the product properties with regard to device safety and avoiding danger. These are legally binding regulations of the European Union (EU). In other words, compliance with the requirements is a statutory condition for marketing the product within the EU.

Where applicable, the products that our company currently manufactures fall within the scope of the following directives:

- 2006/95/EC
 - Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
- 2004/108/EC Electromagnetic compatibility (EMC Directive)
- 2006/42/EC Safety of machinery (Machinery Directive)
- 94/9/EC Equipment and protective systems intended for use in potentially explosive areas (ATEX Directive 100a)
- 1999/5/EC

Radio and telecommunications terminal equipment (R&TTE)

The standards upon which the specified directives are based have been part of our standard of development for a long time. This guarantees conformance with European directives. The numbers of the directives indicate their version at the time of publication. In the event of changes to directives and/or standards, our products will undergo conformity assessment again in good time and a new declaration of conformity will be issued promptly. The current declarations for each product can also be found in our Download Center.

The EMC Directive occupies a special place among the European directives listed. It defines electromagnetic compatibility as a fundamental property of devices based on mandatory guidelines. European Law therefore acknowledges the electromagnetic compatibility of devices and systems as an important condition for error-free operation of machinery and systems. Phoenix Contact is one of the leading international companies in surge protection, and therefore possesses broad expertise in EMC. This expertise and the experience gained over years of developing and applying industrial interface and communication technology have resulted in our products having an extremely high standard of quality with regard to electromagnetic compatibility. It was with a view to providing other companies with this expertise that our associate company, Phoenix Testlab, was founded. Phoenix Testlab GmbH is an independent, accredited service provider offering EMC testing that conforms to European standards. At Phoenix Testlab, devices are also tested with regard to their electrical safety, mechanical influences, and their behavior in relation to environmental influences. Furthermore, Phoenix Testlab is a "Notified Body" in accordance with EMC Directive 2004/108/EC and according to R&TTE Directive 1999/5/EC for radio and telecommunications terminal equipment. As a "Telecom Certification Body" (TCB), Phoenix Testlab may also approve these products for markets in the USA, Canada, and Japan.

Standards and regulations

All relevant standards and regulations are used as the basis for the development and maintenance of our products.

International standards are subject to continuous changes as a result of harmonization and new developments. In line with this process, the current version of all standards that are relevant to our products is documented in the product area on our website at www.phoenixcontact.net/products.

Online product information service on

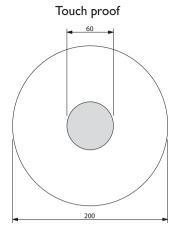
Phoenix Contact's product range is growing constantly.

Due to our commitment to product monitoring, all products are subject to improve-

The Internet is an ideal platform to quickly communicate new product developments and improvements to the market.

You can quickly access the relevant Phoenix Contact website for your region via www.phoenixcontact.com. Here, you will always find the latest overview of products, solutions, and services from Phoenix Contact. This includes technical documents, such as data sheets and user manuals, the latest driver and demo software, plus a means of contacting the appropriate contact person directly.

Shock protection



Back of hand safety

Example: pressure actuation

The accident prevention regulations BGV A 2 issued by the German employer's liability insurance association for precision mechanics and electrical engineering apply to the operators of electrical systems and are aimed at the prevention of electrical accidents by means of special safety requirements.

These regulations contain specifications regarding the safety distances for work, operation, and occasional handling in the proximity of "live parts" in low-voltage systems up to 1000 V \sim or 1500 V -.

- Work with live parts is only permitted once they have been de-energized. Operational activities are only permitted in the vicinity of live parts if these parts are de-energized or are protected against direct contact (§ 6). The following safety measures apply when working in the vicinity of active components:
- Provision of the de-energized state for the duration of the work
- Ensure shock protection is in place in the form of covers or barriers during the work
- Assurance that proximity limits will not be violated (§ 7)

The term "occasional handling" has been introduced for the operation of elements such as pushbuttons, rocker arms or rotary buttons in the proximity of live parts.

In VDE 0105-1, this is covered by "operation with partial protection against direct contact".

Detailed specifications for "occasional handling" can be found in DIN VDE 0106-100. This specifies to what degree live parts in the proximity of operating elements are to be protected against contact. The basis for this is the definition of a "protection area for occasional handling"; this is the area into which the user must reach in order to handle the machine.

The most important thing is that an area formed by an even envelope curve 30 mm in radius must surround the live parts. This area must be touch proof, i.e., the live parts of the electrical device must not be within reach of the VDE test finger in accordance with IEC 60529/DIN VDE 0470-1 (test finger).

Back of hand safety is specified for the "rest of the area" up to 100 mm around the operating element. Back of hand safety means that when a force of 50 N is applied to a ball with a diameter of 50 mm, this does not come into contact with the live parts of the



equipment. No special measures for shock protection are provided outside this area.

Note: systems and equipment that are operated with SELV up to 25 V \sim or 60 V - are considered to be protected against direct contact.

According to § 5, Subsection 4 of the BGV A 2 regulations, there is no need to test the condition of the system prior to initial startup if the company has confirmation from the manufacturer or installer that the electrical



systems and equipment conform to BGV A 2. The confirmation required relates to systems and equipment that have been installed and are ready for operation and can only be issued

by the installer or installation company. The manufacturer of the electrical equipment can only issue a confirmation that products have been produced in accordance with the relevant electrotechnical DIN VDE regulations stipulated in BGV A 2. The installer must bear this in mind when selecting the equipment to be used.

In the field of connection technology, Phoenix Contact offers a wide range of products that are touch proof or that can be protected against contact using covers. Depending on the conditions, all of this must be taken into account when selecting the individual types of terminal block and accessories.

Quality features of insulating housing

Thermoplastics

The majority of our insulating housing is made from thermoplastic materials. Roughly speaking, these can be divided into amorphous and semi-crystalline substances. Thermoplastics are processed using the efficient and environmentally-friendly injection molding process. They have good recycling properties and can be re-used. We use many materials that are modified in different ways to meet the demanding requirements that electrical and electronic modules, devices, and systems have to meet with regard to their mechanical, thermal, and electrical properties.

Behavior of plastics under the influence of temperature (operating temperatures, mechanical influences)

All plastics undergo a process referred to as thermal aging when they are subjected to heat over long periods. This process causes changes in the mechanical and electrical properties of the material. External influences, e.g., radiation, additional mechanical, chemical or electrical stresses, amplify this effect. Special tests on samples can yield characteristic data which provides a good means of drawing comparisons between different plastics. However, applying these characteristics to an evaluation of molded plastic parts is only possible to a limited extent, and can only give the designer a rough guide when it comes to selecting a plastic material. This catalog uses the following assessment criteria: the RTI value according to UL746B/ANSI 746 B (elec. based on dielectric strength) and the Ti value according to IEC 60216-1 (based on a 50% reduction in tensile strength after 20,000 hours).

IEC 60947-7-1/EN 60947-7-1 specifies a permissible temperature increase of 45 K for modular terminal blocks under nominal load. Phoenix Contact terminal blocks meet this requirement.

The properties of plastics are not only affected by the influence of heat as described above; they also undergo changes as a result of cold influences. When subjected to cold as well as low levels of humidity, plastics become increasingly brittle with the result that they are no longer capable of withstanding the same mechanical loads. As the table on the right shows, the plastics concerned can be used down to a temperature of -40°C, but only without a mechanical load. As far as the products presented in the catalog are concerned, it is the ambient temperature specified in each case that is to be regarded as definitive for operation. Regardless of the plastics used, this may be subject to further restrictions (e.g., limited to -20°C) as a result of the components used or other restrictive parameters.

At very low temperatures, this means that any form of mechanical load on the plastic components must be avoided (e.g., mounting of products on/removal of products from the DIN rail, actuation of terminal points, locking/ejection of relays from bases, prizing out of plug-in bridges, bending of cables and lines, etc.), as there is always an associated risk of damage. Unless otherwise indicated, it is recommended that you carry out the specified mounting/operational tasks in a temperature range from -10°C to +40°C.

Inflammability characteristics of plastics (UL 94)

Inflammability tests for plastics have been defined by Underwriters Laboratories (USA) in regulation UL 94. This applies to all areas of application, but in particular to electrical engineering. A horizontal or vertical test is carried out at the test laboratory to determine the inflammability of the plastic material with a naked flame. In order of increasing resistance to combustion, the evaluation classes are HB, V2, V1. V0. and 5V. Test results are recorded on "yellow cards" and are published annually in the Recognized Component Directory.

Thermoplastics: non-reinforced polyamide, PA

We use the modern, semi-crystalline polyamide insulation material, which has now become an essential component in electrical engineering and electronics. It has long occupied a leading position and is authorized for use by the relevant approval authorities such as the CSA, NEMKO, KEMA, PTB, SEV, UL, VDE,

Polyamide also has excellent electrical, mechanical, chemical, and other properties, even at high operating temperatures. Brief peak temperatures up to approximately 200°C are permitted as a result of heat aging stabilization. Depending on the type (PA 4.6, 6.6, 6.10, etc.), its melting point is in the region of 215°C to 295°C.

Polyamide absorbs moisture from its surroundings, on average 2.8%. However, this moisture is not in the form of crystallization water in the plastic itself, but chemically bonded H₂O groups in the molecule structure. This makes the plastic flexible and resistant to breakage, even at temperatures as low as -40°C. According to UL 94, PA belongs to inflammability class V2 to V0.

Thermoplastics: polyester, PBT

We use the semi-crystalline thermoplastic polyester in non-reinforced and fiberglass-reinforced variants for special applications which require increased dimensional and form stability.

In addition to the high operating temperature, the material is characterized by excellent mechanical strength and hardness, and does not absorb moisture from its surroundings. PBT is therefore particularly suitable for strips, for example, which are soldered onto PCBs and subsequently have to pass a burn-in test while they are subjected to heat. According to UL 94, PBT belongs to inflammability class V2

Thermoplastics: polycarbonate, PC

Polycarbonate combines many advantages such as rigidity, impact strength, transparency, dimensional stability, good insulation properties, and resistance to heat.

This amorphous material only absorbs moisture to a very limited degree, and is used for items such as large, rigid electronic component housing.

In its transparent form, polycarbonate is particularly suitable for use as cover profiles or marking materials.

PC has good resistance properties against mineral acids, saturated aliphatic hydrocarbons, gasoline, greases, and oils.

The material is less resistant to solvents, benzene, lyes, acetone, and ammonia. Strain cracks may result from contact with certain chemicals.

According to UL 94, PC belongs to inflammability class V2 to V0.

Thermoplastics: polycarbonate fiber-reinforced, PC-F

Compared to non-reinforced materials, fiber-reinforced polycarbonates feature greater rigidity, impact strength, and operating temperature. In other respects, their properties are largely identical to those of non-reinforced polycarbonate.

Thermoplastics: ABS

We use the thermoplastic molding compound ABS for products which must have good impact and notched impact properties in addition to high mechanical stability and rigidity. The products are resistant to chemicals and stress cracking due to their special surface quality and hardness.

The characteristic thermal properties provide good dimensional stability at both low and high temperatures. Products made from ABS can be coated with metallic surfaces, e.g., nickel.

According to UL 94, the molding compound used belongs to inflammability class HB to V0.

Dimensions: width / height / depth

The dimensions for "width / height / depth" are defined as follows for all DIN-railmountable products in the INTERFACE

- Width: measurement taken along the
- Height: measurement taken across the DIN rail
- Depth: measurement taken starting from the mounting plate and including the NS 35/7,5 DIN rail (EN 60715)

The width, height, and depth never change, even if the products shown in this catalog happen to be photographed from two different perspectives (horizontal or vertical).

To make things easier for you, one of the following two symbols has been included next to each product photo:





Properties	Unit/level	Polyamide PA	Polyester PBT	Polycarbonate PC	Polycarbonate PC-F	ABS
Operating temperature RTI */**	°C	≤ 105	≤ 105	≤ 125	≤ 120	≤ 80
Minimum temperature (without mechanical load)	°C	-40	-40	-40	-40	-40
Dielectric strength according to IEC 60243-1/DIN VDE 0303-21	kV/cm	600	400	> 300		850
Creep resistance	CTIM	550	225	175		200
IEC 60112/DIN VDE 0303-1	CTI	600	225	175	175	600
Tropical and termite resistance		Good	Good	Good		
Specific contact resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ωcm	1012	1016	> 1016	> 1014	1014
Surface resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω	1010	10 ¹³	> 10 ¹⁴		1013
Inflammability class according to UL 94		V2 - V0	V0	V2 - V0	V0	HB-V0
* According to UL 746 B/ANSI 746 B (elec.)	** Minimur	m value				

Connection cross section

The rated cross section of modular terminal blocks must be specified by the manufacturer in accordance with IEC 60947-7-1. The rated cross section is the maximum conductor cross section that can be connected in single-, multi- or fine-strand versions subject to specific thermal, mechanical, and electrical requirements.

The manufacturer must also specify the rated connection capacity, i.e., the area of the conductor that can be connected, as well as the number of conductors that can be connected simultaneously and the necessary preparation of the conductor ends. The conductors can be solid (single or multi-

strand) or stranded (fine-strand).

These values can be found in the productspecific technical data.

The rated connection capacity of Phoenix Contact modular terminal blocks usually exceeds standard requirements, which specify that it must only be possible to connect one conductor with one of the two next smallest cross sections, excluding the rated cross section (standardized for the cross section range from 0.2 to 35 mm²).

In addition, conductors with a rated cross section can usually be wired with ferrules with plastic sleeve.

Phoenix Contact modular terminal blocks

are designed to allow copper conductors to be connected to them untreated. "Special treatment" or the use of ferrules - both permitted according to IEC 60947-7-1 - is not required. If ferrules are nevertheless used to protect stranded conductors against splicing, the connection capacity of the stranded conductor is generally reduced by one level.

Structure a	and dimensior	ns of connectin											
Cross section	Single-strand Multi-strand		Fine-strand	Fine-strand		American Wire Gauge [AWG]							
	Diameter max. di- mension	Number of wires	Diameter max. di- mension	Number of wires (minimum	Diameter max. di- mension	Number of wires (guide val-	Gauge No.	Solid wires		Stranded wires			
[mm ²]				number)		ue)	AWG	[Ø mm]	[circ. mils]	[mm ²]	[Ø mm]	[circ. mils]	[mm ²]
0.2	0.5	1	-	-	_	-	24	0.51	404	0.21	-	-	-
0.5	0.9	1	1.1	7	1.1	16	20	0.81	1022	0.52	0.97	1111	0.56
0.75	1.0	1	1.2	7	1.3	24	18	1.02	1620	0.82	1.16	1600	0.82
1	1.2	1	1.4	7	1.5	32	(17)	1.15	2050	1.04			
-	_	-	-	-	-	-	16	1.29	2580	1.31	1.50	2580	1.32
1.5	1.5	1	1.7	7	1.8	30	(15)	1.45	3260	1.65			
_	-	-	-	-	_	_	14	1.63	4110	2.08	1.85	4100	2.09
2.5	1.9	1	2.2	7	2.3	50	(13)	1.83	5180	2.63			
-	-	-	-	-	-	-	12	2.05	6530	3.31	2.41	6500	3.32
4	2.4	1	2.7	7	2.9	56	(11)	2.30	8230	4.17			
-	-	-	-	-	-	-	10	2.59	10380	5.26	2.95	10530	5.37
6	2.9	1	3.3	7	3.9	84	(9)	2.91	13100	6.63			
-	-	-	-	-	-	-	8	3.26	16510	8.37	3.73	16625	8.48

Tightening torque of terminal block screws

IEC 60947-1/EN 60947-1, modified, Table 4 specifies tightening torques for screw connections based on the screw size for electrical and mechanical type tests.

Extract from IEC 60 947-1/EN 60 947-1, Table 4 The torque according to IEC and the recommended tightening torque for Phoenix Contact terminal blocks are specified.										
Thread	Head screw with slot									
	Torque	Recommended								
	[Nm]	tightening torque [Nm]								
M2.5 (M2.6)	0.4	0.4 - 0.5								
M3	0.5	0.5 - 0.6								
M3.5	0.8	0.8 - 1.0								

1.2

M4

Current carrying capacity

Standard IEC 60947-7-1/ EN 60947-7-1/DIN VDE 0611-1 specifies the test currents for the individual conductor cross sections listed in the adjacent table. The corresponding currents are listed with the connection data for the individual terminal blocks. The type tests for modular terminal blocks are based on this data.

Test currents according to IEC 60947-7-1/EN 60947-7-1, Table 5													
Rated cross section	[mm²]	0.2	0.5	0.75	1.0	1.5	2.5	4	6	10	16		
Test current	[A]	4	6	9	13.5	17.5	24	32	41	57	76		

1.2 - 1.5

Country code

FR

DE

GB

JP

NO

PL

RU

KR

US

Overview of certification bodies and safety marks

Certification	on bodies and approvals	Country code
CB scheme	IECEE CB Scheme (in combination with certifying body)	Interna- tional
CCA	CENELEC Certification Agreement (CCA inspection report) (in combination with certifying body)	EU
®	Canadian Standards Association (CSA)	CA
(l)	Underwriters Laboratories Inc. (UL)	US
91	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
c Al us	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
(1)	INSIEME PER LA QUALITA'E LA SICUREZZA	IT
P	Gosudarstvenne Komitet Standartov (GOST)	RU
KEMA	DEKRA Certification B.V.	NL
ÖVE	Österreichischer Verband für Elektrotechnik	AT
STEES:	South African Bureau of Standards	ZA
SEV	electrosuisse SEV Verband für Elektro-, Energie- und Informationstechnik	СН
DYE VDE	Verband Deutscher Elektrotechniker e.V.(VDE) – Approval of drawings – Reports with production monitoring	DE
6	Berufsgenossenschaft (BG) GS - Geprüfte Sicherheit	DE
∆ TÜV	TÜV Rheinland Industrie Service GmbH	DE

€x Expl	osion protection	Country	Ship classi	fication societies
APPROVED	FM Approvals	US	•	Bureau Veritas
▶ DEKRA	DEKRA Certification B.V.	NL	(GL)	Germanischer Lloyd AG
PĪB	Physikalisch-Technische Bundesanstalt	DE	Lloyds Register	Lloyd's Register EMEA
GS International	QS Schaffhausen	СН	ClassNK	Nippon Kaiji Kyokai
√vπ	VTT Expert Services Oy	FI	<u>18</u> dany	Det Norske Veritas
IBExU	IBExU Institut für Sicherheitstechnik GmbH	DE	(3)	Polski Rejestr Statków
<u>uc</u>	TÜV Rheinland do Brasil	BR	0	Russian Maritime Register of Shipping
97	Underwriters Laboratories Inc. (UL)	US	KR CONTEN	Korean Register of Shipping
TUV NORD	TÜV Nord	DE	ABS	American Bureau of Shipping
▶ DEKRA	DEKRA EXAM GmbH	DE		

EMC: Class A product:

In accordance with statutory regulations, our products are indicated with this footnote if they are intended for use in industrial environments. This means that the permissible limit values for residential applications may be exceeded in the event of conducted and emitted interference. In such cases, the operator may have to take additional safety measures in order to ensure electromagnetic compatibility in residential applications.

Note:

Subject to changes that serve the purpose of technical progress.

Туре	Order No. F	Page	Туре	Order No.	Page	Туре	Order No. F	age	Туре	Order No.	Page
В			CABLE-D-15SUB/M/OE/0,25/S/0,5M CABLE-D-15SUB/M/OE/0,25/S/1,0M CABLE-D-15SUB/M/OE/0,25/S/1,5M CABLE-D-15SUB/M/OE/0,25/S/2,0M	2926438 2926441 2926454 2926467	516 516 516 516	CABLE-D25SUB/B/S/300/KONFEK/S CABLE-D25SUB/B/S/400/KONFEK/S CABLE-D25SUB/B/S/600/KONFEK/S CABLE-D25SUB/S/S/100/KONFEK/S	2302175 2302188	512 512 512 513	CABLE-FCN40/1X50/3,0M/IM/MEL CABLE-FCN40/1X50/3,0M/IP/MEL CABLE-FCN40/1X50/3,0M/M340 CABLE-FCN40/1X50/3,0M/S7-IN	2903471 2903479 2321664 2321127	441 441 447 453
B-STIFT BN-TRK BRIDGE- 2 BRIDGE- 2-3M		560 560 36 37	CABLE-D-15SUB/M/OE/0,25/S/3,0M CABLE-D-15SUB/M/OE/0,25/S/4,0M CABLE-D-15SUB/M/OE/0,25/S/6,0M CABLE-D-25SUB-F-OE-0,25-S/	2926470 2926483 2926496 2900906	516 516 516 516	CABLE-D25SUB/S/S/200/KONFEK/S CABLE-D25SUB/S/S/300/KONFEK/S CABLE-D37-M2,5-4X14-X81-I/ CABLE-D37-M2,5-4X14-Y81P-O/		513 513 440 440	CABLE-FCN40/1X50/3,0M/S7-OUT CABLE-FCN40/1X50/4,0M/IM/MEL CABLE-FCN40/1X50/4,0M/IP/MEL CABLE-FCN40/1X50/4,0M/M340	2321046 2903472 2903480 2321677	453 441 441 447
BRIDGE- 3 BRIDGE- 3-3M BRIDGE- 4 BRIDGE- 4-3M	2900747 2901656 2900748 2901659	36 37 36 37	CABLE-D-25SUB-M-OE-0,25-S/ CABLE-D-25SUB/F/OE/0,25/S/0,5M CABLE-D-25SUB/F/OE/0,25/S/1,0M CABLE-D-25SUB/F/OE/0,25/S/1,5M	2900911 2926153 2926166 2926179	516 516 516 516	CABLE-D37-M2,5/4X14/50/X81-I CABLE-D37-M2,5/4X14/50/Y81P-O CABLE-D37-M2,5/4X14/100/X81-I CABLE-D37-M2,5/4X14/100/Y81P-O	2302515 2302476 2302528 2302489	440 440 440 440	CABLE-FCN40/1X50/4,0M/S7-IN CABLE-FCN40/1X50/4,0M/S7-OUT CABLE-FCN40/1X50/6,0M/IM/MEL CABLE-FCN40/1X50/6,0M/IP/MEL	2321130 2321059 2903473 2903481	453 453 441 441
BRIDGE- 5 BRIDGE- 5-3M BRIDGE- 6 BRIDGE- 6-3M	2900749 2901545 2900750 2901697	36 37 36 37	CABLE-D-25SUB/F/OE/0,25/S/2,0M CABLE-D-25SUB/F/OE/0,25/S/3,0M CABLE-D-25SUB/F/OE/0,25/S/4,0M CABLE-D-25SUB/F/OE/0,25/S/6,0M	2926182 2926195 2926205 2926218	516 516 516 516	CABLE-D37-M2,5/4X14/200/X81-I CABLE-D37-M2,5/4X14/200/Y81P-O CABLE-D37-M2,5/4X14/300/X81-I CABLE-D37-M2,5/4X14/300/Y81P-O	2302531 2302492 2302544 2302502	440 440 440 440	CABLE-FCN40/1X50/ 6,0M/M340 CABLE-FCN40/1X50/ 6,0M/S7-IN CABLE-FCN40/1X50/ 6,0M/S7-OUT CABLE-FCN40/1X50/ 8,0M/IM/MEL	2321680 2321143 2321062 2903474	447 453 453 441
BRIDGE- 7 BRIDGE- 7-3M BRIDGE- 8 BRIDGE- 8-3M	2900751 2901698 2900752 2901700	36 37 36 37	CABLE-D-25SUB/M/OE/0,25/S/0,5M CABLE-D-25SUB/M/OE/0,25/S/1,0M CABLE-D-25SUB/M/OE/0,25/S/1,5M CABLE-D-25SUB/M/OE/0,25/S/2,0M	2926506 2926519 2926522 2926535	516 516 516 516	CABLE-D37SUB/B/B/ 100/KONFEK/S CABLE-D37SUB/B/B/ 200/KONFEK/S CABLE-D37SUB/B/B/ 300/KONFEK/S CABLE-D37SUB/B/B/ 400/KONFEK/S	2305512 2305525	513 513 513 513	CABLE-FCN40/1X50/8,0M/IP/MEL CABLE-FCN40/1X50/8,0M/M340 CABLE-FCN40/1X50/8,0M/S7-IN CABLE-FCN40/1X50/8,0M/S7-OUT	2903482 2321693 2321156 2321075	441 447 453 453
BRIDGE- 9 BRIDGE- 9-3M BRIDGE-10 BRIDGE-10-3M	2900753 2901701 2900754 2901702	36 37 36 37	CABLE-D-25SUB/M/OE/0,25/S/3,0M CABLE-D-25SUB/M/OE/0,25/S/4,0M CABLE-D-25SUB/M/OE/0,25/S/6,0M CABLE-D-37SUB-F-OE-0,25-S/	2926548 2926551 2926564 2900907	516 516 516 517	CABLE-D37SUB/B/B/ 600/KONFEK/S CABLE-D37SUB/B/B/ 800/KONFEK/S CABLE-D37SUB/B/1000/KONFEK/S CABLE-D37SUB/B/B/1500/KONFEK/S	\$ 2900761 \$ 2900762	513 513 513 513	CABLE-FCN40/1X50/10,0M/IM/MEL CABLE-FCN40/1X50/10,0M/IP/MEL CABLE-FCN40/1X50/10,0M/M340 CABLE-FCN40/1X50/10,0M/S7-IN	2903475 2903483 2321703 2321169	441 441 447 453
С			CABLE-D-37SUB-M-OE-0,25-S/ CABLE-D-37SUB/F/OE/0,25/S/0,5M CABLE-D-37SUB/F/OE/0,25/S/1,0M CABLE-D-37SUB/F/OE/0,25/S/1,5M	2900912 2926221 2926234 2926247	517 517 517 517	CABLE-D37SUB/B/B/2000/KONFEK/S CABLE-D37SUB/B/S/50/KONFEK/S CABLE-D37SUB/B/S/100/KONFEK/S CABLE-D37SUB/B/S/150/KONFEK/S	2302191 2302201	513 512 512 512	CABLE-FCN40/1X50/10,0M/S7-OUT CABLE-FCN40/1X50/15,0M/M340 CABLE-FCN40/4X14/ 0,5M/IM/MEL CABLE-FCN40/4X14/ 0,5M/M340	2321088 2903748 2903502 2321716	453 447 441 447
CABLE D-SUB-B-B-S/// CABLE D-SUB-S-S-S/// CABLE D-SUB-S/// CABLE-40/2FLK16/ 2,0M/YUC	2302434 2302340	515 515 515 467	CABLE-D-37SUB/F/OE/0,25/S/2,0M CABLE-D-37SUB/F/OE/0,25/S/3,0M CABLE-D-37SUB/F/OE/0,25/S/4,0M CABLE-D-37SUB/F/OE/0,25/S/6,0M	2926250 2926263 2926276 2926289	517 517 517 517	CABLE-D37SUB/B/S/200/KONFEK/S CABLE-D37SUB/B/S/300/KONFEK/S CABLE-D37SUB/B/S/400/KONFEK/S CABLE-D37SUB/B/S/600/KONFEK/S	2302230 2302243	512 512 512 512	CABLE-FCN40/4X14/ 0,5M/S7-IN CABLE-FCN40/4X14/ 0,5M/S7-OUT CABLE-FCN40/4X14/ 1,0M/IM/MEL CABLE-FCN40/4X14/ 1,0M/M/340	2321253 2321172 2903503 2321729	453 453 441 447
CABLE-40/2FLK16/ 4,0M/YUC CABLE-40/2FLK16/10,0M/YUC CABLE-40/2FLK16/15,0M/YUC CABLE-40/2FLK16/20,0M/YUC	2321350 2321376	467 467 467 467	CABLE-D-37SUB/M/OE/0,25/S/0,5M CABLE-D-37SUB/M/OE/0,25/S/1,0M CABLE-D-37SUB/M/OE/0,25/S/1,5M CABLE-D-37SUB/M/OE/0,25/S/2,0M	2926577 2926580 2926593 2926603	517 517 517 517	CABLE-D37SUB/S/S/100/KONFEK/S CABLE-D37SUB/S/S/200/KONFEK/S CABLE-D37SUB/S/S/300/KONFEK/S CABLE-D50SUB/B/B/100/KONFEK/S	2305677 2305680	513 513 513 513	CABLE-FCN40/4X14/1,0M/S7-IN CABLE-FCN40/4X14/1,0M/S7-OUT CABLE-FCN40/4X14/2,0M/IM/MEL CABLE-FCN40/4X14/2,0M/M340	2321266 2321185 2903504 2321732	453 453 441 447
CABLE-50/4FLK14/ 2,0M/YUC CABLE-50/4FLK14/ 4,0M/YUC CABLE-50/4FLK14/ 6,0M/YUC CABLE-50/4FLK14/10,0M/YUC	2314671 2318978	467 467 467 467	CABLE-D-37SUB/M/OE/0,25/S/3,0M CABLE-D-37SUB/M/OE/0,25/S/4,0M CABLE-D-37SUB/M/OE/0,25/S/6,0M CABLE-D-50SUB-F-OE-0,25-S/	2926616 2926629 2926632 2900908	517 517 517 517	CABLE-D50SUB/B/B/200/KONFEK/S CABLE-D50SUB/B/B/300/KONFEK/S CABLE-D50SUB/B/S/ 50/KONFEK/S CABLE-D50SUB/B/S/100/KONFEK/S	2305567 2302269	513 513 512 512	CABLE-FCN40/4X14/ 2,0M/S7-IN CABLE-FCN40/4X14/ 2,0M/S7-OUT CABLE-FCN40/4X14/ 3,0M/IM/MEL CABLE-FCN40/4X14/ 3,0M/M340	2321279 2321198 2903505 2321745	453 453 441 447
CABLE-50/4FLK14/15,0M/YUC CABLE-50/4FLK14/20,0M/YUC CABLE-D 9SUB/B/B/100/KONFEK/S CABLE-D 9SUB/B/B/200/KONFEK/S	2314778 3 2305415	467 467 513 513	CABLE-D-50SUB-M-OE-0,25-S/ CABLE-D-50SUB/F/OE/0,25/S/0,5M CABLE-D-50SUB/F/OE/0,25/S/1,0M CABLE-D-50SUB/F/OE/0,25/S/1,5M	2900913 2926292 2926302 2926315	517 517 517 517	CABLE-D50SUB/B/S/150/KONFEK/S CABLE-D50SUB/B/S/200/KONFEK/S CABLE-D50SUB/B/S/300/KONFEK/S CABLE-D50SUB/B/S/400/KONFEK/S	2302298 2302308	512 512 512 512	CABLE-FCN40/4X14/ 3,0M/S7-IN CABLE-FCN40/4X14/ 3,0M/S7-OUT CABLE-FCN40/4X14/ 4,0M/IM/MEL CABLE-FCN40/4X14/ 4,0M/M340	2321282 2321208 2903506 2321758	453 453 441 447
CABLE-D 9SUB/B/B/300/KONFEK/S CABLE-D 9SUB/B/S/ 50/KONFEK/S CABLE-D 9SUB/B/S/100/KONFEK/S CABLE-D 9SUB/B/S/150/KONFEK/S	2299987 2299990	513 512 512 512	CABLE-D-50SUB/F/OE/0,25/S/2,0M CABLE-D-50SUB/F/OE/0,25/S/3,0M CABLE-D-50SUB/F/OE/0,25/S/4,0M CABLE-D-50SUB/F/OE/0,25/S/6,0M	2926328 2926331 2926344 2926357	517 517 517 517	CABLE-D50SUB/B/S/600/KONFEK/S CABLE-D50SUB/S/S/100/KONFEK/S CABLE-D50SUB/S/S/200/KONFEK/S CABLE-D50SUB/S/S/300/KONFEK/S	2305693 2305703	512 513 513 513	CABLE-FCN40/4X14/ 4,0M/S7-IN CABLE-FCN40/4X14/ 4,0M/S7-OUT CABLE-FCN40/4X14/ 6,0M/IM/MEL CABLE-FCN40/4X14/ 6,0M/M340	2321295 2321211 2903507 2321761	453 453 441 447
CABLE-D 9SUB/B/S/200/KONFEK/S CABLE-D 9SUB/B/S/300/KONFEK/S CABLE-D 9SUB/B/S/400/KONFEK/S CABLE-D 9SUB/B/S/600/KONFEK/S	3 2302023 3 2302036	512 512 512 512	CABLE-D-50SUB/M/OE/0,25/S/0,5M CABLE-D-50SUB/M/OE/0,25/S/1,0M CABLE-D-50SUB/M/OE/0,25/S/1,5M CABLE-D-50SUB/M/OE/0,25/S/2,0M	2926658 2926661	517 517 517 517	CABLE-EC56-F-OE-0,34-S/ CABLE-EC56/F/OE/0,34/S/ 1,0M CABLE-EC56/F/OE/0,34/S/ 2,0M CABLE-EC56/F/OE/0,34/S/ 4,0M	2904025 2903395 2903396 2903397	518 518 518 518	CABLE-FCN40/4X14/ 6,0M/S7-IN CABLE-FCN40/4X14/ 6,0M/S7-OUT CABLE-FCN40/4X14/ 8,0M/IM/MEL CABLE-FCN40/4X14/ 8,0M/M340	2321305 2321224 2903508 2321774	453 453 441 447
CABLE-D 9SUB/S/S/100/KONFEK/S CABLE-D 9SUB/S/S/200/KONFEK/S CABLE-D 9SUB/S/S/300/KONFEK/S CABLE-D- 9SUB-F-OE-0,25-S/	2305583 2305596	513 513 513 516	CABLE-D-50SUB/M/OE/0,25/S/3,0M CABLE-D-50SUB/M/OE/0,25/S/4,0M CABLE-D-50SUB/M/OE/0,25/S/6,0M CABLE-D15SUB/B/B/100/KONFEK/S	2926690 2926700	517 517 517 513	CABLE-EC56/F/OE/0,34/S/6,0M CABLE-EC56/F/OE/0,34/S/8,0M CABLE-EC56/F/OE/0,34/S/10,0M CABLE-EC56/F/OE/0,34/S/15,0M	2903398 2903399 2903400 2903401	518 518 518 518	CABLE-FCN40/4X14/ 8,0M/S7-IN CABLE-FCN40/4X14/ 8,0M/S7-OUT CABLE-FCN40/4X14/10,0M/IM/MEL CABLE-FCN40/4X14/10,0M/M340	2321318 2321237 2903509 2321787	453 453 441 447
CABLE-D- 9SUB-M-OE-0,25-S/ CABLE-D- 9SUB/F/OE/0,25/S/0,5M CABLE-D- 9SUB/F/OE/0,25/S/1,0M CABLE-D- 9SUB/F/OE/0,25/S/1,5M	2926014 2926027	516 516 516 516	CABLE-D15SUB/B/B/200/KONFEK/S CABLE-D15SUB/B/B/300/KONFEK/S CABLE-D15SUB/B/S/50/KONFEK/S CABLE-D15SUB/B/S/100/KONFEK/S	2305460 2302052	513 513 512 512	CABLE-EC56/F/OE/0,34/S/20,0M CABLE-FCN24-2X14-OMR-IN/ CABLE-FCN24-2X14-OMR-OUT/ CABLE-FCN24/2X14/100/OMR-IN	2903402 2302845 2302858 2304241	518 442 442 442	CABLE-FCN40/4X14/10,0M/S7-IN CABLE-FCN40/4X14/10,0M/S7-OUT CABLE-FCN40/4X14/100/OMR-IN CABLE-FCN40/4X14/100/OMR-OUT	2304209	453 453 442 442
CABLE-D- 9SUB/F/OE/0,25/S/2,0M CABLE-D- 9SUB/F/OE/0,25/S/3,0M CABLE-D- 9SUB/F/OE/0,25/S/4,0M CABLE-D- 9SUB/F/OE/0,25/S/6,0M		516 516	CABLE-D15SUB/B/S/150/KONFEK/S CABLE-D15SUB/B/S/200/KONFEK/S CABLE-D15SUB/B/S/300/KONFEK/S CABLE-D15SUB/B/S/400/KONFEK/S	2302081 2302094	512 512 512 512	CABLE-FCN24/2X14/100/OMR-OUT CABLE-FCN24/2X14/200/OMR-IN CABLE-FCN24/2X14/200/OMR-OUT CABLE-FCN40-4X14-OMR-IN/	2304225 2304254 2304238 2302816	442 442 442 442	CABLE-FCN40/4X14/15,0M/M340 CABLE-FCN40/4X14/200/OMR-IN CABLE-FCN40/4X14/200/OMR-OUT CABLE-FLK10-OE-0,14/	2903749 2304212 2304199 2904331	447 442 442 502
CABLE-D- 9SUB/M/OE/0,25/S/0,5M CABLE-D- 9SUB/M/OE/0,25/S/1,0M CABLE-D- 9SUB/M/OE/0,25/S/1,5M CABLE-D- 9SUB/M/OE/0,25/S/2,0M	2926373 2926386	516 516 516 516	CABLE-D15SUB/B/S/600/KONFEK/S CABLE-D15SUB/S/S/100/KONFEK/S CABLE-D15SUB/S/S/200/KONFEK/S CABLE-D15SUB/S/S/300/KONFEK/S	2305606 2305619	512 513 513 513	CABLE-FCN40-4X14-OMR-OUT/ CABLE-FCN40/1X50/ 0,5M/IM/MEL CABLE-FCN40/1X50/ 0,5M/IP/MEL CABLE-FCN40/1X50/ 0,5M/M340	2903468 2903476	442 441 441 447	CABLE-FLK10/OE/0,14/0,5M CABLE-FLK10/OE/0,14/1,0M CABLE-FLK10/OE/0,14/1,5M CABLE-FLK10/OE/0,14/2,0M	2904073 2904074 2904075 2904076	502 502 502 502
CABLE-D- 9SUB/M/OE/0,25/S/3,0M CABLE-D- 9SUB/M/OE/0,25/S/4,0M CABLE-D- 9SUB/M/OE/0,25/S/6,0M CABLE-D-15SUB-F-OE-0,25-S/	2926412 2926425	516 516 516 516	CABLE-D25SUB/B/2X14/100/TU812 CABLE-D25SUB/B/2X14/200/TU812 CABLE-D25SUB/B/2X14/300/TU812 CABLE-D25SUB/B/2X14/500/TU812	2304652 2304665	423 423 423 423	CABLE-FCN40/1X50/ 0,5M/S7-IN CABLE-FCN40/1X50/ 0,5M/S7-OUT CABLE-FCN40/1X50/ 1,0M/IM/MEL CABLE-FCN40/1X50/ 1,0M/IP/MEL	2321091 2321017 2903469 2903477	453 453 441 441	CABLE-FLK10/OE/0,14/2,5M CABLE-FLK10/OE/0,14/3,0M CABLE-FLK10/OE/0,14/4,0M CABLE-FLK10/OE/0,14/6,0M	2904077 2904078 2904079 2904080	502 502 502 502
CABLE-D-15SUB-M-OE-0,25-S/ CABLE-D-15SUB/F/OE/0,25/S/0,5M CABLE-D-15SUB/F/OE/0,25/S/1,0M CABLE-D-15SUB/F/OE/0,25/S/1,5M	2926098	516 516 516 516	CABLE-D25SUB/B/2X14/TU812/ CABLE-D25SUB/B/B/100/KONFEK/S CABLE-D25SUB/B/B/200/KONFEK/S CABLE-D25SUB/B/B/300/KONFEK/S	2305486	423 513 513 513	CABLE-FCN40/1X50/1,0M/M340 CABLE-FCN40/1X50/1,0M/S7-IN CABLE-FCN40/1X50/1,0M/S7-OUT CABLE-FCN40/1X50/2,0M/IM/MEL	2321648 2321101 2321020 2903470	447 453 453 441	CABLE-FLK10/OE/0,14/8,0M CABLE-FLK10/OE/0,14/10,0M CABLE-FLK14/OE/0,14/50 CABLE-FLK14/OE/0,14/100	2904081 2904082 2305761 2305253	502 502 502 502
CABLE-D-15SUB/F/OE/0,25/S/2,0M CABLE-D-15SUB/F/OE/0,25/S/3,0M CABLE-D-15SUB/F/OE/0,25/S/4,0M CABLE-D-15SUB/F/OE/0,25/S/6,0M	2926124 2926137		CABLE-D25SUB/B/S/50/KONFEK/S CABLE-D25SUB/B/S/100/KONFEK/S CABLE-D25SUB/B/S/150/KONFEK/S CABLE-D25SUB/B/S/200/KONFEK/S	2302133 2302146	512 512 512 512	CABLE-FCN40/1X50/2,0M/IP/MEL CABLE-FCN40/1X50/2,0M/M340 CABLE-FCN40/1X50/2,0M/S7-IN CABLE-FCN40/1X50/2,0M/S7-OUT	2903478 2321651 2321114 2321033	441 447 453 453	CABLE-FLK14/OE/0,14/150 CABLE-FLK14/OE/0,14/200 CABLE-FLK14/OE/0,14/250 CABLE-FLK14/OE/0,14/300	2305266 2305279 2305282 2305295	502 502 502 502

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
CABLE-FLK14/OE/0,14/ 400	2305774 502	DEK-OV- 12DC/240AC/800	2964636 401	EEM-MEMO-MA600	2901370 202	ELR W3-24DC/500AC-9I	2297057 19
CABLE-FLK14/OE/0,14/ 600	2305787 502	DEK-OV- 24DC/ 24DC/ 3	2941374 401	EEM-MKT-DRA	2902078 205	ELR W3-24DC/500AC-16	2297332 39
CABLE-FLK14/OE/0,14/ 800	2305790 502	DEK-OV- 24DC/ 24DC/ 3/AKT	2964296 401	EEM-PB-MA600	2901368 203	ELR W3-230AC/500AC-2	2297303 38
CABLE-FLK14/OE/0,14/	2305732 502	DEK-OV- 24DC/ 24DC/ 10	2964322 401	EEM-PB12-MA600	2901418 203	ELR W3-230AC/500AC-2I	2297044 18
CABLE-FLK14/OE/0,14/1000	2305800 502	DEK-OV- 24DC/240AC/800	2964649 401	EEM-RS485-MA400	2901365 203	ELR W3-230AC/500AC- 9	2297329 39
CABLE-FLK16/OE/0,14/0,5M	2318127 502	DEK-REL- 5//1	2941183 398	EEM-RS485-MA600	2901367 203	ELR W3-230AC/500AC- 9I	2297060 19
CABLE-FLK16/OE/0,14/1,0M	2318130 502	DEK-REL- 5/O/1	2941170 399	EEM-TEMP-MA600	2901949 204	ELR W3-230AC/500AC-16	2297345 39
CABLE-FLK16/OE/0,14/1,5M	2318143 502	DEK-REL- 24/1/AKT	2964063 399	EIK1-SVN-24P	2940799 412	ELR W3/ 9-400 S	2963569 42
CABLE-FLK16/OE/0,14/2,0M	2318156 502	DEK-REL- 24/1/S	2964131 403	EL1-P16	2833547 372	EM RD-ADAPTER EM RI-ADAPTER CLASSIC EM RI-ADAPTER COMPACT EM SWD-ADAPTER	2902747 29
CABLE-FLK16/OE/0,14/2,5M	2318169 502	DEK-REL- 24/1/SEN	2964050 399	EL1-P25	2833550 372		2902831 29
CABLE-FLK16/OE/0,14/3,0M	2318172 502	DEK-REL- 24/1/1	2940171 398	EL2-P35	2833592 378		2902748 29
CABLE-FLK16/OE/0,14/4,0M	2318185 502	DEK-REL- 24/0/1	2941154 399	EL3-M52	2833628 382		2902776 32
CABLE-FLK16/OE/0,14/6,0M	2318198 502	DEK-REL-G24/21	2964500 397	ELR 1- 24DC/600AC-20	2297138 46	EM-CAN-GATEWAY-IFS	2901504 14
CABLE-FLK16/OE/0,14/8,0M	2318208 502	DEK-TR/INV	2964319 413	ELR 1- 24DC/600AC-30	2297154 47	EM-CP-PP-ETH	2902802 247
CABLE-FLK16/OE/0,14/	2318224 502	DFLK 10/FKCT	2903034 531	ELR 1- 24DC/600AC-50	2297170 47	EM-DNET-GATEWAY-IFS	2901529 14
CABLE-FLK16/OE/0,14/10,0M	2318211 502	DFLK 14/FKCT	2903035 531	ELR 1-230AC/600AC-20	2297141 46	EM-EV-CLR-12V	2903246 247
CABLE-FLK20/OE/0,14/ 50	2305826 503	DFLK 16	2280239 530	ELR 1-230AC/600AC-30	2297167 47	EM-MODBUS-GATEWAY-IFS	2901528 14
CABLE-FLK20/OE/0,14/ 100	2305305 503	DFLK 16/FKCT	2903036 531	ELR 1-230AC/600AC-50	2297183 47	EM-PB-GATEWAY-IFS	2297620 14
CABLE-FLK20/OE/0,14/ 150	2305318 503	DFLK 20	2280242 530	ELR 2+1-24DC/500AC-37	2297277 41	EM-RS232-GATEWAY-IFS	2901526 14
CABLE-FLK20/OE/0,14/ 200	2305321 503	DFLK 20/FKCT	2903038 531	ELR 2+1-230AC/500AC-37	2297280 41	EM-RS485-GATEWAY-IFS	2901527 14
CABLE-FLK20/OE/0,14/250	2305334 503	DFLK 26	2280255 530	ELR 3- 24DC/500AC- 2	2297196 40	EMD-BL-3V-400	2903525 251
CABLE-FLK20/OE/0,14/300	2305347 503	DFLK 26/FKCT	2903039 531	ELR 3- 24DC/500AC- 9	2297219 41	EMD-BL-3V-400-PT	2903526 251
CABLE-FLK20/OE/0,14/400	2305839 503	DFLK 34	2280268 530	ELR 3- 24DC/500AC-16	2297235 41	EMD-BL-C-10	2903521 250
CABLE-FLK20/OE/0,14/600	2305842 503	DFLK 34/FKCT	2903041 531	ELR 3-230AC/500AC- 2	2297206 40	EMD-BL-C-10-PT	2903522 250
CABLE-FLK20/OE/0,14/800	2305855 503	DFLK 40	2280271 530	ELR 3-230AC/500AC- 9	2297222 41	EMD-BL-PH-480	2903527 251
CABLE-FLK20/OE/0,14/	2305745 503	DFLK 40/FKCT	2903042 531	ELR 3-230AC/500AC-16	2297248 41	EMD-BL-PH-480-PT	2903528 251
CABLE-FLK20/OE/0,14/1000	2305868 503	DFLK 50	2280284 530	ELR 5011 IP PN	2700745 48	EMD-BL-V-230	2903523 250
CABLE-FLK50/0,14/HF/0,5M	2314134 505	DFLK 50/FKCT	2903043 531	ELR 5011-2 IP PN	2701007 48	EMD-BL-V-230-PT	2903524 250
CABLE-FLK50/0,14/HF/1,0M	2314147 505	DFLK-D 9 SUB/B	2287135 537	ELR 5030 IP PN	2701006 49	EMD-FL-3V-230	2885773 254
CABLE-FLK50/0,14/HF/1,5M	2314150 505	DFLK-D 9 SUB/F/FKCT	2903063 538	ELR 5030-2 IP PN	2701008 49	EMD-FL-3V-400	2866064 254
CABLE-FLK50/0,14/HF/2,0M	2314163 505	DFLK-D 9 SUB/M/FKCT	2903052 538	ELR H3-I-SC- 24DC/500AC-0,6	2900542 24	EMD-FL-3V-500	2867979 255
CABLE-FLK50/0,14/HF/2,5M	2314176 505	DFLK-D 9 SUB/S	2283870 537	ELR H3-I-SC- 24DC/500AC-2	2900543 24	EMD-FL-3V-690	2885249 255
CABLE-FLK50/0,14/HF/3,0M	2314189 505	DFLK-D15 SUB/B	2280307 537	ELR H3-I-SC- 24DC/500AC-9	2900545 25	EMD-FL-C-10	2866022 252
CABLE-FLK50/0,14/HF/4,0M	2314192 505	DFLK-D15 SUB/F/FKCT	2903065 538	ELR H3-I-SC-230AC/500AC-0,6	2900685 24	EMD-FL-PF-400	2885809 256
CABLE-FLK50/0,14/HF/5,0M	2314202 505	DFLK-D15 SUB/M/FKCT	2903054 538	ELR H3-I-SC-230AC/500AC-2	2900544 24	EMD-FL-RP-480	2900177 256
CABLE-FLK50/0,14/HF/6,0M	2314215 505	DFLK-D15 SUB/S	2280297 537	ELR H3-I-SC-230AC/500AC-9	2900546 25	EMD-FL-V-300	2866048 253
CABLE-FLK50/0,14/HF/ 7,0M	2314228 505	DFLK-D25 SUB/B	2280323 537	ELR H3-IES-PT-24DC/500AC-0,6	2903914 20	EMD-SL-3V-400	2866051 255
CABLE-FLK50/0,14/HF/ 8,0M	2314231 505	DFLK-D25 SUB/F/FKCT	2903067 538	ELR H3-IES-PT-24DC/500AC-2	2903916 20	EMD-SL-3V-400-N	2885278 255
CABLE-FLK50/0,14/HF/10,0M	2314244 505	DFLK-D25 SUB/M/FKCT	2903055 538	ELR H3-IES-PT-24DC/500AC-9	2903918 21	EMD-SL-C-OC-10	2866019 252
CABLE-FLK50/OE/0,14/ 50	2305871 503	DFLK-D25 SUB/S	2280310 537	ELR H3-IES-SC-24DC/500AC-0,6	2900566 20	EMD-SL-C-UC-10	2867937 252
CABLE-FLK50/OE/0,14/100	2305350 503	DFLK-D37 SUB/B	2280349 537	ELR H3-IES-SC- 24DC/500AC-2	2900567 20	EMD-SL-LL-110	2901137 257
CABLE-FLK50/OE/0,14/150	2305363 503	DFLK-D37 SUB/F/FKCT	2903069 538	ELR H3-IES-SC- 24DC/500AC-9	2900569 21	EMD-SL-LL-230	2885906 257
CABLE-FLK50/OE/0,14/200	2305376 503	DFLK-D37 SUB/M/FKCT	2903056 538	ELR H3-IES-SC-230AC/500AC-0,6	2900689 20	EMD-SL-PH-400	2866077 255
CABLE-FLK50/OE/0,14/250	2305389 503	DFLK-D37 SUB/S	2280336 537	ELR H3-IES-SC-230AC/500AC-2	2900568 20	EMD-SL-PS-24AC	2866103 252
CABLE-FLK50/OE/0,14/300	2305392 503	DFLK-D50 SUB/B	2287669 537	ELR H3-IES-SC-230AC/500AC-9	2900570 21	EMD-SL-PS- 24DC	2885359 252
CABLE-FLK50/OE/0,14/400	2305884 503	DFLK-D50 SUB/F/FKCT	2903070 538	ELR H3-SC-24DC/500AC-9	2900530 27	EMD-SL-PS-110AC	2866116 252
CABLE-FLK50/OE/0,14/600	2305897 503	DFLK-D50 SUB/M/FKCT	2903058 538	ELR H3-SC-230AC/500AC-9	2900531 27	EMD-SL-PS-120AC	2885731 252
CABLE-FLK50/OE/0,14/800	2305907 503	DFLK-D50 SUB/S	2291286 537	ELR H5-I-SC-24DC/500AC-0,6	2900573 22	EMD-SL-PS-230AC	2866129 252
CABLE-FLK50/OE/0,14/ CABLE-FLK50/OE/0,14/1000 CLIPFIX 35 CM-KBL-RS232/USB	2305758 503 2305910 503 3022218 318 2881078 149	DIKD 1,5	2715979 399	ELR H5-I-SC- 24DC/500AC-2 ELR H5-I-SC- 24DC/500AC-9 ELR H5-I-SC-230AC/500AC-0,6 ELR H5-I-SC-230AC/500AC-2	2900574 22 2900576 23 2900691 22 2900575 22	EMD-SL-PS45-110AC EMD-SL-PS45-120AC EMD-SL-PS45-230AC EMD-SL-PS45-400AC	2885281 255 2885744 255 2885294 255 2885304 255
D		E		ELR H5-I-SC-230AC/500AC-9 ELR H5-IES-PT-24DC/500AC-0,6 ELR H5-IES-PT-24DC/500AC-2 ELR H5-IES-PT-24DC/500AC-9	2900578 23 2903902 18 2903904 18 2903906 19	EMD-SL-PS45-500AC EMD-SL-PTC EMD-SL-V-UV-300 EMG 17-OV- 24DC/ 48DC/2	2885317 256 2866093 257 2866035 253 2942810 405
D-DEK 1,5 GN	2716949 397	EB 2- DIK BU	2716648 403	ELR H5-IES-SC- 24DC/500AC-0,6	2900582 18	EMG 17-REL/KSR-G 24/2E/SO38	2941646 407
D-UKK 3/5	2770024 183	EB 2- DIK RD	2716693 403	ELR H5-IES-SC- 24DC/500AC-2	2900414 18	EMG 17-REL/KSR-G 24/SO38 BK	2949994 407
D-UKK 3/5 BU	2770105 183	EB 3- DIK BU	2716651 403	ELR H5-IES-SC- 24DC/500AC-9	2900421 19	EMG 22-DIO 4E	2950048 262
DB 50- 90 BK	2820916 372	EB 3- DIK RD	2716745 403	ELR H5-IES-SC-230AC/500AC-0,6	2900692 18	EMG 22-DIO 4E-1N5408	2952790 262
DB 50-90 BU	2821180 372	EB 4- DIK BU	2716664 403	ELR H5-IES-SC-230AC/500AC-2	2900420 18	EMG 22-DIO 4M-1N5408	2952211 262
DB 50-90 GY	2820929 372	EB 4- DIK RD	2716758 403	ELR H5-IES-SC-230AC/500AC-9	2900422 19	EMG 22-DIO 4P-1N5408	2952198 262
DEK-OE- 5DC/ 5DC/100KHZ-G	2964542 411	EB 5- DIK BU	2716677 403	ELR H5-IES-SC-SWD/500AC-0,6	2903116 31	EMG 22-DIO 7M	2950077 262
DEK-OE- 5DC/ 24DC/100KHZ	2964270 410	EB 5- DIK RD	2716761 403	ELR H5-IES-SC-SWD/500AC-2	2903117 31	EMG 22-DIO 7P	2950064 262
DEK-OE- 5DC/24DC/100KHZ-G	2964555 411	EB 10- DIK BU	2716680 403	ELR H5-IES-SC-SWD/500AC-9	2903118 31	EMG 22-LA 7S/230	2949677 263
DEK-OE- 5DC/48DC/100	2940223 400	EB 10- DIK RD	2716774 403	ELR H5-SC-24DC/500AC-9	2900538 26	EMG 22-LED 7S/24	2952305 263
DEK-OE- 12DC/48DC/100	2964487 400	EB 80- DIK BU	2715940 397	ELR H5-SC-230AC/500AC-9	2900539 26	EMG 22-REL/KSR-230/21/SO46	2940760 404
DEK-OE- 24DC/5DC/100KHZ-G	2964364 411	EB 80- DIK RD	2715953 397	ELR H51-0.6-DIN-RAIL-SET	2902952 29	EMG 22-REL/KSR-230/21/AU/SO46	6 2940061 404
DEK-OE- 24DC/ 24DC/100KHZ	2964283 410	EB 80- DIK WH	2715788 397	ELR H51-2.4-DIN-RAIL-SET	2902953 29	EMG 22-REL/KSR-G 24/TRN 5	2949787 414
DEK-OE- 24DC/ 24DC/100KHZ-G	2964348 411	EEM-2AO-MA600	2901475 202	ELR H51-9-DIN-RAIL-SET	2902954 29	EMG 22-REL/KSR-G 24/TRN12	2952363 414
DEK-OE- 24DC/ 48DC/100	2940207 400	EEM-2DIO-MA600	2901371 202	ELR H51-IESSC-24DC500AC-06	2902746 29	EMG 22-REL/KSR-G 24/TRN35	2952350 414
DEK-OE- 60DC/ 48DC/100	2941536 400	EEM-ETH-MA600	2901373 203	ELR H51-IESSC-24DC500AC-2	2902744 29	EMG 22-REL/KSR-G 24/TRP 5	2949790 415
DEK-OE-120AC/ 48DC/100	2941659 400	EEM-ETH-RS485-MA600	2901374 203	ELR H51-IESSC-24DC500AC-9	2902745 29	EMG 22-REL/KSR-G 24/TRP12	2952156 415
DEK-OE-230AC/ 48DC/100	2940210 400	EEM-IMP-MA400	2904314 204	ELR W1/2-24DC	2963598 44	EMG 22-REL/KSR-G 24/TRP35	2952169 415
DEK-OE-230AC/ 48DC/100/SO 46	2964678 405	EEM-IMP-MA600	2904313 204	ELR W1/6-24DC	2982090 44	EMG 30-SP- 4K7LIN	2940252 148
DEK-OV- 5DC/ 24DC/ 3	2941361 401	EEM-MA200	2901362 201	ELR W2+1-24DC/500AC-37	2297374 39	EMG 30-SP-10K LIN	2942124 148
DEK-OV- 5DC/24DC/10	2961752 401	EEM-MA250	2901363 201	ELR W2+1-230AC/500AC-37	2297387 39	EMG 45-DIO 8E	2950103 262
DEK-OV- 5DC/240AC/800	2964623 401	EEM-MA400	2901364 201	ELR W3-24DC/500AC-2	2297293 38	EMG 45-DIO 8E-1N5408	2949389 262
DEK-OV- 12DC/24DC/ 3	2941387 401	EEM-MA600	2901366 200	ELR W3-24DC/500AC-2I	2297031 18	EMG 45-DIO 8E/LP	2954798 263
DEK-OV- 12DC/24DC/10	2961749 401	EEM-MA600-24DC	2902352 201	ELR W3-24DC/500AC-9	2297316 39	EMG 45-DIO 8M-1N5408	2954882 262

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
EMG 45-DIO 8P-1N5408	2954879 262	FBST 500-PLC GY	2966838 368	FLK 16/14/DV-IN/200	2300562 432	FLK 40/4X14/EZ-DR/ 200/OB32	2298522 431
EMG 45-DIO14M	2950129 262	FBST 500-PLC RD	2966786 368	FLK 16/14/DV-IN/300	2304403 432	FLK 40/4X14/EZ-DR/ 300/B32	2296841 431
EMG 45-DIO14M/LP	2950132 263	FL CRIMPTOOL	2744869 48	FLK 16/14/DV-IN/400	2305185 432	FLK 40/4X14/EZ-DR/ 300/OB32	2298535 431
EMG 45-DIO14P	2950116 262	FL PLUG RJ45 GN/2	2744571 48	FLK 16/14/DV-OUT/ 30	2304348 432	FLK 40/EZ-DR/ 50/KONFEK	2288985 507
EMG 45-LED 14S/24	2952334 263	FL PLUG RJ45 GR/2	2744856 48	FLK 16/14/DV-OUT/ 50	2304351 432	FLK 40/EZ-DR/ 50/SLC	2294610 430
EMG 90-DIO 16E/LP	2954808 263	FLK 10/EZ-DR/ 50/KONFEK	2299204 506	FLK 16/14/DV-OUT/100	2300575 432	FLK 40/EZ-DR/ 100/KONFEK	2288998 507
EMG 90-DIO 17E	2954895 262	FLK 10/EZ-DR/ 100/KONFEK	2299217 506	FLK 16/14/DV-OUT/200	2300588 432	FLK 40/EZ-DR/ 100/SLC	2294623 430
EMG 90-DIO 32M	2954934 262	FLK 10/EZ-DR/ 150/KONFEK	2299220 506	FLK 16/14/DV-OUT/300	2304364 432	FLK 40/EZ-DR/ 150/KONFEK	2289007 507
EMG 90-DIO 32M/LP	2954785 263	FLK 10/EZ-DR/ 200/KONFEK	2299233 506	FLK 16/24/DV-AI/EZ-DR/ 30	2304319 432	FLK 40/EZ-DR/150/SLC	2294636 430
EMG 90-DIO 32P	2954918 262	FLK 10/EZ-DR/ 300/KONFEK	2299246 506	FLK 16/24/DV-AI/EZ-DR/ 50	2304296 432	FLK 40/EZ-DR/200/KONFEK	2289010 507
EMG-GKS 12	2947035 262	FLK 10/EZ-DR/ 400/KONFEK	2299259 506	FLK 16/24/DV-AI/EZ-DR/100	2301134 432	FLK 40/EZ-DR/200/SLC	2294649 430
EML (15X6) R YE	0819288 372	FLK 10/EZ-DR/ 600/KONFEK	2299262 506	FLK 16/24/DV-AI/EZ-DR/200	2301545 432	FLK 40/EZ-DR/250/KONFEK	2289023 507
EMM 3- 24DC/500AC-16-IFS	2297523 12	FLK 10/EZ-DR/ 800/KONFEK	2299275 506	FLK 16/24/DV-AI/EZ-DR/300	2304322 432	FLK 40/EZ-DR/ 300/KONFEK	2289036 507
EMM 3- 24DC/500AC-IFS	2297497 12	FLK 10/EZ-DR/1000/KONFEK	2299288 506	FLK 16/EZ-DR/ 50/KONFEK	2299291 506	FLK 40/EZ-DR/ 300/SLC	2294652 430
EMM 3-230AC/500AC-16-IFS	2297536 12	FLK 14-16-EZ-DR-HF-S7/	2295693 457	FLK 16/EZ-DR/ 100/KONFEK	2299301 506	FLK 40/EZ-DR/ 350/KONFEK	2289049 507
EMM 3-230AC/500AC-IFS	2297507 12	FLK 14/16/EZ-DR/ 50/S7	2293815 456	FLK 16/EZ-DR/ 150/KONFEK	2299314 506	FLK 40/EZ-DR/ 400/KONFEK	2289052 507
ETD-BL-1T-F- 10S	2917492 259	FLK 14/16/EZ-DR/ 100/S7	2293828 456	FLK 16/EZ-DR/ 200/KONFEK	2299327 506	FLK 40/EZ-DR/ 600/KONFEK	2299589 507
ETD-BL-1T-F- 10S-PT	2901489 259	FLK 14/16/EZ-DR/ 150/S7	2293831 456	FLK 16/EZ-DR/ 300/KONFEK	2299330 506	FLK 40/EZ-DR/ 800/KONFEK	2299592 507
ETD-BL-1T-F- 30MIN	2917515 259	FLK 14/16/EZ-DR/ 200/S7	2293844 456	FLK 16/EZ-DR/ 400/KONFEK	2299343 506	FLK 40/EZ-DR/1000/KONFEK	2299602 507
ETD-BL-1T-F- 30MIN-PT	2901491 259	FLK 14/16/EZ-DR/ 250/S7	2293857 456	FLK 16/EZ-DR/ 600/KONFEK	2299356 506	FLK 50-2FLK20-EZ-DR-DV/	2304966 432
ETD-BL-1T-F-300MIN	2917528 259	FLK 14/16/EZ-DR/ 300/S7	2293860 456	FLK 16/EZ-DR/ 800/KONFEK	2299369 506	FLK 50-4X14-EZ-DR	2302405 508
ETD-BL-1T-F-300MIN-PT	2901492 259	FLK 14/16/EZ-DR/ 400/S7	2293886 456	FLK 16/EZ-DR/1000/KONFEK	2299372 506	FLK 50-4X14-EZ-DR-S	2302447 508
ETD-BL-1T-F-300S	2917502 259	FLK 14/16/EZ-DR/ 500/S7	2293899 456	FLK 20/2FLK14/EZ-DR/	2304487 432	FLK 50-EZ-DR-D37SUB-X81-I/	2302683 440
ETD-BL-1T-F-300S-PT	2901490 259	FLK 14/16/EZ-DR/ 600/S7	2293909 456	FLK 20/2FLK14/EZ-DR/100/KONFE	K 2298470 432	FLK 50-EZ-DR-D37SUB-Y81P-O/	2302625 440
ETD-BL-1T-OFF-CC- 10S	2917450 259	FLK 14/16/EZ-DR/ 700/S7	2293912 456	FLK 20/2FLK14/EZ-DR/200/KONFEF		FLK 50-EZ-DR-FCN40-OMR-IN/	2302803 442
ETD-BL-1T-OFF-CC- 10S-PT	2901485 259	FLK 14/16/EZ-DR/ 800/S7	2293925 456	FLK 20/2FLK14/EZ-DR/300/KONFEF		FLK 50-EZ-DR-FCN40-OMR-OUT/.	2302829 442
ETD-BL-1T-OFF-CC- 30MIN	2917467 259	FLK 14/16/EZ-DR/ 900/S7	2293938 456	FLK 20/EZ-DR/ 50KONFEK		FLK 50-PA/EZ-DR/KS/ 200/YUC	2314299 466
ETD-BL-1T-OFF-CC- 30MIN-PT	2901487 259	FLK 14/16/EZ-DR/1000/S7	2293941 456	FLK 20/EZ-DR/ 100KONFEK		FLK 50-PA/EZ-DR/KS/ 300/YUC	2314309 466
ETD-BL-1T-OFF-CC-300MIN	2917489 259	FLK 14/16/EZ-DR/HF/ 50/S7	2296919 457	FLK 20/EZ-DR/ 150KONFEK	2296472 506	FLK 50-PA/EZ-DR/KS/ 400/YUC	2314312 466
ETD-BL-1T-OFF-CC-300MIN-PT	2901488 259	FLK 14/16/EZ-DR/HF/ 100/S7	2296922 457	FLK 20/EZ-DR/ 200KONFEK	2296485 506	FLK 50-PA/EZ-DR/KS/ 500/YUC	2321499 466
ETD-BL-1T-OFF-CC-300S	2917463 259	FLK 14/16/EZ-DR/HF/ 150/S7	2296935 457	FLK 20/EZ-DR/ 300KONFEK	2296498 506	FLK 50-PA/EZ-DR/KS/ 600/YUC	2314927 466
ETD-BL-1T-OFF-CC-300S-PT	2901486 259	FLK 14/16/EZ-DR/HF/ 200/S7	2296948 457	FLK 20/EZ-DR/ 400KONFEK	2296508 506	FLK 50-PA/EZ-DR/KS/ 700/YUC	2321509 466
ETD-BL-1T-ON- 10S	2917379 258	FLK 14/16/EZ-DR/HF/ 250/S7	2296951 457	FLK 20/EZ-DR/ 600KONFEK	2296511 506	FLK 50-PA/EZ-DR/KS/ 800/YUC	2314930 466
ETD-BL-1T-ON- 10S-PT	2901476 258	FLK 14/16/EZ-DR/HF/ 300/S7	2296964 457	FLK 20/EZ-DR/ 800KONFEK	2296524 506	FLK 50-PA/EZ-DR/KS/ 900/YUC	2321512 466
ETD-BL-1T-ON- 30MIN	2917395 258	FLK 14/16/EZ-DR/HF/ 400/S7	2904525 457	FLK 20/EZ-DR/1000KONFEK	2296537 506	FLK 50-PA/EZ-DR/KS/1000/YUC	2314325 466
ETD-BL-1T-ON- 30MIN-PT	2901478 258	FLK 14/16/EZ-DR/HF/ 500/S7	2304704 457	FLK 26/EZ-DR/ 50/KONFEK	2299385 506	FLK 50-PA/EZ-DR/KS/1100/YUC	2321389 466
ETD-BL-1T-ON-300MIN	2917405 258	FLK 14/16/EZ-DR/HF/600/S7	2904526 457	FLK 26/EZ-DR/ 100/KONFEK	2299398 506	FLK 50-PA/EZ-DR/KS/1200/YUC	2321525 466
ETD-BL-1T-ON-300MIN-PT	2901479 258	FLK 14/16/EZ-DR/HF/800/S7	2904527 457	FLK 26/EZ-DR/ 150/KONFEK	2299408 506	FLK 50-PA/EZ-DR/KS/1300/YUC	2321392 466
ETD-BL-1T-ON-300S	2917382 258	FLK 14/16/EZ-DR/HF/1000/S7	2904528 457	FLK 26/EZ-DR/ 200/KONFEK	2299411 506	FLK 50-PA/EZ-DR/KS/1400/YUC	2321402 466
ETD-BL-1T-ON-300S-PT	2901477 258	FLK 14/EZ-DR/ 30/KONFEK	2295729 504	FLK 26/EZ-DR/ 300/KONFEK	2299424 506	FLK 50-PA/EZ-DR/KS/1500/YUC	2314338 466
ETD-BL-1T-ON-CC- 10S	2917418 259	FLK 14/EZ-DR/ 50/KONFEK	2288901 504	FLK 26/EZ-DR/ 400/KONFEK	2299437 506	FLK 50-PA/EZ-DR/KS/1600/YUC	2321538 466
ETD-BL-1T-ON-CC- 10S-PT	2901480 259	FLK 14/EZ-DR/ 50/KONFEK/S	2296977 505	FLK 26/EZ-DR/ 600/KONFEK	2299440 506	FLK 50-PA/EZ-DR/KS/1700/YUC	2321541 466
ETD-BL-1T-ON-CC- 30MIN	2917434 259	FLK 14/EZ-DR/ 100/KONFEK	2288914 504	FLK 26/EZ-DR/ 800/KONFEK	2299453 506	FLK 50-PA/EZ-DR/KS/1800/YUC	2321554 466
ETD-BL-1T-ON-CC- 30MIN-PT	2901483 259	FLK 14/EZ-DR/ 100/KONFEK/S	2296980 505	FLK 26/EZ-DR/1000/KONFEK	2299466 506	FLK 50-PA/EZ-DR/KS/1900/YUC	2321567 466
ETD-BL-1T-ON-CC-300MIN	2917447 259	FLK 14/EZ-DR/ 150/KONFEK	2288927 504	FLK 34/EZ-DR/ 50/KONFEK	2299479 506	FLK 50-PA/EZ-DR/KS/2000/YUC	2314503 466
ETD-BL-1T-ON-CC-300MIN-PT	2901484 259	FLK 14/EZ-DR/ 150/KONFEK/S	2296993 505	FLK 34/EZ-DR/ 100/KONFEK	2299482 506	FLK 50-PA/EZ-DR/KS/2500/YUC	2314516 466
ETD-BL-1T-ON-CC-300S	2917421 259	FLK 14/EZ-DR/ 200/KONFEK	2288930 504	FLK 34/EZ-DR/ 150/KONFEK	2299495 506	FLK 50-PA/EZ-DR/KS/3000/YUC	2314529 466
ETD-BL-1T-ON-CC-300S-PT	2901481 259	FLK 14/EZ-DR/ 200/KONFEK/S	2297002 505	FLK 34/EZ-DR/ 200/KONFEK	2299505 506	FLK 50/2FLK20/EZ-DR/ 50/DV	2304872 432
ETD-FL-2T-DTI	2866187 260	FLK 14/EZ-DR/ 250/KONFEK	2288943 504	FLK 34/EZ-DR/ 300/KONFEK	2299518 506	FLK 50/2FLK20/EZ-DR/ 100/DV	2304898 432
ETD-SL-1T-DTF	2866161 261	FLK 14/EZ-DR/ 300/KONFEK	2288956 504	FLK 34/EZ-DR/ 400/KONFEK	2299521 506	FLK 50/2FLK20/EZ-DR/ 200/DV	2304908 432
ETD-SL-2T-I	2866174 261	FLK 14/EZ-DR/ 300/KONFEK/S	2299013 505	FLK 34/EZ-DR/ 600/KONFEK	2299534 506	FLK 50/2FLK20/EZ-DR/ 300/DV	2304911 432
EU4A-RJ45-USB-CAB1 PXC	2903465 34	FLK 14/EZ-DR/ 350/KONFEK	2288969 504	FLK 34/EZ-DR/ 800/KONFEK	2299547 506	FLK 50/2FLK20/EZ-DR/ 600/DV	2304937 432
EU5C-SWD-CAN PXC	2903098 33	FLK 14/EZ-DR/ 400/KONFEK	2288972 504	FLK 34/EZ-DR/1000/KONFEK	2299550 506	FLK 50/2FLK20/EZ-DR/ 800/DV	2304940 432
EU5C-SWD-DP PXC	2903100 33	FLK 14/EZ-DR/ 400/KONFEK/S	2299026 505	FLK 40-PA/EZ-DR/KS/100/YUC	2322786 466	FLK 50/2FLK20/EZ-DR/1000/DV	2304953 432
EU5C-SWD-EIP-MODTCP PXC	2903244 33	FLK 14/EZ-DR/ 450/KONFEK	2290847 504	FLK 40-PA/EZ-DR/KS/200/YUC	2314341 466	FLK 50/4X14/EZ-DR/ 50/KONFEK	2296689 508
EU5C-SWD-PF2-1 PXC	2903113 33	FLK 14/EZ-DR/ 500/KONFEK	2290834 504	FLK 40-PA/EZ-DR/KS/300/YUC	2314354 466	FLK 50/4X14/EZ-DR/ 100/KONFEK	2296692 508
EU5E-SWD-2A2A PXC	2903104 33	FLK 14/EZ-DR/ 550/KONFEK	2290850 504	FLK 40-PA/EZ-DR/KS/ 400/YUC	2314367 466	FLK 50/4X14/EZ-DR/ 150/KONFEK	2296702 508
EU5E-SWD-4D4D PXC	2903101 33	FLK 14/EZ-DR/ 600/KONFEK	2290863 504	FLK 40-PA/EZ-DR/KS/ 500/YUC	2321570 466	FLK 50/4X14/EZ-DR/ 200/KONFEK	2296715 508
EU5E-SWD-4DX PXC	2903102 33	FLK 14/EZ-DR/ 600/KONFEK/S	2299039 505	FLK 40-PA/EZ-DR/KS/ 600/YUC	2314943 466	FLK 50/4X14/EZ-DR/ 250/KONFEK	2305402 508
EU5E-SWD-X8D PXC	2903103 33	FLK 14/EZ-DR/ 800/KONFEK	2299563 504	FLK 40-PA/EZ-DR/KS/ 700/YUC	2321583 466	FLK 50/4X14/EZ-DR/ 300/KONFEK	2296728 508
F		FLK 14/EZ-DR/800/KONFEK/S FLK 14/EZ-DR/1000/KONFEK FLK 14/EZ-DR/1000/KONFEK/S FLK 14/EZ-DR/HF/50/KONFEK	2299042 505 2299576 504 2299055 505 2305952 505	FLK 40-PA/EZ-DR/KS/800/YUC FLK 40-PA/EZ-DR/KS/900/YUC FLK 40-PA/EZ-DR/KS/1000/YUC FLK 40-PA/EZ-DR/KS/1100/YUC	2314956 466 2321415 466 2314370 466 2321428 466	FLK 50/4X14/EZ-DR/ 400/KONFEK FLK 50/4X14/EZ-DR/ 600/KONFEK FLK 50/4X14/EZ-DR/ 800/KONFEK FLK 50/4X14/EZ-DR/1000/KONFEK	2296731 508 2296744 508 2296757 508 2296773 508
FBS 2-6	3030336 318	FLK 14/EZ-DR/HF/ 100/KONFEK	2305965 505	FLK 40-PA/EZ-DR/KS/1200/YUC	2321431 466	FLK 50/EZ-DR/ 50/KONFEK	2289065 504
FBS 2-6 BU	3036932 318	FLK 14/EZ-DR/HF/ 150/KONFEK	2305978 505	FLK 40-PA/EZ-DR/KS/1300/YUC	2321444 466	FLK 50/EZ-DR/ 50/KONFEK/S	2299097 505
FBS 2-6 GY	3032237 318	FLK 14/EZ-DR/HF/ 200/KONFEK	2305981 505	FLK 40-PA/EZ-DR/KS/1400/YUC	2321457 466	FLK 50/EZ-DR/ 100/KONFEK	2289078 504
FBS 2-8	3030284 318	FLK 14/EZ-DR/HF/ 250/KONFEK	2305994 505	FLK 40-PA/EZ-DR/KS/1500/YUC	2314383 466	FLK 50/EZ-DR/ 100/KONFEK/S	2299107 505
FBS 2-8 BU	3032567 318	FLK 14/EZ-DR/HF/ 300/KONFEK	2304759 505	FLK 40-PA/EZ-DR/KS/1600/YUC	2321596 466	FLK 50/EZ-DR/ 150/KONFEK	2289081 504
FBS 2-8 GY 7042	3032541 318	FLK 14/EZ-DR/HF/ 400/KONFEK	2304762 505	FLK 40-PA/EZ-DR/KS/1700/YUC	2321606 466	FLK 50/EZ-DR/ 150/KONFEK/S	2299110 505
FBS 5-6	3030349 318	FLK 14/EZ-DR/HF/ 500/KONFEK	2304717 505	FLK 40-PA/EZ-DR/KS/1800/YUC	2321619 466	FLK 50/EZ-DR/ 200/KONFEK	2289094 504
FBS 10-6	3030271 318	FLK 14/EZ-DR/HF/ 600/KONFEK	2306003 505	FLK 40-PA/EZ-DR/KS/1900/YUC	2321622 466	FLK 50/EZ-DR/ 200/KONFEK/S	2299123 505
FBS 20-6	3030365 318	FLK 14/EZ-DR/HF/ 700/KONFEK	2314011 505	FLK 40-PA/EZ-DR/KS/2000/YUC	2314532 466	FLK 50/EZ-DR/ 250/KONFEK	2289104 504
FBS 50-6	3032224 318	FLK 14/EZ-DR/HF/ 800/KONFEK	2314024 505	FLK 40-PA/EZ-DR/KS/2500/YUC	2314545 466	FLK 50/EZ-DR/ 300/KONFEK	2289117 504
FBST 6-PLC BU	2966812 368	FLK 14/EZ-DR/HF/1000/KONFEK	2314037 505	FLK 40-PA/EZ-DR/KS/3000/YUC	2314558 466	FLK 50/EZ-DR/ 300/KONFEK/S	2299136 505
FBST 6-PLC GY	2966825 368	FLK 16-14-DV-IN/	2304416 432	FLK 40/4X14/EZ-DR/ 50/IB32	2296812 431	FLK 50/EZ-DR/ 350/KONFEK	2289120 504
FBST 6-PLC RD	2966236 368	FLK 16-14-DV-OUT/	2304377 432	FLK 40/4X14/EZ-DR/ 50/OB32	2296786 431	FLK 50/EZ-DR/ 400/KONFEK	2289133 504
FBST 8-PLC GY	2967688 368	FLK 16-24-DV-AI-EZ-DR/	2304335 432	FLK 40/4X14/EZ-DR/ 100/IB32	2296825 431	FLK 50/EZ-DR/ 400/KONFEK/S	2299149 505
FBST 14-PLC BK	2967691 368	FLK 16/14/DV-IN/50	2304393 432	FLK 40/4X14/EZ-DR/ 100/OB32	2298483 431	FLK 50/EZ-DR/ 450/KONFEK	2289573 504
FBST 500-PLC BU	2966692 368	FLK 16/14/DV-IN/100	2300559 432	FLK 40/4X14/EZ-DR/ 200/IB32	2296838 431	FLK 50/EZ-DR/ 500/KONFEK	2289586 504

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
FLK 50/EZ-DR/ 550/KONFEK	2289599 504	FLKM S135-431-4UA/S400	2314846 459	LV- 12- 24UC	2833712 388	MACX MCR-SL-NAM-R-SP	2924252 120
FLK 50/EZ-DR/ 600/KONFEK	2289609 504	FLKM S135-454-4UA/S400	2314859 461	LV- 48- 60UC	2833725 388	MACX MCR-SL-RPSSI-2I	2924825 107
FLK 50/EZ-DR/ 600/KONFEK/S	2299152 505	FLKM S135-460-4UA/U/S400	2314613 461	LV-120-230AC/110DC	2833738 388	MACX MCR-SL-RPSSI-2I-SP	2924838 107
FLK 50/EZ-DR/ 650/KONFEK	2289612 504	FLKM S135-460-4UA/U/S400	2314862 461	LV3- 12- 24UC	2833835 388	MACX MCR-SL-RPSSI-I	2865955 106
FLK 50/EZ-DR/ 700/KONFEK FLK 50/EZ-DR/ 750/KONFEK FLK 50/EZ-DR/ 800/KONFEK FLK 50/EZ-DR/ 800/KONFEK/S	2289625 504 2289638 504 2289641 504 2299165 505	FLKM S135-465-4UA/T/S400 FLKM S135-465-4UA/U/S400 FLKM S135-470-4UC//S400 FLKM S135-470-4UC/U/S400	2314875 462 2314888 462 2314626 462 2314891 462	LV3-48-60UC LV3-120-230AC/110DC	2833848 388 2833851 388	MACX MCR-SL-RPSSI-I-SP MACX MCR-SL-RPSSI-I-UP MACX MCR-SL-RPSSI-I-UP-SP MACX MCR-SL-RTD-I	2924207 106 2865968 108 2924210 108 2865065 110
FLK 50/EZ-DR/ 850/KONFEK FLK 50/EZ-DR/ 900/KONFEK FLK 50/EZ-DR/ 950/KONFEK FLK 50/EZ-DR/1000/KONFEK	2289654 504 2289667 504 2289670 504 2289683 504	FLKM S135/42X0,75/3,0M/OE FLKM S135/42X0,75/5,0M/OE FLKM S135/S400/SO120 FLKM S135/S400/SO121	2315007 463 2318017 463 2301723 459 2301736 459	M		MACX MCR-SL-RTD-I-NC MACX MCR-SL-RTD-I-SP MACX MCR-SL-RTD-I-SP-NC MACX MCR-SL-TC-I	2865078 110 2924317 110 2924320 110 2924333 112
FLK 50/EZ-DR/1000/KONFEK/S	2299178 505	FLKM S135/S400/SO122	2301749 459	MACX MCR-EX-SL-2NAM-R-UP	2865984 175	MACX MCR-SL-TC-I-NC	2924346 112
FLK 50/EZ-DR/D37SUB/ 50/X81-I	2302641 440	FLKM S135/S400/SO123	2301752 460	MACX MCR-EX-SL-2NAM-R-UP-SF	2924249 175	MACX MCR-T-UI-UP	2811394 114
FLK 50/EZ-DR/D37SUB/ 50/Y81P-O	2302599 440	FLKM S135/S400/SO124	2301765 461	MACX MCR-EX-SL-2NAM-RO	2865476 174	MACX MCR-T-UI-UP-C	2811873 114
FLK 50/EZ-DR/D37SUB/100/X81-I	2302654 440	FLKM S135/S400/SO125	2301778 460	MACX MCR-EX-SL-2NAM-RO-SP	2924087 174	MACX MCR-T-UI-UP-SP	2811860 114
FLK 50/EZ-DR/D37SUB/100/Y81P-C	2302667 440	FLKM S135/S400/SO126	2301781 460	MACX MCR-EX-SL-2NAM-T	2865489 177	MACX MCR-T-UI-UP-SP-C	2811970 114
FLK 50/EZ-DR/D37SUB/200/X81-I		FLKM S135/S400/SO127	2301794 460	MACX MCR-EX-SL-2NAM-T-SP	2924090 177	MACX MCR-T-UIREL-UP	2811378 116
FLK 50/EZ-DR/D37SUB/200/Y81P-C		FLKM S135/S7/FLK50/PLC	2314736 463	MACX MCR-EX-SL-IDSI-I	2865405 164	MACX MCR-T-UIREL-UP-C	2811514 116
FLK 50/EZ-DR/D37SUB/300/X81-I		FLKM-2FLK14/KDS3-MT/PPA/S7	2295062 482	MACX MCR-EX-SL-IDSI-I-SP	2924032 164	MACX MCR-T-UIREL-UP-SP	2811828 116
FLK 50/EZ-DR/D37SUB/300/Y81P-C FLK 50/EZ-DR/FCN40/100/OMR-IN FLK 50/EZ-DR/FCN40/100/OMR-OU FLK 50/EZ-DR/FCN40/200/OMR-IN	2304160 442 JT 2304144 442	FLKM-D25 SUB/B/KDS3-MT/TU810 FLKM-D25 SUB/B/KDS3-MT/TU810 FLKM-D25 SUB/B/KDS3-MT/TU830 FLKM-KS40/AO16/YCS	/P 2304539 422	MACX MCR-EX-SL-NAM-2RO MACX MCR-EX-SL-NAM-2RO-SP MACX MCR-EX-SL-NAM-2T MACX MCR-EX-SL-NAM-2T-SP	2865450 173 2924061 173 2865463 176 2924074 176	MACX MCR-T-UIREL-UP-SP-C MACX MCR-UI-UI MACX MCR-UI-UI-NC MACX MCR-UI-UI-SP	2811831 116 2811284 102 2811446 102 2811572 102
FLK 50/EZ-DR/FCN40/200/OMR-OL	JT 2304157 442	FLKM-KS40/YCS	2314642 468	MACX MCR-EX-SL-NAM-NAM	2866006 178	MACX MCR-UI-UI-SP-NC	2811556 102
FLK EZ-DR-S//	2295046 456	FLKM-PA-2D15/HW/DI/C300	2901879 438	MACX MCR-EX-SL-NAM-NAM-SP	2924883 178	MACX MCR-UI-UI-UP	2811459 104
FLK EZ-DR//	2295059 456	FLKM-PA-2D15/HW/DO/C300	2900924 438	MACX MCR-EX-SL-NAM-R	2865434 172	MACX MCR-UI-UI-UP-NC	2811297 104
FLKM 14-PA-AB/1756/EXTC	2302861 425	FLKM-PA-D37/HW/AN/C300	2900622 438	MACX MCR-EX-SL-NAM-R-SP	2924045 172	MACX MCR-UI-UI-UP-SP	2811585 104
FLKM 14-PA-AB/1756/IF6I/EXTC	2901037 425	FLKM-PA-D37/HW/DIO/C300	2901423 438	MACX MCR-EX-SL-RPSS-2I-2I	2865382 162	MACX MCR-UI-UI-UP-SP-NC	2811569 104
FLKM 14-PA-AB/1756/IN/EXTC	2302874 425	FLKMS 50/32IM/LA/PLC	2284510 480	MACX MCR-EX-SL-RPSS-2I-2I-SP	2924676 162	MC 1,5/5-ST-3,81	1803604 12
FLKM 14-PA-INLINE/32	2302777 444	FLKMS 50/32IM/PLC	2284523 480	MACX MCR-EX-SL-RPSSI-2I	2865366 161	MCR-1CLP-I-I-00	2814016 135
FLKM 14-PA-INLINE/DIO8	2900889 444	FLKMS 50/32IM/ZFKDS/PLC	2901389 480	MACX MCR-EX-SL-RPSSI-2I-SP	2924236 161	MCR-2CLP-I-I-00	2814029 135
FLKM 14-PA-INLINE/IN16	2302751 444	FLKMS-KS40/AI/YCS	2314286 469	MACX MCR-EX-SL-RPSSI-I	2865340 160	MCR-4CLP-I-I-00	2814045 135
FLKM 14-PA-INLINE/OUT16	2302764 444	FLKMS-KS40/SI/AI16/YCS	2314273 469	MACX MCR-EX-SL-RPSSI-I-SP	2924016 160	MCR-C-I-I-00-DC	2814508 131
FLKM 14-PA-MODI/M340	2903208 446	FLKMS-KS50/32IM/YCS	2314451 468	MACX MCR-EX-SL-RPSSI-I-UP	2865793 163	MCR-C-I-U- 4-DC	2814511 131
FLKM 14-PA-S300	2299770 451	FUSE-10X38-16A-GR	2903126 29	MACX MCR-EX-SL-RPSSI-I-UP-SP	2924029 163	MCR-C-U-I- 4-DC	2814537 131
FLKM 14-PA-SLC500/IN FLKM 14-PA-SLC500/IN/M FLKM 14-PA-SLC500/OUT FLKM 14-PA/GE/DI	2293462 428 2293475 428 2293459 428 2290038 437	FUSE-10X38-20A-GR FUSE-10X38-30A-MR	2903384 29 2903119 29	MACX MCR-EX-SL-RTD-I MACX MCR-EX-SL-RTD-I-NC MACX MCR-EX-SL-RTD-I-SP MACX MCR-EX-SL-RTD-I-SP-NC	2865939 165 2865573 165 2924142 165 2924168 165	MCR-C-U-U-DC MCR-ET 38X35 WH MCR-F-UI-DC MCR-FL-C-UI-2UI-DCI	2814469 131 2814317 149 2814605 144 2814854 132
FLKM 14-PA/GE/DO FLKM 14/8M/SI/PLC FLKM 14/KDS3-MT/PPA/PLC FLKM 16-PA-331-1KF//MINI-MCR	2290009 437 2294487 478 2290423 482 2318237 455	1		MACX MCR-EX-SL-SD-21-25-LP MACX MCR-EX-SL-SD-21-25-LP-S MACX MCR-EX-SL-SD-21-40-LP MACX MCR-EX-SL-SD-21-40-LP-S	2865764 181	MCR-FL-C-UI-2UI-DCI-NC MCR-FL-HT-T-I MCR-FL-HT-T-I-EX MCR-FL-HT-TS-I-EX	2814867 132 2864529 142 2864532 189 2864545 188
FLKM 16-PA- 332-5HF/I/MINI-MCR	2318240 455	IB IL 24 DI 16-PAC	2861250 207	MACX MCR-EX-SL-SD-21-60-LP	2924867 179	MCR-FL-T-LP-I	2864561 140
FLKM 16-PA-S300/MINI-MCR	2314749 454	IB IL 24 DI 2-PAC	2861221 207	MACX MCR-EX-SL-SD-21-60-LP-S		MCR-FL-T-LP-I-EX	2864574 187
FLKM 16/AI/DV	2304429 433	IB IL 24 DI 4-PAC	2861234 207	MACX MCR-EX-SL-SD-23-48-LFD		MCR-FL-TS-LP-I-EX	2864587 187
FLKM 16/AO/SI/DV	2304445 433	IB IL 24 DI 8-PAC	2861247 207	MACX MCR-EX-SL-SD-23-48-LFD-		MCR-PAC-T-USB	2309000 149
FLKM 16/DI/SI/LA/DV	2304458 433	IB IL 24 FLM-PAC	2736903 50	MACX MCR-EX-SL-SD-24-48-LP	2865609 181	MCR-PSP	2811912 146
FLKM 16/DV	2304432 433	IB IL AI 2/SF-PAC	2861302 207	MACX MCR-EX-SL-SD-24-48-LP-S	P 2924126 181	MCR-PSP-DC	2811925 146
FLKM 50-PA-AB/1756/EXTC	2302735 424	IB IL AI 8/IS-PAC	2861661 207	MACX MCR-EX-SL-TC-I	2865942 166	MCR-PT100-I	2810353 138
FLKM 50-PA-AB/1756/IN/EXTC	2302748 424	IB IL AI 8/SF-PAC	2861412 207	MACX MCR-EX-SL-TC-I-NC	2865586 166	MCR-PT100-I-DC	2810337 138
FLKM 50-PA-AB/IBN	2289816 426	IB IL DI 8/S0-PAC	2897020 207	MACX MCR-EX-T-UI-UP	2865654 168	MCR-PT100-U	2810340 138
FLKM 50-PA-AB/OBN	2289829 426	IBS IP 400 MBH -F	2732868 48	MACX MCR-EX-T-UI-UP-C	2811763 168	MCR-PT100-U-DC	2810311 138
FLKM 50-PA-GE/TKFC/RXI	2321473 436	IBS PG SET	2836599 48	MACX MCR-EX-T-UI-UP-SP	2924689 168	MCR-S-1-5-UI-DCI	2814634 230
FLKM 50-PA-GE/TKFC/RXI/IN	2321486 436	IBS RBC/F-T/	2740151 50	MACX MCR-EX-T-UI-UP-SP-C	2924692 168	MCR-S-1-5-UI-DCI-NC	2814715 230
FLKM 50-PA-MODI-TSX/Q	2294306 445	IFS-CONFSTICK IFS-CONFSTICK-L IFS-OP-CRADLE IFS-OP-UNIT	2986122 12	MACX MCR-EX-T-UIREL-UP	2865751 170	MCR-S-1-5-UI-SW-DCI	2814650 230
FLKM 50-PA-S300	2294445 450		2901103 12	MACX MCR-EX-T-UIREL-UP-C	2865722 170	MCR-S-1-5-UI-SW-DCI-NC	2814731 230
FLKM 50-PA-S300/SO167	2307662 452		2811886 118	MACX MCR-EX-T-UIREL-UP-SP	2924799 170	MCR-S-10-50-UI-DCI	2814647 230
FLKM 50-PA-S400	2294500 458		2811899 118	MACX MCR-EX-T-UIREL-UP-SP-C	2924809 170	MCR-S-10-50-UI-SW-DCI	2814663 230
FLKM 50-PA-S400(3-48) FLKM 50-PA-SLC500/OUT/2A FLKM 50-PA/DO326/S7-300 FLKM 50/4-FLK14/PA-MODI-TSX/C	2294908 458 2293446 428 2321952 452 2294416 445	IFS-USB-PROG-ADAPTER IMC 1,5/5-ST-3,81	2811271 119 1857919 12	MACX MCR-PTB MACX MCR-PTB-SP MACX MCR-S-MUX MACX MCR-S-MUX-TB	2865625 126 2924184 126 2865599 186 2308124 186	MCR-S10-50-UI-DCI-NC MCR-S10-50-UI-SW-DCI-NC MCR-SL-1CLP-I-I-00-4KV MCR-SL-CUC-100-I	2814728 230 2814744 230 2814841 134 2308027 229
FLKM 50/ 4-FLK14/PA-S400 FLKM 50/32M/DV FLKM 50/32M/IN/LA/DV FLKM 50/32M/PLC	2294429 458 2304869 434 2304856 434 2289719 477	L		MACX MCR-SL-2NAM-R-UP MACX MCR-SL-2NAM-R-UP-SP MACX MCR-SL-2NAM-RO MACX MCR-SL-2NAM-RO-SP	2865052 123 2924304 123 2865049 122 2924294 122	MCR-SL-CUC-100-U MCR-SL-CUC-200-I MCR-SL-CUC-200-U MCR-SL-CUC-300-I	2308108 229 2308030 229 2308205 229 2308043 229
FLKM 50/32M/SI/PLC	2294490 478	LDM- 12- 24DC	2833686 388	MACX MCR-SL-2NAM-T	2865036 125	MCR-SL-CUC-300-U	2308302 229
FLKM 50/32P/PLC	2291121 477	LDM- 48- 60DC	2833699 388	MACX MCR-SL-2NAM-T-SP	2924281 125	MCR-SL-CUC-400-I	2308072 229
FLKM 50/4-FLK14/PA-S300	2296281 450	LDM-110DC	2833709 388	MACX MCR-SL-CAC- 5-I	2810612 232	MCR-SL-CUC-500-I	2308085 229
FLKM 50/KDS3-MT/PPA/AN/PLC	2291587 482	LDM3- 12- 24DC	2833806 388	MACX MCR-SL-CAC- 5-I-UP	2810625 232	MCR-SL-CUC-600-I	2308098 229
FLKM 50/KDS3-MT/PPA/PLC	2290614 482	LDM3- 48- 60DC	2833819 388	MACX MCR-SL-CAC-12-I-UP	2810638 232	MCR-SL-D-RA	2810081 150
FLKM 50/KDS3-MT/PPA/S7-300	2304490 482	LDM3-110DC	2833822 388	MACX MCR-SL-IDSI-I	2865971 109	MCR-SL-D-SPA-UI	2710314 151
FLKM S115-454-7LA/S400	2314901 464	LDP- 12- 24DC	2833657 388	MACX MCR-SL-IDSI-I-SP	2924223 109	MCR-SL-D-U-I	2864011 150
FLKM S115-465-7LA/UI/S400	2314914 464	LDP- 48- 60DC	2833660 388	MACX MCR-SL-NAM-2RO	2865010 121	MCR-SL-HT-PT 100-I	2864516 143
FLKM S115/47X0,75/3,0M/OE	2314985 465	LDP-110DC	2833673 388	MACX MCR-SL-NAM-2RO-SP	2924265 121	MCR-SL-PT100-LP-I	2864558 141
FLKM S115/47X0,75/5,0M/OE	2314998 465	LDP3- 12- 24DC	2833770 388	MACX MCR-SL-NAM-2T	2865023 124	MCR-SL-PT100-SP	2814948 139
FLKM S115/S400/S0155	2307248 464	LDP3- 48- 60DC	2833783 388	MACX MCR-SL-NAM-2T-SP	2924278 124	MCR-SL-S- 16-SP- 24	2864464 235
FLKM S115/S7/FLK50/PLC/S0137	2306294 465	LDP3-110DC	2833796 388	MACX MCR-SL-NAM-R	2865997 120	MCR-SL-S-100-I-LP	2813486 233

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
MCR-SL-S-100-U	2813457 233	MINI MCR-SL-UI-2I	2864794 72	PACT MCR-V2- 3015- 60- 75-5A-1	2276502 214	PACT MCR-V2-8015-105-500-5A-1	2276269 219
MCR-SL-S-200-I-LP	2813499 233	MINI MCR-SL-UI-2I-NC	2864176 72	PACT MCR-V2- 3015- 60-250-5A-1	2276544 214	PACT MCR-V2-8015-105-600-5A-1	2276272 219
MCR-SL-S-200-U	2813460 233	MINI MCR-SL-UI-2I-SP	2864804 72	PACT MCR-V2- 4012- 70	2277284 215	PACT MCR-V2-8015-105-750-5A-1	2276285 219
MCR-SLP-1-5-UI-0	2814359 234	MINI MCR-SL-UI-2I-SP-NC	2864189 72	PACT MCR-V2- 5012- 85	2277297 216	PACT MCR-V2-8015-105-800-5A-1	2276298 219
MCR-SWS-I MCR-SWS-U MCR-T-UI MCR-T-UI-E	2766478 147 2766465 147 2814090 136 2814113 136	MINI MCR-SL-UI-F MINI MCR-SL-UI-F-SP MINI MCR-SL-UI-I-LP-NC MINI MCR-SL-UI-I-LP-SP-NC	2864082 83 2810243 83 2902829 75 2902830 75	PACT MCR-V2- 6015- 85 PACT MCR-V2- 6040- 96 PACT MCR-V2- 6315- 95 PACT MCR-V2- 8015-105	2277336 217 2277349 218 2277307 218 2277352 219	PACT MCR-V2-8015-105-1000-5A-1 PACT MCR-V2-8015-105-1000-5A-1 PACT MCR-V2-8015-105-1250-5A-1 PACT MCR-V2-8015-105-1500-5A-1	2277721 219 2276311 219
MCR-T-UI-E-NC MCR-T-UI-NC MCR-TTL-RS232 MCR-TTL-RS232-E	2814126 136 2814100 136 2814391 149 2814388 149	MINI MCR-SL-UI-REL MINI MCR-SL-UI-REL-SP MINI MCR-SL-UI-UI MINI MCR-SL-UI-UI-NC	2864480 85 2864493 85 2864383 66 2864150 66	PACT MCR-V2-8020-105 PACT MCR-V2-10020-129 PACT MCR-V2-10020-129-2500-5A PACT MCR-V2-10036-129	2277365 219 2277378 220 2276395 220 2277381 220	PACT MCR-V2-8015-105-1600-5A-1 PACT MCR-V2-8015-105-2000-5A-1 PACT MCR-V2-8015-105-2500-5A-1 PACT MCR-V2-8020-105-1000-5A-1	2276337 219 2276340 219
MCR-VAC-UI-O-DC MCR-VDC-UI-B-DC MCR/PI-CONF-WIN ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2811103 236 2811116 236 2814799 149 2709561 91	MINI MCR-SL-UI-UI-SP MINI MCR-SL-UI-UI-SP-NC MINI MCR-SL-V8-FLK 16-A MINI MCR-TC-UI-NC	2864710 66 2864163 66 2811268 94 2902851 80	PACT MCR-V2-10036-129-3000-5A PACT MCR-V2-12020-159 PACT MCR-V2-12040-159 PACT MCR-V2-12040-159-4000-5A	2277394 221 2277404 221	PACT MCR-V2-8020-105-1500-5A-1 PACT MCR-V2-8020-105-2000-5A-1 PACT MCR-V3-60 PACT-FAST-MNT-W13-L40	2277750 219 2276382 219 2277417 222 2276612 223
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437 12	MINI-PS-100-240AC/24DC/1.5/EX	2866653 91	PACT MCR-V2-3015- 60- 60-5A-1	2277815 214	PACT-FAST-MNT-W13-L65	2276625 223
ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728 90	MINI-SYS-PS-100-240AC/24DC/1.5	2866983 91	PACT MCR-V2-3015- 60- 75-5A-1	2277828 214	PACT-FAST-MNT-W16-L40	2276638 223
MINI MCR DKL	2308111 88	MM-CONF-SET	2297992 15	PACT MCR-V2-3015- 60- 80-5A-1	2277831 214	PACT-FAST-MNT-W16-L65	2276641 223
MINI MCR-DKL-LABEL	2810272 88	MP 1	2833631 372	PACT MCR-V2-3015- 60- 100-5A-1	2277064 214	PLC-2RPT-24DC/1	2901639 348
MINI MCR-RTD-UI-NC	2902849 76	MP2	2833644 378	PACT MCR-V2-3015- 60- 125-5A-1	2277624 214	PLC-2RSC-24DC/1	2987309 348
MINI MCR-RTD-UI-SP-NC	2902850 76	MPS-IH BK	0201731 191	PACT MCR-V2-3015- 60- 150-5A-1	2277077 214	PLC-2RSP-24DC/1	2987312 348
MINI MCR-SL-1CP-I-I	2864419 74	MPS-IH BU	0201689 191	PACT MCR-V2-3015- 60- 150-5A-1	2277844 214	PLC-ATP BK	2966841 368
MINI MCR-SL-1CP-I-I-SP	2864749 74	MPS-IH GN	0201702 191	PACT MCR-V2-3015- 60- 200-5A-1	2277637 214	PLC-BP A1-14	2980283 368
MINI MCR-SL-2CP-I-I	2864655 74	MPS-IH GY	0201728 191	PACT MCR-V2-3015- 60- 200-5A-1	2277857 214	PLC-BPT- 24DC/21RW	2900261 360
MINI MCR-SL-2CP-I-I-SP	2864781 74	MPS-IH RD	0201676 191	PACT MCR-V2-3015- 60- 250-5A-1	2277080 214	PLC-BPT- 24UC/ 1/ACT	2900450 329
MINI MCR-SL-CVS-24-5-10-NC	2902822 87	MPS-IH WH	0201663 191	PACT MCR-V2-3015- 60- 250-5A-1	2277860 214	PLC-BPT-120UC/ 1/SEN/SO46	2900456 335
MINI MCR-SL-CVS-24-5-10-SP-NC	2902823 87	MPS-IH YE	0201692 191	PACT MCR-V2-3015- 60- 300-5A-1	2277640 214	PLC-BPT-120UC/21/SO46	2900453 334
MINI MCR-SL-F-UI-NC MINI MCR-SL-F-UI-SP-NC MINI MCR-SL-FM-RC-NC MINI MCR-SL-FM-RC-SP-NC	2902832 82 2902833 82 2902961 89 2902962 89	MPS-MT	0201744 191	PACT MCR-V2-3015- 60- 400-5A-1 PACT MCR-V2-3015- 60- 500-5A-1 PACT MCR-V2-3015- 60- 600-5A-1 PACT MCR-V2-3015- 60- 750-5A-1	2277093 214 2277653 214 2277103 214 2277666 214	PLC-BPT-230UC/1/SEN/SO46 PLC-BPT-230UC/21/SO46 PLC-BPT-TTL/1 PLC-BSC-24UC/1/ACT	2900457 335 2900455 334 2900458 356 2982799 329
MINI MCR-SL-I-I MINI MCR-SL-I-I-SP MINI MCR-SL-I-U-0 MINI MCR-SL-I-U-0-SP	2864406 71 2864723 71 2813541 71 2813554 71	0		PACT MCR-V2-4012- 70- 250-5A-1 PACT MCR-V2-4012- 70- 300-5A-1 PACT MCR-V2-4012- 70- 400-5A-1 PACT MCR-V2-4012- 70- 500-5A-1	2277116 215 2277679 215 2277129 215 2277682 215	PLC-BSC-120UC/ 1/SEN/SO46 PLC-BSC-120UC/21-21/SO46 PLC-BSC-120UC/21/SO46 PLC-BSC-120UC/21/HC/SO46	2980322 335 2980416 335 2980319 334 2980432 335
MINI MCR-SL-I-U-4	2813538 71	OPT-5DC/24DC/ 2	2967989 340	PACT MCR-V2-4012- 70- 600-5A-1	2277132 215	PLC-BSC-230UC/1/SEN/SO46	2980348 335
MINI MCR-SL-I-U-4-SP	2813567 71	OPT-5DC/24DC/ 5	2982113 288	PACT MCR-V2-4012- 70- 750-5A-1	2277695 215	PLC-BSC-230UC/21-21/SO46	2980429 335
MINI MCR-SL-MUX-V8-FLK 16	2811815 95	OPT-5DC/48DC/100	2967992 340	PACT MCR-V2-4012- 70- 800-5A-1	2277145 215	PLC-BSC-230UC/21/SO46	2980335 334
MINI MCR-SL-NAM-2RNO	2864105 86	OPT-5DC/230AC/ 2	2982168 289	PACT MCR-V2-4012- 70-1000-5A-1	2277158 215	PLC-BSC-230UC/21/HC/SO46	2980445 335
MINI MCR-SL-NAM-2RNO-SP	2810269 86	OPT-24DC/24DC/2	2966595 280	PACT MCR-V2-5012- 85- 150-5A-1	2276117 216	PLC-BSC-TTL/1	2982689 356
MINI MCR-SL-PT100-LP	2810298 79	OPT-24DC/24DC/5	2982100 288	PACT MCR-V2-5012- 85- 200-5A-1	2276120 216	PLC-BSP- 24DC/21RW	2961396 360
MINI MCR-SL-PT100-LP-NC	2810308 79	OPT-24DC/48DC/100	2966618 340	PACT MCR-V2-5012- 85- 250-5A-1	2276133 216	PLC-BSP- 24UC/ 1/ACT	2982809 329
MINI MCR-SL-PT100-LP-NC-SP	2810395 79	OPT-24DC/230AC/1	2967950 281	PACT MCR-V2-5012- 85- 300-5A-1	2276146 216	PLC-BSP-120UC/ 1/SEN/SO46	2980364 335
MINI MCR-SL-PT100-LP-SP	2810382 79	OPT-24DC/230AC/ 2	2982171 289	PACT MCR-V2-5012- 85- 400-5A-1	2277161 216	PLC-BSP-120UC/21/SO46	2980351 334
MINI MCR-SL-PT100-UI	2864435 78	OPT-60DC/24DC/ 2	2966605 340	PACT MCR-V2-5012- 85- 500-5A-1	2276159 216	PLC-BSP-230UC/1/SEN/SO46	2980380 335
MINI MCR-SL-PT100-UI-200	2864309 77	OPT-60DC/24DC/ 5	2982126 288	PACT MCR-V2-5012- 85- 600-5A-1	2276162 216	PLC-BSP-230UC/21/SO46	2980377 334
MINI MCR-SL-PT100-UI-200-NC	2864370 77	OPT-60DC/48DC/100	2966621 340	PACT MCR-V2-5012- 85- 600-5A-1	2277174 216	PLC-BSP-TTL/1	2982692 356
MINI MCR-SL-PT100-UI-200-SP	2864192 77	OPT-60DC/230AC/ 1	2967963 341	PACT MCR-V2-5012- 85- 750-5A-1	2276175 216	PLC-ESK GY	2966508 368
MINI MCR-SL-PT100-UI-200-SP-NO	2864202 77	OPT-60DC/230AC/ 2	2982184 289	PACT MCR-V2-5012- 85- 800-5A-1	2277187 216	PLC-OPT- 5DC/24DC/100KHZ	2902969 354
MINI MCR-SL-PT100-UI-NC	2864273 78	OV-24DC/60DC/4	2982647 559	PACT MCR-V2-5012- 85-1000-5A-1	2276463 216	PLC-OPT- 5DC/24DC/2/ACT	2900375 327
MINI MCR-SL-PT100-UI-SP	2864736 78	OV-24DC/350DC/1	2982634 558	PACT MCR-V2-5012- 85-1000-5A-1	2277190 216	PLC-OPT- 5DC/5DC/100KHZ-G	2902971 355
MINI MCR-SL-PT100-UI-SP-NC MINI MCR-SL-PTB MINI MCR-SL-PTB-FM MINI MCR-SL-PTB-FM-SP	2864286 78 2864134 90 2902958 89 2902959 89	OV-24DC/480AC/5	2982650 559	PACT MCR-V2-5012- 85-1250-5A-1 PACT MCR-V2-5012- 85-1500-5A-1 PACT MCR-V2-6015- 85-200-5A-1 PACT MCR-V2-6015- 85-250-5A-1		PLC-OPT- 5DC/24DC/100KHZ-G PLC-OPT- 5DC/300DC/1 PLC-OPT- 12DC/300DC/1 PLC-OPT- 24DC/ 24DC/10/R	2902973 355 2900381 352 2900382 352 2900398 353
MINI MCR-SL-PTB-SP MINI MCR-SL-R-UI MINI MCR-SL-R-UI-SP MINI MCR-SL-RPS-I-I	2864147 90 2864095 84 2810256 84 2864422 73	P		PACT MCR-V2-6015- 85- 300-5A-1 PACT MCR-V2-6015- 85- 400-5A-1 PACT MCR-V2-6015- 85- 500-5A-1 PACT MCR-V2-6015- 85- 600-5A-1	2277899 217 2277909 217 2277912 217 2277925 217	PLC-OPT- 24DC/ 24DC/2 PLC-OPT- 24DC/ 24DC/2/ACT PLC-OPT- 24DC/ 24DC/3RW PLC-OPT- 24DC/ 48DC/100	2900364 325 2900376 327 2900379 359 2900352 324
MINI MCR-SL-RPS-I-I-SP	2864752 73	PACT MCR-CB-21- 8	2277569 223	PACT MCR-V2-6015- 85- 750-5A-1		PLC-OPT- 24DC/ 48DC/100/SEN	2900358 331
MINI MCR-SL-RPSS-I-I	2864079 73	PACT MCR-CB-21-12	2277556 223	PACT MCR-V2-6015- 85- 800-5A-1		PLC-OPT- 24DC/ 48DC/500/W	2900378 353
MINI MCR-SL-RPSS-I-I-SP	2810230 73	PACT MCR-CB-28-12	2277543 223	PACT MCR-V2-6015- 85-1000-5A-1		PLC-OPT- 24DC/ 5DC/100KHZ-G	2902972 355
MINI MCR-SL-SHUNT-UI	2810858 68	PACT MCR-CB-42-12	2277530 223	PACT MCR-V2-6015- 85-1250-5A-1		PLC-OPT- 24DC/110DC/3RW	2900391 359
MINI MCR-SL-SHUNT-UI-NC	2810780 68	PACT MCR-ETC-60	2277572 223	PACT MCR-V2-6015- 85-1500-5A-1		PLC-OPT- 24DC/230AC/1	2900369 325
MINI MCR-SL-SHUNT-UI-SP	2810874 68	PACT MCR-ETC-75	2277585 223	PACT MCR-V2-6015- 85-1600-5A-1		PLC-OPT- 24DC/24DC/100KHZ	2902970 354
MINI MCR-SL-SHUNT-UI-SP-NC	2810793 68	PACT MCR-ICAP	2277608 223	PACT MCR-V2-6040- 96- 600-5A-1		PLC-OPT- 24DC/24DC/100KHZ-G	2902974 355
MINI MCR-SL-TB	2811420 88	PACT MCR-RA	2277598 223	PACT MCR-V2-6040- 96- 750-5A-1		PLC-OPT- 24DC/300DC/1	2900383 352
MINI MCR-SL-TC-UI	2864448 81	PACT MCR-V1-21-44	2277268 213	PACT MCR-V2-6040- 96- 800-5A-1	2276214 218	PLC-OPT- 24DC/TTL	2900363 358
MINI MCR-SL-TC-UI-NC	2864299 81	PACT MCR-V1-21-44- 50-5A-1	2277019 213	PACT MCR-V2-6040- 96-1000-5A-1	2277705 218	PLC-OPT- 36DC/110DC/3RW	2900392 359
MINI MCR-SL-U-I-0	2813512 71	PACT MCR-V1-21-44- 75-5A-1	2277611 213	PACT MCR-V2-6040- 96-1250-5A-1	2276227 218	PLC-OPT- 48DC/ 24DC/2	2900365 325
MINI MCR-SL-U-I-0-SP	2813570 71	PACT MCR-V1-21-44-100-5A-1	2277022 213	PACT MCR-V2-6040- 96-1500-5A-1	2277718 218	PLC-OPT- 48DC/ 48DC/100	2900353 324
MINI MCR-SL-U-I-4 MINI MCR-SL-U-I-4-SP MINI MCR-SL-U-U MINI MCR-SL-U-U-SP	2813525 71 2813583 71 2864684 71 2864697 71	PACT MCR-V1-21-44-125-5A-1 PACT MCR-V1-21-44-150-5A-1 PACT MCR-V1-21-44-200-5A-1 PACT MCR-V1-21-44-250-5A-1	2277763 213 2277035 213 2277776 213 2277048 213	PACT MCR-V2-6040- 96-1600-5A-1 PACT MCR-V2-6040- 96-2000-5A-1 PACT MCR-V2-6315- 95-800-5A-1 PACT MCR-V2-6315- 95-1000-5A-1	2276243 218 2277213 218	PLC-OPT- 48DC/110DC/3RW PLC-OPT- 48DC/230AC/1 PLC-OPT- 60DC/ 24DC/2 PLC-OPT- 60DC/ 48DC/100	2900393 359 2900370 325 2900366 325 2900354 324
MINI MCR-SL-U-UI MINI MCR-SL-U-UI-NC MINI MCR-SL-U-UI-SP MINI MCR-SL-U-UI-SP-NC	2864053 70 2865007 70 2811213 70 2810078 70	PACT MCR-V1-21-44-300-5A-1 PACT MCR-V1-21-44-400-5A-1 PACT MCR-V1-21-44-500-5A-1 PACT MCR-V2-3015-60	2277789 213 2277051 213 2277792 213 2277271 214	PACT MCR-V2-6315- 95-1250-5A-1 PACT MCR-V2-6315- 95-1500-5A-1 PACT MCR-V2-6315- 95-1600-5A-1 PACT MCR-V2-8015-105- 400-5A-1	2277242 218 2277255 218	PLC-OPT- 60DC/230AC/1 PLC-OPT- 60DC/300DC/1 PLC-OPT- 72DC/110DC/3RW PLC-OPT- 96DC/110DC/3RW	2900371 325 2900384 352 2900394 359 2900395 359

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Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
PLC-OPT-110DC/24DC/3RW	2900380 359	PLC-OSP- 60DC/230AC/ 1	2967918 325	PLC-RSC- 12DC/21AU	2966919 323	PLC-RSP-110UC/21-21/RW	2987147 363
PLC-OPT-110DC/110DC/3RW	2900396 359	PLC-OSP- 60DC/300DC/ 1	2980843 352	PLC-RSC- 12DC/21HC	2967617 333	PLC-RSP-110UC/21-21AU/RW	2987150 363
PLC-OPT-110DC/300DC/1	2900385 352	PLC-OSP- 72DC/110DC/ 3RW	2982540 359	PLC-RSC- 24DC/ 1- 1/ACT	2967109 327	PLC-RSP-110UC/21/RW	2987053 362
PLC-OPT-120AC/300DC/1	2900388 352	PLC-OSP- 96DC/110DC/ 3RW	2982553 359	PLC-RSC- 24DC/ 1/ACT	2966210 326	PLC-RSP-110UC/21AU/RW	2987066 362
PLC-OPT-120UC/24DC/2	2900367 325	PLC-OSP-110DC/24DC/ 3RW	2980526 359	PLC-RSC- 24DC/ 1AU/SEN	2966317 330	PLC-RSP-110UC/21HC/RW	2987095 363
PLC-OPT-120UC/48DC/100	2900355 324	PLC-OSP-110DC/110DC/ 3RW	2982566 359	PLC-RSC- 24DC/ 1IC/ACT	2967604 332	PLC-RSP-120UC/1AU/SEN	2967390 330
PLC-OPT-120UC/48DC/100/SEN	2900359 331	PLC-OSP-110DC/300DC/ 1	2980856 352	PLC-RSC- 24DC/21	2966171 322	PLC-RSP-120UC/21	2966524 322
PLC-OPT-120UC/230AC/1	2900372 325	PLC-OSP-120AC/300DC/ 1	2980872 352	PLC-RSC- 24DC/21-21	2967060 323	PLC-RSP-120UC/21-21	2912549 323
PLC-OPT-220DC/300DC/1	2900387 352	PLC-OSP-120UC/ 24DC/ 2	2967484 325	PLC-RSC- 24DC/21-21AU	2967125 323	PLC-RSP-120UC/21-21AU	2912617 323
PLC-OPT-230AC/300DC/1	2900389 352	PLC-OSP-120UC/ 48DC/100	2967552 324	PLC-RSC- 24DC/21AU	2966265 323	PLC-RSP-120UC/21AU	2966582 323
PLC-OPT-230UC/24DC/2	2900368 325	PLC-OSP-120UC/ 48DC/100/SEN	2967581 331	PLC-RSC- 24DC/21HC	2967620 333	PLC-RSP-120UC/21HC	2912316 333
PLC-OPT-230UC/48DC/100	2900356 324	PLC-OSP-120UC/230AC/ 1	2967921 325	PLC-RSC- 24UC/ 1/S/H	2982236 350	PLC-RSP-230UC/1AU/SEN	2967413 330
PLC-OPT-230UC/48DC/100/SEN	2900361 331	PLC-OSP-220DC/300DC/ 1	2980869 352	PLC-RSC- 24UC/ 1/S/L	2834876 350	PLC-RSP-230UC/21	2966537 322
PLC-OPT-230UC/230AC/1	2900374 325	PLC-OSP-230AC/300DC/ 1	2980885 352	PLC-RSC- 24UC/21	2966184 322	PLC-RSP-230UC/21-21	2912552 323
PLC-OPT-LPE-24DC/48DC/100	2903173 366	PLC-OSP-230UC/ 24DC/ 2	2967497 325	PLC-RSC- 24UC/21-21	2967073 323	PLC-RSP-230UC/21-21AU	2912620 323
PLC-OSC- 5DC/ 5DC/100KHZ-G	2902965 355	PLC-OSP-230UC/ 48DC/100	2967565 324	PLC-RSC- 24UC/21-21AU	2967112 323	PLC-RSP-230UC/21-21AU/RWF	2968001 361
PLC-OSC- 5DC/24DC/ 2/ACT	2980144 327	PLC-OSP-230UC/ 48DC/100/SEN	2967594 331	PLC-RSC- 24UC/21AU	2966278 323	PLC-RSP-230UC/21AU	2966647 323
PLC-OSC- 5DC/24DC/100KHZ-G	2902967 355	PLC-OSP-230UC/230AC/ 1	2967934 325	PLC-RSC- 24UC/21HC	2967633 333	PLC-RSP-230UC/21HC	2912329 333
PLC-OSC- 5DC/24DC/100KHZ	2902963 354	PLC-PT-EIK 1-SVN 24P/P	2900397 364	PLC-RSC- 48DC/21	2966113 322	PLC-SC-EIK 1-SVN 24P/P	2982663 364
PLC-OSC- 5DC/300DC/ 1	2980652 352	PLC-RPT- 12DC/21	2900316 322	PLC-RSC- 48DC/21-21	2967248 323	PLC-SC-ELR W1/ 2-24DC	2980539 365
PLC-OSC-12DC/300DC/ 1	2980665 352	PLC-RPT- 12DC/21-21	2900329 323	PLC-RSC- 48DC/21-21AU	2967280 323	PLC-SC-S/H	2980733 351
PLC-OSC-24DC/ 5DC/100KHZ-G	2902966 355	PLC-RPT- 12DC/21-21AU	2900337 323	PLC-RSC- 48DC/21AU	2966126 323	PLC-SC-S/L	2980775 351
PLC-OSC-24DC/24DC/ 2	2966634 325	PLC-RPT- 12DC/21AU	2900317 323	PLC-RSC- 48DC/21HC	2967646 333	PLC-SP-EIK 1-SVN 24P/P	2982676 364
PLC-OSC-24DC/24DC/ 2/ACT	2966676 327	PLC-RPT- 12DC/21HC	2900290 333	PLC-RSC- 60DC/21	2966139 322	PLC-SP-ELR W1/ 2-24DC	2980555 365
PLC-OSC-24DC/ 24DC/ 5/ACT	2982786 328	PLC-RPT- 24DC/ 1/ACT	2900312 326	PLC-RSC- 60DC/21-21	2967293 323	PLC-SP-S/H	2980746 351
PLC-OSC-24DC/ 24DC/ 10/R	2982702 353	PLC-RPT- 24DC/ 1AU/SEN	2900313 330	PLC-RSC- 60DC/21-21AU	2967303 323	PLC-SP-S/L	2980788 351
PLC-OSC-24DC/ 24DC/100KHZ-G	2902968 355	PLC-RPT- 24DC/ 1IC/ACT	2900298 332	PLC-RSC- 60DC/21AU	2966142 323	PLC-V8/D15B/IN	2296087 369
PLC-OSC-24DC/ 48DC/100	2966728 324	PLC-RPT- 24DC/21	2900299 322	PLC-RSC- 60DC/21HC	2967659 333	PLC-V8/D15B/OUT	2296061 369
PLC-OSC-24DC/ 48DC/100/SEN	2966773 331	PLC-RPT- 24DC/21-21	2900330 323	PLC-RSC-120UC/1AU/SEN	2966320 330	PLC-V8/D15S/IN	2296074 369
PLC-OSC-24DC/ 48DC/500/W	2980636 353	PLC-RPT- 24DC/21-21AU	2900338 323	PLC-RSC-120UC/21	2966197 322	PLC-V8/D15S/OUT	2296058 369
PLC-OSC-24DC/230AC/ 1	2967840 325	PLC-RPT- 24DC/21AU	2900306 323	PLC-RSC-120UC/21-21	2967086 323	PLC-V8/FLK14/IN	2296553 369
PLC-OSC-24DC/230AC/ 1/ACT	2967947 327	PLC-RPT- 24DC/21HC	2900291 333	PLC-RSC-120UC/21-21AU	2967138 323	PLC-V8/FLK14/IN/M	2304115 369
PLC-OSC-24DC/230AC/ 2/ACT	2982760 328	PLC-RPT- 24UC/ 1/S/H	2900328 350	PLC-RSC-120UC/21AU	2966281 323	PLC-V8/FLK14/OUT	2295554 369
PLC-OSC-24DC/24DC/100KHZ	2902964 354	PLC-RPT- 24UC/ 1/S/L	2900327 350	PLC-RSC-120UC/21HC	2967662 333	PLC-V8/FLK14/OUT/M	2304102 369
PLC-OSC-24DC/300DC/ 1	2980678 352	PLC-RPT- 24UC/21	2900300 322	PLC-RSC-230UC/1AU/SEN	2966333 330	PLC-V8L/FLK14/OUT	2299660 369
PLC-OSC-24DC/TTL	2982728 358	PLC-RPT- 24UC/21-21	2900332 323	PLC-RSC-230UC/21	2966207 322	PLC-V8L/FLK14/OUT/M	2304306 369
PLC-OSC- 48DC/ 24DC/ 2	2967002 325	PLC-RPT- 24UC/21-21/RW	2900346 363	PLC-RSC-230UC/21-21	2967099 323	PLC-VT	2296870 486
PLC-OSC- 48DC/ 48DC/100	2966993 324	PLC-RPT- 24UC/21-21AU	2900339 323	PLC-RSC-230UC/21-21AU	2967141 323	PLC-VT/ACT	2295567 487
PLC-OSC- 48DC/230AC/ 1	2967853 325	PLC-RPT- 24UC/21-21AU/RW	2900349 363	PLC-RSC-230UC/21AU	2966294 323	PLC-VT/ACT/LA	2296867 487
PLC-OSC- 60DC/ 24DC/ 2	2967468 325	PLC-RPT- 24UC/21/RW	2900318 362	PLC-RSC-230UC/21HC	2967675 333	PLC-VT/LA	2296854 486
PLC-OSC-60DC/48DC/100	2967455 324	PLC-RPT- 24UC/21AU	2900307 323	PLC-RSP- 12DC/21	2967439 322	PR1-BSC2/2X21	2833518 372
PLC-OSC-60DC/230AC/ 1	2967866 325	PLC-RPT- 24UC/21AU/RW	2900321 362	PLC-RSP- 12DC/21-21	2912497 323	PR1-BSC3/2X21	2833521 373
PLC-OSC-60DC/300DC/ 1	2980681 352	PLC-RPT- 24UC/21HC	2900293 333	PLC-RSP- 12DC/21-21AU	2912565 323	PR1-BSP3/2X21	2833534 373
PLC-OSC-110DC/300DC/ 1	2980694 352	PLC-RPT- 24UC/21HC/RW	2900324 363	PLC-RSP- 12DC/21AU	2967442 323	PR1-RSC3-LDP-24DC/21	2834326 390
PLC-OSC-120AC/300DC/ 1	2980717 352	PLC-RPT- 48DC/21	2900301 322	PLC-RSP- 12DC/21HC	2912264 333	PR1-RSC3-LDP-24DC/21AU	2834368 390
PLC-OSC-120UC/24DC/ 2	2966650 325	PLC-RPT- 48DC/21-21	2900333 323	PLC-RSP- 24DC/ 1/ACT	2967345 326	PR1-RSC3-LDP-24DC/2X21	2834481 391
PLC-OSC-120UC/48DC/100	2966744 324	PLC-RPT- 48DC/21-21AU	2900340 323	PLC-RSP- 24DC/ 1AU/SEN	2967374 330	PR1-RSC3-LDP-24DC/2X21AU	2834520 391
PLC-OSC-120UC/48DC/100/SEN	2966799 331	PLC-RPT- 48DC/21AU	2900308 323	PLC-RSP- 24DC/ 1IC/ACT	2912413 332	PR1-RSC3-LV-24AC/21	2834339 390
PLC-OSC-120UC/230AC/ 1	2967879 325 2980050 325 2980047 324 2980063 325	PLC-RPT- 48DC/21HC	2900294 333	PLC-RSP- 24DC/21	2966472 322	PR1-RSC3-LV- 24AC/21AU	2834371 390
PLC-OSC-125DC/ 24DC/ 2		PLC-RPT- 60DC/21	2900303 322	PLC-RSP- 24DC/21-21	2912507 323	PR1-RSC3-LV- 24AC/2X21	2834494 391
PLC-OSC-125DC/ 48DC/100		PLC-RPT- 60DC/21-21	2900334 323	PLC-RSP- 24DC/21-21AU	2912578 323	PR1-RSC3-LV- 24AC/2X21AU	2834533 391
PLC-OSC-125DC/230AC/ 1		PLC-RPT- 60DC/21-21AU	2900341 323	PLC-RSP- 24DC/21AU	2966540 323	PR1-RSC3-LV-120AC/21	2834342 390
PLC-OSC-220DC/300DC/ 1	2980704 352	PLC-RPT- 60DC/21AU	2900309 323	PLC-RSP- 24DC/21HC	2912277 333	PR1-RSC3-LV-120AC/21AU	2834384 390
PLC-OSC-230AC/300DC/ 1	2980720 352	PLC-RPT- 60DC/21HC	2900295 333	PLC-RSP- 24UC/ 1/S/H	2982249 350	PR1-RSC3-LV-120AC/2X21	2834504 391
PLC-OSC-230UC/ 24DC/ 2	2966663 325	PLC-RPT- 72UC/21-21/RW	2900347 363	PLC-RSP- 24UC/ 1/S/L	2834889 350	PR1-RSC3-LV-120AC/2X21AU	2834546 391
PLC-OSC-230UC/ 48DC/100	2966757 324	PLC-RPT- 72UC/21-21AU/RW	2900350 363	PLC-RSP- 24UC/21	2966485 322	PR1-RSC3-LV-230AC/21	2834355 390
PLC-OSC-230UC/48DC/100/SEN	2966809 331	PLC-RPT- 72UC/21/RW	2900319 362	PLC-RSP- 24UC/21-21	2912510 323	PR1-RSC3-LV-230AC/21AU	2834397 390
PLC-OSC-230UC/230AC/ 1	2967882 325	PLC-RPT- 72UC/21AU/RW	2900322 362	PLC-RSP- 24UC/21-21/RW	2987105 363	PR1-RSC3-LV-230AC/2X21	2834517 391
PLC-OSC-LPE-24DC/48DC/100	2903171 366	PLC-RPT- 72UC/21HC/RW	2900325 363	PLC-RSP- 24UC/21-21AU	2912581 323	PR1-RSC3-LV-230AC/2X21AU	2834559 391
PLC-OSP-5DC/24DC/2/ACT	2980157 327	PLC-RPT-110UC/21-21/RW	2900348 363	PLC-RSP- 24UC/21-21AU/RW	2987118 363	PR1-RSP3-LDP-24DC/21	2834407 392
PLC-OSP- 5DC/300DC/ 1	2980814 352	PLC-RPT-110UC/21-21AU/RW	2900351 363	PLC-RSP- 24UC/21/RW	2987011 362	PR1-RSP3-LDP-24DC/21AU	2834449 392
PLC-OSP- 12DC/300DC/ 1	2980827 352	PLC-RPT-110UC/21/RW	2900320 362	PLC-RSP- 24UC/21AU	2966553 323	PR1-RSP3-LDP-24DC/2X21	2834562 393
PLC-OSP- 24DC/ 24DC/ 2	2967471 325	PLC-RPT-110UC/21AU/RW	2900323 362	PLC-RSP- 24UC/21AU/RW	2987024 362	PR1-RSP3-LDP-24DC/2X21AU	2834601 393
PLC-OSP- 24DC/ 24DC/ 2/ACT	2967507 327	PLC-RPT-110UC/21HC/RW	2900326 363	PLC-RSP- 24UC/21HC	2912280 333	PR1-RSP3-LV-24AC/21	2834410 392
PLC-OSP- 24DC/ 24DC/ 3RW	2980513 359	PLC-RPT-120UC/1AU/SEN	2900314 330	PLC-RSP- 24UC/21HC/RW	2987079 363	PR1-RSP3-LV-24AC/21AU	2834452 392
PLC-OSP- 24DC/ 24DC/ 10/R	2982715 353	PLC-RPT-120UC/21	2900304 322	PLC-RSP- 48DC/21	2966498 322	PR1-RSP3-LV-24AC/2X21	2834575 393
PLC-OSP- 24DC/ 48DC/100	2967549 324	PLC-RPT-120UC/21-21	2900335 323	PLC-RSP- 48DC/21-21	2912523 323	PR1-RSP3-LV-24AC/2X21AU	2834614 393
PLC-OSP- 24DC/ 48DC/100/SEN	2967578 331	PLC-RPT-120UC/21-21AU	2900342 323	PLC-RSP- 48DC/21-21AU	2912594 323	PR1-RSP3-LV-120AC/21	2834423 392
PLC-OSP- 24DC/ 48DC/500W	2980649 353	PLC-RPT-120UC/21AU	2900310 323	PLC-RSP- 48DC/21AU	2966566 323	PR1-RSP3-LV-120AC/21AU	2834465 392
PLC-OSP- 24DC/110DC/ 3RW	2982511 359	PLC-RPT-120UC/21HC	2900296 333	PLC-RSP- 48DC/21HC	2912293 333	PR1-RSP3-LV-120AC/2X21	2834588 393
PLC-OSP- 24DC/230AC/ 1	2967895 325	PLC-RPT-230UC/1AU/SEN	2900315 330	PLC-RSP- 60DC/21	2966511 322	PR1-RSP3-LV-120AC/2X21AU	2834627 393
PLC-OSP- 24DC/300DC/ 1	2980830 352	PLC-RPT-230UC/21	2900305 322	PLC-RSP- 60DC/21-21	2912536 323	PR1-RSP3-LV-230AC/21	2834436 392
PLC-OSP- 24DC/TTL	2982731 358	PLC-RPT-230UC/21-21	2900336 323	PLC-RSP- 60DC/21-21AU	2912604 323	PR1-RSP3-LV-230AC/21AU	2834478 392
PLC-OSP- 36DC/110DC/ 3RW	2982524 359	PLC-RPT-230UC/21-21AU	2900343 323	PLC-RSP- 60DC/21AU	2966579 323	PR1-RSP3-LV-230AC/2X21	2834591 393
PLC-OSP- 48DC/ 24DC/ 2	2967727 325	PLC-RPT-230UC/21-21AU/RWF	2900345 361	PLC-RSP- 60DC/21HC	2912303 333	PR1-RSP3-LV-230AC/2X21AU	2834630 393
PLC-OSP- 48DC/ 48DC/100	2967743 324	PLC-RPT-230UC/21AU	2900311 323	PLC-RSP- 72UC/21-21/RW	2987121 363	PR2-BSC2/4X21	2833563 378
PLC-OSP- 48DC/110DC/ 3RW	2982537 359	PLC-RPT-230UC/21HC	2900297 333	PLC-RSP-72UC/21-21AU/RW	2987134 363	PR2-BSC3/4X21	2833576 379
PLC-OSP- 48DC/230AC/ 1	2967905 325	PLC-RSC- 12DC/21	2966906 322	PLC-RSP-72UC/21/RW	2987037 362	PR2-BSP3/4X21	2833589 379
PLC-OSP- 60DC/ 24DC/ 2	2967730 325	PLC-RSC- 12DC/21-21	2967235 323	PLC-RSP-72UC/21AU/RW	2987040 362	PR2-RSC3-LDP-24DC/2X21	2834643 394
PLC-OSP- 60DC/ 48DC/100	2967756 324	PLC-RSC- 12DC/21-21AU	2967277 323	PLC-RSP-72UC/21HC/RW	2987082 363	PR2-RSC3-LDP-24DC/4X21AU	2834724 394

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
PR2-RSC3-LV-24AC/2X21	2834656 394	REL-IR2/LDP- 60DC/2X21	2903662 292	REL-OR/L- 24AC/1	2901911 386	RIF-4-RPT-LV-120AC/2X21	2903280 314
PR2-RSC3-LV-24AC/4X21AU	2834737 394	REL-IR2/LDP-110DC/2X21	2903663 292	REL-OR/L- 24AC/1/MB	2901905 386	RIF-4-RPT-LV-120AC/3X1	2903274 316
PR2-RSC3-LV-120AC/2X21	2834669 394	REL-IR4/L- 24AC/4X21	2903686 292	REL-OR/L-120AC/1	2901912 386	RIF-4-RPT-LV-120AC/3X21	2903277 315
PR2-RSC3-LV-120AC/4X21AU	2834740 394	REL-IR4/L- 24AC/4X21AU	2903683 292	REL-OR/L-120AC/1/MB	2901906 386	RIF-4-RPT-LV-230AC/2X21	2903279 314
PR2-RSC3-LV-230AC/2X21	2834672 394	REL-IR4/L-120AC/4X21	2903687 292	REL-OR/L-230AC/1	2901913 386	RIF-4-RPT-LV-230AC/3X1	2903273 316
PR2-RSC3-LV-230AC/4X21AU	2834753 394	REL-IR4/L-120AC/4X21AU	2903684 292	REL-OR/L-230AC/1/MB	2901907 386	RIF-4-RPT-LV-230AC/3X21	2903276 315
PR2-RSP3-LDP-24DC/2X21	2834685 395	REL-IR4/L-230AC/4X21	2903688 292	REL-OR/LDP- 24DC/1	2901908 386	RIF-LDP-110 DC	2900941 304
PR2-RSP3-LDP-24DC/4X21AU	2834766 395	REL-IR4/L-230AC/4X21AU	2903685 292	REL-OR/LDP- 24DC/1/MB	2901901 386	RIF-LDP-12-24 DC	2900939 304
PR2-RSP3-LV-24AC/2X21	2834698 395	REL-IR4/LDP- 12DC/4X21	2903676 292	REL-OR/LDP-110DC/1	2901909 386	RIF-LDP-48-60 DC	2900940 304
PR2-RSP3-LV-24AC/4X21AU	2834779 395	REL-IR4/LDP- 12DC/4X21AU	2903669 292	REL-OR/LDP-110DC/1/MB	2901902 386	RIF-LV-12-24 UC	2900942 304
PR2-RSP3-LV-120AC/2X21	2834708 395	REL-IR4/LDP- 24DC/4X21	2903677 292	REL-OR/LDP-220DC/1	2901910 386	RIF-LV-120-230 AC/110 DC	2900944 304
PR2-RSP3-LV-120AC/4X21AU	2834782 395	REL-IR4/LDP- 24DC/4X21AU	2903670 292	REL-OR/LDP-220DC/1/MB	2901904 386	RIF-LV-48-60 UC	2900943 304
PR2-RSP3-LV-230AC/2X21	2834711 395	REL-IR4/LDP- 48DC/4X21	2903678 292	REL-OR2/L- 24AC/2X21	2903690 296	RIF-RC-12-24 UC	2900949 304
PR2-RSP3-LV-230AC/4X21AU	2834795 395	REL-IR4/LDP- 48DC/4X21AU	2903671 292	REL-OR2/L-120AC/2X21	2903691 296	RIF-RC-120-230 UC	2900951 304
PR3-BSC1/2X21	2833602 382	REL-IR4/LDP- 60DC/4X21	2903679 292	REL-OR2/L-230AC/2X21	2903692 296	RIF-RC-48-60 UC	2900950 304
PR3-BSC1/3X21	2833615 383	REL-IR4/LDP- 60DC/4X21AU	2903672 292	REL-OR2/LDP- 24DC/2X21	2903689 296	RIF-RH-1	2900953 283
PSK AFS2000IOL	2700709 209	REL-IR4/LDP-110DC/4X21	2903680 292	REL-OR3/L-24AC/3X21	2903694 296	RIF-RH-2	2900954 291
PSK AFS5000IOL	2700705 209	REL-IR4/LDP-110DC/4X21AU	2903673 292	REL-OR3/L-120AC/3X21	2903695 296	RIF-RH-3	2900955 295
PSK AFS6000IOL	2700707 208	REL-MR 4,5DC/21AU	2961370 338	REL-OR3/L-230AC/3X21	2903696 296	RIF-RH-4	2900956 299
PSK AFS6050IOL	2700704 208	REL-MR- 4,5DC/21	2961367 338	REL-OR3/LDP-24DC/3X21	2903693 296	RIF-T3-24UC	2902647 305
PSK AFS8000IOL PSK DL BASIC PSK DL FLEX PSM-KAD 9 SUB 25/BS	2700708 209 2700726 206 2700727 207 2761295 149	REL-MR- 12DC/21 REL-MR- 12DC/21-21 REL-MR- 12DC/21-21AU REL-MR- 12DC/21AU	2961150 278 2961257 284 2961299 284 2961163 278	REL-PR2- 24AC/2X21 REL-PR2- 24DC/2X21 REL-PR2-120AC/2X21 REL-PR2-230AC/2X21	2903699 300 2903698 300 2903700 300 2903701 300	RIF-V-12-24 UC RIF-V-120-230 UC RIF-V-48-60 UC	2900945 304 2900948 304 2900947 304
PSM-ME-RS232/RS485-P PSM-ME-RS485/RS485-P	2744416 186 2744429 186	REL-MR- 12DC/21HC REL-MR- 12DC/21HC AU REL-MR- 18DC/21 REL-MR- 18DC/21AU	2961309 284 2961532 284 2961383 338 2961493 338	REL-PR3- 24AC/3X1 REL-PR3- 24AC/3X21 REL-PR3- 24DC/3X1 REL-PR3- 24DC/3X21	2903707 302 2903703 300 2903706 302 2903702 300	S	
R		REL-MR- 24AC/21-21 REL-MR- 24AC/21-21/MS REL-MR- 24AC/21-21AU REL-MR- 24AC/21HC	2961435 284 2987956 286 2961464 284 2961406 284	REL-PR3-120AC/3X1 REL-PR3-120AC/3X21 REL-PR3-230AC/3X1 REL-PR3-230AC/3X21	2903708 302 2903704 300 2903709 302 2903705 300	SCK-C-MODBUS SCK-M-I-4S-20A SCK-M-I-8S-20A SCK-M-U-1500V	2901674 240 2903242 241 2903241 241 2903591 241
RC- 12- 24UC	2833741 388	REL-MR- 24AC/21HC AU	2961503 284	RIF-0-BPT/1	2901873 277	SIM-AMS 1	2271015 560
RC- 48- 60UC	2833754 388	REL-MR- 24AC/21HC/MS	2987891 286	RIF-0-BPT/21	2900958 276	SIM-AMS 1-R	2271031 561
RC-120-230UC	2833767 388	REL-MR- 24DC/1IC	2961341 339	RIF-0-RPT-12DC/1	2903362 307	SIM-AMS 2	2271028 560
RC3- 12- 24UC	2833893 388	REL-MR- 24DC/21	2961105 278	RIF-0-RPT-12DC/1AU	2903360 307	SIM-AMS 2-R	2271044 561
RC3- 48- 60UC	2833903 388	REL-MR- 24DC/21-21	2961192 284	RIF-0-RPT-12DC/21	2903371 306	SIM-AMSC1	2271390 561
RC3-120-230UC	2833916 388	REL-MR- 24DC/21-21/MS	2987943 286	RIF-0-RPT-12DC/21AU	2903369 306	SIM-EI- 5DC/48DC/100	2271057 556
RCM-A-SCT- 20	2806045 245	REL-MR- 24DC/21-21AU	2961215 284	RIF-0-RPT-24DC/1	2903361 307	SIM-EI- 5DC/TTL/100	2271138 557
RCM-A-SCT- 30	2806058 245	REL-MR- 24DC/21-21AU/MS	2987985 286	RIF-0-RPT-24DC/1AU	2903359 307	SIM-EI- 12DC/48DC/100	2271060 556
RCM-A-SCT- 35	2806061 245	REL-MR- 24DC/21AU	2961121 278	RIF-0-RPT-24DC/21	2903370 306	SIM-EI- 12DC/TTL/100	2271141 557
RCM-A-SCT- 70	2806074 245	REL-MR- 24DC/21HC	2961312 284	RIF-0-RPT-24DC/21AU	2903368 306	SIM-EI- 24DC/48DC/100	2271073 556
RCM-A-SCT-105	2806087 245	REL-MR- 24DC/21HC AU	2961545 284	RIF-1-BPT/2X21	2900931 282	SIM-EI- 24DC/TTL/100	2271154 557
RCM-A-SCT-140	2806090 245	REL-MR- 24DC/21HC AU/MS	2987927 286	RIF-1-RPT-LDP-24DC/1X21	2903342 308	SIM-EI- 60DC/48DC/100	2271086 556
RCM-A-SCT-210	2806100 245	REL-MR- 24DC/21HC/MS	2987888 286	RIF-1-RPT-LDP-24DC/1X21AU	2903338 308	SIM-EI- 60DC/TTL/100	2271167 557
RCM-A/50/85-264V	2806016 245	REL-MR- 48DC/21-21	2834834 284	RIF-1-RPT-LDP-24DC/2X21	2903334 309	SIM-EI-110DC/48DC/100	2271099 556
RCM-B-SCT- 35	2806223 244	REL-MR- 48DC/21-21AU	2834847 284	RIF-1-RPT-LDP-24DC/2X21AU	2903330 309	SIM-EI-110DC/TTL/100	2271170 557
RCM-B-SCT- 70	2806236 244	REL-MR- 48DC/21HC	2834821 284	RIF-1-RPT-LV-120AC/1X21	2903340 308	SIM-EI-120AC/48DC/100	2271112 556
RCM-B-SCT-105	2806249 244	REL-MR- 60DC/21	2961118 338	RIF-1-RPT-LV-120AC/1X21AU	2903336 308	SIM-EI-120AC/48DC/100/RC	2271439 557
RCM-B/50/85-264V	2806210 244	REL-MR- 60DC/21-21	2961273 284	RIF-1-RPT-LV-120AC/2X21	2903332 309	SIM-EI-120AC/TTL/100	2271196 557
REL-IR/L- 24AC/2X21	2834054 380	REL-MR- 60DC/21-21AU	2961286 284	RIF-1-RPT-LV-120AC/2X21AU	2903328 309	SIM-EI-220DC/48DC/100	2271109 556
REL-IR/L- 24AC/4X21AU	2834122 380	REL-MR- 60DC/21AU	2961134 338	RIF-1-RPT-LV-230AC/1X21	2903339 308	SIM-EI-220DC/TTL/100	2271183 557
REL-IR/L-120AC/2X21	2834067 380	REL-MR- 60DC/21HC	2961325 284	RIF-1-RPT-LV-230AC/1X21AU	2903335 308	SIM-EI-230AC/48DC/100	2271125 556
REL-IR/L-120AC/4X21AU	2834135 380	REL-MR-110DC/21-21	2961202 284	RIF-1-RPT-LV-230AC/2X21	2903331 309	SIM-EI-230AC/48DC/100/RC	2271426 557
REL-IR/L-230AC/2X21	2834070 380	REL-MR-110DC/21-21AU	2961228 284	RIF-1-RPT-LV-230AC/2X21AU	2903327 309	SIM-EI-230AC/TTL/100	2271206 557
REL-IR/L-230AC/4X21AU	2834148 380	REL-MR-110DC/21HC	2961338 284	RIF-1-RPT-LV-24AC/1X21	2903341 308	SIM-EI-OV- 24DC/ 24DC/3	2300096 557
REL-IR/LDM- 12DC/2X21	2834151 380	REL-MR-110DC/21HC AU	2961561 284	RIF-1-RPT-LV-24AC/1X21AU	2903337 308	SIM-ERSN	2271484 556
REL-IR/LDM- 12DC/4X21AU	2834193 380	REL-MR-120AC/21-21	2961448 284	RIF-1-RPT-LV-24AC/2X21	2903333 309	SIM-ERSN-HB-KSR	2271468 556
REL-IR/LDM- 24DC/2X21	2834164 380	REL-MR-120AC/21-21/MS	2987969 286	RIF-1-RPT-LV-24AC/2X21AU	2903329 309	SIM-ERSN-HB-KSR/MET	2271497 556
REL-IR/LDM- 24DC/4X21AU	2834203 380	REL-MR-120AC/21-21AU	2961477 284	RIF-2-BPT/4X21	2900934 290	SIM-ERSN-HB-MR	2271471 556
REL-IR/LDM- 48DC/2X21	2834177 380	REL-MR-120AC/21HC	2961419 284	RIF-2-RPT-LDP-24DC/2X21	2903315 310	SIM-ERSN-HB-MR/MET	2271510 556
REL-IR/LDM- 48DC/4X21AU	2834216 380	REL-MR-120AC/21HC AU	2961516 284	RIF-2-RPT-LDP-24DC/4X21	2903308 311	SSA 3-6	2839295 191
REL-IR/LDM-110DC/2X21	2834180 380	REL-MR-120AC/21HC/MS	2987901 286	RIF-2-RPT-LV-120AC/2X21	2903311 310	SSA 5-10	2839512 191
REL-IR/LDM-110DC/4X21AU	2834229 380	REL-MR-230AC/21-21	2961451 284	RIF-2-RPT-LV-120AC/4X21	2903305 311	ST-OV3- 24DC/400AC/3	2905417 408
REL-IR/LDP- 12DC/2X21	2834012 380	REL-MR-230AC/21-21/MS	2987972 286	RIF-2-RPT-LV-230AC/2X21	2903310 310	ST-OV4- 24DC/ 24DC/1-PRO	2905572 409
REL-IR/LDP- 12DC/4X21AU	2834083 380	REL-MR-230AC/21-21AU	2961480 284	RIF-2-RPT-LV-230AC/4X21	2903304 311	ST-OV4- 24DC/ 24DC/4-PRO	2905585 409
REL-IR/LDP- 24DC/2X21	2834025 380	REL-MR-230AC/21-21AU/MS	2987998 286	RIF-2-RPT-LV-24AC/2X21	2903313 310	ST-REL3-KG 24/ 1/SO38	2829564 406
REL-IR/LDP- 24DC/4X21AU	2834096 380	REL-MR-230AC/21HC	2961422 284	RIF-2-RPT-LV-24AC/4X21	2903306 311	ST-REL3-KG 24/21/AU/SO46	2826981 404
REL-IR/LDP-110DC/2X21	2834041 380	REL-MR-230AC/21HC AU	2961529 284	RIF-3-BPT/2X21	2900937 294	ST-REL3-KG 24/21/SO46	2826091 404
REL-IR/LDP-110DC/4X21AU	2834119 380	REL-MR-230AC/21HC AU/MS	2987930 286	RIF-3-BPT/3X21	2900938 295	ST-REL3-KG120/21/AU/SO46	2829797 404
REL-IR/LDP-125DC/2X21	2834960 380	REL-MR-230AC/21HC/MS	2987914 286	RIF-3-RPT-LDP-24DC/2X21	2903297 312	ST-REL3-KG120/21/SO46	2833026 404
REL-IR/LDP-125DC/4X21AU	2834313 380	REL-MR-G 24/1	2961037 554	RIF-3-RPT-LDP-24DC/3X21	2903294 313	ST-REL3-KG230/21/AU/SO46	2826266 404
REL-IR/LDP-220DC/2X21	2834957 380	REL-OR- 24AC/2X21	2834245 384	RIF-3-RPT-LV-120AC/2X21	2903296 312	ST-REL3-KG230/21/SO46	2832027 404
REL-IR/LDP-220DC/4X21AU	2834973 380	REL-OR- 24AC/3X21	2834287 384	RIF-3-RPT-LV-120AC/3X21	2903293 313	STP 5-2	0800967 318
REL-IR2/L-24AC/2X21	2903666 292	REL-OR- 24DC/2X21	2834232 384	RIF-3-RPT-LV-230AC/2X21	2903295 312	SWD4-100LF-8-24 PXC	2903111 34
REL-IR2/L-120AC/2X21	2903667 292	REL-OR- 24DC/3X21	2834274 384	RIF-3-RPT-LV-230AC/3X21	2903292 313	SWD4-3LF8-24-2S PXC	2903112 34
REL-IR2/L-230AC/2X21	2903668 292	REL-OR-120AC/2X21	2834258 384	RIF-4-BPT/3X21	2900961 298	SWD4-8MF2 PXC	2903108 34
REL-IR2/LDP- 12DC/2X21	2903659 292	REL-OR-120AC/3X21	2834290 384	RIF-4-RPT-LDP-24DC/2X21	2903281 314	SWD4-8SF2-5 PXC	2903107 34
REL-IR2/LDP- 24DC/2X21	2903660 292	REL-OR-230AC/2X21	2834261 384	RIF-4-RPT-LDP-24DC/3X1	2903275 316	SWD4-8SFF2-5 PXC	2903109 34
REL-IR2/LDP- 48DC/2X21	2903661 292	REL-OR-230AC/3X21	2834300 384	RIF-4-RPT-LDP-24DC/3X21	2903278 315	SWD4-CRP-1 PXC	2903110 34

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
SWD4-CRP-2 PXC SWD4-RC8-10 PXC SZF 1-0,6X3,5	2903114 34 2903106 34 1204517 368	UMK- 8 RM/KSR-G 24/21/PLC UMK- 8 RM/MR-G24/ 1/PLC UMK- 8 RM110DC/MKDS UMK- 8 RM230AC/MKDS	2979485 494 2979469 492 2972945 551 2972961 551	VIP-2/PT/FLK14/LED/PLC VIP-2/PT/FLK14/PLC VIP-2/PT/FLK16 VIP-2/PT/FLK16/LED	2904279 470 2903801 470 2903789 526 2904250 527	VIP-3/PT/HD26SUB/M VIP-3/PT/HD44SUB/F VIP-3/PT/HD44SUB/M VIP-3/PT/HD62SUB/F	2904269 539 2904274 539 2904270 539 2904275 539
Т		UMK- 8 RM24DC/MKDS UMK- D32M-VS UMK- EC38/38-XOL UMK- EC38/38-XOR	2972916 551 2970060 541 2976284 542 2976297 542	VIP-2/PT/FLK20 VIP-2/PT/FLK20/LED VIP-2/PT/FLK50 (1-40) /S7 VIP-2/PT/FLK50/16/SLC500	2903790 526 2904251 527 2903804 472 2904287 429	VIP-3/PT/HD62SUB/M VIP-3/PT/PDM-2/16 VIP-3/PT/PDM-2/24 VIP-3/PT/PDM-2/32	2904271 539 2903797 549 2903798 549 2903799 549
TC-D37SUB-ADIO16-EX-P-UNI	2924854 129	UMK- EC56/25/EX -FRONT 2,5V/L	2900115 545	VIP-2/PT/FLK50/AB-1756	2904286 473	VIP-3/PT/PDM-2/48	2903800 549
TC-D37SUB-ADIO16-M-P-UNI	2902933 97	UMK- EC56/25/EX -FRONT 2,5V/F	2900114 545	VIP-2/PT/FLK50/LED/PLC	2904280 471	VIP-3/PT/RJ45	2904290 546
TC-D37SUB-AIO16-EX-PS-UNI	2902932 129	UMK- EC56/25/EX -L	2900113 545	VIP-2/PT/FLK50/MODI-TSX/Q	2904285 473	VIP-3/SC/D25SUB/F	2315188 533
TC-D37SUB-AIO16-M-PS-UNI	2902934 97	UMK- EC56/25/EX -R	2900112 545	VIP-2/PT/FLK50/PLC	2903803 471	VIP-3/SC/D25SUB/F/LED	2322210 533
THERMAL FUSE TF104	2900796 38	UMK- EC56/32-XOL UMK- EC56/32-XOR UMK- EC56/32-XUL UMK- EC56/32-XUR	2975764 543 2975858 543 2975780 543 2975777 543	VIP-2/PT/FLK50/S7/A-S400 VIP-2/PT/HD15SUB/F VIP-2/PT/HD15SUB/M VIP-2/SC/2FLK14 (1-20) /S7	2904289 472 2904272 539 2904268 539 2315230 474	VIP-3/SC/D25SUB/M VIP-3/SC/D25SUB/M/LED VIP-3/SC/D37SUB/F VIP-3/SC/D37SUB/F/LED	2315133 533 2322168 533 2315191 533 2322223 533
U		UMK- EC56/56-XOL UMK- EC56/56-XOR UMK- EC56/FRONT 2,5V/L UMK- EC56/FRONT 2,5V/R	2975890 543 2975900 543 2976158 543 2976161 543	VIP-2/SC/2FLK14/AB-1756 VIP-2/SC/D 9SUB/F VIP-2/SC/D 9SUB/F/LED VIP-2/SC/D 9SUB/M	2322333 475 2315162 532 2322197 533 2315117 532	VIP-3/SC/D37SUB/M VIP-3/SC/D37SUB/M/HW/C300 VIP-3/SC/D37SUB/M/LED VIP-3/SC/D50SUB/F	2315146 533 2900675 439 2322171 533 2315201 533
UC-EMLP (11X9)	0819291 127	UMK- EC90/32/EX-XOL	2900110 544	VIP-2/SC/D 9SUB/M/LED	2322142 533	VIP-3/SC/D50SUB/F/LED	2322236 533
UC-EMLP (11X9) CUS	0824547 127	UMK- EC90/32/EX-XOR	2900109 544	VIP-2/SC/D15SUB/F	2315175 532	VIP-3/SC/D50SUB/M	2315159 533
UDK-RELG 4	2777056 409	UMK- EC90/32/EX-XUL	2969071 544	VIP-2/SC/D15SUB/F/LED	2322207 533	VIP-3/SC/D50SUB/M/LED	2322184 533
UKK 5-2R/NAMUR	2941662 183	UMK- EC90/32/EX-XUR	2969068 544	VIP-2/SC/D15SUB/M	2315120 532	VIP-3/SC/FLK14/8IM/LED/PLC	2322265 479
UM 25-10 MSTB/FRONT/Q	2959803 547	UMK- PVB	2971302 549	VIP-2/SC/D15SUB/M/LED	2322155 533	VIP-3/SC/FLK14/8IM/PLC	2322278 479
UM 25-18 MSTB/FRONT/Q	2959502 547	UMK- PVB 6	2972136 549	VIP-2/SC/D37SUB/M	2900676 439	VIP-3/SC/FLK26	2315052 525
UM 25-D 9SUB/B/FRONT/Q	2959560 536	UMK-16 OM-R/MF/MKDS	2972770 553	VIP-2/SC/D37SUB/M/SO	2900786 439	VIP-3/SC/FLK26/LED	2322087 525
UM 25-D 9SUB/S/FRONT/Q	2959573 536	UMK-16 OM-R/MF/MKDS/P	2972796 553	VIP-2/SC/FLK10	2315010 524	VIP-3/SC/FLK34	2315065 525
UM 25-D15SUB/B/FRONT/Q	2959586 536	UMK-16 OM/MF/MKDS	2972754 553	VIP-2/SC/FLK10/LED	2322045 525	VIP-3/SC/FLK34/LED	2322090 525
UM 25-D15SUB/S/FRONT/Q	2959599 536	UMK-16 RELS/KSR-G24/21/E/PLC	2974891 495	VIP-2/SC/FLK14	2315023 524	VIP-3/SC/FLK40	2315078 525
UM 25-D25SUB/B/FRONT/Q	2959609 536	UMK-16 RELS/KSR-G24/21/PLC	2974901 495	VIP-2/SC/FLK14/8M/PLC	2322281 476	VIP-3/SC/FLK40/LED	2322100 525
UM 25-D25SUB/S/FRONT/Q	2959612 536	UMK-16 RM 5DC/MKDS	2972974 551	VIP-2/SC/FLK14/8P/PLC	2322294 476	VIP-3/SC/FLK50	2315081 525
UM 25-FLK20/FRONT/Q	2959515 528	UMK-16 RM 12DC/MKDS	2972987 551	VIP-2/SC/FLK14/LED	2322058 525	VIP-3/SC/FLK50/LED	2322113 525
UM 45-8RM/MR-G24/1/PLC	2962900 490	UMK-16 RM 24DC/MKDS	2972990 551	VIP-2/SC/FLK14/LED/PLC	2322249 470	VIP-3/SC/FLK60	2315094 525
UM 45-16RM/MR-G24/1/E/PLC	2962926 491	UMK-16 RM 60DC/MKDS	2973038 551	VIP-2/SC/FLK14/PLC	2315214 470	VIP-3/SC/FLK60/LED	2322126 525
UM 45-16RM/MR-G24/1/PLC	2962913 491	UMK-16 RM/KSR-G 24/21/E/PLC	2979508 495	VIP-2/SC/FLK16	2315036 524	VIP-3/SC/FLK64	2315104 525
UM 45-D37SUB/B/FRONT/Q	2959625 536	UMK-16 RM/KSR-G 24/21/PLC	2979498 495	VIP-2/SC/FLK16/LED	2322061 525	VIP-3/SC/FLK64/LED	2322139 525
UM 45-D37SUB/S/FRONT/Q	2959638 536	UMK-16 RM110DC/MKDS	2973041 551	VIP-2/SC/FLK20	2315049 524	VIP-3/SC/HD26SUB/F	2322414 539
UM 45-D50SUB/B/FRONT/Q	2959641 536	UMK-16 RM230AC/MKDS	2973067 551	VIP-2/SC/FLK20/LED	2322074 525	VIP-3/SC/HD26SUB/M	2322375 539
UM 45-D50SUB/S/FRONT/Q	2959654 536	UMK-32 MDSTB/MKKDS3/R	2970196 547	VIP-2/SC/FLK50 (1-40) /S7	2315243 472	VIP-3/SC/HD44SUB/F	2322427 539
UM 45-DI/DO/S/LA/SIM8	2968205 483	UMK-32 RM/MR-G24/1/PLC	2979472 492	VIP-2/SC/FLK50/16/SLC500	2322320 429	VIP-3/SC/HD44SUB/M	2322388 539
UM 45-DO/LA/SIM8	2968195 483	UMKS- C64M-VS	2970565 540	VIP-2/SC/FLK50/AB-1756	2322317 473	VIP-3/SC/HD62SUB/F	2322430 539
UM 45-FLK14/ 8IM/ZFKDS/PLC	2965211 481	UMKS- E48M-VS	2970154 541	VIP-2/SC/FLK50/LED/PLC	2322252 471	VIP-3/SC/HD62SUB/M	2322391 539
UM 45-FLK34/FRONT/Q	2959531 528	UMKS- F48M-VR	2970167 541	VIP-2/SC/FLK50/MODI-TSX/Q	2322304 473	VIP-3/SC/RJ45	2900701 546
UM 45-FLK40/FRONT/Q UM 45-FLK50/32IM/ZFKDS/PLC UM 45-FLK50/FRONT/Q UM-8 RELS/KSR-G24/21/MT/PLC	2959544 528 2965224 481 2959557 528 2962463 497	UMKS- F48M-VS URELG 3 UT 4-MTD-R/CVC 690/SET	2970714 541 2820136 404 2901667 12	VIP-2/SC/FLK50/PLC VIP-2/SC/FLK50/S7/A-S400 VIP-2/SC/HD15SUB/F VIP-2/SC/HD15SUB/M	2315227 471 2322359 472 2322401 539 2322326 539	VIP-CAB-FLK10-0,14/ VIP-CAB-FLK10/0,14/0,5M VIP-CAB-FLK10/0,14/1,0M VIP-CAB-FLK10/0,14/1,5M	2318376 500 2318305 500 2318318 500 2318321 500
UM- 8 RWRT-G24/21/PLC UM- 8RWKSR-G24/21/MS/PLC UM- 8RWKSR-G24/21/MS/SI/PLC UM- 8RWKSR-G24/21/SI/PLC	2968386 493 2900890 498 2900893 499 2900892 499	V		VIP-2/SC/PDM-2/16 VIP-2/SC/PDM-2/24 VIP-2/SC/PDM-2/32 VIP-2/SC/PDM-2/48	2315256 548 2315269 548 2315272 548 2903717 548	VIP-CAB-FLK10/0,14/2,0M VIP-CAB-FLK10/0,14/3,0M VIP-CAB-FLK10/0,14/4,0M VIP-CAB-FLK10/0,14/6,0M	2318334 500 2318347 500 2318350 500 2318363 500
UM-16 RELS/KSR-G24/21/E/MT/PL/	C 2962379 497	V- 12- 24UC	2833864 388	VIP-3/PT/D25SUB/F	2903782 535	VIP-CAB-FLK14-0,14/	2318457 500
UM-16 RELS/KSR-G24/21/MT/PLC	2962382 497	V- 48- 60UC	2833877 388	VIP-3/PT/D25SUB/F/LED	2904265 535	VIP-CAB-FLK14/0,14/0,5M	2318389 500
UM-25 FLK26/FRONT/Q	2959528 528	V-120-230UC	2833880 388	VIP-3/PT/D25SUB/M	2903781 535	VIP-CAB-FLK14/0,14/1,0M	2318392 500
UM-32 RM/RT-G24/21/PLC	2968373 493	V3- 12- 24UC	2833929 388	VIP-3/PT/D25SUB/M/LED	2904260 535	VIP-CAB-FLK14/0,14/1,5M	2318402 500
UM-32RM/KSR-G24/21/MS/PLC	2900891 498	V3- 48- 60UC	2833932 388	VIP-3/PT/D37SUB/F	2903784 535	VIP-CAB-FLK14/0,14/2,0M	2318415 500
UM-DELTA V/A/SI	5603256 435	V3-120-230UC	2833945 388	VIP-3/PT/D37SUB/F/LED	2904266 535	VIP-CAB-FLK14/0,14/3,0M	2318428 500
UM-DELTA V/A/SI/BFI/TP	5603258 435	VFD 5007 IL IB	2701054 50	VIP-3/PT/D37SUB/M	2903783 535	VIP-CAB-FLK14/0,14/4,0M	2318431 500
UM-DELTA V/D/SI	5603255 435	VFD 5015 IL IB	2701055 51	VIP-3/PT/D37SUB/M/HW/C300	2904276 439	VIP-CAB-FLK14/0,14/6,0M	2318444 500
UM-DELTA V/D/SI/BFI/TP	5603257 435	VFD 5022 IL IB	2701057 51	VIP-3/PT/D37SUB/M/LED	2904261 535	VIP-CAB-FLK14/16/0,5M/S7	2904514 457
UMK- 1 OM-R/AMS	2983002 553	VFD 5040 IL IB	2701058 51	VIP-3/PT/D50SUB/F	2903786 535	VIP-CAB-FLK14/16/1,0M/S7	2904515 457
UMK- 4 OM-R/MF	2970882 553	VIP-2/PT/2FLK14 (1-20) /S7	2903802 474	VIP-3/PT/D50SUB/F/LED	2904267 535	VIP-CAB-FLK14/16/1,5M/S7	2904516 457
UMK- 4 OM-R/MF/P	2972673 553	VIP-2/PT/2FLK14/AB-1756	2904288 475	VIP-3/PT/D50SUB/M	2903785 535	VIP-CAB-FLK14/16/10,0M/S7	2904524 457
UMK- 4 RM 5DC	2972819 550	VIP-2/PT/D 9SUB/F	2903778 534	VIP-3/PT/D50SUB/M/LED	2904262 535	VIP-CAB-FLK14/16/2,0M/S7	2904517 457
UMK- 4 RM 12DC	2972822 550	VIP-2/PT/D 9SUB/F/LED	2904263 535	VIP-3/PT/FLK14/8IM/LED/PLC	2904281 479	VIP-CAB-FLK14/16/2,5M/S7	2904518 457
UMK- 4 RM 24	2971344 550	VIP-2/PT/D 9SUB/M	2903777 534	VIP-3/PT/FLK14/8IM/PLC	2904282 479	VIP-CAB-FLK14/16/3,0M/S7	2904519 457
UMK- 4 RM 24DC	2972835 550	VIP-2/PT/D 9SUB/M/LED	2904258 535	VIP-3/PT/FLK26	2903791 527	VIP-CAB-FLK14/16/4,0M/S7	2904520 457
UMK- 4 RM 60DC	2972851 550	VIP-2/PT/D15SUB/F	2903780 534	VIP-3/PT/FLK26/LED	2904252 527	VIP-CAB-FLK14/16/5,0M/S7	2904521 457
UMK- 4 RM110DC	2972864 550	VIP-2/PT/D15SUB/F/LED	2904264 535	VIP-3/PT/FLK34	2903792 527	VIP-CAB-FLK14/16/6,0M/S7	2904522 457
UMK- 4 RM230AC	2972880 550	VIP-2/PT/D15SUB/M	2903779 534	VIP-3/PT/FLK34/LED	2904253 527	VIP-CAB-FLK14/16/8,0M/S7	2904523 457
UMK- 8 OM-R/MF/MKDS	2972738 553	VIP-2/PT/D15SUB/M/LED	2904259 535	VIP-3/PT/FLK40	2903793 527	VIP-CAB-FLK14/AXIO/0,14/0,5M	2901604 443
UMK- 8 OM-R/MF/MKDS/P	2972699 553	VIP-2/PT/D37SUB/M	2904277 439	VIP-3/PT/FLK40/LED	2904254 527	VIP-CAB-FLK14/AXIO/0,14/1,0M	2901605 443
UMK- 8 OM/MF/MKDS	2972712 553	VIP-2/PT/D37SUB/M/SO	2904278 439	VIP-3/PT/FLK50	2903794 527	VIP-CAB-FLK14/AXIO/0,14/1,5M	2901606 443
UMK- 8 RELS/KSR-24/21/21	2975722 551	VIP-2/PT/FLK10	2903787 526	VIP-3/PT/FLK50/LED	2904255 527	VIP-CAB-FLK14/AXIO/0,14/2,0M	2901607 443
UMK- 8 RELS/KSR-G24/21-21/PLC	2976187 496	VIP-2/PT/FLK10/LED	2904248 527	VIP-3/PT/FLK60	2903795 527	VIP-CAB-FLK14/AXIO/0,14/2,5M	2901608 443
UMK-8 RELS/KSR-G24/21/PLC	2974914 494	VIP-2/PT/FLK14	2903788 526	VIP-3/PT/FLK60/LED	2904256 527	VIP-CAB-FLK14/AXIO/0,14/3,0M	2901609 443
UMK-8 RM 5DC/MKDS	2972893 551	VIP-2/PT/FLK14/8M/PLC	2904283 476	VIP-3/PT/FLK64	2903796 527	VIP-CAB-FLK14/AXIO/0,14/4,0M	2901610 443
UMK-8 RM 12DC/MKDS	2972903 551	VIP-2/PT/FLK14/8P/PLC	2904284 476	VIP-3/PT/FLK64/LED	2904257 527	VIP-CAB-FLK14/AXIO/0,14/6,0M	2901611 443
UMK-8 RM 60DC/MKDS	2972932 551	VIP-2/PT/FLK14/LED	2904249 527	VIP-3/PT/HD26SUB/F	2904273 539	VIP-CAB-FLK14/FR/OE/0,14/0,5M	2900122 502

Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page	Туре	Order No. Page
VIP-CAB-FLK14/FR/OE/0,14/1,0M VIP-CAB-FLK14/FR/OE/0,14/1,5M VIP-CAB-FLK14/FR/OE/0,14/2,0M VIP-CAB-FLK14/FR/OE/0,14/3,0M	2900123 502 2900125 502 2900126 502 2900127 502	VIP-PA-FLK14/ 2,5M/S7 VIP-PA-FLK14/ 3,0M/S7 VIP-PA-FLK14/ 4,0M/S7 VIP-PA-FLK14/ 5,0M/S7	2322692 449 2322702 449 2322715 449 2322728 449				
VIP-CAB-FLK14/FR/OE/0,14/4,0M VIP-CAB-FLK14/FR/OE/0,14/6,0M VIP-CAB-FLK16-0,14/ VIP-CAB-FLK16/0,14/0,5M	2900128 502 2900129 502 2318538 500 2318460 500	VIP-PA-FLK14/ 6,0M/S7 VIP-PA-FLK14/ 7,0M/S7 VIP-PA-FLK14/ 8,0M/S7 VIP-PA-FLK14/10,0M/S7	2322731 449 2322744 449 2322757 449 2322760 449				
VIP-CAB-FLK16/0,14/1,0M VIP-CAB-FLK16/0,14/1,5M VIP-CAB-FLK16/0,14/2,0M VIP-CAB-FLK16/0,14/3,0M	2318473 500 2318486 500 2318499 500 2318509 500	VIP-PA-FLK50-4X14-S7/ VIP-PA-FLK50-S7/ VIP-PA-FLK50/ 0,5M/S7 VIP-PA-FLK50/ 1,0M/S7	2900886 449 2900885 448 2322443 448 2322456 448				
VIP-CAB-FLK16/0,14/4,0M VIP-CAB-FLK16/0,14/6,0M VIP-CAB-FLK16/FR/OE/0,14/0,5M VIP-CAB-FLK16/FR/OE/0,14/1,0M	2318512 500 2318525 500 2900130 502 2900131 502	VIP-PA-FLK50/ 1,5M/S7 VIP-PA-FLK50/ 2,0M/S7 VIP-PA-FLK50/ 2,5M/S7 VIP-PA-FLK50/ 3,0M/S7	2322469 448 2321800 448 2322472 448 2322485 448				
VIP-CAB-FLK16/FR/OE/0,14/1,5M VIP-CAB-FLK16/FR/OE/0,14/2,0M VIP-CAB-FLK16/FR/OE/0,14/3,0M VIP-CAB-FLK16/FR/OE/0,14/4,0M	2900132 502 2900133 502 2900134 502 2900135 502	VIP-PA-FLK50/ 4,0M/S7 VIP-PA-FLK50/ 5,0M/S7 VIP-PA-FLK50/ 6,0M/S7 VIP-PA-FLK50/ 7,0M/S7	2322498 448 2322508 448 2322511 448 2322524 448				
VIP-CAB-FLK16/FR/OE/0,14/6,0M VIP-CAB-FLK20-0,14/ VIP-CAB-FLK20/0,14/0,5M VIP-CAB-FLK20/0,14/1,0M	2900136 502 2318619 500 2318541 500 2318554 500	VIP-PA-FLK50/ 8,0M/S7 VIP-PA-FLK50/10,0M/S7 VIP-PA-FLK50/4X14/ 0,5M/S7 VIP-PA-FLK50/4X14/ 1,0M/S7	2322537 448 2322540 448 2322553 449 2322566 449				
VIP-CAB-FLK20/0,14/1,5M VIP-CAB-FLK20/0,14/2,0M VIP-CAB-FLK20/0,14/3,0M VIP-CAB-FLK20/0,14/4,0M	2318567 500 2318570 500 2318583 500 2318596 500	VIP-PA-FLK50/4X14/ 1,5M/S7 VIP-PA-FLK50/4X14/ 2,0M/S7 VIP-PA-FLK50/4X14/ 2,5M/S7 VIP-PA-FLK50/4X14/ 3,0M/S7	2322579 449 2321910 449 2322582 449 2322595 449				
VIP-CAB-FLK20/0,14/6,0M VIP-CAB-FLK20/FR/OE/0,14/0,5M VIP-CAB-FLK20/FR/OE/0,14/1,0M VIP-CAB-FLK20/FR/OE/0,14/1,5M	2318606 500 2900138 503 2900139 503 2900141 503	VIP-PA-FLK50/4X14/ 4,0M/S7 VIP-PA-FLK50/4X14/ 5,0M/S7 VIP-PA-FLK50/4X14/ 6,0M/S7 VIP-PA-FLK50/4X14/ 7,0M/S7	2322605 449 2322618 449 2322621 449 2322634 449				
VIP-CAB-FLK20/FR/OE/0,14/2,0M VIP-CAB-FLK20/FR/OE/0,14/3,0M VIP-CAB-FLK20/FR/OE/0,14/4,0M VIP-CAB-FLK20/FR/OE/0,14/6,0M	2900142 503 2900143 503 2900144 503 2900145 503	VIP-PA-FLK50/4X14/ 8,0M/S7 VIP-PA-FLK50/4X14/10,0M/S7 VS-937/	2322647 449 2322650 449 1402611 48				
VIP-CAB-FLK26-0,14/ VIP-CAB-FLK26/0,14/0,5M VIP-CAB-FLK26/0,14/1,0M VIP-CAB-FLK26/0,14/1,5M	2318693 501 2318622 501 2318635 501 2318648 501	Z					
VIP-CAB-FLK26/0,14/2,0M VIP-CAB-FLK26/0,14/3,0M VIP-CAB-FLK26/0,14/4,0M VIP-CAB-FLK26/0,14/6,0M	2318651 501 2318664 501 2318677 501 2318680 501	ZB 15:UNBEDRUCKT ZB 5:UNBEDRUCKT ZB 6,LGS:FORTLZAHLEN ZB 6:UNBEDRUCKT	0811972 318 1050004 318 1051016 368 1051003 318				
VIP-CAB-FLK34-0,14/ VIP-CAB-FLK34/0,14/0,5M VIP-CAB-FLK34/0,14/1,0M VIP-CAB-FLK34/0,14/1,5M	2318774 501 2318703 501 2318716 501 2318729 501						
VIP-CAB-FLK34/0,14/2,0M VIP-CAB-FLK34/0,14/3,0M VIP-CAB-FLK34/0,14/4,0M VIP-CAB-FLK34/0,14/6,0M	2318732 501 2318745 501 2318758 501 2318761 501						
VIP-CAB-FLK40-0,14/ VIP-CAB-FLK40/0,14/0,5M VIP-CAB-FLK40/0,14/1,0M VIP-CAB-FLK40/0,14/1,5M	2318855 501 2318787 501 2318790 501 2318800 501						
VIP-CAB-FLK40/0,14/2,0M VIP-CAB-FLK40/0,14/3,0M VIP-CAB-FLK40/0,14/4,0M VIP-CAB-FLK40/0,14/6,0M	2318813 501 2318826 501 2318839 501 2318842 501						
VIP-CAB-FLK50/0,14/ VIP-CAB-FLK50/0,14/0,5M VIP-CAB-FLK50/0,14/1,0M VIP-CAB-FLK50/0,14/1,5M	2318936 501 2318868 501 2318871 501 2318884 501						
VIP-CAB-FLK50/0,14/2,0M VIP-CAB-FLK50/0,14/3,0M VIP-CAB-FLK50/0,14/4,0M VIP-CAB-FLK50/0,14/6,0M	2318897 501 2318907 501 2318910 501 2318923 501						
VIP-CAB-FLK50/FR/OE/0,14/0,5M VIP-CAB-FLK50/FR/OE/0,14/1,0M VIP-CAB-FLK50/FR/OE/0,14/1,5M VIP-CAB-FLK50/FR/OE/0,14/2,0M	2900146 503 2900147 503 2900148 503 2900149 503						
VIP-CAB-FLK50/FR/OE/0,14/3,0M VIP-CAB-FLK50/FR/OE/0,14/4,0M VIP-CAB-FLK50/FR/OE/0,14/6,0M VIP-PA-FLK14-S7/	2900150 503 2900151 503 2900152 503 2900887 449						
VIP-PA-FLK14/ 0,5M/S7 VIP-PA-FLK14/ 1,0M/S7 VIP-PA-FLK14/ 1,5M/S7 VIP-PA-FLK14/ 2,0M/S7	2322663 449 2322676 449 2322689 449 2321790 449						
E00							







OOO «ЛайфЭлектроникс" "LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 P/C 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 3010181090000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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