

Isolation amplifier - MACX MCR-SL-NAM-2RO-SP - 2924265

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NAMUR isolation amplifier for operating proximity sensors and switches. The signals are transferred to the control level using 2 separate relay outputs (N/O contacts). Line fault detection (LFD), galvanic 3-way isolation, SIL 2.

The illustration shows the versions with screw connection

Product Features

- ✓ Power supply and error indication possible via DIN rail connector
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Up to SIL 2 according to EN 61508
- ✓ Line fault detection (LFD), can be activated/deactivated, error indicated by red flashing LED with de-excitation of output relay
- ✓ 4-way electrical isolation
- ✓ Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- ✓ LED indicators for supply voltage, switching state, and malfunction according to NAMUR NE 44
- ✓ 2 relay signal outputs (N/O contact); output 2 can also be used as an error signaling output
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)



Key commercial data

| | |
|--------------------------------------|-----------|
| Packing unit | 1 pc |
| Weight per Piece (excluding packing) | 140.0 GRM |
| Custom tariff number | 85437090 |
| Country of origin | Germany |

Technical data

Note

| | |
|-------------------------|---|
| Utilization restriction | EMC: class A product, see manufacturer's declaration in the download area |
|-------------------------|---|

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Technical data

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| Height | 99 mm |
| Depth | 114.5 mm |

Ambient conditions

| | |
|---|--|
| Ambient temperature (operation) | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Maximum altitude | ≤ 2000 m |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |
| Noise immunity | EN 61000-6-2 |
| Degree of protection | IP20 |

Input data

| | |
|---------------------------------|-----------------------|
| Non-load voltage | ~ 8 V DC |
| Switching points (attenuated) | < 1.2 mA (blocking) |
| Switching points (unattenuated) | > 2.1 mA (conductive) |

Output data

| | |
|---------------------------|---|
| Switching output | Relay output |
| Contact type | 2 N/O contacts |
| Contact material | AgSnO ₂ , hard gold-plated |
| Maximum switching voltage | 250 V AC (2 A) 120 V DC (0.2 A) 30 V DC (2 A) |
| Max. switching power | 500 VA |
| Mechanical service life | 10 ⁷ cycles |

Power supply

| | |
|--------------------------|-----------------------|
| Nominal supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | 30 mA (24 V DC) |
| Power consumption | < 950 mW |

Connection data

| | |
|--|---------------------|
| Conductor cross section solid min. | 0.2 mm ² |
| Conductor cross section solid max. | 1.5 mm ² |
| Conductor cross section stranded min. | 0.2 mm ² |
| Conductor cross section stranded max. | 1.5 mm ² |
| Conductor cross section AWG/kcmil min. | 24 |
| Conductor cross section AWG/kcmil max. | 16 |

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Connection data

| | |
|-------------------|------------------------|
| Stripping length | 8 mm |
| Connection method | Spring-cage connection |

General

| | |
|---|--|
| No. of channels | 1 |
| Status display | Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) |
| Inflammability class according to UL 94 | V0 |
| Pollution degree | 2 |
| Surge voltage category | III |
| Housing material | PA 66-FR |
| Color | green |
| Designation | Input/output/supply, DIN rail connector |
| Electrical isolation | 300 V _{rms} (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage) |
| Designation | Input/supply, DIN rail connector |
| Electrical isolation | 300 V _{rms} (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage) |
| Designation | Output 1/output 2/input, power supply, T connector |
| Electrical isolation | 300 V _{rms} (Rated insulation voltage (surge voltage category III; pollution degree 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage) |
| Conformance | CE-compliant, additionally EN 61326 |
| ATEX | # II 3 G Ex nA nC IIC T4 Gc X |
| UL, USA / Canada | UL applied for |

Safety characteristic data

| | |
|------------------------------|---------------------------------|
| Integrity requirement | IEC 61508 - Low demand |
| Designation | Non-inverted operation |
| Equipment type | Type A |
| Safety Integrity Level (SIL) | Up to 2 |
| Safe Failure Fraction (SFF) | 78 % |
| λ_{SU} | 2.49×10^{-7} (249 FIT) |
| λ_{SD} | 6×10^{-9} (6 FIT) |
| λ_{DU} | 6.4×10^{-8} (64 FIT) |
| λ_{DD} | 7×10^{-9} (7 FIT) |

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Technical data

Safety characteristic data

| | |
|--|--|
| Probability of a hazardous failure on demand (PFD _{AVG}) | 3.09 x 10 ⁻⁴ (1 year) |
| | 6.17 x 10 ⁻⁴ (2 years) |
| | 1.54 x 10 ⁻³ (5 years) |
| Diagnostic coverage (DC) | DC _S = 2.4%, DC _D = 9% |
| Integrity requirement | IEC 61508 - Low demand |
| Designation | Inverted operation |
| Equipment type | Type A |
| Safety Integrity Level (SIL) | Up to 2 |
| Safe Failure Fraction (SFF) | 78 % |
| λ _{SU} | 2.48 x 10 ⁻⁷ (248 FIT) |
| λ _{SD} | 1 x 10 ⁻⁹ (1 FIT) |
| λ _{DU} | 6.2 x 10 ⁻⁸ (62 FIT) |
| λ _{DD} | 6 x 10 ⁻⁹ (6 FIT) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 3.01 x 10 ⁻⁴ (1 year) |
| | 6.02 x 10 ⁻⁴ (2 years) |
| | 1.5 x 10 ⁻³ (5 years) |
| Diagnostic coverage (DC) | DC _S = 0.4%, DC _D = 8% |

Classifications

eCl@ss

| | |
|------------|----------|
| eCl@ss 4.0 | 27210121 |
| eCl@ss 4.1 | 27210121 |
| eCl@ss 5.0 | 27210121 |
| eCl@ss 5.1 | 27210121 |
| eCl@ss 6.0 | 27210121 |
| eCl@ss 7.0 | 27210121 |
| eCl@ss 8.0 | 27210121 |

ETIM

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|----------|----------|
| ETIM 2.0 | EC001430 |
| ETIM 3.0 | EC001599 |
| ETIM 4.0 | EC002653 |
| ETIM 5.0 | EC002653 |

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Classifications

UNSPSC

| | |
|---------------|----------|
| UNSPSC 6.01 | 30211506 |
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11 | 39121008 |
| UNSPSC 12.01 | 39121008 |
| UNSPSC 13.2 | 39121008 |

Approvals

Approvals

Approvals

GL / Functional Safety

Ex Approvals

ATEX

Approvals submitted

Approval details

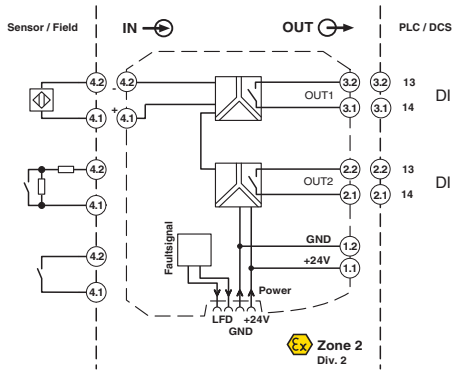
| |
|----|
| GL |
|----|

| |
|-------------------|
| Functional Safety |
|-------------------|

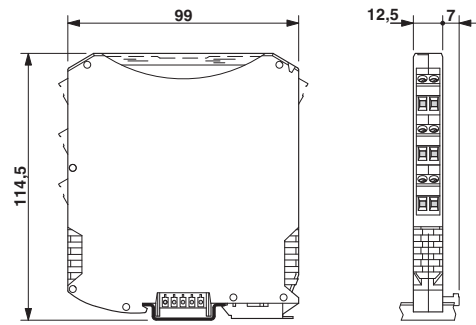
Drawings

Isolation amplifier - MACX MCR-SL-NAM-2RO-SP - 2924265

Block diagram



Dimensioned drawing



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