

788 Power Relays/SPDT, 16 Amp Rating (DC & AC)



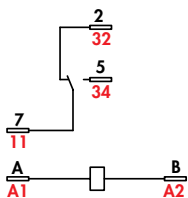
General Specifications

(UL 508)

788XAX

Contact Characteristics		Units	Standard
Number and type of Contacts			SPDT
Contact materials			Silver Alloy
Thermal (Carrying) Current		A	16
Maximum Switching Voltage		V	300
Switching Current @ Voltage	~	Resistive	16A @ 277V 50/60Hz
	~	Resistive	16A @ 120V 50/60Hz
	≡	Resistive	16A @ 28V
		HP	1/3 @ 120VAC
		HP	1/2 @ 240 VAC
		Pilot Duty	B300
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)
Coil Characteristics			
Voltage Range		~	V
		≡	V
Operating Range	% of Nominal	~	6...240, 50/60 Hz
		≡	6...125
		~	85% to 110%
		≡	80% to 110%
Average consumption		~	VA
		≡	W
		~	3
		≡	1.4
Drop-out voltage threshold		~	15%
		≡	10%
Performance Characteristics			
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000
Mechanical Life	Unpowered		5,000,000
Operating time (response time)		ms	20
Dielectric strength	Between coil and contact	~	Vrms
	Between poles	~	Vrms
	Between contacts	~	Vrms
			1500
			1500
			1500
Environment			
Product certifications	Standard version		UL, CSA, CE
Ambient air temperature around the device	Storage	°C	-40...+85
	Operation	°C	-40...+55
Vibration resistance	Operational	g-n	3, 10 - 55 Hz
Shock resistance		g-n	10
Degree of protection			IP 40
Weight		grams	88

788XAX



Wiring Diagram Bottom View

Full Featured Dimensions



Plain Cover Dimensions





Full Featured



Plain Cover

Standard Part Numbers

Nominal Voltage	Coil Resistance	SPDT Part Number (Full Feature) 16 Amp	SPDT Part Number (Plain Cover) 16 Amp
AC Operated			
6 VAC 50/60 Hz	4.2 Ohms	788XAXM4L-6A	788XAXC-6A
12 VAC 50/60 Hz	18 Ohms	788XAXM4L-12A	788XAXC-12A
24 VAC 50/60 Hz	72 Ohms	788XAXM4L-24A	788XAXC-24A
120 VAC 50/60 Hz	1700 Ohms	788XAXM4L-120A	788XAXC-120A
220-240 VAC 50/60 Hz	7200 Ohms	788XAXM4L-220/240A	788XAXC-220/240A
DC Operated			
6 VDC	32 Ohms	788XAXM4L-6D	788XAXC-6D
12 VDC	120 Ohms	788XAXM4L-12D	788XAXC-12D
24 VDC	470 Ohms	788XAXM4L-24D	788XAXC-24D
48 VDC	1800 Ohms	788XAXM4L-48D	788XAXC-48D
110-125 VDC	10000 Ohms	788XAXM4L-110/125D	788XAXC-110/125D

Custom Relay Part Number Builder

788	XAX		C	T	ML-	240A
Series	Contact Config.	Contact Code	Cover Options	Terminal Style	Feature Options	Coil Voltage
788	XAX = SPDT	16 Amp Silver Alloy = No Code	Full Feature = No Code Plain Cover = C	Plug In = No Code PC terminal = T	Side Push Button = M Locking Push Button = M4 Bi-Polar LED = L	VAC = 6 - 240A VDC = 6 - 125D

For other mating sockets, see Section 2: 70-463-1, 70-124-1, 70-124-2, 70-178-1, 70-178-2



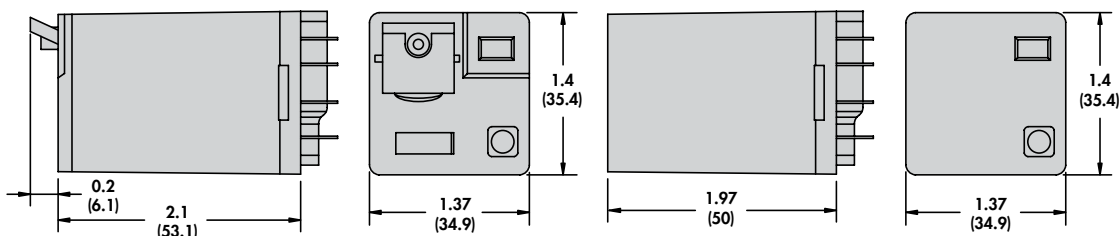
788 Power Relays/SPDT or DPDT, 16 Amp Rating (DC & AC)



General Specifications		(UL 508)	788XBX	788HXX69, 788XHX69
Contact Characteristics		Units	Standard	Standard
Number and type of Contacts			DPDT	SPST-NO-DM, SPDT-DM-DB
Contact materials			Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	16	16
Maximum Switching Voltage		V	300	300
Switching Current @ Voltage		~ Resistive	16A @ 277V 50/60Hz	16A @ 277V 50/60Hz
		~ Resistive	16A @ 120V 50/60Hz	16A @ 120V 50/60Hz
		~ Resistive	16A @ 28V	16A @ 28V
		~ HP	1/3 @ 120VAC	1/3 @ 120VAC
		~ HP	1/2 @ 240 VAC	1/2 @ 240 VAC
		~ Pilot Duty	B300	B300
Current rating with magnetic blowout *(Optional for XBX, Standard for HXX & XHX)		~ A	3 @ 150VDC*	10 @ 150VDC*
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)
Coil Characteristics				
Voltage Range		~ V	6...240, 50/60 Hz	6...240, 50/60 Hz
		~ V	6...125	6...125
Operating Range	% of Nominal	~	85% to 110%	85% to 110%
		~	80% to 110%	80% to 110%
Average consumption		~ VA	3	3
		~ W	1.4	1.4
Drop-out voltage threshold		~	15%	15%
		~	10%	10%
Performance Characteristics				
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000
Mechanical Life	Unpowered		5,000,000	5,000,000
Operating time (response time)		ms	20	20
Dielectric strength	Between coil and contact	~ Vrms	1500	1500
	Between poles	~ Vrms	1500	1500
	Between contacts	~ Vrms	1500	1500
Environment				
Product certifications	Standard version		UL, CSA, CE	UL, CSA, CE
Ambient air temperature around the device	Storage	°C	-40...+85	-40...+85
	Operation	°C	-40...+55	-40...+55
Vibration resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock resistance		g-n	10	10
Degree of protection			IP 40	IP 40
Weight		grams	88	88

Full Featured Dimensions

Plain Cover Dimensions





Full Featured



Plain Cover

Standard Part Numbers

BOLD-FACED PART NUMBERS ARE NORMALLY STOCKED

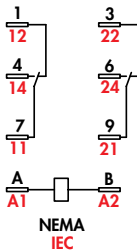
Nominal Voltage	Coil Resistance	DPDT Part Number (Full Feature) 16 Amp	DPDT Part Number (Plain Cover) 16 Amp
AC Operated			
6 VAC 50/60 Hz	4.2 Ohms	788BXM4L-6A	788BXC-6A
12 VAC 50/60 Hz	18 Ohms	788BXM4L-12A	788BXC-12A
24 VAC 50/60 Hz	72 Ohms	788BXM4L-24A	788BXC-24A
120 VAC 50/60 Hz	1700 Ohms	788BXM4L-120A	788BXC-120A
220-240 VAC 50/60 Hz	7200 Ohms	788BXM4L-220/240A	788BXC-220/240A
DC Operated			
6 VDC	32 Ohms	788BXM4L-6D	788BXC-6D
12 VDC	120 Ohms	788BXM4L-12D	788BXC-12D
24 VDC	470 Ohms	788BXM4L-24D	788BXC-24D
48 VDC	1800 Ohms	788BXM4L-48D	788BXC-48D
110-125 VDC	10000 Ohms	788BXM4L-110/125D	788BXC-110/125D

Custom Relay Part Number Builder

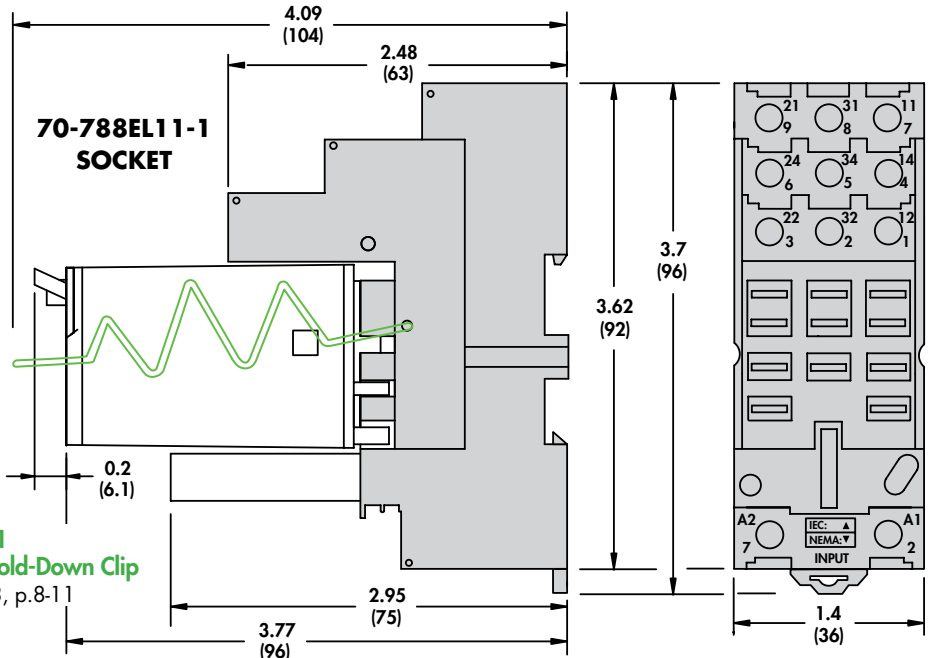
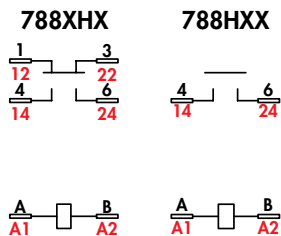
788	XBX	C	T	ML-	240A	
Series	Contact Configuration	DC Switching	Cover Options	Terminal Style	Feature Options	Coil Voltage
788	XBX = DPDT	Magnetic Blowout = 69	Full Feature = No Code	Plug In = No Code	Side Push Button = M	VAC = 6 -240A
	XHX = SPDT-DM-DB	(Optional for XBX,	Plain Cover = C	PC terminal = T	Locking Push Button = M4	VDC = 6 -125D
	HXX = SPST-NO-DM	Standard for HXX & XHX)			Bi-Polar LED = L	

For other mating sockets, see Section 2: 70-463-1, 70-124-1, 70-124-2, 70-178-1, 70-178-2

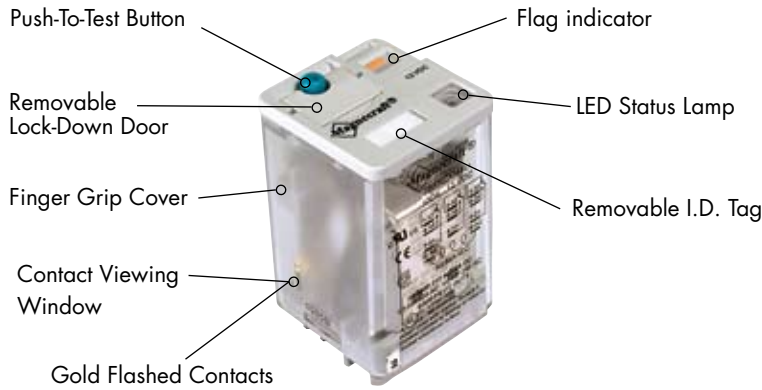
788XBX



Wiring Diagrams
Bottom View



788 Power Relays/3PDT, 16 Amp Rating (DC & AC)



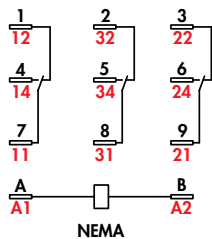
General Specifications

(UL 508)

788XCX

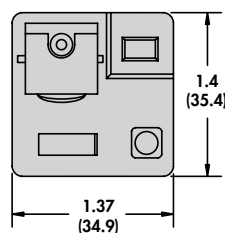
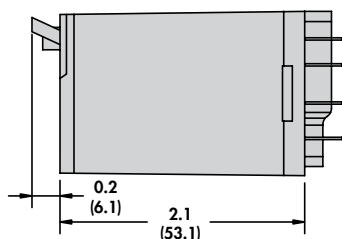
Contact Characteristics		Units	Standard
Number and type of Contacts			3PDT
Contact materials			Silver Alloy
Thermal (Carrying) Current		A	16
Maximum Switching Voltage		V	300
Switching Current @ Voltage	~	Resistive	16A @ 277V 50/60Hz
	~	Resistive	16A @ 120V 50/60Hz
	~	Resistive	16A @ 28V
	~	HP	1/3 @ 120VAC
	~	HP	1/2 @ 240 VAC
	~	Pilot Duty	B300
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)
Coil Characteristics			
Voltage Range	~	V	6...240, 50/60 Hz
	~	V	6...125
Operating Range	% of Nominal	~	85% to 110%
		~	80% to 110%
Average consumption	~	VA	3
	~	W	1.4
Drop-out voltage threshold	~		10%
	~		10%
Performance Characteristics			
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000
Mechanical Life	Unpowered		5,000,000
Operating time (response time)		ms	20
Dielectric strength	Between coil and contact	~	Vrms 1500
	Between poles	~	Vrms 1500
	Between contacts	~	Vrms 1500
Environment			
Product certifications	Standard version		UL, CSA, CE
Ambient air temperature around the device	Storage	°C	-40...+85
	Operation	°C	-40...+55
Vibration resistance	Operational	g-n	3, 10 - 55 Hz
Shock resistance		g-n	10
Degree of protection			IP 40
Weight		grams	88

788XCX

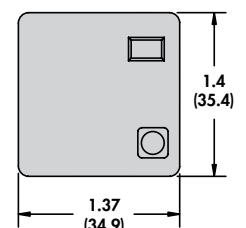
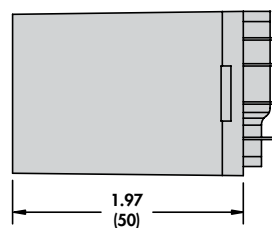


Wiring Diagram
Bottom View

Full Featured Dimensions



Plain Cover Dimensions





Full Featured



Plain Cover

Standard Part Numbers

BOLD-FACED PART NUMBERS ARE NORMALLY STOCKED

Nominal Voltage	Coil Resistance	3PDT Part Number (Full Feature) 16 Amp	3PDT Part Number (Plain Cover) 16 Amp
AC Operated			
6 VAC 50/60 Hz	4.2 Ohms	788XCM4L-6A	788XCXC-6A
12 VAC 50/60 Hz	18 Ohms	788XCM4L-12A	788XCXC-12A
24 VAC 50/60 Hz	72 Ohms	788XCM4L-24A	788XCXC-24A
120 VAC 50/60 Hz	1700 Ohms	788XCM4L-120A	788XCXC-120A
220-240 VAC 50/60 Hz	7200 Ohms	788XCM4L-220/240A	788XCXC-220/240A
DC Operated			
6 VDC	32 Ohms	788XCM4L-6D	788XCXC-6D
12 VDC	120 Ohms	788XCM4L-12D	788XCXC-12D
24 VDC	470 Ohms	788XCM4L-24D	788XCXC-24D
48 VDC	1800 Ohms	788XCM4L-48D	788XCXC-48D
110-125 VDC	10000 Ohms	788XCM4L-110/125D	788XCXC-110/125D

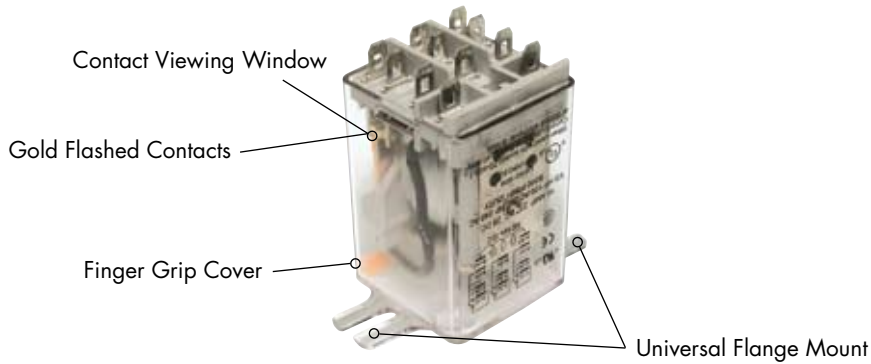
Custom Relay Part Number Builder

Series	Contact Config.	Contact Code	Cover Options	Terminal Style	Feature Options	Coil Voltage
788	XCX		C	T	ML-	240A
788	XCX = 3PDT	16 Amp Silver Alloy = No Code	Full Feature = No Code Plain Cover = C	Plug In = No Code PC terminal = T	Side Push Button = M Locking Push Button = M4 Bi-Polar LED = L	VAC = 6 - 240A VDC = 6 - 125D

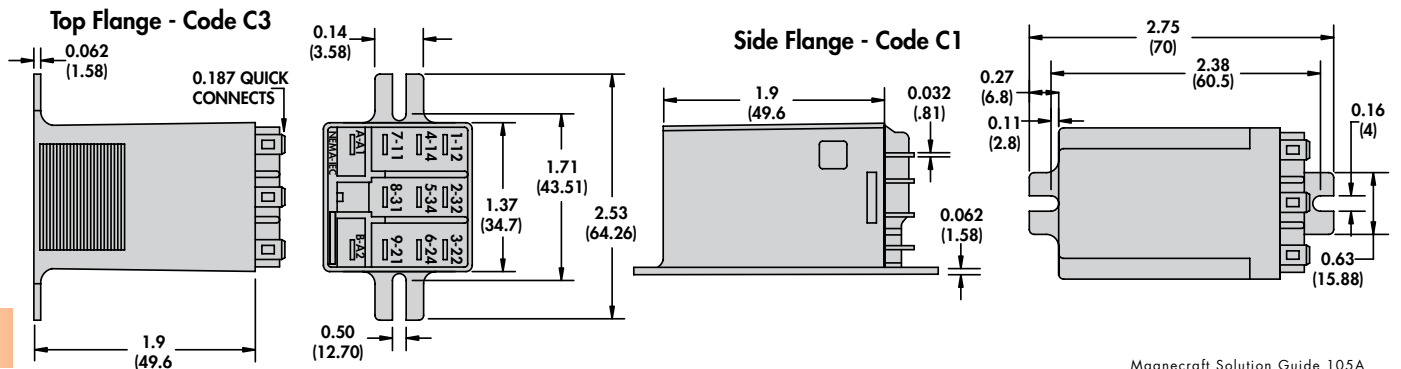
For other mating sockets, see Section 2: 70-463-1, 70-124-1, 70-124-2, 70-178-1, 70-178-2



788 Power Relays – Mounting Solutions/SPDT, DPDT, 3PDT, 16 Amp Rating (DC & AC)



General Specifications		(UL 508)	788XAX	788XBX/XCX
Contact Characteristics		Units	Standard	Standard
Number and type of Contacts			SPDT	DPDT/3PDT
Contact materials			Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	16	16
Maximum Switching Voltage		V	300	300
Switching Current @ Voltage		~ Resistive	16A @ 277V 50/60Hz	16A @ 277V 50/60Hz
		~ Resistive	16A @ 120V 50/60Hz	16A @ 120V 50/60Hz
		~ Resistive	16A @ 28V	16A @ 28V
		~ HP	1/3 @ 120VAC	1/3 @ 120VAC
		~ HP	1/2 @ 240 VAC	1/2 @ 240 VAC
		~ Pilot Duty	B300	B300
Current rating with magnetic blowout - Code 69		~ A		3 @ 150VDC
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)
Coil Characteristics				
Voltage Range		~ V	6....240, 50/60 Hz	6....240, 50/60 Hz
		~ V	6....125	6....125
Operating Range	% of Nominal	~	85% to 110%	85% to 110%
		~	80% to 110%	80% to 110%
Average consumption		~ VA	3	2.0 - 3.0
		~ W	1.4	1.4
Drop-out voltage threshold		~	15%	10%
		~	10%	10%
Performance Characteristics				
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000
Mechanical Life	Unpowered		5,000,000	5,000,000
Operating time (response time)		ms	20	20
Dielectric strength	Between coil and contact	~ Vrms	1500	1500
	Between poles	~ Vrms	1500	1500
	Between contacts	~ Vrms	1500	1500
Environment				
Product certifications	Standard version		UL, CSA, CE	UL, CSA, CE
Ambient air temperature around the device	Storage	°C	-40...+85	-40...+85
	Operation	°C	-40...+55	-40...+55
Vibration resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock resistance		g-n	10	10
Degree of protection			IP 40	IP 40
Weight		grams	88	88





Top Flange



Side Flange



DIN Mount

BOLD-FACED PART NUMBERS ARE NORMALLY STOCKED

Standard Part Numbers

788XAX

788XBX

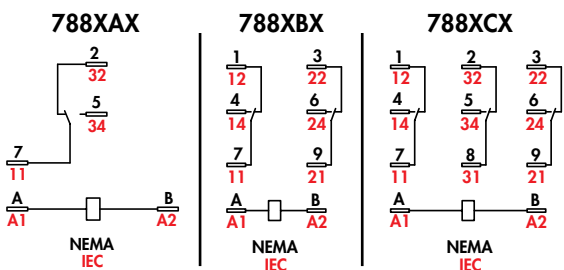
Nominal Voltage	Coil Resistance	SPDT Part Number (Top Flange) 16 Amp	SPDT Part Number (Side Flange) 16 Amp	DPDT Part Number (Top Flange) 16 Amp	DPDT Part Number (Side Flange) 16 Amp
AC Operated					
6 VAC 50/60 Hz	4.2 Ohms	788XAXC3-6A	788XAXC1-6A	788XBXC3-6A	788XBXC1-6A
12 VAC 50/60 Hz	18 Ohms	788XAXC3-12A	788XAXC1-12A	788XBXC3-12A	788XBXC1-12A
24 VAC 50/60 Hz	72 Ohms	788XAXC3-24A	788XAXC1-24A	788XBXC3-24A	788XBXC1-24A
120 VAC 50/60 Hz	1700 Ohms	788XAXC3-120A	788XAXC1-120A	788XBXC3-120A	788XBXC1-120A
220-240 VAC 50/60 Hz	7200 Ohms	788XAXC3-220/240A	788XAXC1-220/240A	788XBXC3-220/240A	788XBXC1-220/240A
DC Operated					
6 VDC	32 Ohms	788XAXC3-6D	788XAXC1-6D	788XBXC3-6D	788XBXC1-6D
12 VDC	120 Ohms	788XAXC3-12D	788XAXC1-12D	788XBXC3-12D	788XBXC1-12D
24 VDC	470 Ohms	788XAXC3-24D	788XAXC1-24D	788XBXC3-24D	788XBXC1-24D
48 VDC	1800 Ohms	788XAXC3-48D	788XAXC1-48D	788XBXC3-48D	788XBXC1-48D
110-125 VDC	10000 Ohms	788XAXC3-110/125D	788XAXC1-110/125D	788XBXC3-110/125D	788XBXC1-110/125D

788XCX

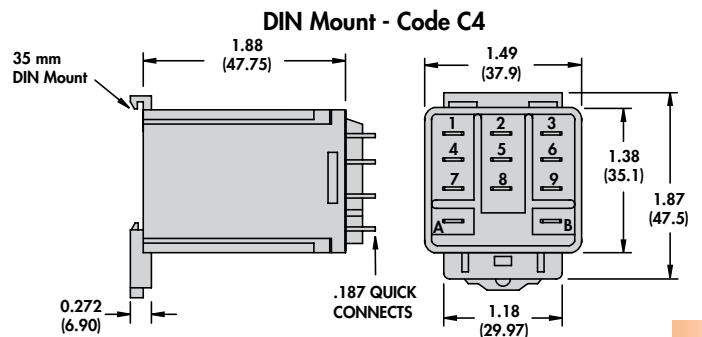
Nominal Voltage	Coil Resistance	3PDT Part Number (Top Flange) 16 Amp	3PDT Part Number (Side Flange) 16 Amp
AC Operated			
6 VAC 50/60 Hz	4.2 Ohms	788XCXC3-6A	788XCXC1-6A
12 VAC 50/60 Hz	18 Ohms	788XCXC3-12A	788XCXC1-12A
24 VAC 50/60 Hz	72 Ohms	788XCXC3-24A	788XCXC1-24A
120 VAC 50/60 Hz	1700 Ohms	788XCXC3-120A	788XCXC1-120A
220-240 VAC 50/60 Hz	7200 Ohms	788XCXC3-220/240A	788XCXC1-220/240A
DC Operated			
6 VDC	32 Ohms	788XCXC3-6D	788XCXC1-6D
12 VDC	120 Ohms	788XCXC3-12D	788XCXC1-12D
24 VDC	470 Ohms	788XCXC3-24D	788XCXC1-24D
48 VDC	1800 Ohms	788XCXC3-48D	788XCXC1-48D
110-125 VDC	10000 Ohms	788XCXC3-110/125D	788XCXC1-110/125D

Custom Relay Part Number Builder

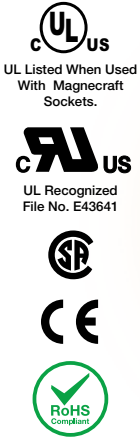
Series	Contact Config.	Contact Code	Cover Options	Feature Options	Coil Voltage
788	XAX = SPDT	16 Amp Silver Alloy = No Code	Side Flange = C1	Side Push Button = M	VAC = 6 - 240A
	XBX = DPDT		Top Flange = C3	Bi-Polar LED = L	VDC = 6 - 125D
	XCX = 3PDT		DIN Mount = C4		



**Wiring Diagrams
Bottom View**



788V Power Relays/DPST and 3PST, 16 Amp Rating (DC and AC), 3mm Spacing



Benefits of the 3mm Contact Gap Design:

- High Dielectric Strength Across Contacts.
- Improved Arc Quenching When Breaking High Current Loads.
- Meets European Spacing Requirements of 8mm Across Surfaces.



General Specifications

(UL 508)

788VBXX, CXX

Contact Characteristics		Units	Standard
Number and type of Contacts			DPST, 3PST (N.O.)
Contact materials			Silver Alloy
Thermal (Carrying) Current		A	16
Maximum Switching Voltage		V	300
Switching Current @ Voltage	~	Resistive	16A @ 277V 50/60Hz
	~	Resistive	16A @ 120V 50/60Hz
	≡	Resistive	16A @ 28V
		HP	1/3 @ 120VAC
		HP	1/2 @ 240 VAC
		Pilot Duty	B300
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)
Coil Characteristics			
Voltage Range	~	V	6...240, 50/60 Hz
	≡	V	6...125
Operating Range	% of Nominal	~	85% to 110%
		≡	80% to 110%
Average consumption	~	VA	2.0 - 3.0
	≡	W	1.4
Drop-out voltage threshold	~		10%
	≡		10%
Performance Characteristics			
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000
Mechanical Life	Unpowered		5,000,000
Operating time (response time)		ms	20
Dielectric strength	Between coil and contact	~	Vrms
	Between poles	~	Vrms
	Between contacts	~	Vrms
			4000
			2000
			1500
Environment			
Product certifications	Standard version		UL, CSA, CE
Ambient air temperature around the device	Storage	°C	-40...+85
	Operation	°C	-40...+55
Vibration resistance	Operational	g-n	3, 10 - 55 Hz
Shock resistance		g-n	10
Degree of protection			IP 40
Weight		grams	88

Full Featured Dimensions



Plain Cover Dimensions





Full Featured



Plain Cover

Standard Part Numbers

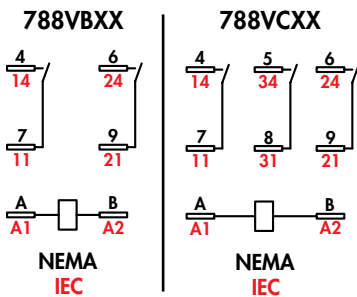
Nominal Voltage AC Operated	Coil Resistance	DPST Part Number (Full Feature)	DPST Part Number (Plain Cover)	DPST Superceding (Plain Cover)
6 VAC 50/60 Hz	4.2 Ohms	788VBXXM4L-6A	788VBXXC-6A	388VBXXC-6A
12 VAC 50/60 Hz	18 Ohms	788VBXXM4L-12A	788VBXXC-12A	388VBXXC-12A
24 VAC 50/60 Hz	72 Ohms	788VBXXM4L-24A	788VBXXC-24A	388VBXXC-24A
120 VAC 50/60 Hz	1700 Ohms	788VBXXM4L-120A	788VBXXC-120A	388VBXXC-120A
220-240 VAC 50/60 Hz	7200 Ohms	788VBXXM4L-220/240A	788VBXXC-220/240A	388VBXXC-220/240A
DC Operated				
6 VDC	32 Ohms	788VBXXM4L-6D	788VBXXC-6D	388VBXXC-6D
12 VDC	120 Ohms	788VBXXM4L-12D	788VBXXC-12D	388VBXXC-12D
24 VDC	470 Ohms	788VBXXM4L-24D	788VBXXC-24D	388VBXXC-24D
48 VDC	1800 Ohms	788VBXXM4L-48D	788VBXXC-48D	388VBXXC-48D
110-125VDC	10000 Ohms	788VBXXM4L-110/125D	788VBXXC-110/125D	388VBXXC-110/125D

Nominal Voltage AC Operated	Coil Resistance	3PST Part Number (Full Feature)	3PST Part Number (Plain Cover)	3PST Superceding (Plain Cover)
6 VAC 50/60 Hz	4.2 Ohms	788VCXXM4L-6A	788VCXXC-6A	388VCXXC-6A
12 VAC 50/60 Hz	18 Ohms	788VCXXM4L-12A	788VCXXC-12A	388VCXXC-12A
24 VAC 50/60 Hz	72 Ohms	788VCXXM4L-24A	788VCXXC-24A	388VCXXC-24A
120 VAC 50/60 Hz	1700 Ohms	788VCXXM4L-120A	788VCXXC-120A	388VCXXC-120A
220-240 VAC 50/60 Hz	7200 Ohms	788VCXXM4L-220/240A	788VCXXC-220/240A	388VCXXC-220/240A
DC Operated				
6 VDC	32 Ohms	788VCXXM4L-6D	788VCXXC-6D	388VCXXC-6D
12 VDC	120 Ohms	788VCXXM4L-12D	788VCXXC-12D	388VCXXC-12D
24 VDC	470 Ohms	788VCXXM4L-24D	788VCXXC-24D	388VCXXC-24D
48 VDC	1800 Ohms	788VCXXM4L-48D	788VCXXC-48D	388VCXXC-48D
110-125VDC	10000 Ohms	788VCXXM4L-110/125D	788VCXXC-110/125D	388VCXXC-110/125D

Custom Relay Part Number Builder

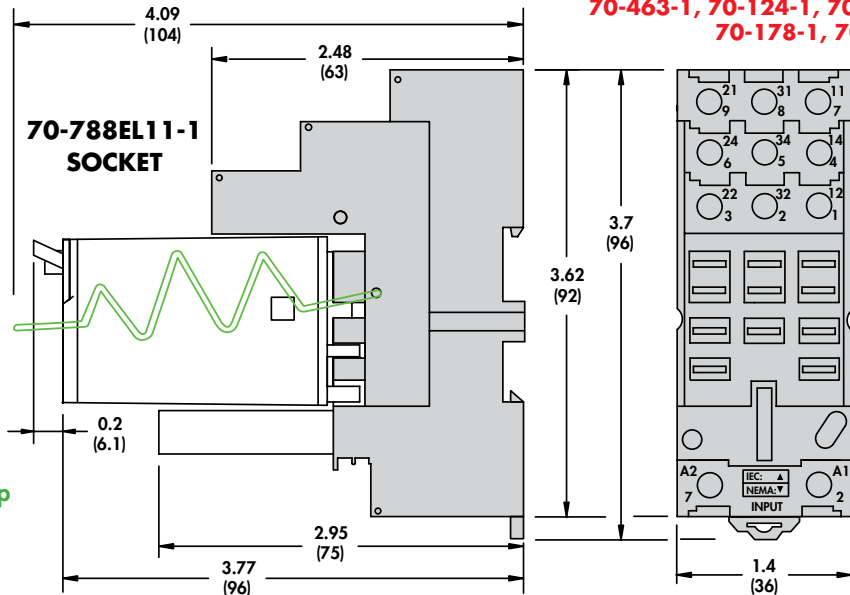
Series	Contact Configuration	Cover Options	Terminal Style	Feature Options	Coil Voltage
788V	BXX = DPST-NO CXX = 3PST-NO	Full Feature = No Code Plain Cover = C Side Flange = C1 Top Flange = C3	Plug In = No Code PC terminal = T	Side Push Button = M Locking Push Button = M4 Bi-Polar LED = L	240A VAC = 6 - 240A VDC = 6 - 125D

Other mating sockets see Section 2:
70-463-1, 70-124-1, 70-124-2,
70-178-1, 70-178-2



Relay Wiring Diagram
Bottom View

16-1351
Metal Hold-Down Clip
Section 3, p.8-11



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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