

# ProSense® Voltage Monitor Relays

## Overview

Voltage monitor relays monitor AC single-phase (50-60 Hz) or DC voltages to protect equipment from fault conditions. No separate supply is required since each unit is powered by monitored voltage.

ProSense® offers two styles of Voltage Monitor Relays:

**Over/Under Voltage Relays** - provides protection to equipment where either an over or under voltage condition is potentially damaging. They are designed to energize when monitored voltage reaches a preset value ( $U_{max}$ ) and drop-out when the monitored voltage drops to a level below the preset value ( $U_{min}$ ).

**Voltage Band Relays** - provides protection to equipment that is required to operate within an upper and lower voltage limit. As long as the monitored voltage remains within an OVER ( $U_{max}$ ) and UNDER voltage ( $U_{min}$ ) range, the internal relay stays energized. If the monitored voltage falls outside this range, the relay will drop-out.

## Features

- Monitors AC single-phase and DC voltages
- True RMS voltage measurement ensures more accurate sensing
- Wide range of user adjustable pick-up voltages
- 8-pin socket mount
- LED indicates output relay status



VMR-2C-F-120A



VMR-2C-A-120A



VMR-2C-B-120A

## Technical Specifications

Part Number	VMR-xC-F-xxx	VMR-xC-A-xxx	VMR-xC-B-xxx
<b>Input Voltage Range</b>	See selection table on the following page		
<b>Voltage Tolerance</b>	±50% of nominal AC (50-60Hz, ±5%) or DC voltage No separate input voltage required since unit is powered by monitored voltage.		
<b>Load Burden</b>	Less than 2VA (12-120V); 30VA (240V & 480V)		
<b>Undervoltage</b>	Fixed at 95% of pick-up setting	Adjustable from 75-95% of pick-up setting	75-95% of over/under voltage setting
<b>Overvoltage</b>	Across full range as shown in the product selection table		
<b>Setting Accuracy</b>	Maximum setting (adjustable): +5%, -0% Minimum setting (adjustable): +0%, -50% Fixed Voltage Setting: ±2%		
<b>Repeatability</b>	<1 %		
<b>Sensing Accuracy</b>	Constant conditions within specifications: ±2% Variable conditions within specifications: ±5% (percent base on nominal voltage)		
<b>Temperature</b>	Operating: -28 to 65°C [-18 to 149°F] Storage: -40 to 85°C [-40 to 185°F]		
<b>Indicator LED</b>	Red when relay is energized Green when relay is off		
<b>Response Times</b>	Restart: 1 second (240 & 480V only) Pick-up: 0.5 seconds Drop-out (t): 0.5 seconds (VMR-xC-F-xxx); Adjustable 0.1 - 10 seconds (VMR-xC-A-xxx)		Restart: 1 second (240 & 480V only) Pick-up: 0.5 seconds Drop-out (t): Adjustable 0.1 - 10 seconds
<b>Output Contacts</b>	(All except VMR-1C-x-240A): 10A @ 240 VAC, 7A @ 30 VDC, 1/4HP @ 120/240 VAC, C300 (VMR-1C-x-240A): 5A @ 277 VAC, 5A @ 30 VDC, 1/3HP @ 120/240 VAC, B300 Pilot Duty		10A @ 240 VAC, 7A @ 30 VDC, 1/4HP @ 120/240 VAC, C300
<b>Life</b>	Mechanical: 10,000,000 operations; Full Load: 100,000 operations		
<b>Wire Size</b>	12-22 AWG		
<b>Tightening Torque</b>	12 in•lbs		
<b>Protection Rating</b>	IP20		
<b>Reset</b>	Automatic		
<b>Transient Protection</b>	2000V per IEC 61000-4-5 Level 3 (±2kV)		
<b>Weight (lb)</b>	0.2	0.2	0.2
<b>Agency Approvals</b>	cURus, CE, (cULus when used with socket 70169-D)		

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1-phase Voltage Monitor Relays Selection Table							
Part Number	Price	Input Voltage	Relay Configuration	Contact Rating	Protection Type	Diagram	Drawing Link
<a href="#"><u>VMR-2C-F-120A</u></a>	\$74.00	90-150 VAC	DPDT	10A	overvoltage undervoltage fixed drop-out	213	<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-A-120A</u></a>	\$74.00	90-150 VAC	DPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-B-120A</u></a>	\$74.00	90-150 VAC	DPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-F-240A</u></a>	\$86.00	180-300 VAC	SPDT	10A	overvoltage undervoltage fixed drop-out	150	<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-A-240A</u></a>	\$86.00	180-300 VAC	SPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-B-240A</u></a>	\$86.00	180-300 VAC	SPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-F-480A *</u></a>	\$86.00	360-600 VAC	SPDT	10A	overvoltage undervoltage fixed drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-A-480A *</u></a>	\$86.00	360-600 VAC	SPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-1C-B-480A *</u></a>	\$74.00	360-600 VAC	SPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-F-12D</u></a>	\$74.00	9-15 VDC	DPDT	10A	overvoltage undervoltage fixed drop-out	214	<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-A-12D</u></a>	\$74.00	9-15 VDC	DPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-B-12D</u></a>	\$74.00	9-15 VDC	DPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-F-24D</u></a>	\$74.00	18-30 VDC	DPDT	10A	overvoltage undervoltage fixed drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-A-24D</u></a>	\$74.00	18-30 VDC	DPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-B-24D</u></a>	\$74.00	18-30 VDC	DPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-F-48D</u></a>	\$74.00	36-60 VDC	DPDT	10A	overvoltage undervoltage fixed drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-A-48D</u></a>	\$74.00	36-60 VDC	DPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-B-48D</u></a>	\$74.00	36-60 VDC	DPDT	10A	voltage band		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-F-110D</u></a>	\$74.00	83-138 VDC	DPDT	10A	overvoltage undervoltage fixed drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-A-110D</u></a>	\$74.00	83-138 VDC	DPDT	10A	overvoltage undervoltage adjustable drop-out		<a href="#"><u>PDF</u></a>
<a href="#"><u>VMR-2C-B-110D</u></a>	\$74.00	83-138 VDC	DPDT	10A	voltage band		<a href="#"><u>PDF</u></a>

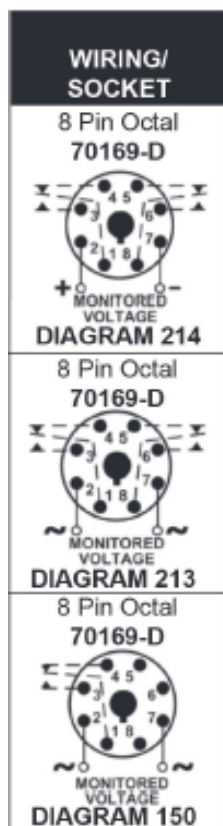
\* VMR-1C-x-480A requires part number [70169-D](#), (purchase separately).

# prosense® Voltage Monitor Relays

## Function Chart

Catalog Number	Operation	Function Chart
<b>VMR-2C-F-12D</b> <b>VMR-2C-F-24D</b> <b>VMR-2C-F-48D</b> <b>VMR-2C-F-110D</b> <b>VMR-2C-F-120A</b> <b>VMR-1C-F-240A</b> <b>VMR-1C-F-480A</b>	Adjust the pick-up voltage setting ( $U_{max}$ ) between the full range as shown on the product nameplate. The drop-out voltage setting ( $U_{min}$ ) is fixed at 95% of the pick-up setting. The relay energizes (and the LED is Red) when the monitored voltage is above the pick-up setting for a period longer than the fixed pick-up time delay of 0.5 seconds. The relay de-energizes (and the LED is Green) when the monitored voltage is below the drop-out setting for a period longer than the drop-out time delay ( $t$ ) of 0.5 seconds.	<p>Monitored Voltage: Pick-Up Voltage (<math>U_{max}</math>), Drop-out Voltage (<math>U_{min}</math>)</p> <p>Relay Output: On, Off</p> <p>Time delay <math>t</math> is shown for both pick-up and drop-out.</p>
<b>VMR-2C-A-12D</b> <b>VMR-2C-A-24S</b> <b>VMR-2C-A-48D</b> <b>VMR-2C-A-110D</b> <b>VMR-2C-A-120A</b> <b>VMR-1C-A-240A</b> <b>VMR-1C-A-480A</b>	Adjust the pick-up voltage setting ( $U_{max}$ ) between the full range as shown on the product nameplate. Then adjust the drop-out voltage setting ( $U_{min}$ ) between 75% and 95% of the pick-up setting. The relay energizes (and the LED is Red) when the monitored voltage is above the pick-up setting for a period longer than the fixed pick-up time delay of 0.5 seconds. The relay de-energizes (and the LED is Green) when the monitored voltage is below the drop-out setting for a period longer than the drop-out time delay ( $t$ ), which is adjustable between 0.1-10 seconds.	<p>Monitored Voltage: Over Voltage (<math>U_{max}</math>), Under Voltage (<math>U_{min}</math>)</p> <p>Relay Output: On, Off</p> <p>Hysteresis is indicated between <math>U_{max}</math> and <math>U_{min}</math>. Time delay <math>t</math> is shown for both pick-up and drop-out.</p>
<b>VMR-2C-B-12D</b> <b>VMR-2C-B-24D</b> <b>VMR-2C-B-48D</b> <b>VMR-2C-B-110D</b> <b>VMR-2C-B-120A</b> <b>VMR-1C-B-240A</b> <b>VMR-1C-B-480A</b>	Adjust the over voltage setting ( $U_{max}$ ) between the full range as shown on the product nameplate. Adjust the under voltage setting ( $U_{min}$ ) between 75% and 95% of the over voltage setting. The relay energizes (and the LED is Red) when the monitored voltage is between the over and under voltage settings for a period longer than the drop-out time delay ( $t$ ), which is adjustable from 0.1-10 seconds. The relay re-energizes when the monitored voltage returns to a value between the over and under voltage settings for a period longer than the pick-up time delay, which is fixed at 0.5 seconds.	<p>Monitored Voltage: Over Voltage (<math>U_{max}</math>), Under Voltage (<math>U_{min}</math>)</p> <p>Relay Output: On, Off</p> <p>Hysteresis is indicated between <math>U_{max}</math> and <math>U_{min}</math>. Time delay <math>t</math> is shown for both pick-up and drop-out.</p>

## Wiring Diagram



# prosense® Octal Sockets

## Features

- Mounts on 35mm DIN rail
- Screw clamp wire termination



**70169-D**



**70170-D**



**750-2C-SKT**

## Octal Sockets for Relays

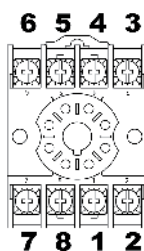
Part Number	Price	Description	Qty	Wt (lb)	Drawing Links
<b><u>70169-D</u></b>	\$5.50	Macromatic relay socket, 8-pin, 35mm DIN rail or panel mount. For use with ProSense octal relays.	1	0.1	<a href="#">PDF</a>
<b><u>70170-D</u></b>	\$6.50	Macromatic relay socket, 11-pin, 35mm DIN rail or panel mount. For use with ProSense octal relays.	1	0.1	<a href="#">PDF</a>
<b><u>750-2C-SKT</u></b>	\$4.75	AutomationDirect relay socket, 8-pin, 35mm DIN rail or panel mount. For use with 750-2C and H750-2C series octal relays.	1	0.1	<a href="#">PDF</a>

## Octal Sockets Specifications

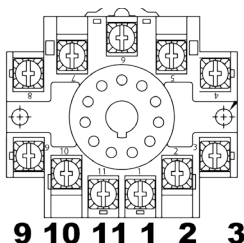
Part Number	Number of Pins	Voltage	Current	Screw Size	Wire Size (capacity)	Screw Torque	Screw Chassis Mounting Torque	Agency Approval *
<b><u>70169-D</u></b>	8	600V	10A	6-32	1 or 2, 12-20 AWG	12 in-lb	7 in-lb	UL Recognized E169693, CSA, CE
<b><u>70170-D</u></b>	11	300V	10A	6-32	1 or 2, 12-20 AWG	12 in-lb	12 in-lb	
<b><u>750-2C-SKT</u></b>	8	600V	5A	M3.5	1-12 AWG / 1-14 AWG	9 in-lb	7 in-lb	UL Recognized E225080, CSA, CE

\* To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.

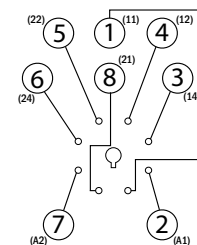
## Socket Pinouts



**70169-D**



**70170-D**



**750-2C-SKT**