

# 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<br>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%<br>Minimum setting (adjustable): +0%, -50% Fixed Voltage Setting: ±2%                                                          |                                           |                                                                                                          |
| <b>Repeatability</b>        | <1 %                                                                                                                                                                  |                                           |                                                                                                          |
| <b>Sensing Accuracy</b>     | Constant conditions within specifications: ±2%<br>Variable conditions within specifications: ±5% (percent base on nominal voltage)                                    |                                           |                                                                                                          |
| <b>Temperature</b>          | Operating: -28 to 65°C [-18 to 149°F]<br>Storage: -40 to 85°C [-40 to 185°F]                                                                                          |                                           |                                                                                                          |
| <b>Indicator LED</b>        | Red when relay is energized<br>Green when relay is off                                                                                                                |                                           |                                                                                                          |
| <b>Response Times</b>       | Restart: 1 second (240 & 480V only)<br>Pick-up: 0.5 seconds<br>Drop-out (t): 0.5 seconds (VMR-xC-F-xxx);<br>Adjustable 0.1 - 10 seconds (VMR-xC-A-xxx)                |                                           | Restart: 1 second (240 & 480V only)<br>Pick-up: 0.5 seconds<br>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<br>(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>           | \$68.00 | 90-150 VAC    | DPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      | 213     | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-A-120A</u></a>           | \$68.00 | 90-150 VAC    | DPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-B-120A</u></a>           | \$68.00 | 90-150 VAC    | DPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-F-240A</u></a>           | \$79.00 | 180-300 VAC   | SPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      | 150     | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-A-240A</u></a>           | \$79.00 | 180-300 VAC   | SPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-B-240A</u></a>           | \$79.00 | 180-300 VAC   | SPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-F-480A *</u></a>         | \$79.00 | 360-600 VAC   | SPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-A-480A *</u></a>         | \$79.00 | 360-600 VAC   | SPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-1C-B-480A *</u></a>         | \$68.00 | 360-600 VAC   | SPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-F-12D</u></a>            | \$68.00 | 9-15 VDC      | DPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      | 214     | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-A-12D</u></a>            | \$68.00 | 9-15 VDC      | DPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-B-12D</u></a>            | \$68.00 | 9-15 VDC      | DPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-F-24D</u></a>            | \$68.00 | 18-30 VDC     | DPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-A-24D</u></a>            | \$68.00 | 18-30 VDC     | DPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-B-24D</u></a>            | \$68.00 | 18-30 VDC     | DPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-F-48D</u></a>            | \$68.00 | 36-60 VDC     | DPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-A-48D</u></a>            | \$68.00 | 36-60 VDC     | DPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-B-48D</u></a>            | \$68.00 | 36-60 VDC     | DPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-F-110D</u></a>           | \$68.00 | 83-138 VDC    | DPDT                | 10A            | overvoltage<br>undervoltage<br>fixed drop-out      |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-A-110D</u></a>           | \$68.00 | 83-138 VDC    | DPDT                | 10A            | overvoltage<br>undervoltage<br>adjustable drop-out |         | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>VMR-2C-B-110D</u></a>           | \$68.00 | 83-138 VDC    | DPDT                | 10A            | voltage band                                       |         | <a href="#"><u>PDF</u></a> |

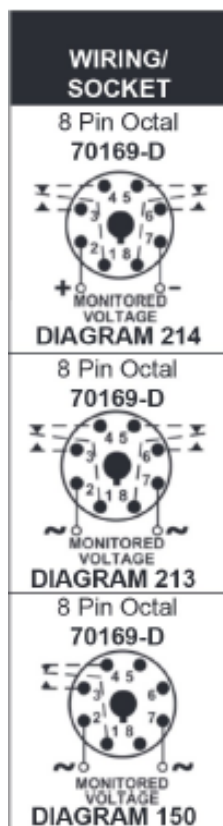
\* VMR-1C-x-480A requires part number [70169-D](#), (purchase separately).

# prosense® Voltage Monitor Relays

## Function Chart

| Catalog Number                                                                                                                                                    | Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Function Chart |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>VMR-2C-F-12D</b><br><b>VMR-2C-F-24D</b><br><b>VMR-2C-F-48D</b><br><b>VMR-2C-F-110D</b><br><b>VMR-2C-F-120A</b><br><b>VMR-1C-F-240A</b><br><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.                                                                           |                |
| <b>VMR-2C-A-12D</b><br><b>VMR-2C-A-24S</b><br><b>VMR-2C-A-48D</b><br><b>VMR-2C-A-110D</b><br><b>VMR-2C-A-120A</b><br><b>VMR-1C-A-240A</b><br><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.                              |                |
| <b>VMR-2C-B-12D</b><br><b>VMR-2C-B-24D</b><br><b>VMR-2C-B-48D</b><br><b>VMR-2C-B-110D</b><br><b>VMR-2C-B-120A</b><br><b>VMR-1C-B-240A</b><br><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. |                |

## 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

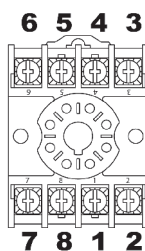
| Part Number              | Price  | Description                                                                                                              | Qty | Wt (lb) | Drawing Links       |
|--------------------------|--------|--------------------------------------------------------------------------------------------------------------------------|-----|---------|---------------------|
| <b><u>70169-D</u></b>    | \$5.25 | 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>    | \$6.25 | 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

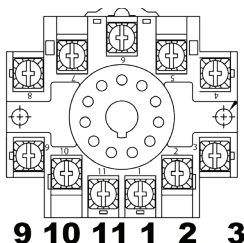
| Part Number              | Number of Pins | Voltage | Current | Screw Size | Wire Size (capacity) | Screw Torque | Screw Chassis Mounting Torque | Agency Approval *              |
|--------------------------|----------------|---------|---------|------------|----------------------|--------------|-------------------------------|--------------------------------|
| <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.

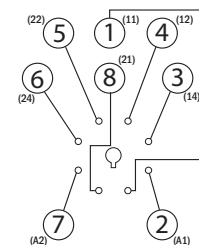
## Socket Pinouts



**70169-D**



**70170-D**



**750-2C-SKT**