

# VOLTAGE MONITOR RELAYS

## VM Series Over/Under voltage

Fixed Time Delay on Drop-Out  
12-120V Plug-In



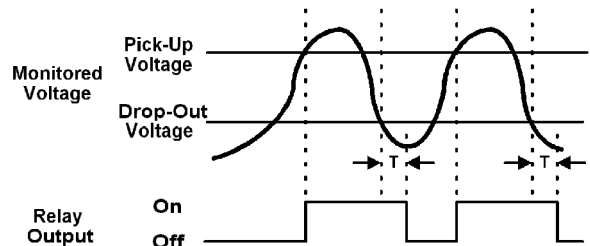
- Monitors AC single phase and DC voltages
- Wide range of user-adjustable pick-up and drop-out settings
- Fixed time delay on drop-out of 500ms
- LED indicates output relay status
- Compact plug-in case utilizing industry standard 8 pin octal socket
- 10A DPDT output contacts



(with appropriate socket)

Over/Under Voltage Relays provide protection to equipment where either an over or under voltage condition is potentially damaging. They are designed to operate when the operating voltage reaches a preset value and drop-out when the operating voltage drops to a level below the preset value.

The pick-up voltage setting is user-adjustable from 85-115% of the nominal voltage rating. As standard, the VMP Series has a drop-out voltage setting fixed at 95% of the pick-up voltage setting. An adjustable drop-out setting of 75-95% of the pick-up setting is available on the VMKP Series. The relay energizes when the monitored voltage is above the pick-up setting. The relay de-energizes when the monitored voltage is below the drop-out setting for a period longer than the drop-out time delay (T), which is a fixed 500ms for VM Series products. An adjustable time delay on drop-out of 0.5-10 seconds is available (see Page 30).



### Adjustable Pick-Up, Fixed Drop-Out Settings \* Time Delay on Drop-out Fixed at 500ms

| NOMINAL VOLTAGE                       | PICK-UP VOLTAGE RANGE                             | DROP-OUT VOLTAGE RANGE*                          | PRODUCT NUMBER                           | WIRING/SOCKET |
|---------------------------------------|---|--|--|---------------|
| 24V AC<br>120V AC                     | 21-27V AC<br>102-138V AC                          | 20-26V AC<br>97-131V AC                          | VMP024A<br>VMP120A                       |               |
| 12V DC<br>24V DC<br>48V DC<br>110V DC | 10-14V DC<br>21-27V DC<br>41-55V DC<br>94-126V DC | 9-13V DC<br>20-26V DC<br>39-52V DC<br>89-121V DC | VMP012D<br>VMP024D<br>VMP048D<br>VMP110D |               |

\* Drop-out Voltage is fixed at 95% of the adjusted Pick-up Setting.

### Adjustable Pick-Up & Drop-Out Settings \*\* Time Delay on Drop-out Fixed at 500ms

| NOMINAL VOLTAGE                       | PICK-UP VOLTAGE RANGE                             | DROP-OUT VOLTAGE RANGE                           | PRODUCT NUMBER                               | WIRING/SOCKET |
|---------------------------------------|---|--|--|---------------|
| 24V AC<br>120V AC                     | 21-27V AC<br>102-138V AC                          | 16-26V AC<br>77-131V AC                          | VMKP024A<br>VMKP120A                         |               |
| 12V DC<br>24V DC<br>48V DC<br>110V DC | 10-14V DC<br>21-27V DC<br>41-55V DC<br>94-126V DC | 8-13V DC<br>16-26V DC<br>32-52V DC<br>71-121V DC | VMKP012D<br>VMKP024D<br>VMKP048D<br>VMKP110D |               |

\*\* Drop-out Voltage is adjustable from 75-95% of the adjusted Pick-up Setting.



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# VOLTAGE MONITOR RELAYS

## VM Series Over/Undervoltage

Fixed Time Delay on Drop-Out

12-120V Plug-In

Application Data & Dimensions

### Operating Modes

These relays can be used as either overvoltage or undervoltage relays, depending on the output contact used:

#### **Overvoltage Relay**

Provides protection to equipment that cannot handle excess voltages. Uses a normally closed contact (N.C.). As long as the monitored voltage remains below the maximum voltage the equipment can withstand (Pick-Up Setting), the relay remains de-energized and the N.C. contact remains closed, keeping the load energized. If the operating voltage increases beyond the maximum rating of the equipment, the relay energizes and the N.C. contact opens, turning off the load. When the voltage falls below the Drop-Out Setting (hysteresis), the relay de-energizes and the N.C. contact re-closes, turning on the load.

#### **Undervoltage Relay**

Provides protection to equipment that is required to operate above a certain minimum voltage. Uses a normally open contact (N.O.). As long as the monitored voltage is above the minimum value required (Pick-Up Setting), the relay will energize and the N.O. contact closes, turning on the load. If the voltage drops below the Drop-out Setting (the minimum voltage required minus the hysteresis), the relay will de-energize and the N.O. contact will re-open, turning off the load.

### Application Data

#### **Voltage Tolerance:**

+25%/-50% of nominal voltage; AC voltages are 50-60Hz;  
No separate supply (input) voltage is required.

**Load (Burden):** Less than 3VA

#### **Voltage Settings:**

Pick-up: Adjustable from 85-115% of nominal voltage  
Drop-out: Fixed at 95% of the pick-up setting

#### **Temperature:**

-28° to 55° C (-20° to 131° F)

#### **Output Contacts:**

10A @ 240V AC/30V DC, 1/2HP @ 120/240V AC (N.O.),  
1/3HP @ 120/240V AC (N.C.)

#### **Life:**

Mechanical: 10,000,000 operations  
Full Load: 100,000 operations

#### **Response Times:**

Operate: 500ms

Release: Fixed 500 ms

**Indicator LED:** Red Steady when Relay is energized; Green when Relay is Off.

#### **Transient Protection:**

10,000 volts for 20 microseconds

**Reset:** Automatic. Contact Macromatic for information on units with Manual Reset.

#### **Approvals:**

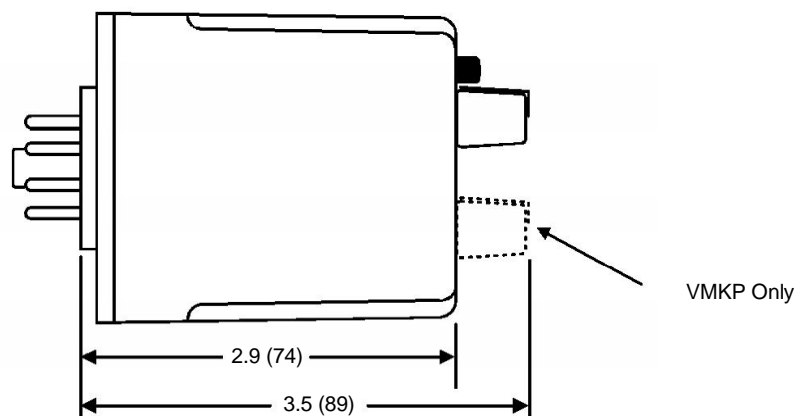
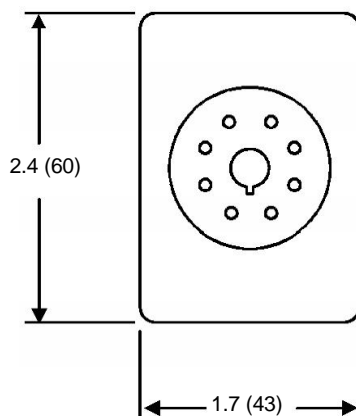


Low Voltage & EMC Directives  
EN60947-1, EN60947-5-1



with appropriate socket  
File #E109466

### Dimensions



All Dimensions in  
Inches (Millimeters)