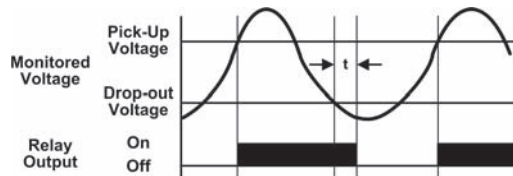


# OVER/UNDER VOLTAGE | FIXED TIME DELAY ON DROP-OUT

## 12-120V | VM SERIES

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. If an adjustable time delay on drop-out is required, see VAP/VAKP Series.



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

NOMINAL VOLTAGE	PICK-UP VOLTAGE RANGE	DROP-OUT VOLTAGE RANGE*	PRODUCT NUMBER	WIRING/SOCKET
24V AC 120V AC	21-27V AC 102-138V AC	20-26V AC 97-131V AC	VMP024A VMP120A	8 Pin Octal <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 20</b>
12V DC 24V DC 48V DC 110V DC	10-14V DC 21-27V DC 41-55V DC 94-126V DC	9-13V DC 20-26V DC 39-52V DC 89-121V DC	VMP012D VMP024D VMP048D 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 120V AC	21-27V AC 102-138V AC	16-26V AC 77-131V AC	VMKP024A VMKP120A	8 Pin Octal <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 20</b>
12V DC 24V DC 48V DC 110V DC	10-14V DC 21-27V DC 41-55V DC 94-126V DC	8-13V DC 16-26V DC 32-52V DC 71-121V DC	VMKP012D VMKP024D VMKP048D VMKP110D	

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

Sockets & Accessories available



- ◆ 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



**UL LISTED**  
(with appropriate socket)



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[SALES@MACROMATIC.COM](mailto:SALES@MACROMATIC.COM)

# OVER/UNDER VOLTAGE

12-120V | VM & VA SERIES

## 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 pick-up setting (VMP & VAP)  
Adjustable from 75-95% of pick-up setting (VMKP & VAKP)

**Temperature:** Operating: -28° to 55°C (-18° to 131°F)  
Storage: -40° to 85°C (-40° to 185°F)

### **Output Contacts:**

10A @ 240V AC/30V DC, 1/2HP @ 120/240V AC (N.O.),  
1/3HP @ 120/240V AC (N.C.) B300

### **Life:**

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

### **Response Times:**

Operate: 500ms  
Release: 500ms (VMP & VMKP Series);  
Adjustable 0.5 - 10 Seconds (VAK & VAKP Series)

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

### **Transient Protection:**

10,000 volts for 20 microseconds

**Reset:** Automatic

### **Approvals:**



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

IND. CONT. EQUIP  
5007  
with  
appropriate  
socket  
File #E109466

## DIMENSIONS

