

# VOLTAGE MONITOR RELAYS

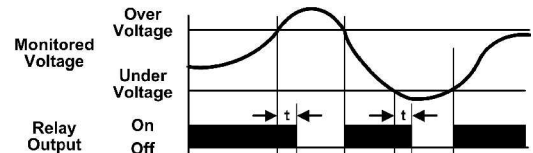
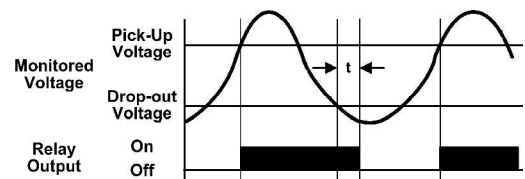
## PRODUCT SUMMARY



Voltage Monitor Relays monitor either AC single phase (50-60Hz) or DC voltages to protect equipment against voltage fault conditions. No separate supply (input) voltage is required on any Macromatic Voltage Monitor Relays. All versions are available in a compact plug-in case utilizing an 8 pin octal socket.

Macromatic 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. When used as an under voltage relay, they provide protection to equipment that is required to operate above a minimum voltage. When used as over voltage relays, they protect equipment against excessive voltage conditions. Over/Under Voltage Relays 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.
- ◆ **Voltage Band Relays**--provides protection to equipment that is required to operate within an upper & lower voltage limit. As long as the operating voltage remains within an OVER & UNDER voltage range, the internal relay stays energized. If the operating voltage falls outside this range, the relay will drop-out.



These products are summarized below:

OVERVOLTAGE/UNDERVOLTAGE RELAYS					
Monitored Voltage	Pick-up Setting	Drop-out Setting	Time Delay on Drop-out	Series	Page
12V DC, 24V AC, 24V DC, 48V DC, 110V DC & 120V AC	Adjustable	Fixed	Fixed 500ms	VMP	23
	Adjustable	Adjustable	Fixed 500ms	VMKP	23
	Adjustable	Fixed	Adjustable 0.5-10 Seconds	VAP	24
	Adjustable	Adjustable	Adjustable 0.5-10 Seconds	VAKP	24
208-240V AC	Adjustable	Adjustable	Adjustable 0.1-10 Seconds	VAKPU	26
VOLTAGE BAND RELAYS					
Monitored Voltage	Overvoltage Setting	Undervoltage Setting	Time Delay on Drop-out	Series	Page
12V DC, 24V AC, 24V DC, 48V DC, 110V DC & 120V AC	Adjustable	Adjustable	Fixed 500ms	VWP	28
	Adjustable	Adjustable	Adjustable 0.5-10 Seconds	VWKP	28
208-240V AC	Adjustable	Adjustable	Adjustable 0.1-10 Seconds	VWKPU	30

# VOLTAGE MONITOR RELAYS

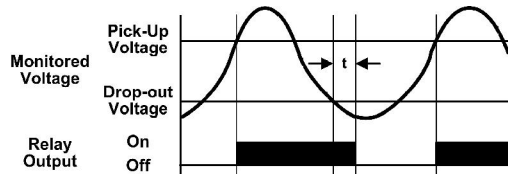
## VM SERIES OVER/UNDERVOLTAGE

### FIXED TIME DELAY ON DROP-OUT

### 12-120V PLUG-IN

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 24).



**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	<p>DIAGRAM 20</p>
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	<p>DIAGRAM 20</p>
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.



- ◆ 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)



**800-238-7474**

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[sales@macromatic.com](mailto:sales@macromatic.com)

Application Data & Dimensions—Page 25  
Sockets & Accessories—Pages 80 & 81

# VOLTAGE MONITOR RELAYS

## VM & VA SERIES OVER/UNDERVOLTAGE

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

##### Temperature:

-28° to 55° C (-18° 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: 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:

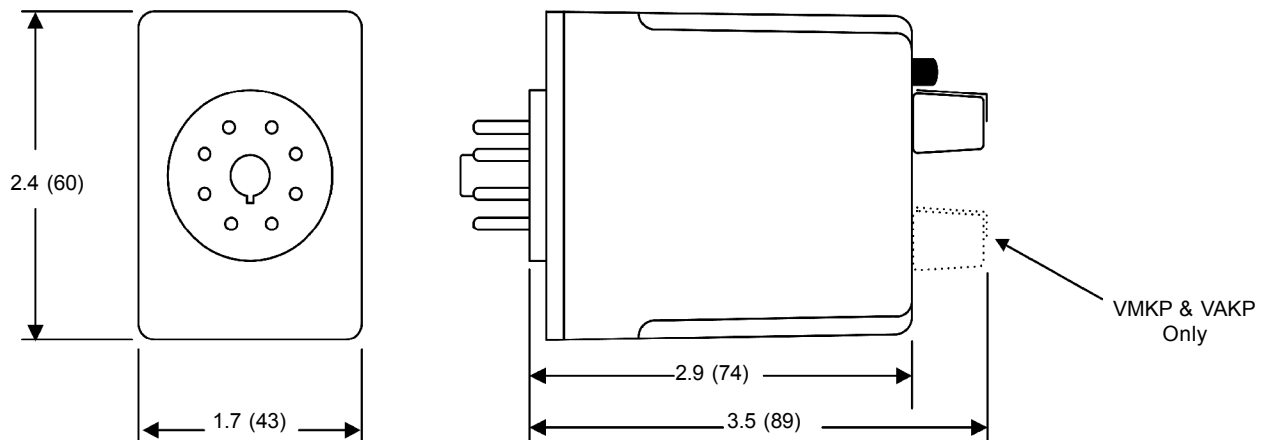
  
File #E109466

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



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

#### DIMENSIONS



All Dimensions in  
Inches (Millimeters)