

# OVER/UNDER VOLTAGE | ADJUSTABLE TIME DELAY & DROP-OUT

## 12-480V | VAKP SERIES

VOLTAGE MONITOR RELAYS | PLUG-IN



12-120V

240-480V

- ◆ Monitors AC single phase and DC voltages
- ◆ True RMS voltage measurement ensures more accurate sensing
- ◆ Wide range of user-adjustable pick-up voltages
- ◆ Adjustable time delay on drop-out of 0.1-10 seconds
- ◆ LED indicates output relay status
- ◆ Pilot duty rating
- ◆ Compact plug-in case utilizing industry standard 8 pin octal socket



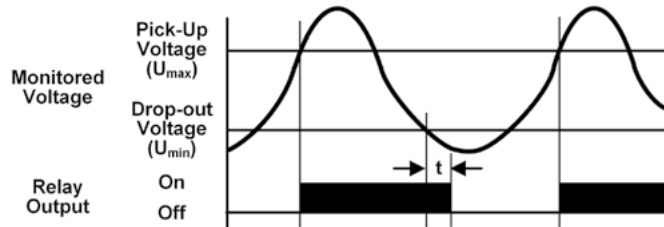
with appropriate socket



Better. By Design.

Over/Under Voltage Relays provide protection to equipment where an over or under voltage condition is potentially damaging. They are designed to energize 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 ( $U_{max}$ ) is user-adjustable across the full range as shown in the table below. The VAKP Series has an adjustable drop-out voltage setting ( $U_{min}$ ) of 75-95% of the pick-up setting (a fixed drop-out voltage setting of 95% of the pick-up setting is available on the VMP Series). 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 from 0.1-10 seconds.



**Adjustable Pick-Up & Drop-Out Settings\***  
Adjustable Time Delay on Drop-out at 0.1-10 Seconds

NOMINAL VOLTAGE	PICK-UP VOLTAGE ( $U_{MAX}$ )	DROP-OUT* VOLTAGE ( $U_{MIN}$ )	PRODUCT NUMBER	WIRING/ SOCKET
12V DC 24V DC 48V DC 110V DC	9-15V DC 18-30V DC 36-60V DC 83-138V DC	7-14V DC 14-28V DC 27-57V DC 62-130V DC	VAKP012D VAKP024D VAKP048D VAKP110D	8 Pin Octal <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 214</b>
120V AC	90-150V AC	68-142V AC	VAKP120A	8 Pin Octal <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 213</b>
240V AC 480V AC	180-300V AC 360-600V AC	135-285V AC 270-570V AC	VAKP240A VAKP480A ▲	8 Pin Octal <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 150</b>

\* Drop-out Voltage is adjustable from 75-95% of the adjusted Pick-up Setting.  
▲ Requires a 600V-rated socket

**Sockets & Accessories available**

# OVER/UNDER VOLTAGE

## 12-480V | VMP & VAKP 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  $U_{max}$ , 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  $U_{min}$  (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 ( $U_{min}$ ), the relay will energize and the N.O. contact closes, turning on the load. If the voltage drops below the  $U_{min}$  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:**

$\pm 5\%$  of nominal AC (50-60Hz,  $\pm 5\%$ ) or DC voltage  
No separate input voltage required since unit is powered by monitored voltage.

**Load (Burden):** Less than 2VA (12-120V); 30VA (240V & 480V)

#### **Voltage Settings:**

Pick-up ( $U_{max}$ ): Adjustable across full range as shown in the product selection table

Drop-out ( $U_{min}$ ): Fixed at 95% of pick-up setting (VMP)  
Adjustable from 75-95% of pick-up setting (VAKP)

**Setting Accuracy:** Maximum Setting (Adjustable):  $+5\%$ ,  $-0\%$   
Minimum Setting (Adjustable):  $+0\%$ ,  $-50\%$   
Fixed Voltage Setting:  $\pm 2\%$

**Repeatability:**  $<1\%$

**Sensing Accuracy:** Constant conditions within specifications:  $\pm 2\%$   
Variable conditions within specifications:  $\pm 5\%$   
(percent base on nominal voltage)

**Temperature:** Operating:  $-28^{\circ}$  to  $65^{\circ}\text{C}$  ( $-18^{\circ}$  to  $149^{\circ}\text{F}$ )  
Storage:  $-40^{\circ}$  to  $85^{\circ}\text{C}$  ( $-40^{\circ}$  to  $185^{\circ}\text{F}$ )

#### **Output Contacts:**

(All except VMP240AX): 10A @ 240V AC, 7A @ 30V DC, 1/4HP @ 120/240V AC, C300  
(VMP240AX): 5A @ 277V AC, 5A @ 30V DC, 1/3HP @ 120/240V AC, B300 Pilot Duty

#### **Life:**

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

#### **Response Times:**

Restart: 1 second (240 & 480V only)  
Pick-up: 0.5 Seconds  
Drop-out (t): 0.5 Seconds (VMP Series);  
Adjustable 0.1 - 10 Seconds (VAKP Series)

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

#### **Transient Protection:**

2000V per IEC 61000-4-5 Level 3 ( $\pm 2\text{kV}$ )

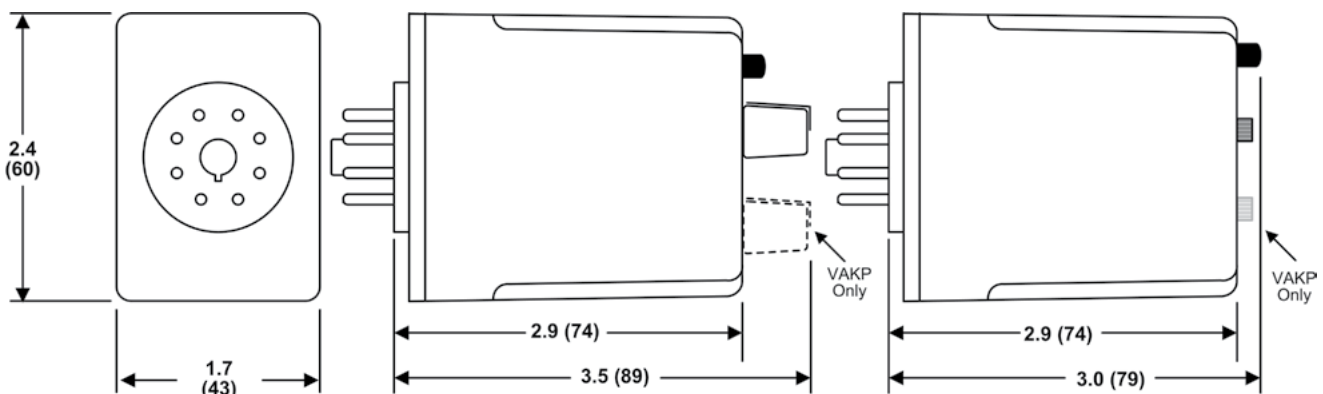
**Reset:** Automatic

#### **Approvals:**



with appropriate socket

### DIMENSIONS



12-120V PRODUCTS

240-480V PRODUCTS

All Dimensions in Inches (Millimeters)