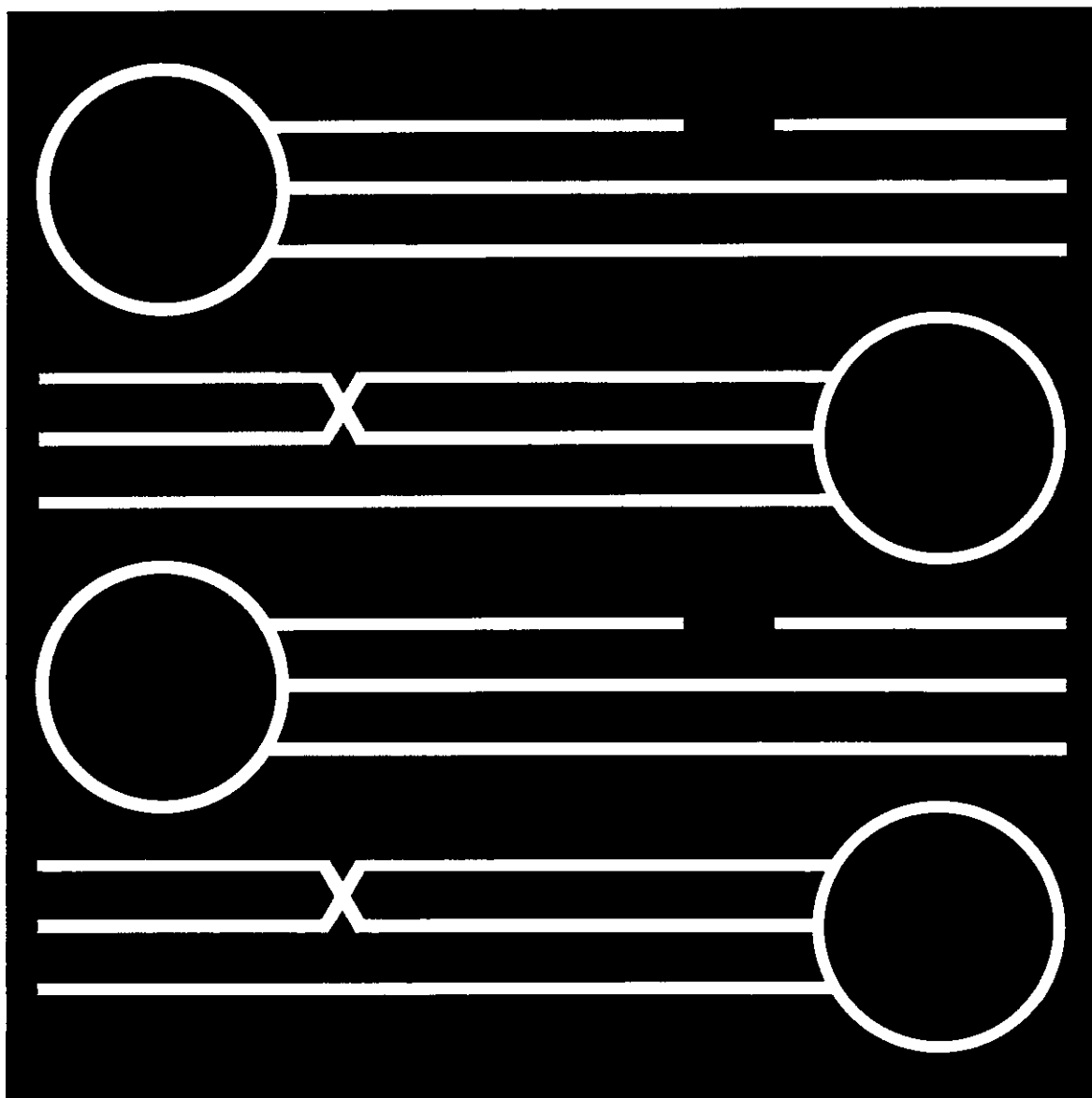


# Type PVR Phase Voltage Relay



## **Type PVR Phase Voltage Relay**

It is well recognized that phase failure or phase reversal can cause severe damage to motors and driven equipment resulting in costly downtime and loss of production.

While these occurrences cannot be prevented, the resulting damage can be eliminated by isolating the electric equipment from the power supply.

The Westinghouse Type PVR Relay is designed to monitor line-to-line voltages to any three phase distribution system and functions independently of line currents. It protects three phase motors and driven equipment from possible damaging effects of reverse phasing and phase voltage unbalance of prescribed magnitude. (See Specifications.) For most applications where all motors on the power circuit are heavily loaded, the PVR Relay will also protect against phase failure. However, if an open phase condition occurs while a motor is running, this motor and/or other lightly loaded motors, also single phased on the same power circuit, may generate sufficient voltage in the open phase resulting in insufficient voltage unbalance to operate the relay.

The PVR relay is easily designed into new systems or fitted into existing equipment.

## **Typical Applications**

- Pumps
- Conveyors
- Elevator Equipment
- Industrial Drives
- Monitoring of Substation Power Lines
- Air Conditioning Compressors
- Fans
- Computers
- Medical Equipment

## **Features—Benefits**

### **1. Small Size**

With both phase failure and reversal functions combined into a single compact package, required panel space is reduced, and the additional labor needed to mount and wire separate devices is eliminated.

### **2. Voltage Sensitive Device**

The PVR relay senses only voltage potential, eliminating the need for current transformers and the additional panel space and wiring they require.

### **3. Direct Line Connection**

Relays are available for direct operation on systems up to 600 volts AC, eliminating the need for potential transformers and the additional panel space and wiring they require.

### **4. Built-in Time Delay**

A built in two second time delay is supplied as standard, to allow for phase unbalances expected during normal motor startups. This eliminates nuisance tripping or the need for a separately mounted and wired timing relay.

### **5. SPDT Contact**

A single pole double throw contact allows the relay to be applied either normally closed (e.g. in the holding coil circuit of a motor starter) or normally open (e.g. an alarm circuit) or both. This eliminates the need for an auxiliary relay to obtain the desired contact arrangement.

### **6. Solid State Circuitry**

Solid state sensing circuits provide maximum reliability and long trouble free life.

## **How The PVR Relay Functions**

The Westinghouse PVR Relay is connected directly to the three-phase supply.

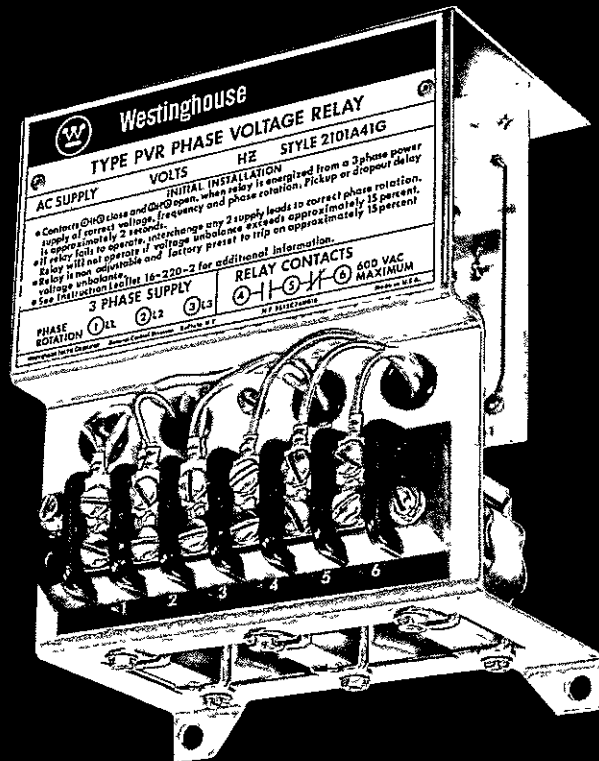
Under normal 3-phase conditions, the relay is picked up.

Whenever low voltage or phase reversal occurs or when a phase loss is detected, the relay drops out.

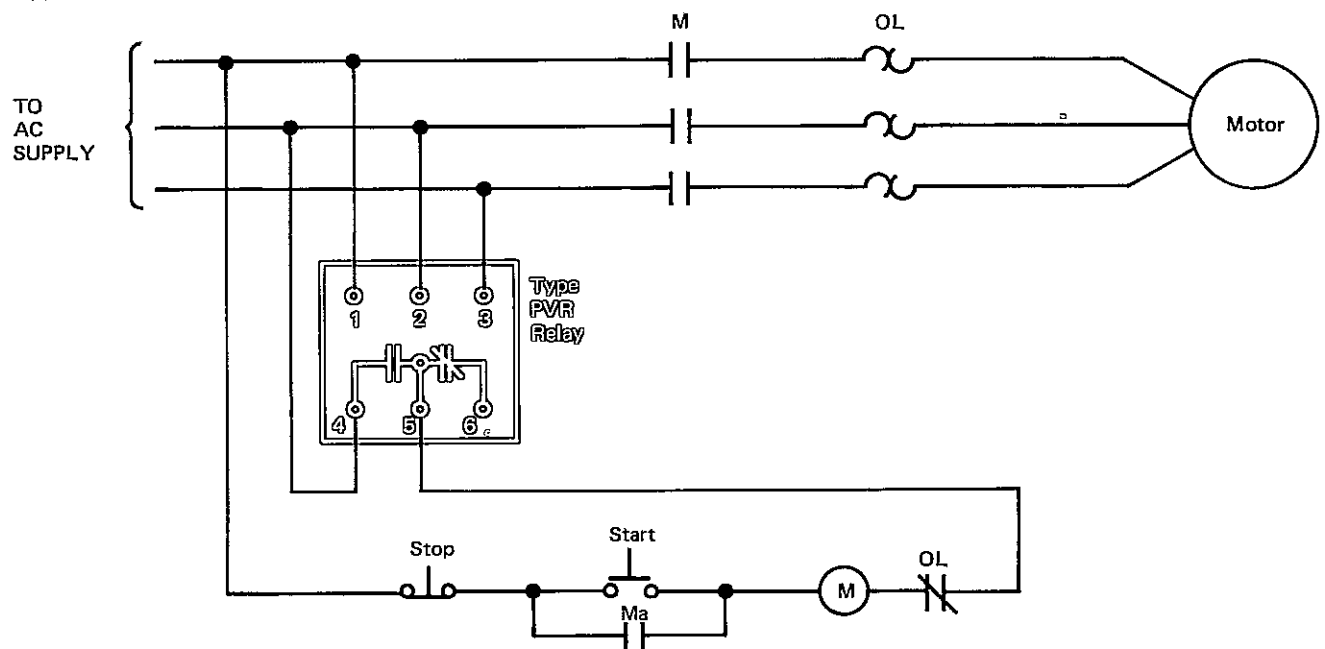
The relay output can be connected to either shutdown the protected equipment or actuate an alarm, or both.

A time delay of two seconds before relay dropout is provided as standard to prevent nuisance tripping as might be caused by momentary voltage dips during normal motor startups.

No external control power source is required, since the PVR Relay takes its power directly from the line.



Typical PVR Relay Application



**SELECTION GUIDE**

Sensing Voltage	Frequency	Catalog Number	Style Number
120	60 HZ	PVR 120	2101A41G01
200	60 HZ	PVR 200	2101A41G02
240	60 HZ	PVR 240	2101A41G03
480	60 HZ	PVR 480	2101A41G04
600	60 HZ	PVR 600	2101A41G05
110	50 HZ	PVR 110	2101A41G06
220	50 HZ	PVR 220	2101A41G07
380	50 HZ	PVR 380	2101A41G08
440	50 HZ	PVR 440	2101A41G09
550	50 HZ	PVR 550	2101A41G10

**Specifications**

Dropout Characteristics  
 12% ±3 unbalanceⓄ.  
 (9% ±3 available on special order.)

Output Contact  
 SPDT

Contact Ratings (0.35 power factor)

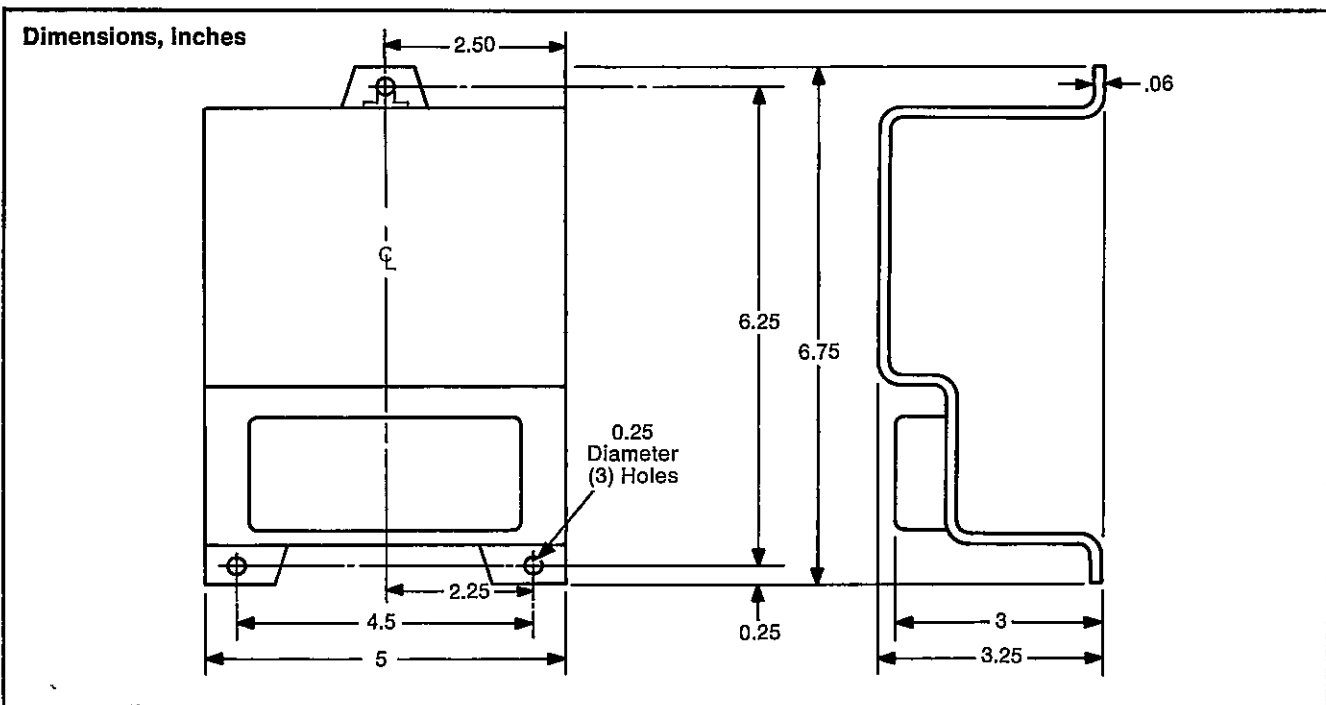
- 3.0 amperes at 120 VAC
- 1.5 amperes at 240 VAC
- 0.75 amperes at 480 VAC
- 0.6 amperes at 600 VAC

Operating Ambient Temperature  
 -40°C to +65°C

Power Requirements  
 7 VA nominal

Ⓞ Percent Voltage Unbalance =  

$$\frac{\text{Maximum Deviation from Average Phase Voltage}}{\text{Average Phase Voltage}} \times 100$$



Westinghouse Electric Corporation  
 General Control Division  
 Buffalo, New York 14240 USA

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