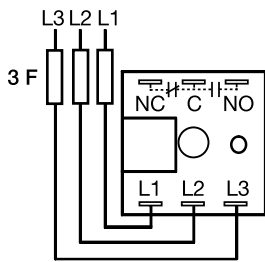


# TVW SERIES



## Wiring Diagram



L1 = Phase A  
L2 = Phase B  
L3 = Phase C  
NO = Normally Open  
NC = Normally Closed  
C = Common, Transfer Contact

Relay contacts are isolated.

F = 2A Fast acting fuses are recommended, but not required

## Description

The TVW Series Provides protection for motors and other sensitive loads. Continuously measures the voltage of each of the three phases using a microcontroller circuit design that senses under and overvoltage, voltage unbalance, phase loss, and phase reversal. Protection is provided even when regenerated voltages are present. Includes a trip delay to prevent nuisance tripping and a restart delay to prevent short cycling after a momentary power outage.

### Operation

Upon application of line voltage, the restart delay begins. The output is de-energized during restart delay. Under normal conditions, the output energizes after the restart delay. Undervoltage, overvoltage, and voltage unbalance must be sensed for the complete trip delay period before the output de-energizes. The restart delay begins as soon as the output de-energizes. If the restart delay is completed when a fault is corrected, the output energizes immediately. The output will not energize if a fault is sensed as the input voltage is applied. If the voltage selector is set between two voltage marks (i.e. between 220 and 230V), the LED will flash red rapidly. The TVW provides fault protection at the lower of the two line voltages (i.e. 220V).

**Reset:** Reset is automatic upon correction of a fault.

### LED Operation

The LED flashes green during the restart delay, then glows green when the output energizes. It flashes red during the trip delay then glows red when the output de-energizes. It flashes red/green if phase reversal is sensed. If the voltage selector knob is between settings, it rapidly flashes red.

## Features & Benefits

FEATURES	BENEFITS
<b>Proprietary microcontroller based circuitry</b>	Constant monitoring to protect against phase loss, phase reversal; over, under, and unbalanced voltage; short cycling
<b>Compact design measures 2 in. (50.8mm) square</b>	Perfect for OEM applications where cost, size and ease of installation are important
<b>LED indication</b>	Provides diagnostics of relay, fault and time delay status
<b>Encapsulated</b>	Protects against shock, vibration and humidity

## Ordering Information

MODEL	LINE VOLTAGE	VOLTAGE UNBALANCE	TRIP DELAY	RESTART DELAY
TWW5103S5S	208 to 240VAC Selectable	Fixed, 10%	Fixed, 3s	Fixed, 5s
TWW575S1M	208 to 240VAC Selectable	Fixed, 7%	Fixed, 5s	Fixed, 1m
TWW6510S0.4S	208, 220, 230, 240VAC	Fixed, 5%	Fixed, 10s	Fixed, 0.4s
TWW8510S0.4S	380, 400 & 415VAC	Fixed, 5%	Fixed, 10s	Fixed, 0.4s

If you don't find the part you need, call us for a custom product 800-843-8848

## TVW SERIES

### Accessories



**LPSM003ZXID (Indicating), LPSM003Z (Non-indicating) Fuse Holders**  
Littelfuse POWR-SAFE Dead Front holders provide optimum protection to personnel for Class CC and Midget-Style fuses. 600 VAC/DC



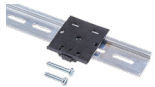
**OKLK002.T Midget Fuse (2 Amp)**  
10 x 38 fast acting, high-interrupting capacity, current-limiting type fuse. 600 Vac/500 Vdc



**P1015-13 (AWG 10/12), P1015-64 (AWG 14/16), P1015-14 (AWG 18/22) Female Quick Connect**  
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.



**C103PM (AL) DIN Rail**  
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.



**P1023-20 DIN Rail Adapter**  
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.



**VRM6048 Voltage Reduction Module**  
Allows the voltage monitor to monitor a 3-phase 550 to 600VAC Line.

### Specifications

#### Line Voltage Type

3-phase delta or wye with no connection to neutral

#### Input Voltage/Tolerance AC Line Frequency Phase Sequence Power Consumption

208 to 480VAC in 4 ranges/-30% - 20%  
50 - 100 Hz  
ABC  
Approx. 2W for 240V units  
Approx. 3W for 480V units

#### Overvoltage, Undervoltage, & Voltage Unbalance Overvoltage & Undervoltage

Voltage detection with delay trip & automatic reset  
Undervoltage Trip Point 88 - 92% of the selected line voltage  
Reset Voltage  $\approx +3\%$  of trip voltage  
Overvoltage Trip Point 109 - 113% of the selected line voltage  
Reset Voltage  $\approx -3\%$  of trip voltage  
Trip Variation vs Temperature  $\leq \pm 2\%$   
Voltage Unbalance Factory fixed, from 4 - 10%  
Reset On Balance  $\approx -0.7\%$  unbalance  
Trip Delay Range Fixed from 0.2 - 100s  $\pm 15\%$  or  $\pm 0.1$ s, whichever is greater

#### Restart Delay Range

Fixed from 0.4s - 999m  $\pm 15\%$  or  $\pm 0.2$ s, whichever is greater

#### Phase Reversal & Phase Loss Response Phase Loss

$\leq 200$ ms; automatic reset  
 $\geq 25\%$  unbalance

#### Output Type Rating

Isolated, SPDT

#### 208 to 240VAC (55°C)

10A resistive @ 125VAC, 5A @ 250VAC, 1/4 hp @ 125VAC

#### 380 to 480VAC

10A resistive @ 240VAC, 1/4 hp @ 125VAC, 1/3 hp @ 250VAC, max. voltage 277VAC  
Mechanical -  $1 \times 10^6$ ; Electrical -  $1 \times 10^5$

#### Life

#### Protection

#### Phase Reversal/Failure Motors and Generators Surge

ASME A17.1 Rule 210.6  
NEMA MG1 14:30, 14:35  
IEEE C62.41-1991 Level B

#### Dielectric Breakdown

#### 208 to 240VAC 380 to 480VAC

$\geq 1500$ V RMS input to output terminals  
 $\geq 2500$ V RMS input to output terminals

#### Mechanical

#### Mounting Dimensions

Surface mount with one #8 (M5 x 0.8) screw  
**H** 50.8 mm (2.0"); **W** 50.8 mm (2.0");  
**D** 31.75 mm (1.25")

#### Termination

0.25 in. (6.35 mm) male quick connect terminals

#### Environmental

#### Operating/Storage

#### Temperature

-40° to 55°C / -40° to 85°C

#### Humidity

95% relative, non-condensing

#### Weight

$\approx 2.8$  oz (79 g)