TVW SERIES

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

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

Ordering Information

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LINE VOLTAGE</th>
<th>VOLTAGE UNBALANCE</th>
<th>TRIP DELAY</th>
<th>RESTART DELAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVW5103S5S</td>
<td>208 to 240VAC</td>
<td>Fixed, 10%</td>
<td>Fixed, 3s</td>
<td>Fixed, 5s</td>
</tr>
<tr>
<td>TVW575S1M</td>
<td>208 to 240VAC</td>
<td>Fixed, 7%</td>
<td>Fixed, 3s</td>
<td>Fixed, 5s</td>
</tr>
<tr>
<td>TVW6510S0.4S</td>
<td>208, 220, 230, 240VAC</td>
<td>Fixed, 5%</td>
<td>Fixed, 10s</td>
<td>Fixed, 0.4s</td>
</tr>
<tr>
<td>TVW8510S0.4S</td>
<td>380, 400 &amp; 415VAC</td>
<td>Fixed, 5%</td>
<td>Fixed, 10s</td>
<td>Fixed, 0.4s</td>
</tr>
<tr>
<td>TVW9510S0.4S</td>
<td>430, 440, 460, 480VAC</td>
<td>Fixed, 5%</td>
<td>Fixed, 10s</td>
<td>Fixed, 0.4s</td>
</tr>
</tbody>
</table>

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.

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

0KLK002.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: 208 to 480VAC in 4 ranges/-30% - 20%
- AC Line Frequency: 50 - 100 Hz
- Phase Sequence: ABC
- Power Consumption: 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
  - +3% of trip voltage
- Overvoltage Trip Point: 109 - 113% of the selected line voltage
  - -3% of trip voltage
- Trip Variation vs Temperature: ≤ ±2%
- Voltage Unbalance: Factory fixed, from 4 - 10%
  - -0.7% unbalance
- Reset On Balance: Fixed from 0.2 - 100 s ±15% or ±0.1 s, whichever is greater
- Restart Delay Range: Fixed from 0.4 s - 999 ms ±15% or ±0.2 s, whichever is greater
- Phase Reversal & Phase Loss Response: ≤ 200 ms; automatic reset
  ≥ 25% unbalance
- Output
  - Type: Isolated, SPDT
  - Rating: 10A resistive @ 125VAC, 5A @ 250VAC, 1/4 hp @ 125VAC
  10A resistive @ 240VAC, 1/4 hp @ 125VAC, 1/3 hp @ 250VAC, max. voltage 277VAC
- Life
  - Protection: ASME A17.1 Rule 210.6
  - Motors and Generators: NEMA MG1 14.30, 14.35
  - Surge: IEEE C62.41-1991 Level B
- Dielectric Breakdown
  - 208 to 240VAC: ≥ 1500V RMS input to output terminals
  - 380 to 480VAC: ≥ 2500V RMS input to output terminals
- Mechanical
  - Mounting: Surface mount with one #8 (M5 x 0.8) screw
  - Dimensions
    - 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: 2.8 oz (79 g)