HLMU SERIES

Description
The HLMU Series is a universal voltage, encapsulated, 3-phase voltage monitor. It continuously measures the voltage of each of the three phases with microcontroller accuracy and compares the value to preset trip points. It separately senses phase reversal and loss; over, under and unbalanced voltages; and over or under frequency. Protection is assured during periods of large average voltage fluctuations, or when regenerated voltages are present. The unit trips within 200ms when phase loss is detected. Adjustable time delays are included to prevent nuisance tripping and short cycling of sensitive equipment. The isolated, 10A, DPDT relay contacts trip when a phase voltage exceeds the trip limits for the trip delay. Nominal line voltage, voltage unbalance, and time delays are knob adjustable. The phase loss setpoint and the acceptable frequency range are fixed. Both delta and wye systems can be monitored; no connection to neutral is required.

Features & Benefits

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<th>BENEFITS</th>
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<td>Proprietary microcontroller based circuitry</td>
<td>Constant monitoring to protect against phase loss, phase reversal; over, under, and unbalanced voltage; over and under frequency</td>
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<td>Universal line voltage range</td>
<td>Flexibility to work in 200 to 480VAC applications</td>
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<td>DIN rail (35mm) or surface mounting</td>
<td>Installation flexibility</td>
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<td>LED indication</td>
<td>Provides diagnostics of relay, fault and time delay status</td>
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<td>Encapsulated</td>
<td>Protects against shock, vibration, and humidity</td>
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<td>Finger-safe terminal blocks</td>
<td>Meets IEC 61000 safety requirements</td>
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Operation
Upon application of line voltage, the output is de-energized and the restart delay begins. If all the three-phase voltages are within the acceptable range, the output energizes at the end of the restart delay. The microcontroller circuitry automatically senses the voltage range, and selects the correct operating frequency (50 or 60Hz). The over and under voltage trip points are set at ± 10% of the adjusted line voltage. When the measured value of any phase voltage exceeds the acceptable range limits (lower or upper) the trip delay begins. At the end of the trip delay the output relay de-energizes. If the phase voltage returns to an acceptable value before the trip delay expires, the trip delay is reset and the output remains energized. Under, over, and unbalanced voltages plus over or under frequency must be sensed for the complete trip delay before the unit trips. The unit trips in 200ms when phase loss or reversal are sensed. The unit will not energize if a fault is sensed as the line voltage is applied.

Reset: Reset is automatic upon correction of the voltage or frequency fault or phase sequence.

Restart Delay Options
L = Lockout, min off time. The restart delay begins when the output trips. The unit cannot be re-energized until the restart delay is complete. This provides a minimum off time or lockout time to allow equipment sensitive to short cycling,
time to reset. If the fault is corrected after the restart delay is complete, the output energizes immediately. The restart delay also occurs when line voltage is applied/reapplied.

R = Restart Delay on fault correction. The restart delay begins when line voltage is reapplied or when a voltage fault is corrected. This option is normally selected when staggered restarting of multiple motors on a power system is required.

N = No Restart Delay. A 0.6 second initialization delay on application of line voltage applies.

Restart Notes: All restart options remain reset when the following conditions are detected:
1. Phase loss (phase unbalance greater than 25%)
2. Average line voltage less than 120VAC
3. Phase reversal

The restart delay begins when the condition is corrected.

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 a fault is sensed during the restart delay, the LED will glow red during that portion or the full restart delay.

Accessories

LPSM003XID (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

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.

Specifications

Line Voltage
Type: 3-phase delta or wye with no connection to neutral

Operating Voltage
200 - 480VAC
Range | Voltage Adj. Range | Frequency
--- | --- | ---
240 | 200-240VAC | 50 or 60Hz
380 | 340-420VAC | 50Hz
480 | 400-480VAC | 60Hz

Line Voltage Max.
550VAC

AC Line Frequency
50/60 Hz automatically detected

Phase Loss
≥ 25% unbalance

Response Time
≤200ms

Undervoltage & Voltage Unbalance
Type: Voltage detection with delayed trip & automatic reset

Overvoltage
Trip Voltage: 109 - 113% of the adjusted line voltage
Reset Voltage: -3% of the trip voltage

Undervoltage
Trip Voltage: 88 - 92% of the adjusted line voltage
Reset Voltage: +3% of the trip voltage

Trip Delay
Active On: Over/undervoltage, voltage unbalance, over/under frequency

Range: Adjustable from 1 - 30s or specify fixed delay 1 - 30s in 1s increments

Tolerance: ±15%

Reset Delay
Range: Adjustable from 0.6 - 300s; if no restart delay is selected a 0.6s initialization delay applies

Tolerance: ±15%

Over/Under Frequency
±4%; Reset ±3%; 50/60 Hz

Phase Sequence
A, B, C, L1, L2, L3

Response Time-Phase Reversal & Phase Loss
Reset: ≤200 ms

Automatic

Output
Type: Isolated Electromechanical Relay
Form: DPDT
Rating: 10A resistive @ 240VAC; 8A resistive @ 277VAC; NO-1/4 hp @ 120VAC; 1/3 hp @ 240VAC

Life: Mechanical - 1 x 10⁶ Electrical (at 10A) - DPDT - 1 x 30³

Protection
Phase Reversal/Failure
ASME A17.1 Rule 210.6

Motors and Generators
NEMA MG1 14:30, 14:35

Surge
IEEE C62.41-1991 Level B

Isolation Voltage
≥ 2500V RMS input to output

Circuitry
Encapsulated

Mechanical
Mounting
Surface mount with one #10 (M5 x 0.7) screw

Note: 0.25 in.(6.35 mm) spacing between units or other devices is required

Dimensions
H: 76.7 mm (3.0”); W: 50.8 mm (2.0”); D: 41.7 mm (1.64”)

Termination
Screw terminal connection up to 12 AWG (3.3 mm²) wire

Environmental
Operating/Storage
Temperature
-40° to 60°C / -40° to 85°C

Humidity
95% relative, non-condensing

Weight
= 3.9 oz (111 g)