

Universal 3 Phase Voltage Monitor HLMU Series (DPDT) Motor Protector



ANSI Device #27/47/59



- Protects Against: Phase Loss, Phase Reversal, Over, Under & Unbalanced Voltages, Over/Under Frequency
- Encapsulated Circuitry
- DPDT Isolated 10 A Contacts
- LED Indicates Relay Status, Faults, & Time Delays
- Universal Line Voltage 200 ... 480 V AC in One Unit
- Compact, Encapsulated Design
- Finger-Safe Terminal Blocks, up to 12 AWG
- ASME A17.1 rule 210.6
- NEMA MG1 14:30, 14:35
- IEEE C62.41-1991 Level B

Approvals:

Accessories

- 3-phase fuse block/disconnect
P/N: **FH3P**
- 2 Amp Fuse
P/N: **P0600-11**

DIN rail P/Ns:
C103PM (A)



DIN rail adaptor
P/N: **P1023-20**
See accessory pages for specifications.

Description

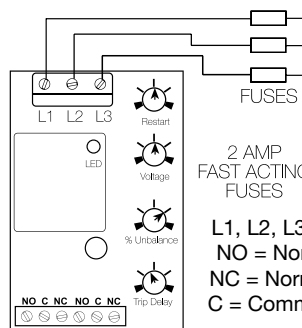
The HLMU Series is a universal voltage, encapsulated, 3 Phase Voltage Monitor. It continuously measures the voltage of each of the three phases with microcontroller accuracy and compares the value to preset trip points. It separately senses Phase Reversal, Over, Under and Unbalanced voltages including Phase Loss 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 200 ms when phase loss is detected. Adjustable time delays are included to prevent nuisance tripping and short cycling of sensitive equipment. The 10A isolated DPDT output 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 set point and the acceptable frequency range are fixed. Both Delta and Wye systems can be monitored; no connection to neutral is required.

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 200 ms 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.

Connection



CAUTION: 2 amp max. fast acting fuses are recommended to protect the equipment's wiring. They are not required to protect the HLMU.

L1, L2, L3 = Line Voltage Input
NO = Normally Open Contact
NC = Normally Closed Contact
C = Common, Transfer Contact

Note: Relay contacts are isolated, 277 V AC max.

Available Models-

- HLMUDLAAA
- HLMUDN0405N
- HLMUDN0504N
- HLMUDNAAN
- HLMUDRAAA
- HLMUSR0604A

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Ordering Table

HLMU Series	X Output	X Restart Function	X Voltage Unbalance	X Trip Delay	X Restart Delay
	D - DPDT	L - Lockout, Min Off Time R - Staggered Restarting N - No Restart Delay	A - Adjustable 2 ...10% Fixed: Specify Unbalance 2 ...10% in 1% increments, using 2 digits [04]	A - Adjustable 1...30 s Fixed: Specify delay 1 ... 30 s in 1 s increments, using 2 digits, [05]	A - Adjustable 0.6 ...300 s 1 N - No Restart Delay

Example P/N:

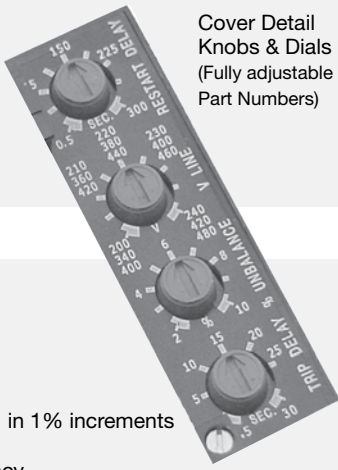
- HLMUDLAAA** = 200 ... 480 V, DPDT, Lockout Restart, Adjustable Unbalance, Trip and Restart Delay
- HLMUDNAAN** = 200 ... 480 V, DPDT, No Restart Delay, Adjustable Unbalance and Trip Delay
- HLMUDRAAA** = 200 ... 480 V, DPDT, Staggered Restart, Adjustable Unbalance, Trip and Restart Delay
- HLMUDL0405A** = 200 ... 480, DPDT, Lockout Restart, Fixed Unbalance 4%, Fixed Trip Delay 5 Seconds, Adjustable Restart

1 Selection "A" is only available for Restart functions "L" and "R"

Universal 3 Phase Voltage Monitor HLMU Series (DPDT) Motor Protector

Voltage
Monitors

Technical Data

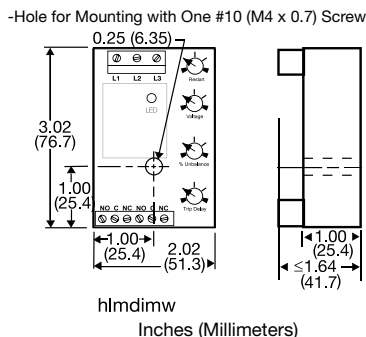
Line Voltage			Cover Detail Knobs & Dials (Fully adjustable Part Numbers)
Type	3 phase Delta or Wye with no connection to neutral		
Operating Voltage	200 ... 480 V AC		
	Range Voltage Adjustment Range Line Frequency		
	240 200 ... 240 V AC 50 or 60 Hz		
	380 340 ... 420 V AC 50 Hz		
	480 400 ... 480 V AC 60 Hz		
Line Voltage Max.	550 V AC		
Line Frequency	50 or 60 Hz Automatically detected		
Phase Loss	≥ 25% Unbalance		
	Response Time ≤200ms		
Undervoltage and Voltage Unbalance			
Type	Voltage detection with delayed trip & automatic reset		
Overvoltage:	Trip Voltage 109 to 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		
Voltage Unbalance:	Trip Set Point Adjustable 2 ... 10%; or specify fixed unbalance of 2 ... 10% in 1% increments		
	Reset on Balance ≅ -0.7% Unbalance		
Trip Delay	Active On Over/Undervoltage, Voltage Unbalance, Over/Under Frequency		
	Range Adjustable from 1 ... 30 s; or specify fixed delay 1 ... 30 s in 1 s increments		
	Tolerance ± 15%		
Restart Delay	Range Adjustable from 0.6 ... 300 s; if no restart delay is selected a 0.6 s initialization delay applies		
	Tolerance ± 15%		
Over/Under Frequency	Trip / Reset ±4%; Reset ±3%; 50 or 60 Hz		
Phase Sequence	A, B, C, L1, L2, L3		
Response Time-Phase Reversal & Phase Loss	≤200 ms		
Reset	Automatic		
Output			
Type	Isolated Electromechanical Relay		
Form	Double pole double throw (DPDT)		
Rating	10 A resistive at 240 V AC; 8 A resistive at 277 V AC; N.O.-1/4 hp at 120 V AC; 1/3 hp at 240 V AC;		
Life	Mechanical -- 1 x 10 ⁶ Electrical -- (at 10 A) -- DPDT = 1 x 30 ³		
Protection			
Surge	IEEE C62.41-1991 Level B		
Isolation Voltage	≥ 2500 V 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		
Package	3 x 2 x 1.5 in. (76.7 x 51.3 x 41.7 mm)		
Termination	Screw terminal connection for up to 12 AWG (3.3 mm ²) wire		
Environmental			
Operating Temperature	-40°C ... +60°C		
Storage Temperature	-40°C ... +85°C		
Humidity	95% relative, non-condensing		
Weight	≅ 3.9 oz (111 g)		

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LED Flashing Table

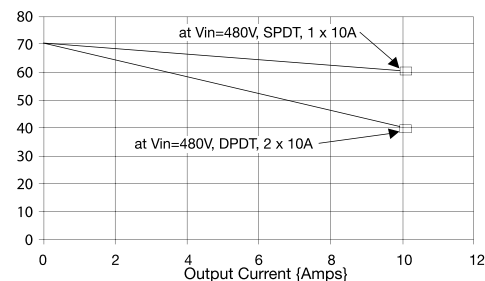
Trip Delay	Red	ON/OFF	120 FPM
Restart Delay	Green	ON/OFF	60 FPM
Phase Reversal	Red/Green	Alternate	120 FPM
FPM = Flashes per minute			

Mechanical View



Ambient Temp (Deg. C)

HLMU output rating



HLM02B01 09.10