Voltage Monitoring Relays
460 Series

3-Phase Voltage Monitor



Description

The 460 series is a three-phase voltage monitor that protects 190–480 V ac or 475–600 V ac, 50/60 Hz motors regardless of their size. This voltage monitor provides a user-selectable nominal voltage setpoint and will automatically sense line voltage. A unique microcontroller-based voltage and phase-sensing circuit constantly monitors the three-phase voltage to detect harmful power line conditions such as low, high, and unbalanced voltage, loss of any phase, and phase reversal. When a harmful condition is detected, the MotorSaver® output relay is deactivated after a specified trip delay. The output relay reactivates after power line conditions return to an acceptable level for a specified amount of time (restart delay). The trip and restart delays prevent nuisance tripping due to rapidly fluctuating power line conditions. All 460 models feature an adjustable 1–30 second trip delay, 1–500 second restart delay, 2–8% voltage unbalance trip point, and one form C contact except where noted on the datasheet.

Features & Benefits

FEATURES	BENEFITS
Auto-sensing wide voltage range	Automatically senses system voltage between 190–480 V ac or 475–600 V ac. Saves set-up time
Adjustable trip & restart delay settings	Prevents nuisance tripping due to rapidly fluctuating power line conditions
Microcontroller-based circuitry	Improved accuracy and high reliability
Advanced LED diagnostics	Quick visual indicator for cause of trip and relay status
Adjustable voltage unbalance trip setting	Provides reliable protection when regenerative voltage is present

Applications

- Oil rigs
- Compressors and fans
- HVAC
- Heat, well, and sump pumps
- Small conveyer motors

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Specifications

Frequency	50/60 Hz
Functional Characteristics	
Low Voltage (% of setpoint)	
Trip	90% ±1%
Reset	93% ±1%
High Voltage (% of setpoint)	
Trip	110% ±1%
Reset	107% ±1%
Voltage Unbalance (NEMA)	
Trip	2–8% adjustable
Reset	Trip setting minus 1% (5–8%), Trip setting minus 0.5% (2–4%)
460L	6% UB fixed (4.5% reset)
Trip Delay Time	
Low, High and Unbalanced Voltage	1–30 seconds adjustable
460L	4 seconds fixed
Single-Phase Faults (>15% UB)	1 second fixed
Restart Delay Time	
After a Fault	1–500 seconds adjustable
After a Complete Power Loss	1–500 seconds adjustable
Output Contact Rating	
Form C	
Pilot Duty	480 VA @ 240 V ac, B300
General Purpose	10 A @ 240 V ac
Form A & Form B	
Pilot Duty	360 VA @ 240 V ac, B300
General Purpose	8 A @ 240 V ac
General Characteristics	
Ambient Temperature Range	
Operating	-20° to 70 °C (-4° to 158 °F)
Storage	-40° to 80 °C (-40° to 176 °F)
Maximum Input Power	6 W
Class of Protection	IP20, NEMA 1 (finger safe)
Relative Humidity	10–95%, non-condensing per IEC 68-2-3
Terminal Torque	4.5 in.-lbs.
Wire Type	Stranded or solid 12–20 AWG, one per terminal
Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6 kV contact, 8 kV air
RFI, Radiated	150 MHz, 10 V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5 kV input power and controls
Surge	
IEC	IEC 61000-4-5, Level 3, 4 kV line-to-line; Level 4, 4 kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave Compliance to a level of 6 kV line-to-line
Hi-potential Test	Meets UL508 (2 x rated V +1000 V for 1 minute)
Enclosure	Polycarbonate
Dimensions	**H** 88.9 mm (3.5"); **W** 52.9 mm (2.08"); **D** 59.69 mm (2.35")
Weight	0.7 lb. (11.2 oz., 317.51 g)
Mounting Method	35 mm DIN-rail or surface mount (#6 or #8 screws)
460-MR (manual reset)	External NO pushbutton required.

Certification & Compliance

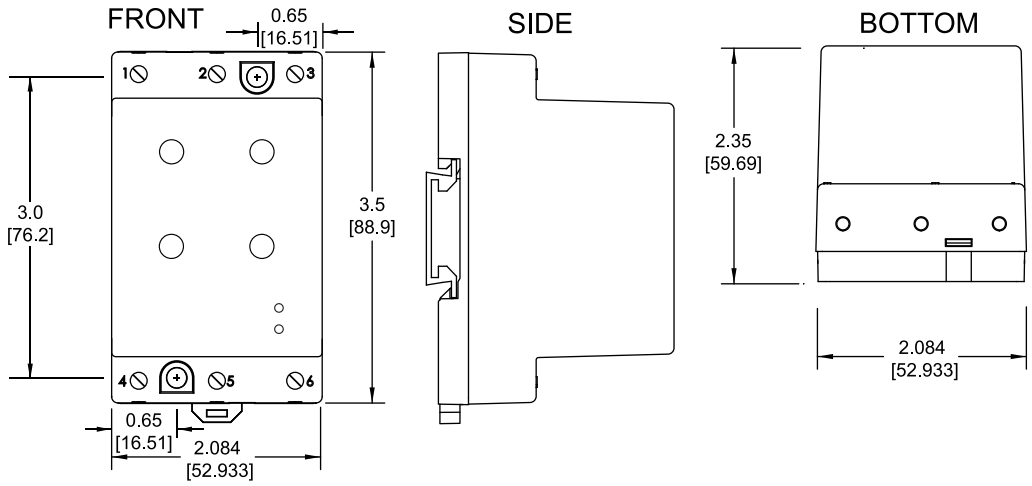
UL	UL508 (File #E68520)
CE	IEC 60947-6-2

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Ordering Information

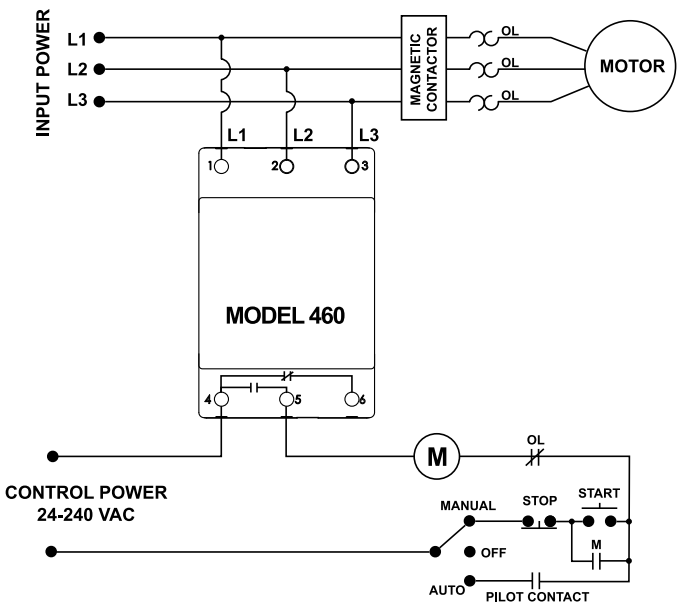
MODEL	LINE VOLTAGE	DESCRIPTION
460	190–480 V ac	Automatically senses line voltage, adjustable 1–30 second trip delay, 1–500 second restart delay, and 2–8% voltage unbalance trip point
460-L	190–480 V ac	Fixed 4 second trip delay and 1 second for single-phase faults, and fixed 6% voltage unbalance trip point
460-14	190–480 V ac	Equipped with 2 sets of contacts: Form A (NO) and Form B (NC). Used for applications requiring 2 different voltages such as 5 V dc for a PLC input and 115 V ac for an alarm
460-575	475–600 V ac	Commonly used in Eastern Canada and on generator units that generate 600 V ac power
460-575-14	475–600 V ac	Commonly used in Eastern Canada and on generator units that generate 600 V ac power. Equipped with 2 sets of contacts: Form A and Form B
460-15	190–480 V ac	Equipped with 2 sets of Form A (NO) contacts. Used on applications where two different units are to be controlled at once such as a unit that has separate contacts for a compressor and a fan
460-MR	190–480 V ac	Equipped with a 2-prong connection for a normally open push button mounted outside the panel. Used in applications requiring an external manual reset button
460-VBM	190–480 V ac	Fixed 6% voltage unbalance trip point. User adjustable low and high voltage trip points
460-400HZ	190–480 V ac	For use with 400 Hz power supply
460-OEM	190–480 V ac	Bulk package of 460, 20 units
460L-OEM	190–480 V ac	Bulk package of 460-L, 20 units

Dimensions Inches (mm)



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Wiring Diagram



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