

## Features

The 460's universal range from 190-480VAC, 50/60 Hz provides the versatility needed to handle global applications.

Four adjustment pots provide versatility for a variety of applications.

Diagnostic LEDs indicate trip status and provide simple troubleshooting.

Microcontroller-based circuitry provides better accuracy and higher reliability than analog designs.

Single-phase conditions are detected regardless of regenerated voltages.

Transient protection meets IEEE and IEC standards and permits operation under tough conditions.



**MotorSaver**  
THREE-PHASE ELECTRIC  
MOTOR PROTECTOR

## Model 460

### Three-Phase Voltage Monitor

### Engineered Protection

### Microcontroller Based

#### *Protects 3-Phase Motors from:*

- Loss of any phase
- Low voltage
- High voltage
- Voltage unbalance
- Phase reversal
- Rapid cycling

#### *Additional Features:*

- Compact design
- UL and cUL listed
- CE compliant
- Finger-safe terminals
- 5-year warranty
- Made in USA
- Standard surface or DIN rail mountable
- Standard 1-500 sec. variable restart delay
- Standard 2-8% variable voltage unbalance
- Standard 1-30 sec. variable trip delay
- One 10 amp general purpose Form C relay
- Optional manual reset

The **Model 460** is designed to protect 3-phase motors from damaging power conditions. The 460's wide operating range combined with UL and CE compliance enables quick access to domestic and global markets.

A unique microcontroller-based voltage and phase-sensing circuit constantly monitors the 3-phase voltages to detect harmful power line conditions. When a harmful condition is detected, the MotorSaver's 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 delay prevents nuisance tripping due to rapidly fluctuating power line conditions.

The Model 460 automatically senses whether it is connected to a 190-240V, 60Hz system, a 440-480V, 60Hz system, or a 380-416V, 50Hz system. An adjustment is provided to set the nominal line voltage from 190-240 or 380-480VAC. Other adjustments include a 1-30 second trip delay, 1-500 second restart delay, and 2-8% voltage unbalance trip point.



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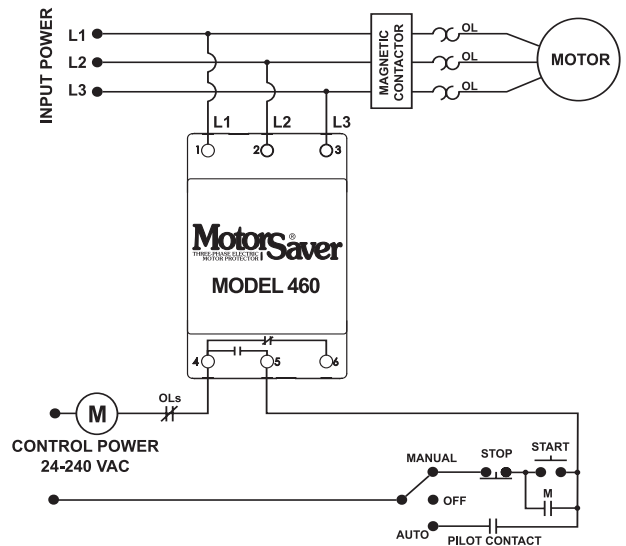
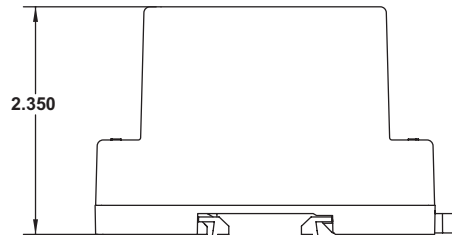
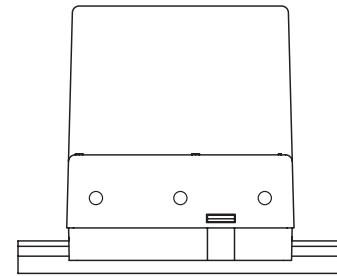
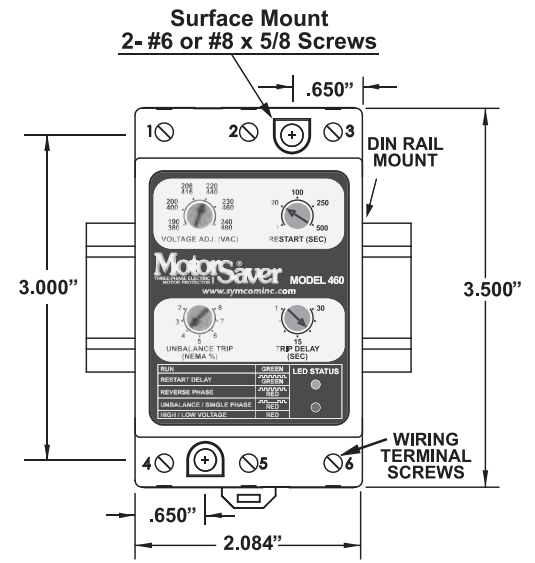
## Model 460 Three-Phase Voltage Monitor

### Specifications

<b>3-Phase Line Voltage</b> .....	190-480VAC (475-600VAC optional) (95-120VAC optional)
<b>Frequency</b> .....	.50*/60Hz
<b>Low Voltage (% of setpoint)</b>	
• Trip .....	.90% ±1%
• Reset .....	.93% ±1%
<b>High Voltage (% of setpoint)</b>	
• Trip .....	.110% ±1%
• Reset .....	.107% ±1%
<b>Voltage Unbalance (NEMA)</b>	
• Trip .....	.2-8% adjustable
• Reset .....	Trip setting minus 1% (5 - 8%) Trip setting minus .5% (2 - 4%)
<b>Trip Delay Time</b>	
• Low, High and Unbalanced Voltage .....	1-30 seconds adjustable
• Single-Phasing Faults .....	1 second fixed
<b>Restart Delay Time</b>	
• After a Fault .....	1-500 seconds adjustable
• After a Complete Power Loss .....	1-500 seconds adjustable
<b>Output Contact Rating</b>	
• 1-Form C .....	10A General Purpose @ 240VAC Pilot Duty 480VA @ 240VAC, B300
<b>Power Consumption</b> .....	6 Watts (max.)
<b>Weight</b> .....	14 oz.
<b>Enclosure</b> .....	Polycarbonate
<b>Terminal Torque</b> .....	.6 in.-lbs.
<b>Wire Type</b> .....	Stranded or solid 12-20 AWG, one per terminal
<b>Safety Marks</b>	
• UL .....	UL508
• CE .....	IEC 60947-6-2
<b>Standards Passed</b>	
• Electrostatic Discharge (ESD) .....	IEC 1000-4-2, Level 3, 6kV contact, 8kV air
• Radio Frequency Immunity, Radiated .....	150 MHz, 10V/m
• Fast Transient Burst .....	IEC 1000-4-4, Level 3, 3.5kV input power & controls
<b>Surge</b>	
• IEC .....	IEC 1000-4-5, Level 3, 4kV line-to-line; Level 4, 4kV line-to-ground
• ANSI/IEEE .....	C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line
• Hi-potential Test .....	Meets UL508 (2 x rated V +1000V for 1 minute)
<b>Environmental</b>	
Temperature Range .....	Ambient Operating: -20° to 70° C (-4° to 158°F) Ambient Storage: -40° to 80° C (-40° to 176°F)
Class of Protection .....	IP20, NEMA 1 (FINGER SAFE)
Relative Humidity .....	10-95%, non-condensing per IEC 68-2-3
<b>Special Options</b>	
Manual Reset .....	External momentary pushbutton required.

\*Note: 50 Hz will increase all delay timers by 20%

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TYPICAL WIRING DIAGRAM