

## Features

Two adjustment pots provide versatility for many applications.

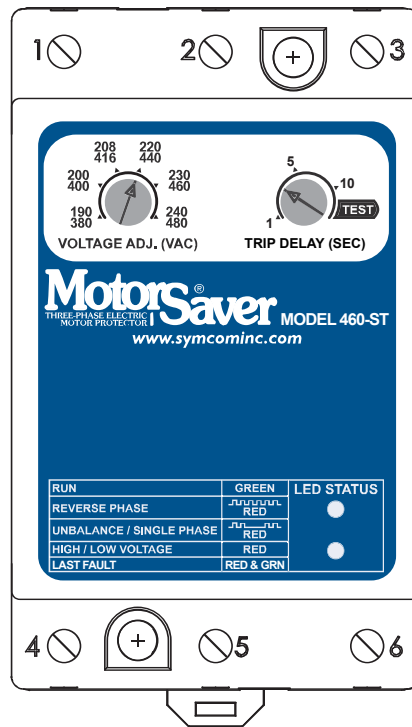
Universal range from 190-480 VAC 50/60 Hz provides the versatility needed to handle global applications.

Diagnostic LEDs indicate trip status and provide simple trouble shooting.

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

Transient protected to meet IEEE and IEC standards and operate under tough conditions.

Will detect single-phase condition regardless of regenerated voltages.



**Motorsaver**  
THREE-PHASE ELECTRIC MOTOR PROTECTOR

**Model 460-ST  
Shunt Trip**

**Three-Phase  
Voltage Monitor**

**Engineered  
Protection**

**Microcontroller  
Based**

**Protects 3-phase power  
system loads from:**

- Loss of any phase\*
- Low voltage\*
- High voltage
- Voltage unbalance
- Phase reversal

**Standard Features:**

- Compact design
- UL and cUL listed
- CE compliant
- Finger safe terminals
- 5 year warranty
- Made in USA
- Surface or DIN rail mountable
- 1-10 sec. variable trip delay
- One 10 amp general purpose form C relay
- Made for shunt-trip breaker control

\*Operation not guaranteed when voltage is less than 150V

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

The 460-ST output contacts change from normal state only when a phase voltage problem is detected for longer than the preset time delay. A total power loss or de-energization of the 460-ST relay will not change the output contacts position. The 460-ST is an excellent choice for service entrance manually reset switches and shunt-trip circuit breaker applications.

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 460-ST's output relay is activated after a specified trip delay. The output relay deactivates after power line conditions return to an acceptable level. The trip delay prevents nuisance tripping due to rapidly fluctuating power line conditions.

The Model 460-ST automatically senses whether it is connected to a 190 to 240V 60 Hz system, a 440-480V 60 Hz system, or a 380 to 416V 50 Hz system. An adjustment is provided to set the nominal line voltage from 190-240 or 380-480 VAC. The other adjustment is a 1-10 second trip delay.

Test position of trip delay setting allows periodic testing of the shunt-trip system to ensure proper operation.



## Specifications • Operating Points

## Model 460-ST 3-Phase Voltage Monitor

### Specifications

<b>3-Phase Line Voltage</b> .....	190 - 480 VAC
<b>Frequency</b> .....	50* or 60 Hz
<b>Low Voltage (% of set point)</b>	
• Trip .....	80% ±1%**
• Reset .....	90% ±1%
<b>High Voltage (% of set point)</b>	
• Trip .....	115% ±1%
• Reset .....	107% ±1%
<b>Voltage Unbalance (NEMA)</b>	
• Trip .....	6%
• Reset .....	5%
<b>Trip Delay Time</b>	
• Low, High and Unbalanced Voltage .....	1 - 10 seconds adjustable
• Reverse Phasing Faults .....	1 second fixed
• Reset Delay .....	1 second
<b>Output Contact Rating</b>	
• 1-Form C .....	10 A General Purpose @ 240 VAC Pilot Duty 480VA @ 240 VAC, 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, 3.5 kv 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

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

\*\*Operation is not guaranteed for input voltages less than 150 VAC

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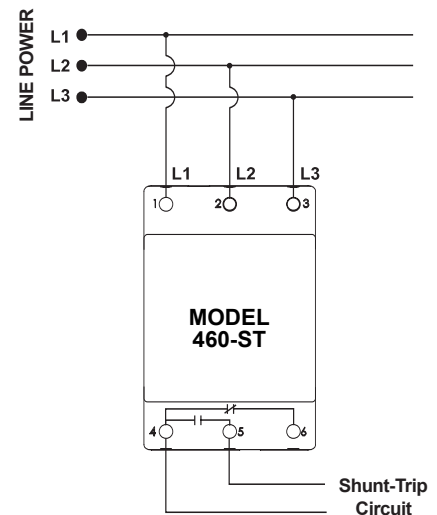
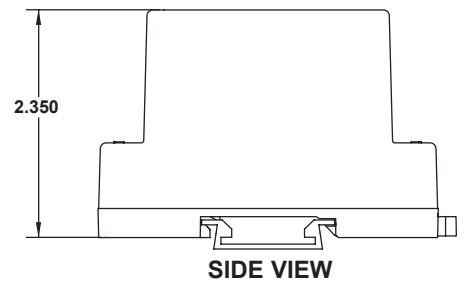
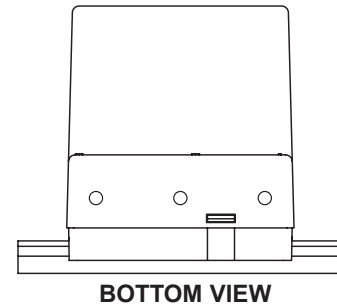
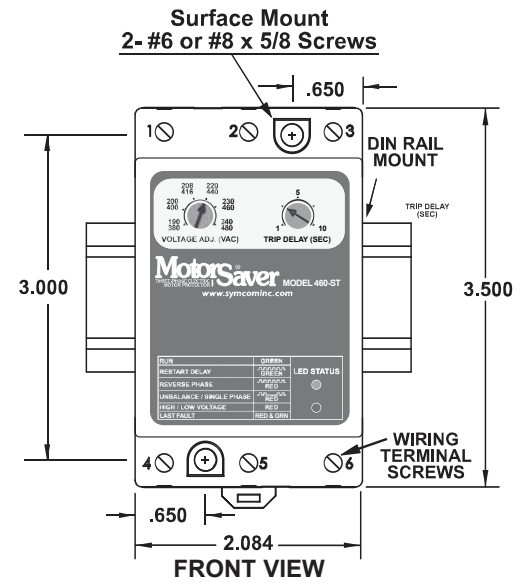


Figure No. 1: Typical Wiring Diagram.  
Contacts indicated in the normal mode.  
A fault will change state.