

Single-phase voltage monitor



The 460-100-SP is used on 95–120 V ac, 50*/60 Hz single-phase motors and the 460-200-SP is used on 190–240 V ac, 50*/60 Hz single-phase motors to protect them from damaging high and low voltage conditions. An adjustment knob allows the user to set a 1–500 second restart delay. The variable restart delay is also a power-up delay and can be utilized to stagger-start motors on the same system.

A unique microcontroller-based, voltage-sensing circuit constantly monitors the voltage 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 and a specified amount of time has elapsed (restart delay). The trip delay prevents nuisance tripping due to rapidly fluctuating power line conditions.

The diagram illustrates the electrical connections for the MotorSaver Model 460-SP. It includes the following components and connections:

- INPUT POWER:** L1 and L2 lines entering the system.
- MAGNETIC CONTACTOR:** Receives input power and controls the motor. It features two OL (Overload) contacts.
- MOTOR:** The load being protected, connected to the output of the magnetic contactor.
- MotorSaver Model 460-SP:** The central protective device with terminals 1, 2, 3, 4, 5, and 6.
- CONTROL POWER:** 24-240 VAC source connected to the control circuit.
- Control Circuit Components:**
 - MANUAL:** A selector switch with positions for ON and OFF.
 - STOP:** A normally closed (NC) stop button.
 - START:** A normally open (NO) start button.
 - M:** A motor protection relay or indicator.
 - PILOT CONTACT:** A contact used for signaling or interlocking.

The wiring shows the power flow from the input through the contactor to the motor, and the control circuit logic involving the manual selector, stop/start buttons, and the MotorSaver unit's internal protection circuitry.

FEATURES	BENEFITS
Proprietary microcontroller based circuitry	Constant monitoring of voltage to detect harmful power line conditions, even before a motor starts
Fixed trip delay 4 s	Prevents nuisance tripping due to rapidly fluctuating power line conditions
Adjustable restart delay (1–500s)	Allows staggered start up of multiple motors on the same system to prevent a low voltage condition
Advanced LED indication	Provides diagnostics which can be used for troubleshooting and to determine relay status
DIN rail or surface mountable	Allows flexibility for panel assembly

MODEL	LINE VOLTAGE
460-100-SP	95–120 V ac
460-200-SP	190–240 V ac

460-XXX-SP SERIES

Specifications

Input Characteristics

Line Voltage

460-100-SP	95–120 V ac
460-200-SP	190–240 V ac

Frequency	50*/60 Hz
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Functional Characteristics

Low Voltage (% of setpoint):

Trip	90 % ±1 %
Reset	93 % ±1 %

High Voltage (% of setpoint)

Trip	110 % ±1 %
Reset	107 % ±1 %

Trip Delay Time

Low or High Voltage	4 seconds fixed
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Restart Delay Time

After a Fault	1–500 seconds adjustable
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After a Complete Power Loss	1–500 seconds adjustable
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Output Characteristics

Output Contact Rating (1 Form C)

Pilot Duty	480 VA @ 240 V ac, B300
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General Purpose	10 A @ 240 V ac
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General Characteristics

Ambient Temperature Range

Operating	-40° to 70°C (-40° to 158°F)
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Storage	-40° to 80°C (-40° to 176°F)
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Maximum Input Power	6 W
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Class of Protection	IP20, NEMA 1 (finger safe)
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Relative Humidity	10–95%, non-condensing per IEC 68-2-3
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Terminal Torque	4.5 in.-lbs.
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Wire Type	Stranded or solid 12–20 AWG, one per terminal
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Standards Passed

Electrostatic Discharge (ESD) IEC 61000-4-2, Level 3, 6 kV contact, 8 kV air

Radio Frequency Immunity,

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 UL 508 (2 x rated V +1000 V for 1 min)

Safety Marks

UL UL 508 (File #E68520)

Enclosure Polycarbonate

Dimensions **H** 88.9 mm (3.5"); **W** 52.93 mm (2.084");

D 59.69 mm (2.35")

Weight 0.9 lb. (14.4 oz., 408.23 g)

Mounting Method 35 mm DIN rail or Surface Mount (#6 or #8 screws)

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