

PumpSaver® Plus

SUBMERSIBLE
PUMP PROTECTOR

INSTALLATION INSTRUCTIONS FOR SYMCOM MODEL 233-P

DANGER!



HAZARDOUS VOLTAGES MAY BE PRESENT DURING INSTALLATION.

Electrical shock can cause death or serious injury.

Installation should be done by qualified personnel following all national, state and local electrical codes.



SymCom PumpSaver® Plus Model 233-P protects 230V, 2 or 3-wire, 1/3 – 3hp, single-phase pumps from dry-well, dead-head, rapid-cycle, jammed-impeller, overvoltage and undervoltage conditions. Typical applications include submersible pumps, centrifugal pumps, circulating pumps, cooling pumps, environmental pumps, residential waterwells, commercial waterwells, irrigation wells, and golf course and other sprinkler systems.

**DISCONNECT POWER PRIOR TO INSTALLATION!
FOLLOW NATIONAL, STATE AND LOCAL CODES!**

CONNECTIONS

NOTE: Use in conjunction with UL listed or recognized thermal or solid-state overload relays only.

1. Mount the PumpSaver® Plus Model 233-P in a convenient location in or near the pump control box. If the location is wet or dusty, a NEMA 3R, 4, or 12 enclosure should be used.
2. Connect one line from the fused disconnect to the Model 233-P's **L1 IN** terminal. Run a wire from the **L1 OUT** terminal to the other in-line controls such as pressure or float switches.
3. Connect the other line from the fused disconnect to the Model 233-P's **L2 IN** terminal. Run a wire from the **L2 OUT** terminal to the other in-line controls such as pressure or float switches (see Figure 1).
4. Refer to the appropriate wiring diagram for your specific application:
 - Typical wiring diagram – Figure 1
 - Standard 3-wire control box – Figure 2
 - Deluxe control box – Figure 3
 - 2-Wire pump direct feed – Figure 4

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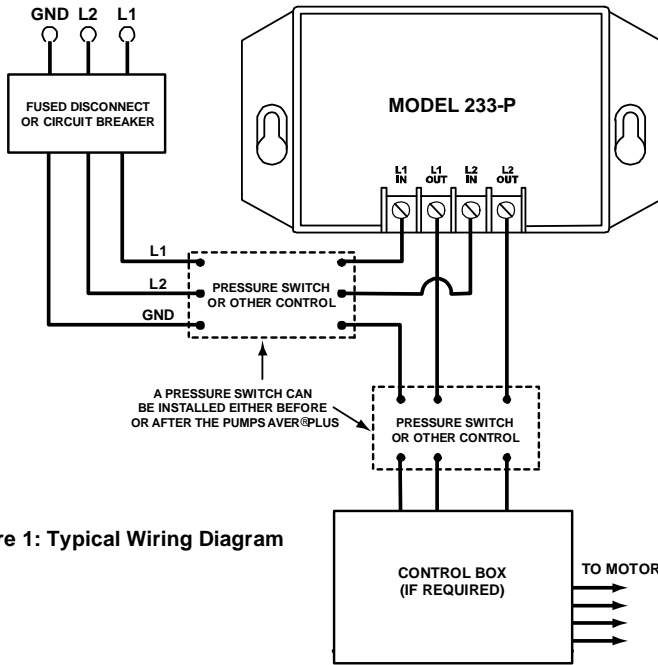


Figure 1: Typical Wiring Diagram

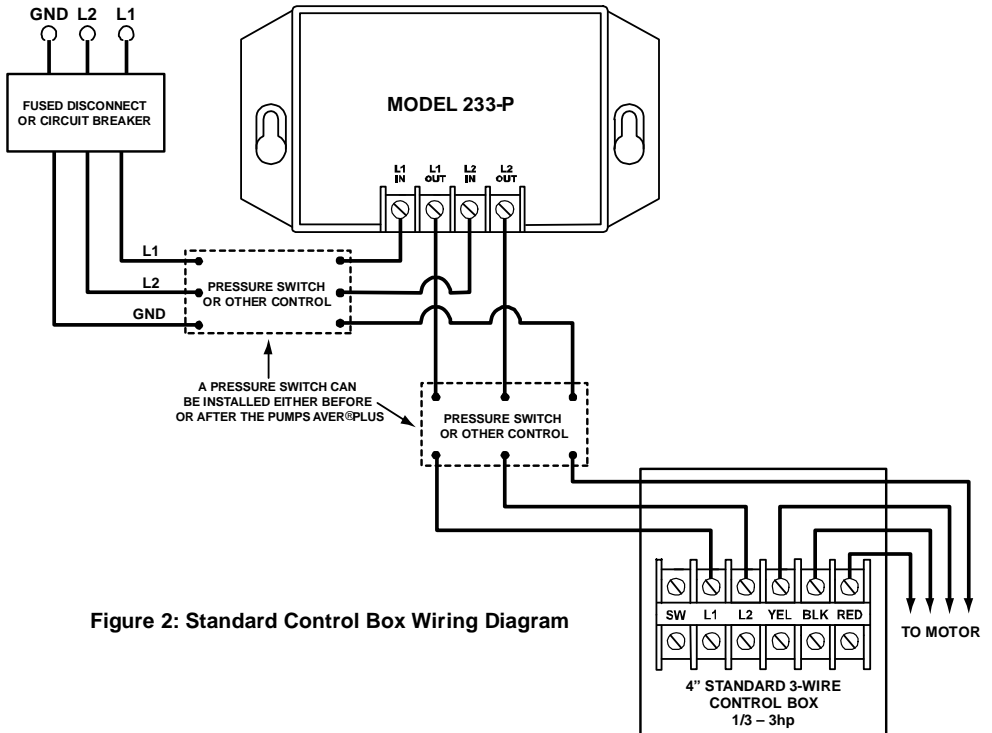


Figure 2: Standard Control Box Wiring Diagram

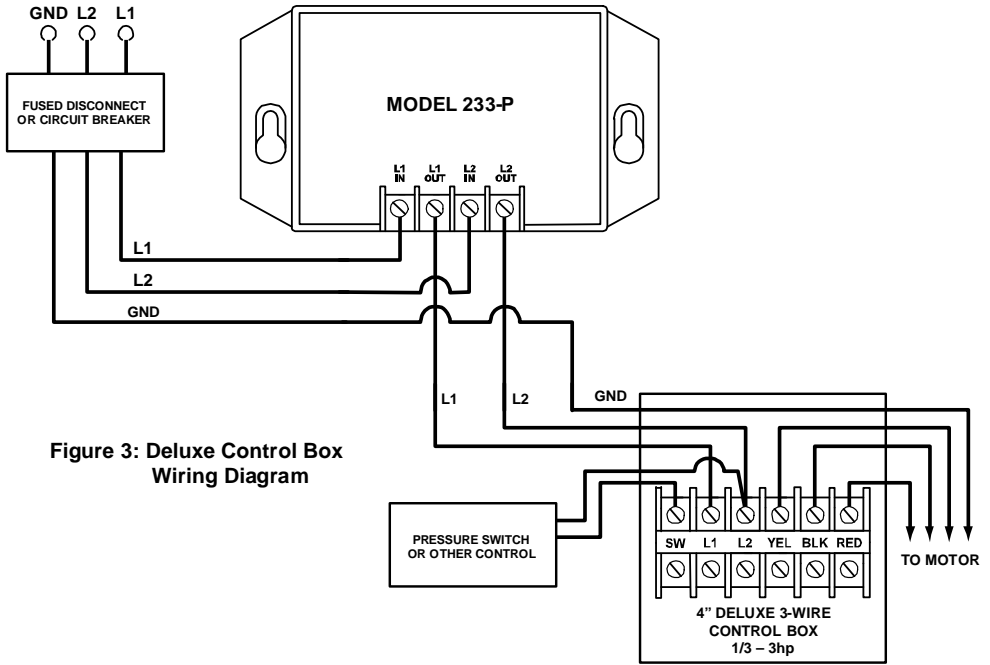


Figure 3: Deluxe Control Box Wiring Diagram

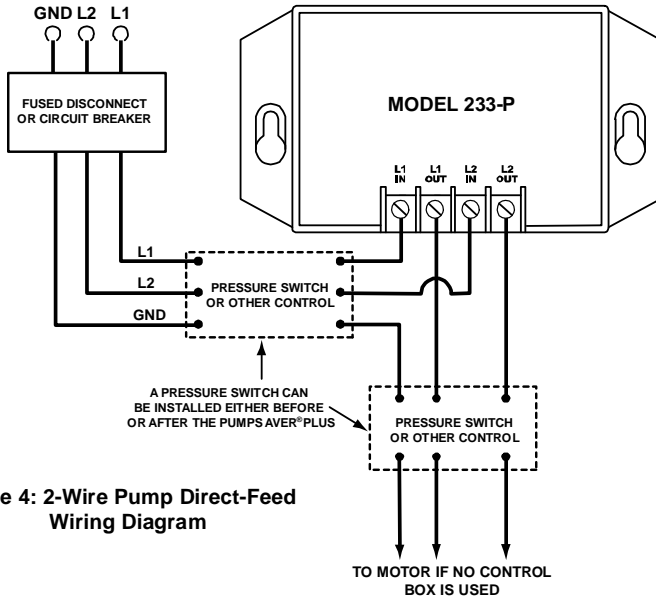


Figure 4: 2-Wire Pump Direct-Feed Wiring Diagram

OPERATION

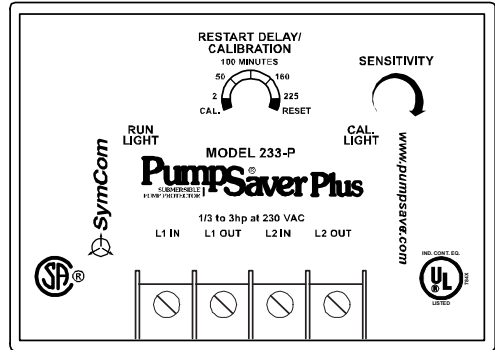
The Model 233-P monitors pump load in amps and kilowatts. When the current (amps) exceeds approximately 125% of calibrated current, or power (kW) drops below the adjustable underload trip point, the 233-P—after the trip delay—will turn off the pump. The 233-P will time through the restart delay, and then restart the pump.

The calibration is stored in permanent memory—it **does not need to be recalibrated if power is lost**.

CALIBRATION

NOTE: The Model 233-P should be calibrated during normal pumping conditions.

1. Turn the **RESTART DELAY/ CALIBRATION** knob fully counter-clockwise to the **CAL.** position.
2. Apply power—the pump will run for approximately 15 seconds then shut off.
3. Set the **RESTART DELAY/ CALIBRATION** knob to the desired restart delay (dry-well recovery time)—the pump will turn on.



CALIBRATING WHILE PUMPING

The Model 233-P can also be calibrated while the pump is running. Turn the **RESTART DELAY/CALIBRATION** knob to **CAL.** while pumping. Wait for the pump to turn off (approximately 10 seconds), then adjust the **RESTART DELAY/CALIBRATION** knob to the desired setting.

SENSITIVITY

The Model 233-P has an adjustment knob to set the underload trip sensitivity. Setting **SENSITIVITY** to the middle position (straight up) is equivalent to SymCom's standard underload trip level. Adjust the **SENSITIVITY** knob to increase/decrease underload sensitivity up to approximately 10% of the standard trip. It may be necessary to increase the sensitivity if the PumpSaver[®]Plus does not trip on dry-run or dead-head or it is known that the water level in the well is very low relative to the pumps capabilities.

WARNING: Decreasing the **SENSITIVITY** may compromise the PumpSaver's ability to detect dry-run and/or dead-head conditions.

MANUAL RESET MODE / RESTART DELAY

Set the **RESTART DELAY/CALIBRATION** knob to **RESET** for manual reset mode. If the 233-P trips off due to a voltage or load problem, the **RESTART DELAY/CALIBRATION** knob must be rotated out of the **RESET** position to restart the pump.

NOTE: Any restart delay can be bypassed by rotating the **RESTART DELAY/CALIBRATION** knob to the **RESET** position and back to the desired restart delay setting.

NOTE: The restart delay can be changed at any time. The next trip will follow the new restart delay setting.

RUN HOURS

The Model 233-P records pump run hours. Run hours can be displayed by a PumpSaver®Plus Informer (see USING AN INFORMER on the following page). Run hours can be reset on the 233-P. Read the following instructions fully before performing the procedure.

NOTE: Turn the SENSITIVITY knob completely to the left (counter-clockwise) or completely to the right (clockwise) when directed.

To Reset Run Hours:

1. Remove power to the 233-P.
2. Set the **RESTART DELAY/CALIBRATION** knob to **RESET** and the **SENSITIVITY** knob to the middle (12:00) position.
3. Apply power to the 233-P—the **CAL. LIGHT** will turn on.
4. Turn the **SENSITIVITY** knob to the **right**—the **CAL. LIGHT** will turn off and the **RUN LIGHT** will turn on.
5. Turn the **SENSITIVITY** knob to the **left**—both lights will turn on.
6. Turn the **SENSITIVITY** knob to the **right**.
7. After 10 seconds, the **CAL.** and **RUN LIGHTS** will blink twice indicating the run hours have successfully been reset.

RAPID CYCLING

Rapid cycling is defined as more than 4 restarts in a 60-second period. The Model 233-P is capable of detecting a rapid-cycle condition whether a control device, such as a pressure switch, is installed before or after the 233-P. Upon detecting either form of rapid cycling, the 233-P will lock-out until power is removed and re-applied.

Protection against rapid cycling of a pressure switch installed before the Model 233-P can be disabled. Read the following instructions fully before performing the procedure.

NOTE: Turn the SENSITIVITY knob completely to the left (counter-clockwise) or completely to the right (clockwise) when directed.

To Disable Rapid-Cycle Protection when a Pressure Switch is Installed BEFORE the 233-P:
(to re-enable, follow the same procedure)

1. Remove power to the 233-P.
2. Set the **RESTART DELAY/CALIBRATION** knob to **RESET** and the **SENSITIVITY** knob to the middle (12:00) position.
3. Apply power to the 233-P—the **CAL. LIGHT** will turn on.
4. Turn the **SENSITIVITY** knob to the **right**—the **CAL. LIGHT** will turn off, **RUN LIGHT** will turn on.
5. Turn the **SENSITIVITY** knob to the **left**—both lights will turn on.
6. Turn the **SENSITIVITY** knob **right—left—right—left—right**.
7. After 10 seconds, the **CAL.** and **RUN LIGHTS** will blink twice.

USING AN INFORMER

The Model 233-P is equipped with an infrared LED that will communicate to a SymCom Informer—a handheld, battery-operated, diagnostic tool. The Informer—when directed at the Model 233-P—will display real-time voltage, current and power; dry-well and overload trip points; calibration voltage; last 20 faults; voltage, current and power at the last fault; highest/lowest voltage and current since calibration; the model number; and the CT size if applicable. The Informer can be used on any single-phase PumpSaver® equipped with an infrared LED transmitter—Models 111- and 231-Insiders; 231-P Insider; 112- and 232-Insiders; 111; 233-1.5(-P); 233(-P); 234; and 235. Contact SymCom for more information at 800-843-8848 or visit our website: www.symcom.com.

TROUBLESHOOTING

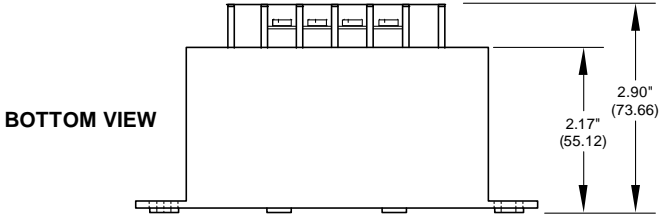
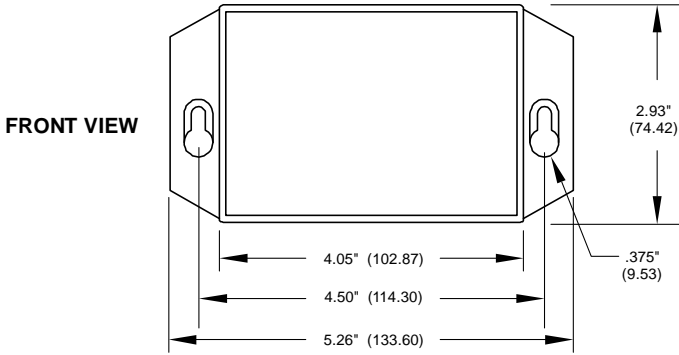
RUN LIGHT	CAL. LIGHT	PROBLEM or FUNCTION	CORRECTIVE ACTION
On Steady	Off	RUN: Pump is running—or ready to run—no problems in operation	If pump is not running, check for loose wiring and ensure proper function of pressure or float switches.
On Steady	On Steady	CAL: The PumpSaver® is in the calibration process.	None
Off	On Steady	CAL COMPLETE: The PumpSaver has calibrated, the RESTART DELAY/ CALIBRATION knob was left in the CAL position. Pump is off.	Pump will restart as soon as the RESTART DELAY/ CALIBRATION knob is rotated out of the CAL position.
Off	Off	OFF / MANUAL RESTART: The pump is not running. Either the PumpSaver® has tripped on dry-run, dead-head, or overload while the RESTART DELAY/ CALIBRATION knob was in the RESET position or source power is not present.	If knob is in the RESET position, rotate out of RESET—If the CAL light blinks, check for an overload condition. If the RUN light blinks, look for a dry-run or dead-head condition. If no lights come on, check incoming power for adequate voltage.
Blinking	Off	DRY RUN / DEAD HEAD: The PumpSaver® has shut the pump off due to a dry run or dead head condition. The unit is timing through the restart delay and will try to restart.	Check for restricted flow or inadequate supply of liquid.
Off	Blinking	OVERLOAD: The PumpSaver® has shut the pump off due to an overload condition. The unit is timing through the restart delay and will try to restart if line voltage is at an acceptable level.	Check for low or high voltage or jammed pump impellers. If these conditions do not exist, recalibrate the unit while it is drawing higher current (amps should not exceed SFA).
Blinking alternately with the CAL. LIGHT	Blinking alternately with the RUN LIGHT	VOLTAGE FAULT: The PumpSaver® is preventing the pump from starting due to voltage problems. The voltage is being interrogated and the unit will remain in this mode until the voltage is at an acceptable level.	If the unit remains in this state for more than 5 seconds, check for high or low voltage.
Blinking in unison with the CAL. LIGHT	Blinking in unison with the RUN LIGHT	RAPID CYCLE: The PumpSaver has shut down on rapid cycling. Power must be removed and reapplied to reset the unit.	Check for a broken bladder in the pressure tank (if used), or check for a defective pressure or float switch.

233-P SPECIFICATIONS

Single-Phase Line Voltage	230VAC
Load Range	1/3 – 3hp
Frequency	50/60Hz
Note: 50Hz will increase all delay timers by 20%	
Operating Points	
Overload	125% of calibration point
Underload (dry-well)	Adjustable
Overvoltage	265VAC
Undervoltage	190VAC
Number of restarts allowed in a 60-second period (rapid-cycling)	4
Trip Delay Times	
Overload	5 seconds
Dry-well	4 seconds
Restart Delay Times	
Over/undervoltage	2 seconds
All other faults	manual, 2-225 minutes
Output Contact Rating—SPDT	3hp, 240VAC (17 amps max.)
Electrostatic Discharge (ESD)	IEC 1000-4-2, Level 2, 4kV contact , 6kV air
Power Consumption	5 Watts (max.)
Weight	14 oz.
Operating Temperature	-40° to 70°C (-40° to 158°F)
Safety Marks	
UL	UL508
CSA	LR 46510-12

SymCom warrants its standard products against defects in material or workmanship for a period of five (5) years from the date of manufacture except for Power Perfect which is warranted for twelve (12) months. All third-party products are warranted by their manufacturer and are handled as a pass-through warranty by SymCom. All custom and private labeled products are warranted for eighteen (18) months unless otherwise stated in writing. The liability of SymCom is limited, at its option, to replace, repair, or credit at the purchase price, for any devices which are returned during the warranty period that prove to be defective.

DIMENSIONS



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you're looking for?*

*SymCom designs and manufactures
custom control boards too.*

Call us for details!