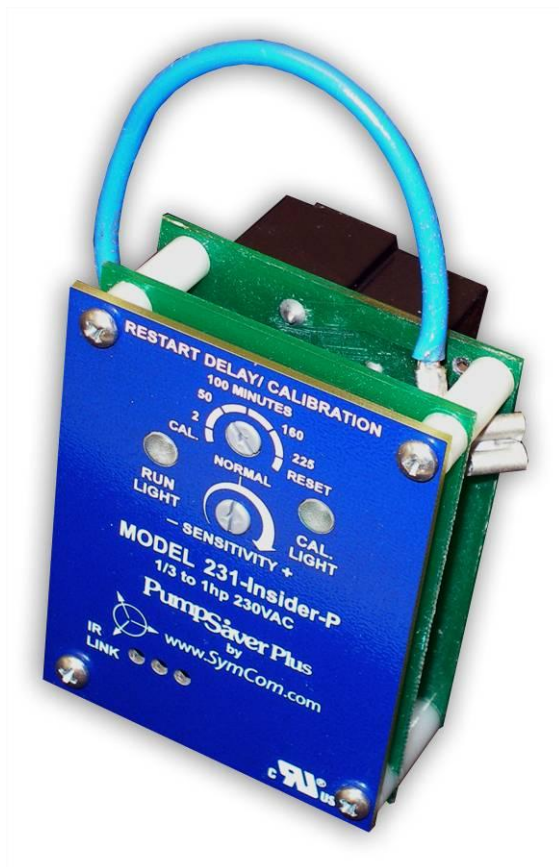


# INSTALLATION INSTRUCTIONS

Revision B  
Rapid City, SD, USA, 07/2015

**PumpSaver® Plus**  
ELECTRONIC PUMP  
CONTROL & PROTECTION

## MODEL 231/111-INSIDER-P



II-231-111-IN-P-C



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222 Disk Drive, Rapid City, SD 57701  
(800) 843-8848 [www.symcom.com](http://www.symcom.com)

## **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.**



**BE SURE POWER IS DISCONNECTED PRIOR TO INSTALLATION!  
FOLLOW NATIONAL, STATE AND LOCAL CODES.  
READ THESE INSTRUCTIONS ENTIRELY BEFORE INSTALLATION.**

The PumpSaver®Plus Model 231-INSIDER-P fits inside 1/3 – 1hp, 230VAC Franklin™, Pentek®, CentriPro™ and Flint and Walling™ control boxes. The Model 111-INSIDER-P fits inside 1/3 and 1/2hp, 115VAC Franklin™, Pentek®, CentriPro™ and Flint and Walling™ control boxes. PumpSavers are designed to protect single-phase pumps from dry-well, dead-head, rapid-cycling, jammed impeller, and over/undervoltage conditions. Typical applications include residential water wells, commercial water wells, irrigation wells, and golf course and other sprinkler systems.

### **CONNECTIONS**

Refer to specific connection instructions depending on the particular control box being used:

|                                |          |
|--------------------------------|----------|
| Franklin™ control box          | – page 3 |
| Pentek® control box            | – page 5 |
| CentriPro™ control box         | – page 7 |
| Flint and Walling™ control box | – page 9 |

After the PumpSaver®Plus has been installed, place the provided **PumpSaver®Plus Label** on the outside of the control box.



**FIGURE 1: PumpSaver®Plus Enclosure Label**

**\*\*\* WARNING \*\*\***

**PROPER OPERATION REQUIRES FIELD CALIBRATION**

# FRANKLIN™ CONTROL BOX

## CONNECTIONS

1. Remove the cover from the front of the 3-wire Franklin™ control box.
2. Disconnect the **yellow** wire from terminal L2 and remove the **blue** wire completely from the control box (save the **blue** wire for future use).
3. Connect the **blue** wire attached to the PumpSaver®Plus to the L1 terminal on the solid-state switch.
4. Press the PumpSaver®Plus onto the L1 and L2 terminals.
5. Reconnect the **yellow** wire to L2 on the PumpSaver®Plus.

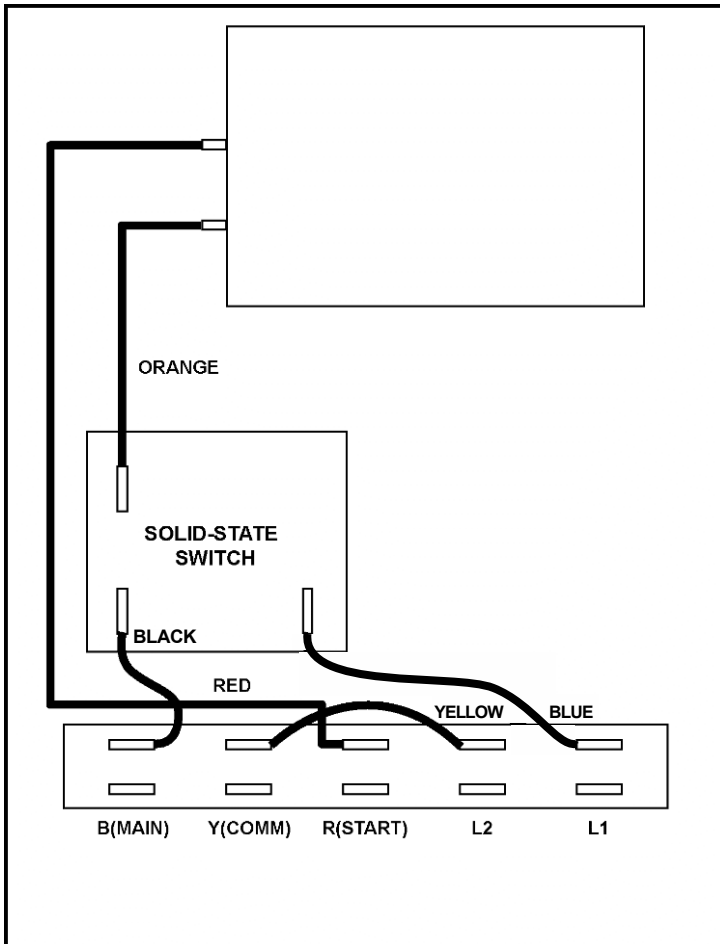
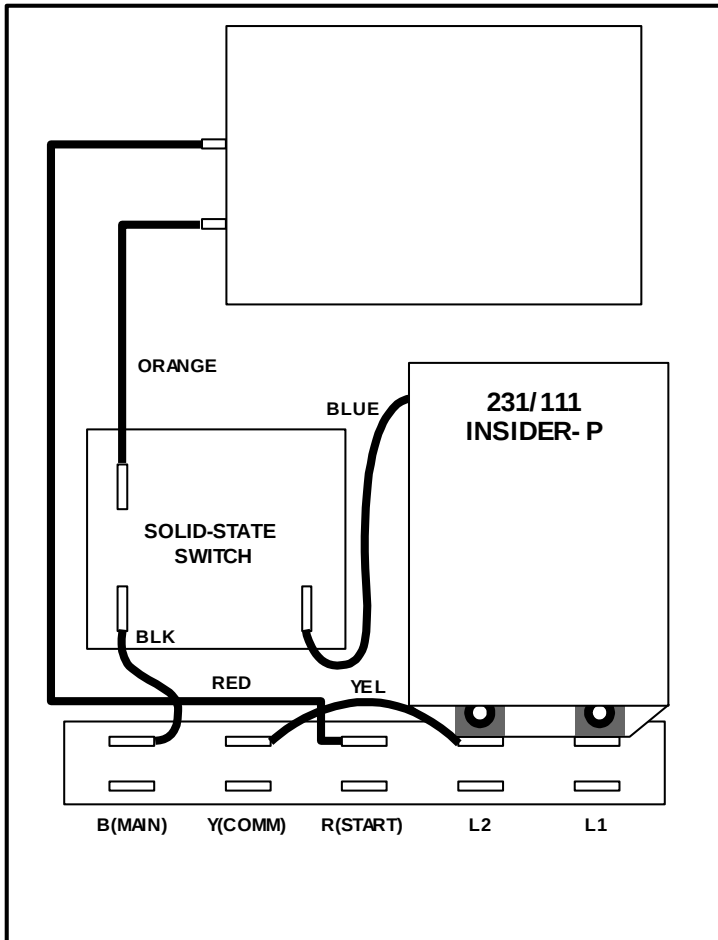


FIGURE 2: Franklin™ Control Box without the PumpSaver®Plus

# FRANKLIN™ CONTROL BOX



**FIGURE 3: Franklin™ Control Box with the PumpSaver® Plus Installed**

# PENTEK® CONTROL BOX

## CONNECTIONS

1. Remove the cover from the front of the 3-wire Pentek® control box.
2. Disconnect the **yellow** wire from terminal L2.
3. Cut and remove the **black** wire connecting L1 and B (MAIN).
4. Press the PumpSaver®Plus onto the L1 and L2 terminals.
5. Reconnect the **yellow** wire to L2 on the PumpSaver®Plus.
6. Connect the **blue** wire attached to the PumpSaver®Plus to the dual-lug terminal with the **black** wire at the top of the capacitor.

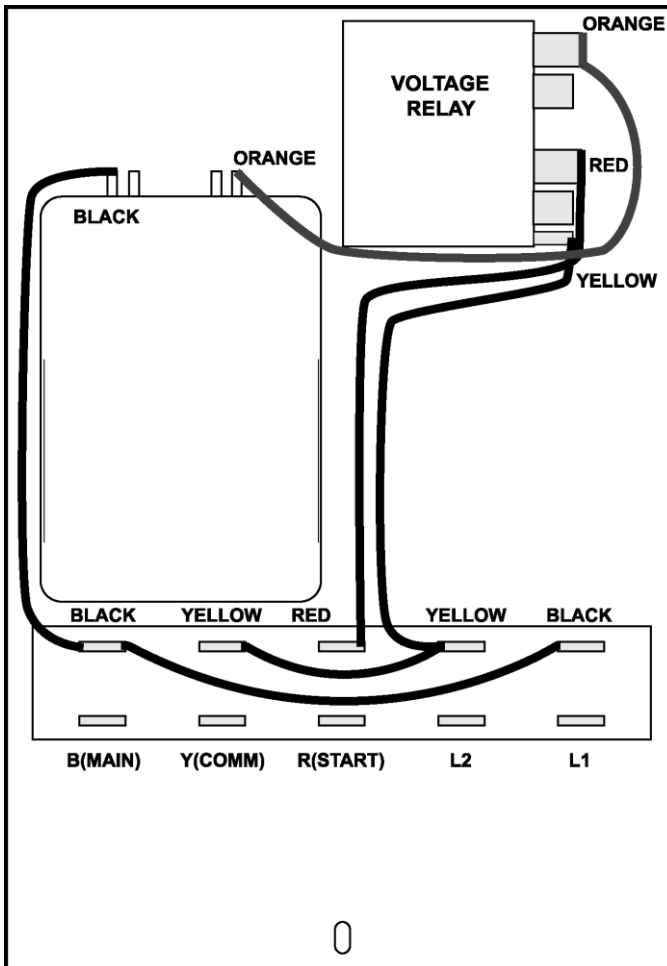


FIGURE 4: Pentek® Control Box without the PumpSaver®Plus Installed

PENTEK® CONTROL BOX

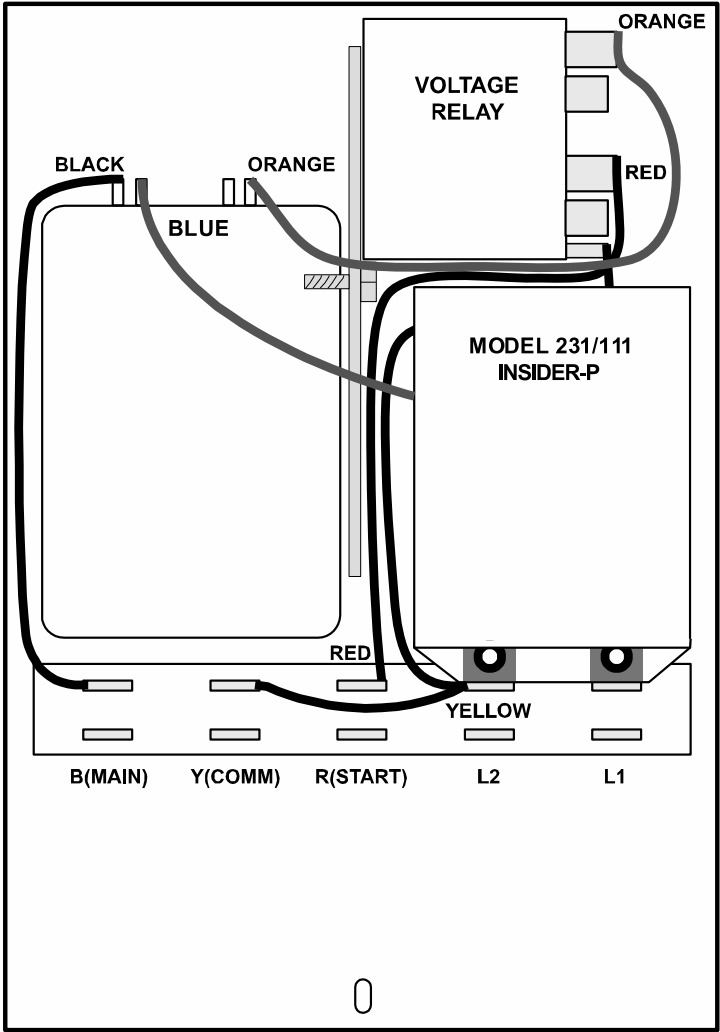


FIGURE 5: Pentek® Control Box with the PumpSaver® Plus Installed

# CENTRIPRO™ CONTROL BOX

## CONNECTIONS

1. Remove the cover from the front of the 3-wire CentriPro™ control box.
2. Disconnect the **yellow** wire from terminal L2.
3. Remove the **black** wire connecting L1 and the capacitor completely from the box (save the **black** wire for future use).
4. Press the PumpSaver® Plus onto the L1 and L2 terminals.
5. Reconnect the **yellow** wire to L2 on the PumpSaver® Plus.
6. Connect the **blue** wire attached to the PumpSaver® Plus to the dual-lug terminal (with the **black** wire) of the capacitor.

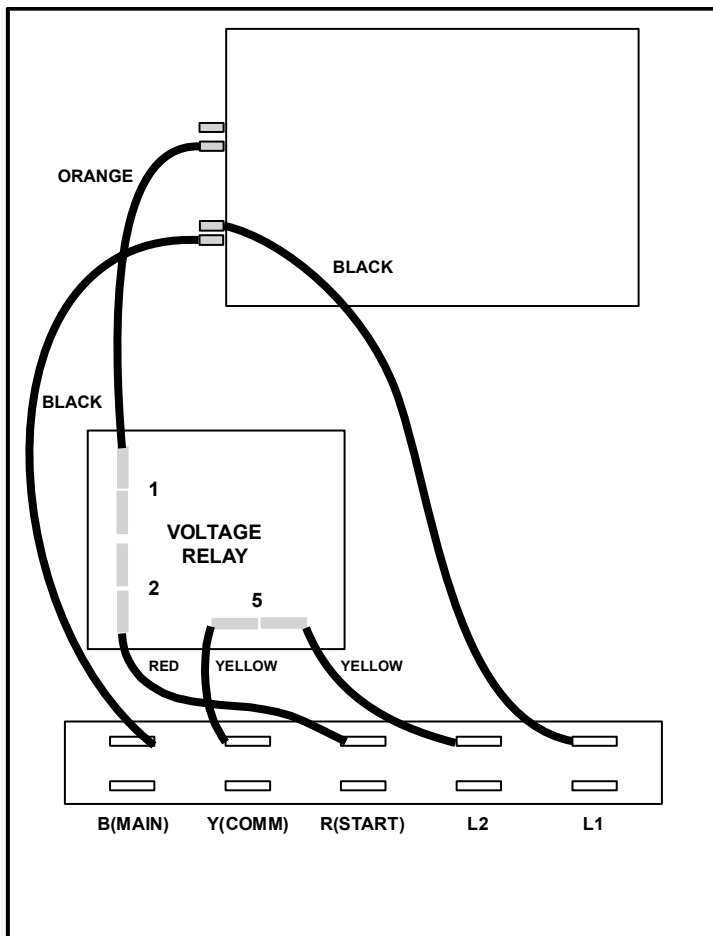


FIGURE 6: CentriPro™ Control Box without the PumpSaver® Plus Installed

CENTRIPRO™ CONTROL BOX

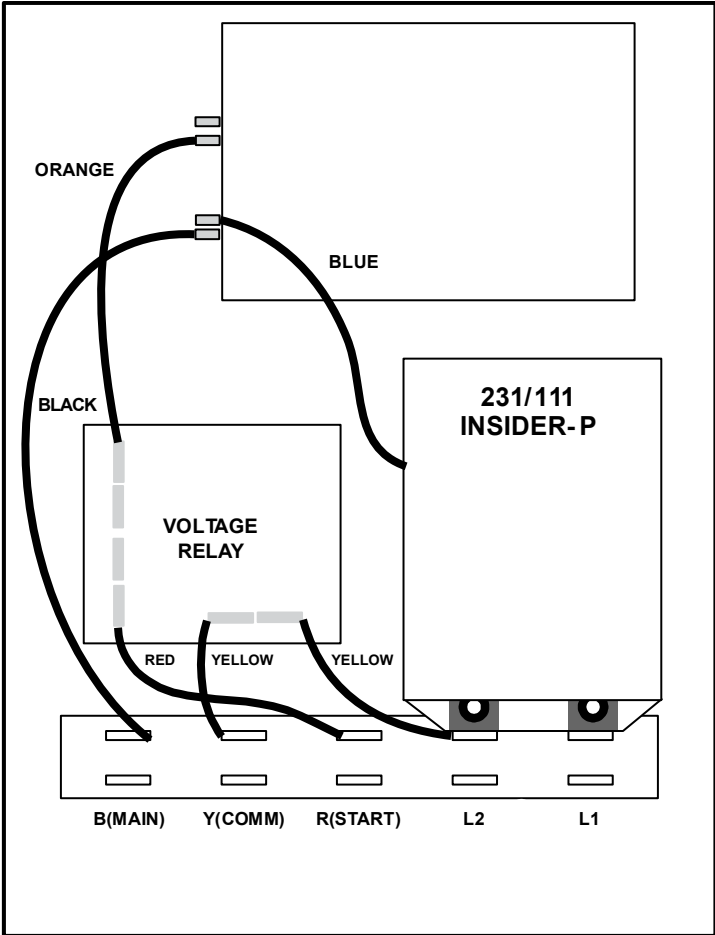


FIGURE 7: CentriPro™ Control Box with the PumpSaver® Plus Installed

# FLINT AND WALLING™ CONTROL BOX

## CONNECTIONS

1. Remove the cover from the front of the 3-wire Flint and Walling™ control box.
2. Disconnect the **yellow** wire from terminal L2.
3. Remove the **black** wire connecting L1 and the capacitor completely from the box (save the **black** wire for future use).
4. Press the PumpSaver® Plus onto the L1 and L2 terminals.
5. Reconnect the **yellow** wire to L2 on the PumpSaver® Plus.
6. Connect the **blue** wire attached to the PumpSaver® Plus to the dual-lug terminal (with the **black** wire) of the capacitor.

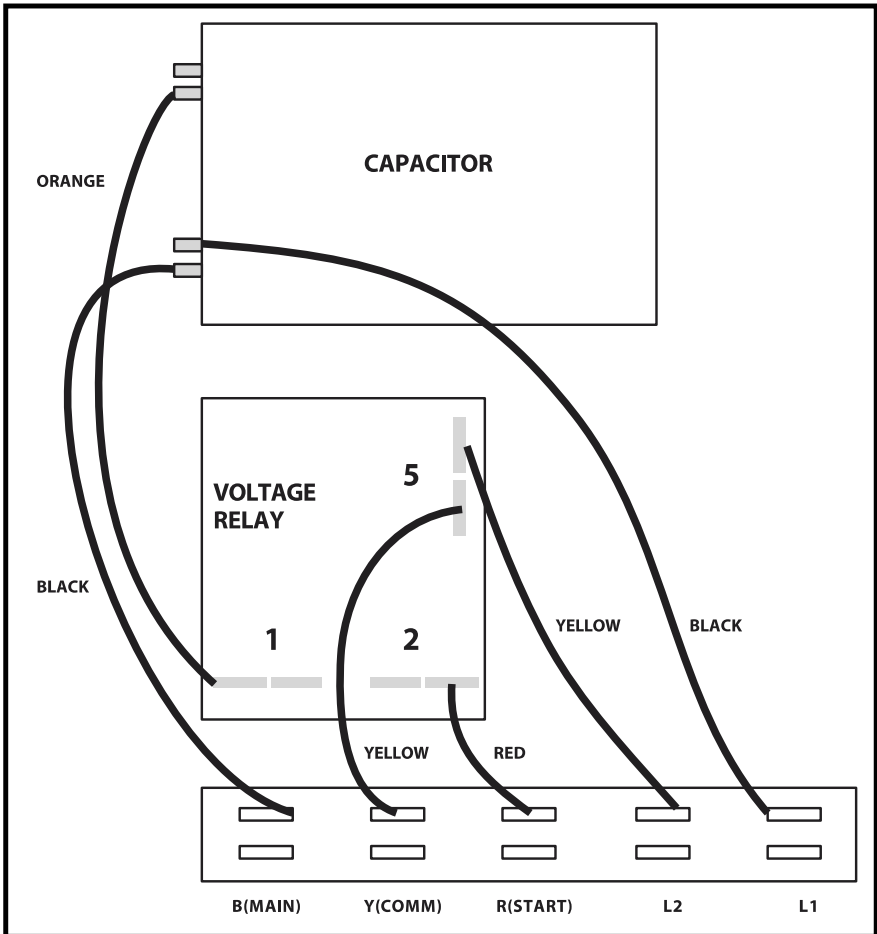


FIGURE 8: Flint and Walling™ Control Box without the PumpSaver® Plus Installed

## FLINT AND WALLING™ CONTROL BOX

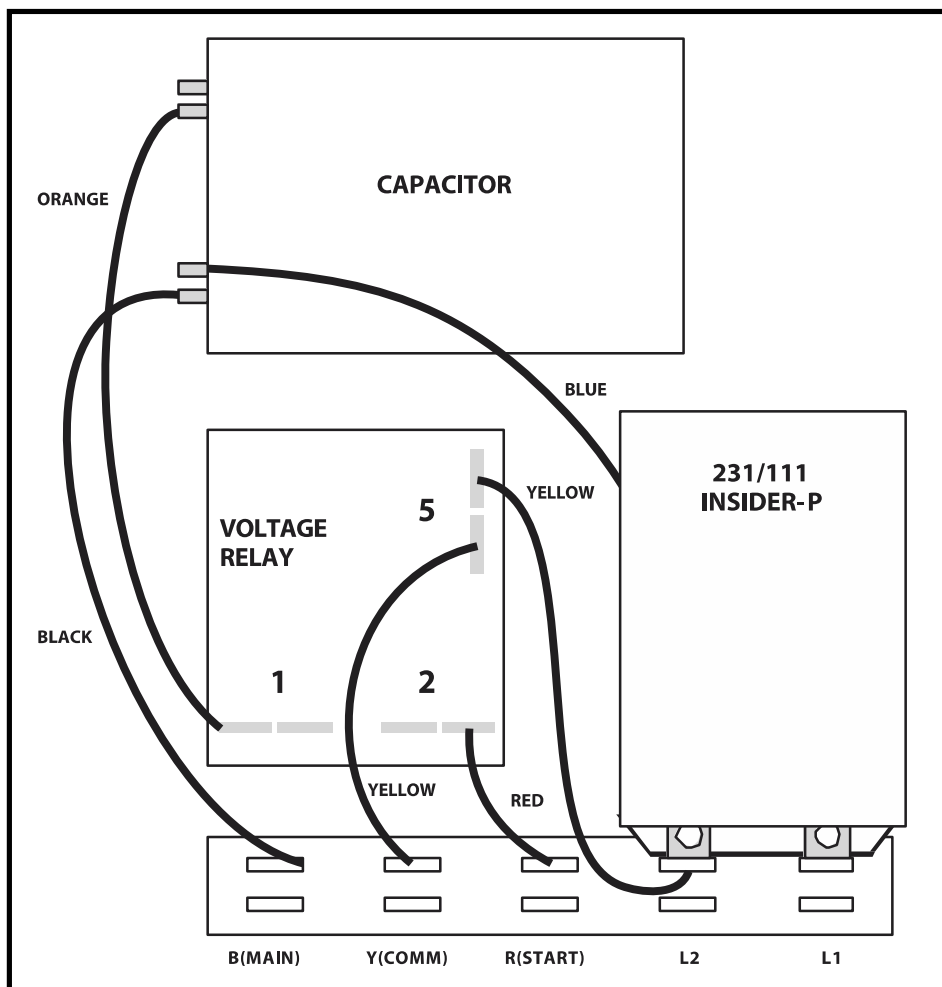


FIGURE 9: Flint and Walling™ Control Box with the PumpSaver®Plus Installed

### OPERATION

The PumpSaver®Plus 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 PumpSaver®Plus—after the trip delay—will turn off the pump. The PumpSaver®Plus will automatically restart the pump after the selected restart delay time. Remove power from the system. Open the control box and set the appropriate dry-well recovery time with the RESTART DELAY/CALIBRATION knob. The calibration is stored in permanent memory. **The PumpSaver®Plus does not need to be recalibrated if power is lost.**

## **CALIBRATION / SETTINGS**

1. Turn **RESTART DELAY/ CALIBRATION** to the **CAL.** position and close the box cover.
2. Ensure the pressure or float switch is fully closed so there is a “call for water”.
3. Ensure there is a call for water, and then apply power to the system. The pump should run for approximately 10 seconds and then shut off—this indicates the PumpSaver®Plus has calibrated.
4. Remove power from the system. Open the control box and set the appropriate dry-well recovery time with the **RESTART DELAY/ CALIBRATION** knob.
5. Shut the control box and re-apply power to the system.

## **SENSITIVITY**

The PumpSaver®Plus has an adjustment knob to set the underload trip sensitivity. Setting **SENSITIVITY** to the “normal” position (straight up) is equivalent to SymCom’s standard underload trip level. Adjust the **SENSITIVITY** knob to increase/decrease underload sensitivity up to approximately  $\pm 10\%$  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 pump’s capabilities.

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

## **RUN HOURS / FAULT HISTORY**

The PumpSaver®Plus records pump run hours and fault history, which can be displayed by a PumpSaver® Informer (see **USING AN INFORMER** section).

## **RAPID CYCLING**

Rapid cycling is defined as more than 4 restarts in a 60-second period. The PumpSaver®Plus is capable of detecting a rapid-cycle condition and will lock-out, preventing damage to the pump\*.

Rapid cycling of the PumpSaver®Plus may be caused by several naturally occurring conditions which are indistinguishable from true rapid cycling. For this reason, once tripped, the PumpSaver®Plus will wait 30 minutes and restart. If any restart is successful (pump runs for more than one minute), the rapid cycle counter will reset to zero. If the PumpSaver®Plus encounters rapid cycle 4 times without a successful restart, it will lock-out and require a manual reset. To reset the PumpSaver®Plus, remove and re-apply power.

\*Protection against line-side rapid cycling is disabled by default. Read the following instructions fully before performing the procedure to enable this feature.

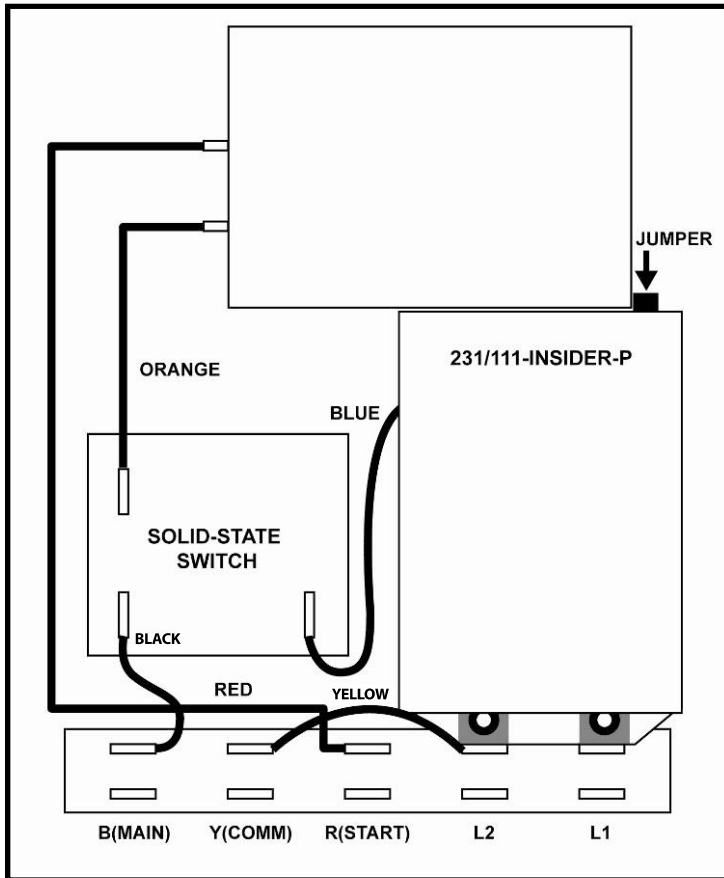
## **WARNING: ENSURE POWER IS DISCONNECTED PRIOR TO PERFORMING THE FOLLOWING PROCEDURE.**

**To Enable Line-Side Rapid-Cycle Protection:** (to disable, follow the same procedure and replace the jumper on the PumpSaver®Plus)

1. Locate the Rapid-Cycle Jumper in the upper-right corner behind the faceplate of the PumpSaver®Plus. See Figure 10 for location of jumper.
2. Remove the Rapid-Cycle Jumper (See Figure 10). The jumper may be removed before

- or after initial installation.
3. Save the removed jumper.
  4. If the PumpSaver®Plus is not already installed, install as described in the CONNECTIONS section.
  5. Re-apply power.

**NOTE: THE RAPID-CYCLE JUMPER MUST BE SAVED IN CASE IT IS NECESSARY TO DISABLE LINE-SIDE RAPID CYCLING AT A FUTURE DATE.**



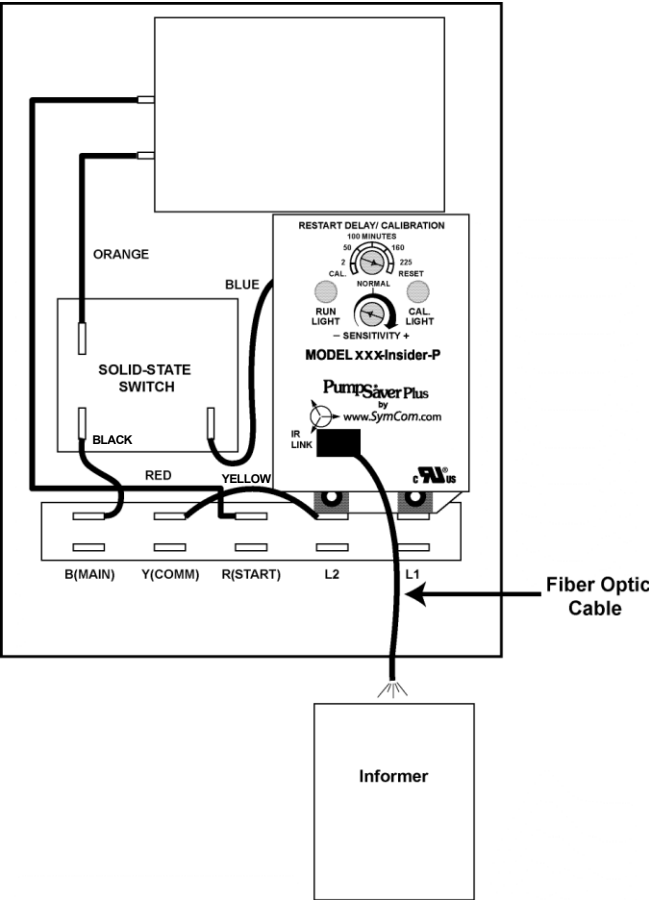
**FIGURE 10: Location of Rapid-Cycle Jumper**

### **USING AN INFORMER**

PumpSaver®Plus products are equipped with an infrared LED that will communicate to a SymCom Informer—a handheld, battery-operated, diagnostic tool. The Informer—when directed at the PumpSaver®Plus—will display the model number; real-time voltage, current and power; dry-well

and overcurrent trip points; calibration voltage; restart delay setting and current restart delay time; pump starts and total run time; last 20 faults; voltage, current, power, and total run time at the time of each fault; highest/lowest voltage and current since calibration; and the CT size if applicable. The Informer can be used on any single-phase PumpSaver®Plus equipped with an infrared LED transmitter. Contact SymCom for more information at 800-843-8848 or visit our website: [www.symcom.com](http://www.symcom.com).

A fiber-optic cable is included to allow the Informer to be used without removing the control box cover. This cable can be plugged into the three holes in the Insider's faceplate labeled IR LINK. The other end of the cable can be routed through a hole in the bottom of the steel enclosure and left hanging. The Informer can be used by aiming the hanging end of the fiber-optic cable at it. See FIGURE 11.



**FIGURE 11: Using the fiber-optic cable to communicate with an Informer**

## TROUBLESHOOTING

| RUN LIGHT                                       | CAL. LIGHT                                     | PROBLEM or FUNCTION                                                                                                                                                                                                                                    | CORRECTIVE ACTION                                                                                                                                                                                                                                                                     |
|-------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| On Steady                                       | Off                                            | <b>RUN:</b><br>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                                      | <b>CAL.:</b><br>The PumpSaver®Plus is in the calibration process.                                                                                                                                                                                      | None                                                                                                                                                                                                                                                                                  |
| Off                                             | On Steady                                      | <b>CAL. COMPLETE:</b><br>The PumpSaver®Plus has calibrated, the <b>RESTART DELAY/ CALIBRATION</b> knob was left in the <b>CAL.</b> position. Pump is off.                                                                                              | Pump will restart as soon as the <b>RESTART DELAY/ CALIBRATION</b> knob is rotated out of the <b>CAL.</b> position.                                                                                                                                                                   |
| Off                                             | Off                                            | <b>OFF / MANUAL RESTART:</b><br>The pump is not running. Either the PumpSaver®Plus has tripped on dry-run, dead-head, or overcurrent while the <b>RESTART DELAY/ CALIBRATION</b> knob was in the <b>RESET</b> position or source power is not present. | If knob is in the <b>RESET</b> position, rotate out of <b>RESET</b> —If the <b>CAL.</b> light blinks, check for an overcurrent condition. If the <b>RUN</b> light blinks, look for a dry-run or dead-head condition. If no lights come on, check incoming power for adequate voltage. |
| Blinking                                        | Off                                            | <b>DRY-RUN / DEAD-HEAD:</b><br>The PumpSaver®Plus 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                                       | <b>OVERCURRENT:</b><br>The PumpSaver®Plus has shut the pump off due to an overcurrent 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 <b>CAL. LIGHT</b> | Blinking alternately with the <b>RUN LIGHT</b> | <b>VOLTAGE FAULT:</b><br>The PumpSaver®Plus 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 <b>CAL. LIGHT</b>   | Blinking in unison with the <b>RUN LIGHT</b>   | <b>RAPID CYCLE:</b><br>The PumpSaver®Plus 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.                                                                                                                                                                         |

**SPECIFICATIONS**

| <b>Functional Specifications</b>                               |                                                                            |
|----------------------------------------------------------------|----------------------------------------------------------------------------|
| Adjustments/Settings                                           |                                                                            |
| Overcurrent                                                    | 125% of calibration point                                                  |
| Underload (dry-well)                                           | Adjustable (70-90% of calibrated run power)                                |
| Overvoltage                                                    |                                                                            |
| 231-INSIDER-P                                                  | 265VAC                                                                     |
| 111-INSIDER-P                                                  | 132.5VAC                                                                   |
| Undervoltage                                                   |                                                                            |
| 231-INSIDER-P                                                  | 190VAC                                                                     |
| 111-INSIDER-P                                                  | 95VAC                                                                      |
| Number of restarts allowed in 60 second period (rapid-cycling) | 4                                                                          |
| Trip Delay Times                                               |                                                                            |
| Overcurrent                                                    | 5 seconds                                                                  |
| Dry-well                                                       | 4 seconds                                                                  |
| Restart Delay Times                                            |                                                                            |
| Over/undervoltage                                              | 2 seconds                                                                  |
| All other faults                                               | Manual, 2-225 minutes                                                      |
| <b>Input Characteristics</b>                                   |                                                                            |
| Supply Voltage                                                 |                                                                            |
| 231-INSIDER-P                                                  | 230VAC                                                                     |
| 111-INSIDER-P                                                  | 115VAC                                                                     |
| Load Range                                                     |                                                                            |
| 231-INSIDER-P                                                  | 1/3 – 1hp                                                                  |
| 111-INSIDER-P                                                  | 1/3 – 1/2hp                                                                |
| Frequency                                                      | 50/60 Hz                                                                   |
|                                                                | (note: 50Hz will increase all delay timers by 20%)                         |
| <b>Output Characteristics</b>                                  |                                                                            |
| Output Contact Rating-SPST                                     |                                                                            |
| 231-INSIDER-P                                                  | 1hp @ 240VAC (17 Amps max.)                                                |
| 111-INSIDER-P                                                  | 1/2hp @ 120VAC (17 Amps max.)                                              |
| <b>General Characteristics</b>                                 |                                                                            |
| Operating Temperature                                          | -40° to 55°C (-40° to 131°F)                                               |
| Maximum Input Power                                            | 5 W                                                                        |
| Standards Passed                                               |                                                                            |
| Electrostatic Discharge (ESD)                                  | IEC 61000-4-2, Level 2, 4kV contact, 6kV air                               |
| Surge Immunity                                                 | IEC 61000-4-5, Level 4, 4kV line-to-line and line-to-ground                |
| Safety Marks                                                   |                                                                            |
| cUR*                                                           | UL508, C22.2 No.14                                                         |
| Weight                                                         | 10 oz.                                                                     |
| Mounting Methods                                               | Inside a Franklin™, Pentek®, CentriPro™, or Flint and Walling™ control box |

\*The 231-Insider-P and 111-Insider-P are UL recognized and designed for use in the Franklin™, Pentek®, CentriPro™, and Flint and Walling™ type 3R control boxes when installed as described in these instructions. The 231-Insider-P and 111-Insider-P are not intended to provide overload protection, and should be used with thermally or impedance protected motors only.

For warranty information, please see **Terms and Conditions** at  
[www.symcom.com](http://www.symcom.com)

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