

### **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.

The PumpSaver<sup>®</sup> Plus Model 231-P-INSIDER fits inside 1/3 – 1hp, 230V Franklin™, Pentek™, or CentriPro™ 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 waterwells, commercial waterwells, 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 |

### **CALIBRATION / SETTINGS**

1. Turn **RESTART DELAY/CALIBRATION** to the **CAL** position and close the box cover.
2. Apply power to the system. The pump should run for approximately 10 seconds and then shut off—this indicates the Model 231-P INSIDER has calibrated.
3. Remove power from the system. Open the control box and set the appropriate dry-well recovery time with the **RESTART DELAY / CALIBRATION** knob.
4. Shut the control box and re-apply power to the system.

### **OPERATION**

The Model 231-P-INSIDER 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 231-P-INSIDER—after the trip delay—will turn off the pump. The 231-P-INSIDER will automatically restart the pump after the selected restart delay time.

The calibration is stored in permanent memory. **The PumpSaver<sup>®</sup> Plus does not need to be recalibrated if power is lost.**

### **SENSITIVITY**

The Model 231-P-INSIDER 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  $\pm 10\%$  of the standard trip. It may be necessary to increase the sensitivity if the PumpSaver<sup>®</sup> 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.**



## **RUN HOURS**

The Model 231-P-INSIDER records pump run hours. Run hours can be displayed by a PumpSaver® Plus Informer (see USING AN INFORMER). Run hours can be reset on the 231-P-INSIDER.—please read the instruction fully before performing the procedure.

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

**WARNING: ENSURE POWER IS APPLIED TO THE 231-P-INSIDER IN A SAFE MANNER WHEN PERFORMING THE FOLLOWING PROCEDURE.**

### **To Reset Run Hours:**

1. Remove power to the 231-P-INSIDER.
2. Set the **RESTART DELAY/CALIBRATION** knob to **RESET** and the **SENSITIVITY** knob to the middle (12:00) position.
3. Apply power to the 231-P-INSIDER—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. Upon detecting rapid-cycling, the 231-P-INSIDER will lock-out until power is removed and re-applied. Rapid-cycle protection can be disabled. Please read the 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.

**WARNING: ENSURE POWER IS APPLIED TO THE 231-P-INSIDER IN A SAFE MANNER WHEN PERFORMING THE FOLLOWING PROCEDURE.**

### **To Disable Rapid-Cycle Protection:** (to re-enable, follow the same procedure)

1. Remove power to the 231-P-INSIDER.
2. Set the **RESTART DELAY/CALIBRATION** knob to **RESET** and the **SENSITIVITY** knob to the middle (12:00) position.
3. Apply power to the 231-P-INSIDER—the **CAL. LIGHT** will turn on.
4. Turn the **SENSITIVITY** knob to the **right**—the **CAL. LIGHT** will turn off, **RUN LIGHT** 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 231-P-INSIDER is equipped with an infrared LED that will communicate to a SymCom Informer—a handheld, battery-operated, diagnostic tool. An *Informer IR Kit* is required for the 231-P-INSIDER to communicate to the Informer. The Informer 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](http://www.symcom.com).

# FRANKLIN™ CONTROL BOX

## CONNECTIONS

1. Remove the cover from the front of the 3-wire Franklin™ control box.
2. Remove the **yellow** wire from the terminal strip at L2 and remove the **blue** wire completely from the control box.
3. Connect the **blue** wire attached to the PumpSaver® to the L1 terminal on the solid-state switch.
4. Press the PumpSaver® onto the L1 and L2 terminals.
5. Connect the **yellow** wire to the bottom terminal on the PumpSaver®.

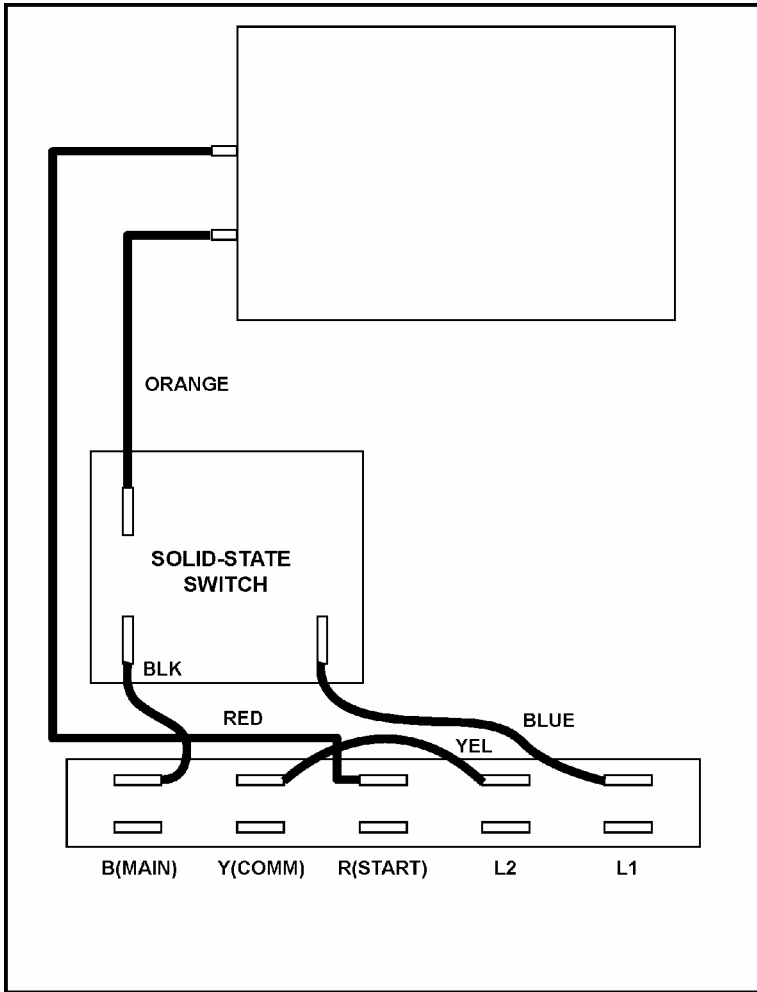


Figure 1: Franklin™ Control Box without the Model 231-P-INSIDER

## FRANKLIN™ CONTROL BOX

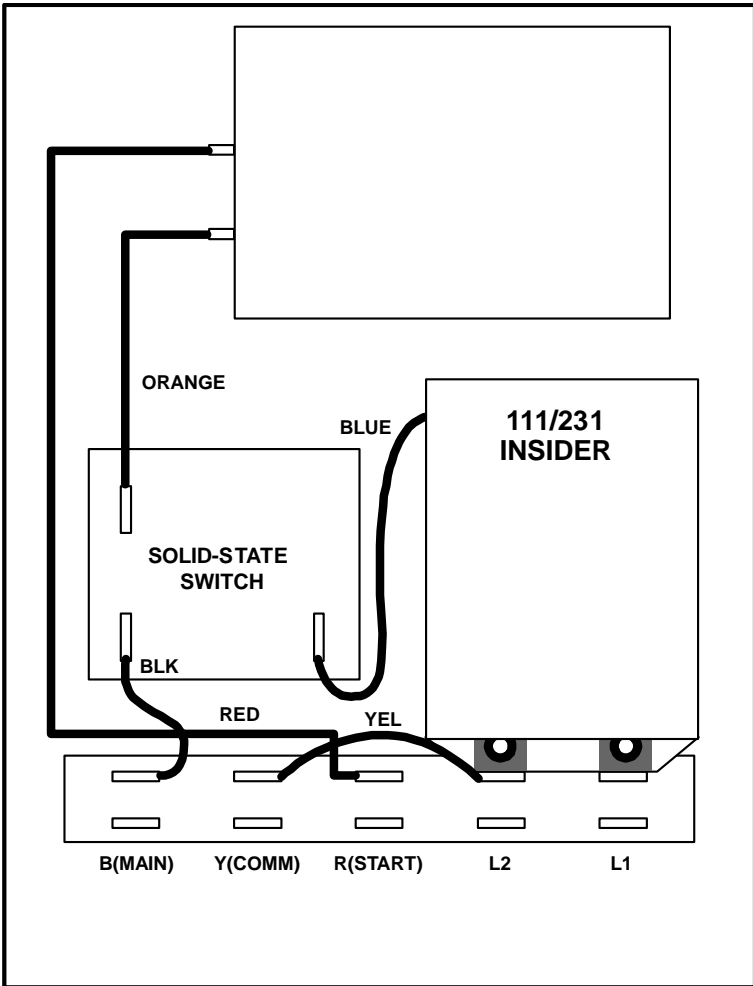


Figure 2: Franklin™ Control Box with the Model 231-P-Insider Installed

# PENTEK™ CONTROL BOX

## CONNECTIONS

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

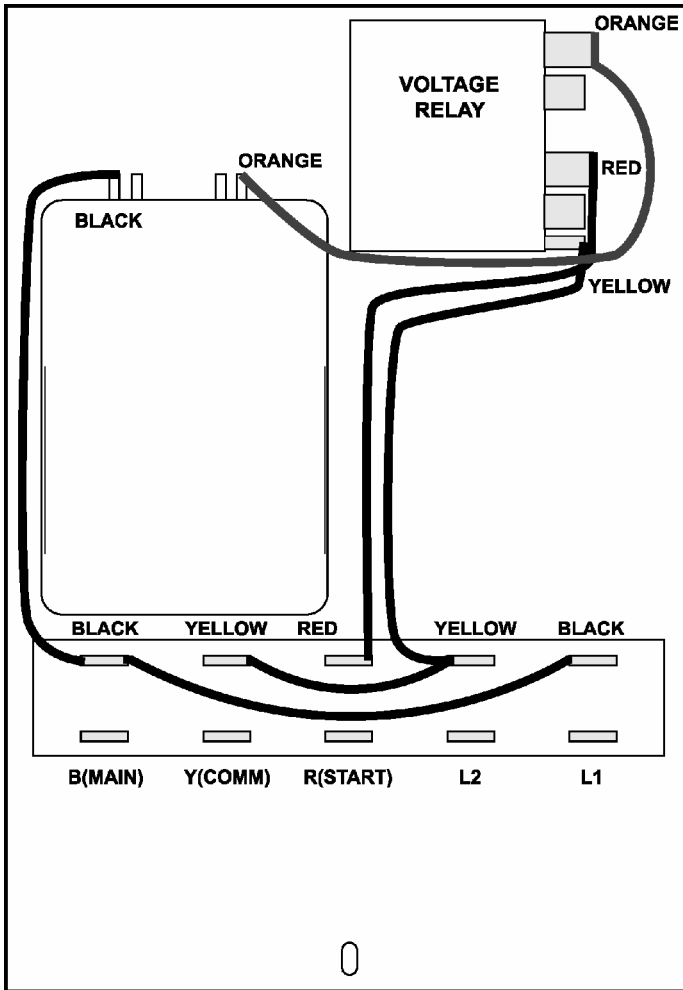


Figure 3: Pentek™ Control Box without the Model 231-P-Insider Installed

# PENTEK™ CONTROL BOX

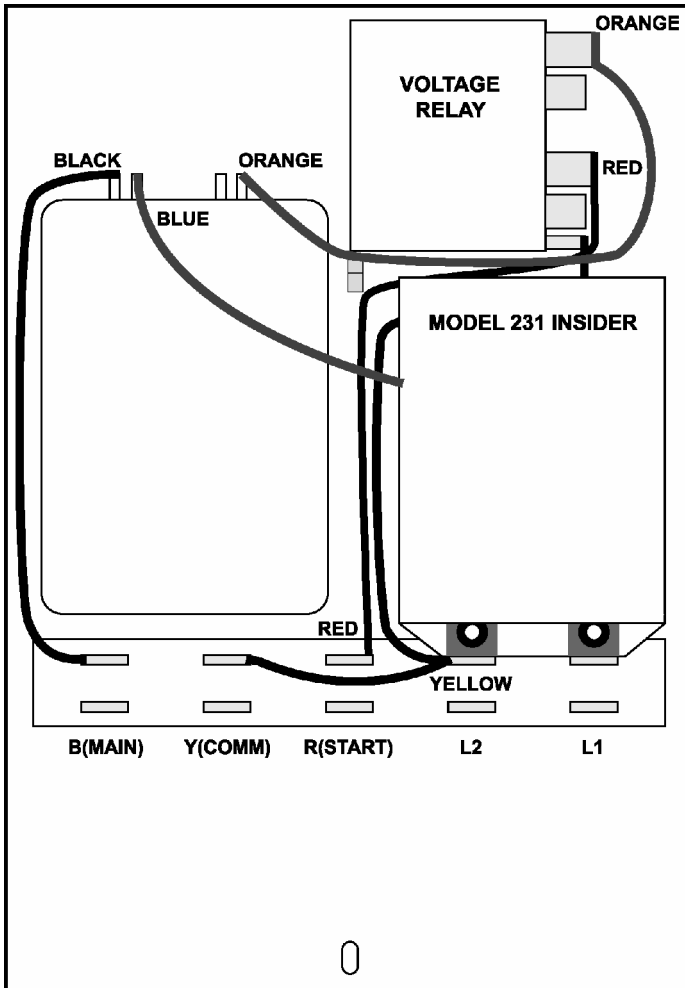


Figure 4: Pentek™ Control Box with the Model 231-P-Insider Installed

# CENTRIPRO™ CONTROL BOX

## CONNECTIONS

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

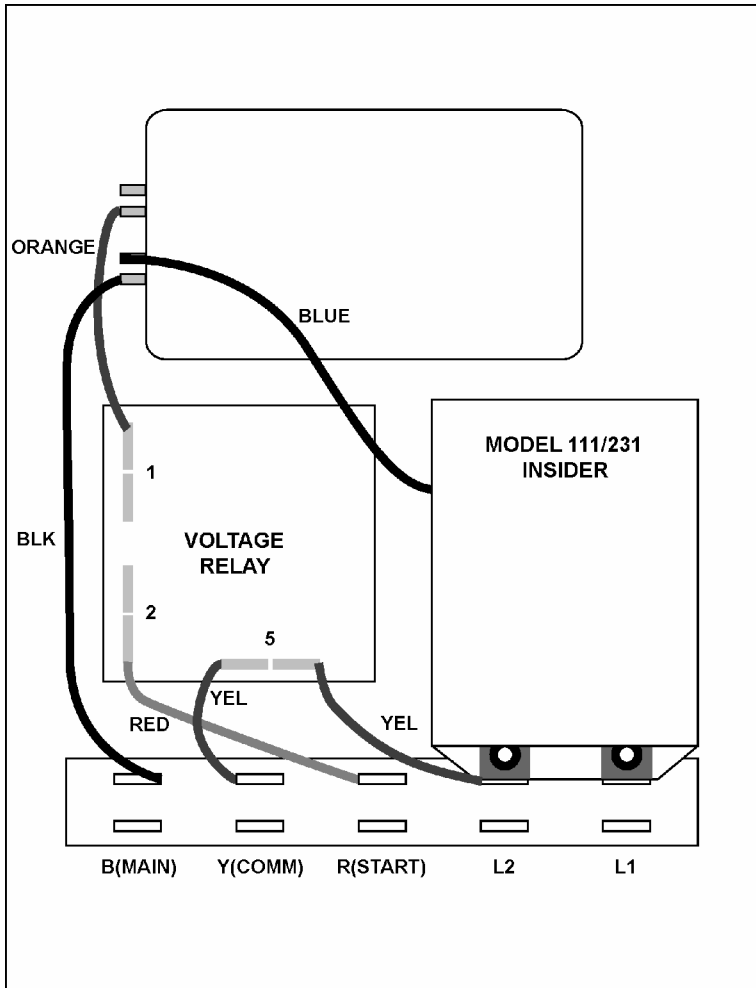


Figure 5: CentriPro™ Control Box with the Model 231-P-Insider Installed

## TROUBLESHOOTING

<b>RUN LIGHT</b>	<b>CAL LIGHT</b>	<b>PROBLEM or FUNCTION</b>	<b>CORRECTIVE ACTION</b>
On Steady	Off	<b>RUN:</b> 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> The PumpSaver® is in the calibration process.	None
Off	On Steady	<b>CAL COMPLETE:</b> 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	<b>OFF / MANUAL RESTART:</b> 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	<b>DRY RUN / DEAD HEAD:</b> 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	<b>OVERLOAD:</b> 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	<b>VOLTAGE FAULT:</b> 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	<b>RAPID CYCLE:</b> 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.

## MODEL 231-P-INSIDER SPECIFICATIONS

<b>Single-Phase Line Voltage</b>	230VAC
<b>Load Range</b>	1/3 to 1hp
<b>Frequency</b>	50/60Hz
Note: 50Hz will increase all delay timers by 20%	
<b>Operating Points</b>	
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
<b>Trip Delay Times</b>	
Overload	5 seconds
Dry-well	4 seconds
<b>Restart Delay Times</b>	
Over/undervoltage	2 seconds
All other faults	manual, 2-255 minutes
<b>Output Contact Rating—SPDT</b>	1hp, 240VAC (17 amps max.)
<b>Electrostatic Discharge (ESD)</b>	IEC 1000-4-2, Level 2, 4kV contact , 6kV air
<b>Safety Marks</b>	
UL	UL508
<b>Power Consumption</b>	5 Watts (max.)
<b>Weight</b>	10 oz.
<b>Operating Temperature</b>	-40° to 70°C (-40° to 158°F)
<b>CSA</b>	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.





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