

Franklin Electric

# PUMPTEC-PLUS

## PUMP PROTECTION SYSTEM

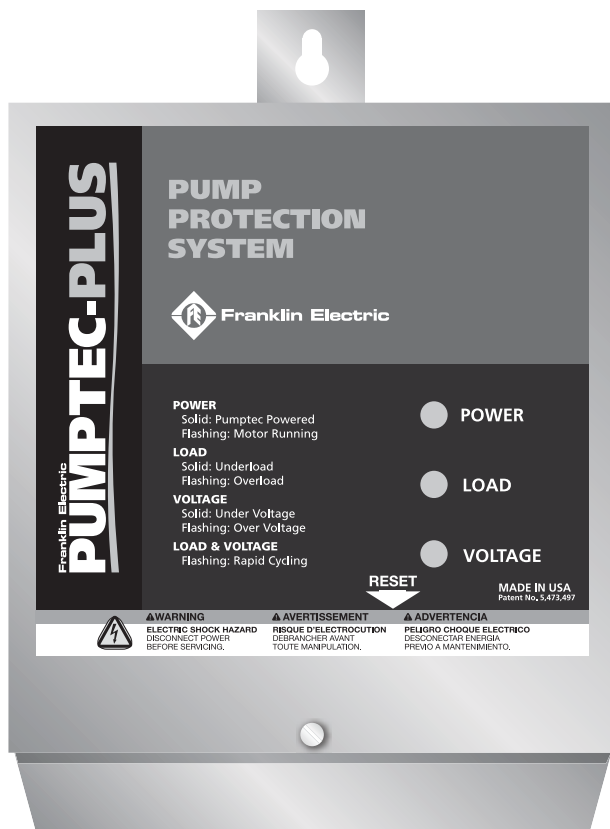
### Installation and Operating Instructions

Congratulations on your purchase of a Franklin Electric pump protection system. Pumptec-Plus is the most sophisticated pump protection system on the market today. It is designed to work on any 230 VAC single-phase induction motor (PSC, CSCR, CSIR and split phase) ranging in size from 1/2 to 5 horsepower.

Your pump protection unit uses a microcomputer to continuously monitor power and line voltage to provide protection against dry well conditions, waterlogged tank, high or low line voltage, and mud or sand clogging. Indicator lights provide complete system status and are easily viewed without removing the cover. A 5 horsepower rated contactor is included with the unit. The control box provides large terminal blocks and plenty of room for wiring, even when using #2 wire. Our unique Snapshot calibration feature provides simple, reliable push-button calibration.

PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLING THE UNIT.

## FEATURES



- Over/Underload Protection
- Over/Under Voltage Protection
- Rapid Cycle Detection
- Fault Indicator Lights
- Run Indicator Light
- 5 hp Contactor
- Heavy Duty Terminal Blocks
- Adjustable Automatic Restart Timer
- Snapshot Calibration
- Continuous Calibration Memory
- Works With All Single-phase Motors
- Transient Surge Protection
- Patent Pending
- UL Listed (E104778)
- Toll-Free Customer Support (800 348 2420)



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# INSTALLATION INFORMATION

**WARNING:** To avoid possible fatal shock, disconnect power at the main power panel before installing, wiring, or servicing Pumtpec-Plus.

**CAUTION:** This product does not replace a motor control box or the need for motor overload protection. Motor overload protection should be in accordance with National Electrical Code Article 430 or in accordance with motor manufacturer's recommendations.

**NOTE:** This unit requires calibration before operation. Calibration is described in step 7 of the installation instructions.

## TECHNICAL SPECIFICATIONS

|                                  |                      |
|----------------------------------|----------------------|
| Horsepower Rating.....           | 1/2 to 5 hp          |
| Operating Voltage.....           | 230 VAC*             |
| Operating Frequency.....         | 60 Hz*               |
| Power Consumption.....           | 5 Watts              |
| Operating Temperature Range..... | -15 °F to 140 °F     |
| Over/Under Voltage Trip.....     | ± 10%                |
| Over/Under Load Trip.....        | ± 25%**              |
| Rapid Cycle Trip.....            | 4 starts/min         |
| Trip Response Time.....          | 2.5 sec              |
| Automatic Restart Time.....      | 1 min to 4 hr 15 min |
| Over/Under Voltage Retry.....    | 2 min                |
| Calibration Abort Time.....      | 3 min                |
| Calibration Memory.....          | 10 years             |
| Contactor Rating.....            | 5 hp                 |

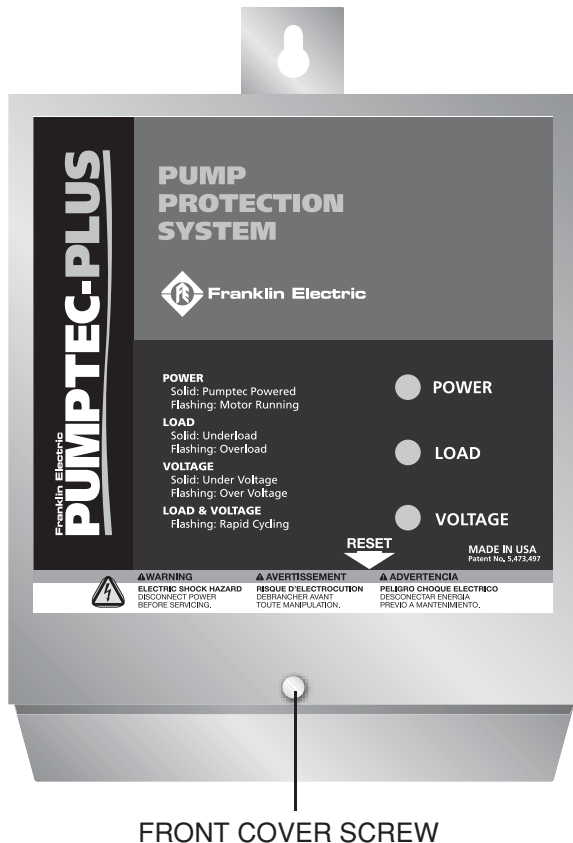
\* 220 Volt, 50 Hz for model #5800060500

\*\* Percent of load time of calibration SNAPSHOT

# INSTALLATION

## 1. REMOVE COVER

Remove the Pumtpec-Plus cover by removing the cover screw and sliding the cover up. Place cover in a safe location.



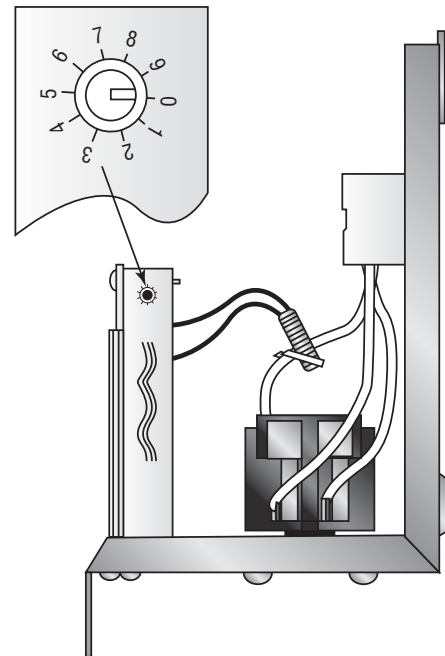
FRONT COVER SCREW

## 2. SET THE TIMER SWITCH

Set the automatic timer switch to the desired reset time. This will reset the time after an underload trip condition (dry well condition) has occurred until the Pumtpec-Plus will try to restart the motor.

### TIMER SWITCH SETTINGS

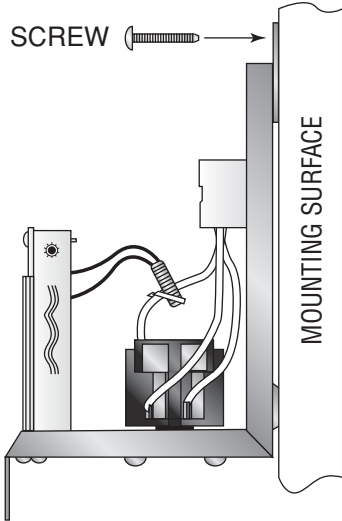
|                 |                       |
|-----------------|-----------------------|
| 0) Manual Reset | 5) 16 Minutes         |
| 1) 1 Minute     | 6) 32 Minutes         |
| 2) 2 Minutes    | 7) 1 Hour 4 Minutes   |
| 3) 4 Minutes    | 8) 2 Hours 8 Minutes  |
| 4) 8 Minutes    | 9) 4 Hours 16 Minutes |



# INSTALLATION, continued

## 3. MOUNT THE UNIT

Mount the Pumptec-Plus unit in a location convenient for wiring. Avoid direct sunlight, rain, or snow.



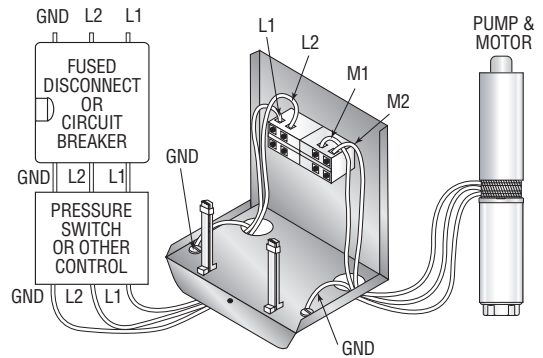
## ⚠ WARNING

**DISCONNECT POWER AT THE MAIN PANEL** before installing, wiring, or servicing the Pumptec-Plus unit. Serious or fatal shock may occur if power is not disconnected.

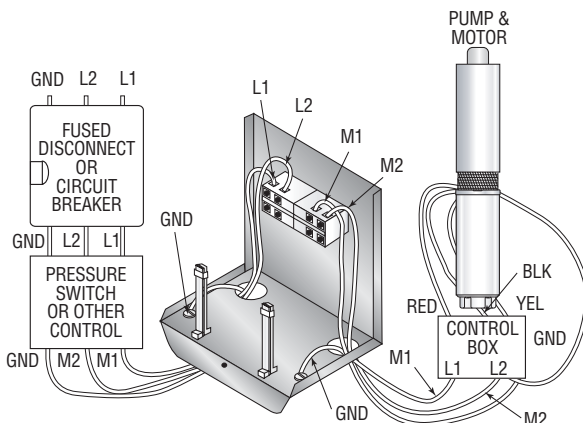
## 4. CONNECT POWER AND MOTOR

Check to make sure the 230 Volt power has been disconnected. Connect Pumptec-Plus unit to the pump motor and the 230 Volt AC line according to one of the two- or three-wire installation drawings below. Pumptec-Plus may be wired into the circuit before or after the pressure or float switch.

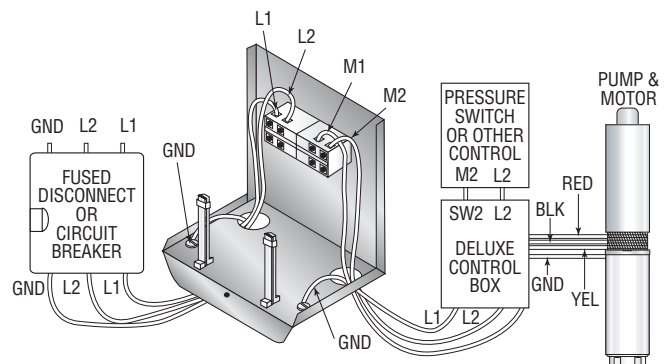
### 2-WIRE INSTALLATION



### 3-WIRE INSTALLATION



### 3-WIRE INSTALLATION WITH DELUXE CONTROL BOX



## INSTALLATION, continued

### 5. REPLACE COVER

Replace cover and secure with screw provided.

### 6. APPLY POWER

Turn on 230 Volt AC power. Once power is applied the Pumptec-Plus unit should trip, indicating an overload condition (blinking yellow light) when the pump tries to run. This is normal and is a reminder that Pumptec-Plus requires calibration.

**NOTE:** Some 1/2 hp motors will not trip in an overload condition upon the initial application of power. The green light will blink instead. This is also a normal condition. Proceed to Step 7.

### 7. CALIBRATE

Before the Pumptec-Plus unit is ready for use it **MUST BE CALIBRATED**. The calibration procedure is quick and as simple as taking a snapshot. Calibration may be performed as many times as desired by following steps A, B, and C below.

A. Press and hold in the reset button on the bottom of the Pumptec-Plus enclosure until the green,

yellow, and red lights blink alternately. This should take approximately 10 seconds. You will hear the Pumptec-Plus contactor engage and the motor should start. Release the reset button. Steps B and C must be completed within three minutes or the calibration procedure will be aborted.

- B. Verify that the pump system is running normally (i.e. the system is pumping water and the motor current is normal). Try to achieve maximum water flow rate. Calibration on a fully recovered well is recommended.
- C. Briefly press the reset switch again and then release it. You have just taken a Snapshot of the motor load. All indicator lights will go off. After 2 to 3 seconds, the green light will start flashing, indicating the system is running normally and calibration is complete. Over/underload trips will occur at 125% and 75% of the Snapshot load.

**NOTE:** CONTINUOUS MEMORY HOLDS CALIBRATION SNAPSHOT EVEN IF POWER IS ABSENT.

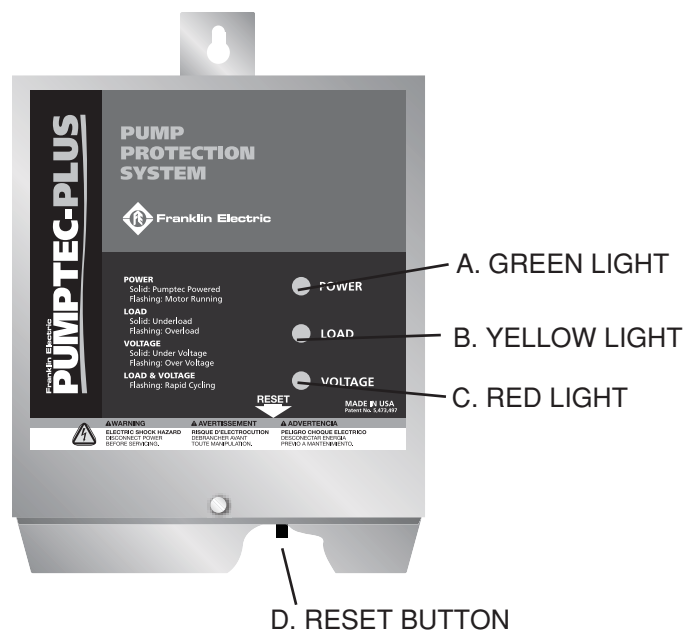
**CAUTION:** Pumptec-Plus should only be calibrated by qualified service personnel. Calibration on a faulty pump system will not provide protection.

## OPERATION

Under normal operating conditions, Pumptec-Plus requires no special attention. The power line voltage and motor power draw are continuously measured. If a fault condition is detected, an indication is given by a light on the front panel and the motor is disconnected from the power line.

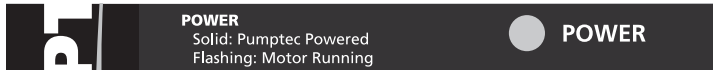
Pumptec-Plus measures the actual motor power (watts), not motor amps or power factor. The motor power draw at the moment of calibration is permanently memorized by Pumptec-Plus. If the motor power draw differs from the memorized calibration power by more than  $\pm 25\%$ , Pumptec-Plus will turn off the pump motor. It is very important to make sure the pump system is running normally during the calibration process.

There are three indicator lights (A, B, and C) visible through the front cover. Each light is a different color and each has a special meaning. Also, on the bottom of the unit enclosure is a reset button (D). The purpose of each light and the operation of the reset button are described on page 5.



# OPERATION, continued

## A. GREEN LIGHT

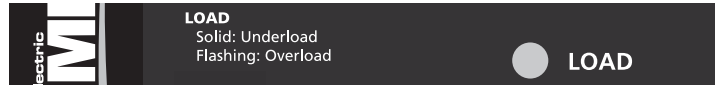


The green light (A) indicates that the status of the pump system is normal.

A **SOLID GREEN LIGHT** indicates that Pumptec-Plus has power and the contactor to the motor is closed but the motor is not running. This may happen when the pressure switch is wired in down-line from Pumptec-Plus and the switch is open. Pumptec-Plus is waiting for the pressure switch to close.

A **FLASHING GREEN LIGHT** indicates the pump motor is running normally and drawing the correct amount of power.

## B. YELLOW LIGHT



The yellow light (B) indicates that a load fault has occurred.

A **SOLID YELLOW LIGHT** indicates an underload fault occurred. The Pumptec-Plus automatic restart timer will restart the motor in accordance with the position of the automatic restart timer switch setting. The switch should be set at the time of installation (refer to Step 2). If set in the manual position, Pumptec-Plus must be reset manually by pushing the **RESET BUTTON (D)**.

A **FLASHING YELLOW LIGHT** indicates an overload condition occurred. This means that the pump system power draw was greater than the normal operating power (calibration) by more than 25% for more than 2.5 seconds. Pumptec-Plus will not run the pump system again until the **RESET BUTTON (D)** is pressed.

## C. RED LIGHT

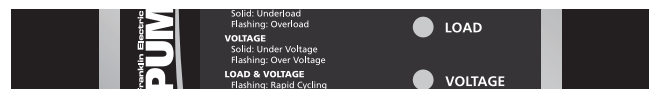


The red light (C) indicates a line voltage fault occurred and Pumptec-Plus has turned off the pump motor.

A **SOLID RED LIGHT** indicates an under voltage condition (line < 207 VAC) existed for more than 2.5 seconds. Pumptec-Plus will automatically try to reset the motor within two minutes. The **RESET BUTTON (D)** may also be pressed to clear this condition.

A **FLASHING RED LIGHT** indicates an over voltage condition (line > 253 VAC) has existed more than 2.5 seconds. Pumptec-Plus will automatically try to reset the motor within two minutes. The **RESET BUTTON (D)** may also be pressed to clear this condition.

## B & C. RED AND YELLOW FLASHING LIGHTS



If the **RED** and **YELLOW** lights (B & C) are flashing on and off together, a rapid cycle condition was detected. A rapid cycle condition is defined as more than four motor starts per minute.

## D. RESET BUTTON



The reset button is used to restart the Pumptec-Plus from a tripped condition. Pressing the reset button for less than ten seconds has no effect on the calibration. Simply press and release the button. The unit will reset.

Pressing the reset button for more than 10 seconds will cause the unit to go into the calibration mode. A rotating light sequence from green to yellow to red will begin. At this point, the contactor closes and the motor will start to run. The unit will stay in the calibration mode for 3 minutes or until the reset button is pressed again.

If after three minutes the reset button is not pressed, the unit will revert back to its normal running mode, making no changes to the calibration.

Pressing the reset button before the three minute period expires will cause the unit to recalibrate to the motor load present at the time the reset button is pressed the second time.

# TROUBLE SHOOTING DURING INSTALLATION

| SYMPTOM                                  | POSSIBLE CAUSE              | SOLUTION  |
|--|-----------------------------|---|
| Unit Appears Dead (No Lights)            | No Power to Unit            | Check wiring. Power supply voltage should be applied to the L1 and L2 terminals of the Pumptec-Plus. In some installations, the pressure switch or other control device is wired to the input of the Pumptec-Plus. Make sure this switch is closed.   |
| Flashing Yellow Light                    | Unit Needs to be Calibrated | Pumptec-Plus is calibrated at the factory so that it will overload on most pump systems when the unit is first installed. This overload condition is a reminder that the Pumptec-Plus unit requires calibration before use. See Step 7 of the installation instructions.  |
|  | Miscalibrated               | Pumptec-Plus should be calibrated on a fully recovered well with maximum water flow. Flow restrictors are not recommended.  |
| Flashing Yellow Light During Calibration | Two-Wire Motor              | Step C of the calibration instructions indicates that a flashing green light condition will occur 2 to 3 seconds after taking the Snapshot of the motor load. On some two-wire motors, the yellow light will flash instead of the green light. Press and release the reset button. The green should start flashing. |
| Flashing Red and Yellow Lights           | Power Interruption          | During the installation of Pumptec-Plus, power may be switched on and off several times. If power is cycled more than four times within a minute, Pumptec-Plus will trip on rapid cycle. Press and release the reset button to restart the unit.  |
|  | Float Switch                | A bobbing float switch may cause the unit to detect a rapid cycle condition on any motor or an overload condition on two-wire motors. Try to reduce water splashing or use a different switch.  |
| Flashing Red Light                       | High Line Voltage           | The line voltage is over 253 Volts. Check line voltage. *   |
|  | Unloaded Generator          | If you are using a generator, the line voltage may become too high when the generator unloads. Pumptec-Plus will not allow the motor to turn on again until the line voltage returns to normal. Over voltage trips will also occur if the line frequency drops too far below 60 Hz.                                 |
| Solid Red Light                          | Low Line Voltage            | The line voltage is below 207 Volts. Check line voltage.  |
|  | Loose Connections           | Check for loose connections which may cause voltage drops.  |
|  | Loaded Generator            | If you are using a generator, the line voltage may become too low when the generator loads. Pumptec-Plus will trip on under voltage if the generator voltage drops below 207 Volts for more than 2.5 seconds. Under voltage trips will also occur if the line frequency rises too far above 60 Hz.                  |

\*Report high or low line voltage to the power company.

# TROUBLE SHOOTING AFTER INSTALLATION

| SYMPTOM                        | POSSIBLE CAUSE       | SOLUTION   |
|--------------------------------|----------------------|--|
| Solid Yellow Light             | Dry Well             | Wait for the automatic restart timer to time out. During the time out period the well should recover and fill with water. If the automatic reset timer switch is set to the manual position, then the reset button must be pressed to reactivate the unit.       |
|                                | Blocked Intake       | Clean or replace pump intake screen.   |
|                                | Blocked Discharge    | Remove blockage in plumbing.   |
|                                | Check Valve Stuck    | Replace check valve.   |
|                                | Broken Shaft         | Replace broken parts.  |
|                                | Severe Rapid Cycling | Machine gun rapid cycling can cause an underload condition. See flashing red and yellow lights section below. Replace worn pump parts and recalibrate.   |
|                                | Worn Pump            | Replace worn pump parts and recalibrate.   |
| Flashing Yellow Light          | Stalled Motor        | Repair or replace pump motor. Pump may be sand or mud locked.  |
|                                | Float Switch         | A bobbing float switch can cause two-wire motors to stall. Arrange plumbing to avoid splashing water. Replace float switch.  |
|                                | Ground Fault         | Check insulation resistance on motor and control box cable.  |
| Solid Red Light                | Low Line Voltage     | The line voltage is below 207 Volts. Check line voltage.* Pumptec-Plus will try to restart the motor every two minutes until line voltage is normal.   |
|                                | Loose Connections    | Check for excessive voltage drops in the system electrical connections (i.e. circuit breakers, fuse clips, pressure switch, and Pumptec-Plus L1 and L2 terminals). Repair connections.   |
| Flashing Red Light             | High Line Voltage    | The line voltage is over 253 Volts. Check line voltage.* The Pumptec-Plus will try to restart the motor every two minutes until line voltage is normal.  |
| Flashing Red and Yellow Lights | Rapid Cycle          | The most common cause for the rapid cycle condition is a waterlogged tank. Check for a ruptured bladder in the water tank. Check the air volume control or snifter valve for proper operation. Check the setting on the pressure switch and examine for defects. |
|                                | Leaky Well System    | Replace damaged pipes or repair leaks.   |
|                                | Stuck Check Valve    | Failed valve will not hold pressure. Replace valve.  |
|                                | Float Switch         | Press and release the reset button to restart the unit. A bobbing float switch may cause the unit to detect a rapid cycle condition on any motor or an overload condition on two-wire motors. Try to reduce water splashing or use a different switch.           |

\*Report high or low line voltage to the power company.

## LIMITED WARRANTY

Franklin Electric warrants to original equipment manufacturers and Franklin Electric Authorized Motor Service shops that each Pumptec-Plus unit sold will be free from defects in workmanship and materials and will perform consistent with samples previously supplied, and will conform to specifications published or mutually established with the buyer, for a period of one year from date of installation but not more than two years from date of manufacture in water well applications. THE WARRANTY STATED IN THIS PARAGRAPH IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT OF TITLE), WRITTEN OR ORAL, STATUTORY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE. Any Pumptec-Plus unit which fails to conform to the contract of sale, including the above warranty, will be repaired or replaced at the option of Franklin Electric. The remedy of repair or replacement is the sole and exclusive remedy afforded for breach of the above warranty or for breach of expressed or implied warranties arising under state law. Warranty on repaired or replaced equipment will be for the time remaining under the terms of the original warranty. Under no circumstances shall Franklin Electric be liable for any special, incidental or consequential economic damages resulting from the failure of Franklin Electric to comply with the contract of sale, breach of the above warranty or for breach of any expressed or implied warranty arising under state law, negligence or otherwise. This warranty is applicable only for water well installations.

## TOLL-FREE HELP FROM A FRIEND

Phone Franklin's toll-free Submersible SERVICE HOTLINE for answers to your installation questions. When you call, a Franklin expert will offer assistance in trouble shooting your pump protection system and provide immediate answers to your motor application questions.

**Franklin Electric Submersible SERVICE HOTLINE (800) 348-2420**



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