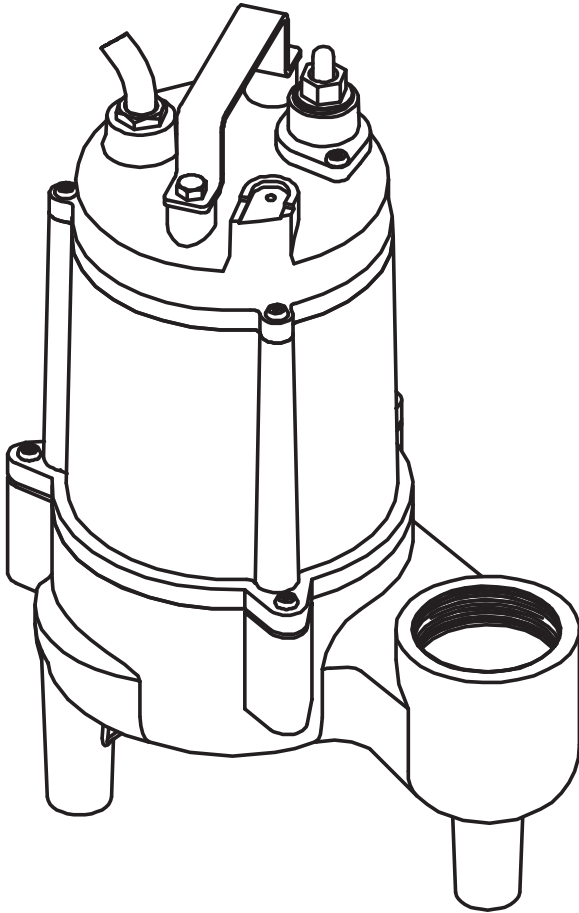


# INSTALLATION, SERVICE & PARTS MANUAL



**Series: PFS531TW,  
PFS531TWA,  
PFS531TWA1**

**0.5 HP • 3450 RPM • 60 Hz  
Submersible Sump, Effluent  
& Sewage Pumps**



## Power-Flo Pumps & Systems

*a Power-Flo Technologies company*

**General Safety Information**


Before installation, read the following instructions carefully. Failure to follow instruction and Safety information could cause serious bodily injury, death and/or property damage. Each Power-Flo pump is individually factory tested to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

**⚠ DANGER** "Danger" indicates an imminent hazardous situation which, if not avoided, WILL result in death or serious injury.

**⚠ WARNING** "Warning" indicates an imminent hazardous situation which, if not avoided, MAY result in death or serious injury.

**⚠ CAUTION** "Caution" indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.

**IMPORTANT - Power-Flo Pumps and Systems is not responsible for losses, injury or death resulting from failure to observe these safety precautions, misuse, abuse or misapplication of pumps or equipment.**

 **ALL RETURNED PRODUCTS MUST BE CLEANED, SANITIZED, OR DECONTAMINATED PRIOR TO SHIPMENT, TO INSURE EMPLOYEES WILL NOT BE EXPOSED TO HEALTH HAZARDS IN HANDLING SAID MATERIAL. ALL APPLICABLE LAWS AND REGULATIONS SHALL APPLY.**

**⚠ WARNING** Installation, wiring, and junction connections must be in accordance with the National Electric Code and all applicable state and local codes. Requirements may vary depending on usage and location.

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**⚠ WARNING** Installation and servicing is to be conducted by qualified personnel only.

**⚠ DANGER** Keep clear of suction and discharge openings. **Do not** insert fingers in pump with power connected.

**⚠ WARNING** Always wear eye protection when working on pumps. Do not wear loose clothing that may become entangled in moving parts

**⚠ DANGER** Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing.

**⚠ DANGER** This pump is *not* intended for use in swimming pools or water installations where human contact with pumped fluid. Pumps when used as a decorative water fountain pump **MUST** be used in circuit protected by a Ground Fault Interrupter.

**⚠ DANGER** Risk of electric shock. To reduce risk of electric shock, always disconnect pump from power source before handling. **Lock out power & tag.**

**⚠ WARNING** **Do not** use these pumps in water over 77°F. **Do not** exceed manufactures recommended maximum performance, as this could cause the motor to overheat.


**⚠ DANGER** **Do not** lift, carry or hang pump by the electrical cables. Damage to the electrical cables can cause shock, burnes or death. **Never** handle connected power cords with wet hands. Use appropriate lifting device.

**⚠ WARNING** Sump and sewage pumps often handle materials which could cause illness or disease. wear adequate protective clothing when working on a used pump or piping. Never enter a basin after it has been used.

**⚠ DANGER** Failure to permanently ground the pump, motor and controls before connecting to power can cause shock, burns or death.

**⚠ WARNING** These pumps are **NOT** to be installed in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70.

**⚠ CAUTION** The Uniform Plumbing Code (UPC) states that sewage systems shall have an audio and visual alarm that signals a malfunction of the systems that is required to reduce the potential for property damage.

 **WARNING:** CANCER AND REPRODUCTIVE HARM- WWW.P65WARNINGS.CA.GOV

**IMPORTANT!** Prior to installation, record Model Number, MFG Date, Amps, Voltage, Phase and HP, from pump name plate for future reference. Also record the Voltage and Current Readings at Startup:

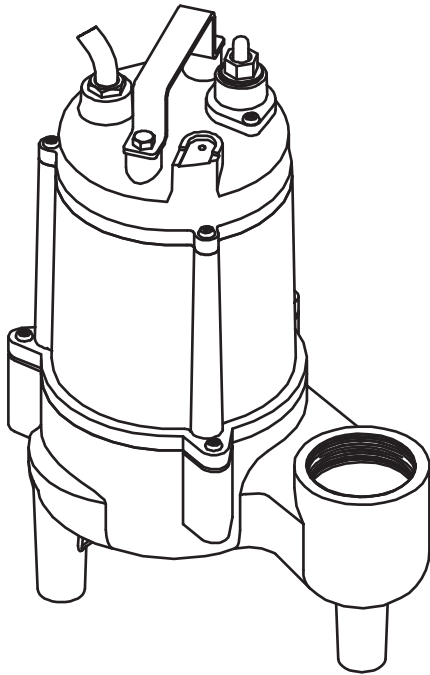
1 Phase Models	
Amps:	Volts:

Model Number: \_\_\_\_\_

MFG Date: \_\_\_\_\_

PHASE: \_\_\_\_\_ HP: \_\_\_\_\_

**Specifications**



**Series: PFS531TW,  
PFS531TWA,  
PFS531TWA1**

**1/2 HP • 3450 RPM • 60 Hz**

<b>DISCHARGE</b>	2" NPT, Female, Vertical
<b>LIQUID TEMPERATURE</b>	77°F (25°C) Continuous 115 volts 104°F (40°C) Maximum
<b>VOLUTE</b>	Cast Iron, Class 30
<b>MOTOR HOUSING</b>	Cast Iron, Class 30
<b>IMPELLER</b>	Recessed Vortex, open vane Material: Cast Iron, Class 30
<b>SHAFT</b>	Stainless Steel
<b>O-RINGS</b>	Buna-N
<b>HARDWARE</b>	Stainless Steel
<b>PAINT</b>	Powder Coated - Industrial Grade
<b>SEAL</b>	Single Mechanical, Material: Carbon/Ceramic/Buna-N
<b>POWER CORD</b>	20 Ft. Cord, with Plug, Pressure Grommet for Sealing and Strain Relief
<b>MOTOR</b>	Oil Filled, Squirrel Cage Induction Class B Insulation
<b>SINGLE PHASE</b>	Permanent Split Capacitor (PSC), Includes Overload Protection in Motor: Trip Off Temp. 248°F (120°C)
<b>UPPER BEARING</b>	Single Row, Ball, Oil Lubricated
<b>LOWER BEARING</b>	Single Row, Ball, Oil Lubricated
<b>LEVEL CONTROL</b>	<p><b>"A"</b> Wide Angle, Mechanical Float, 20Ft. Cord with Piggy-Back Plug, Normally Open (N/O).</p> <p><b>"AI"</b> Intregal Wide Angle, Mechanical Float switch</p>

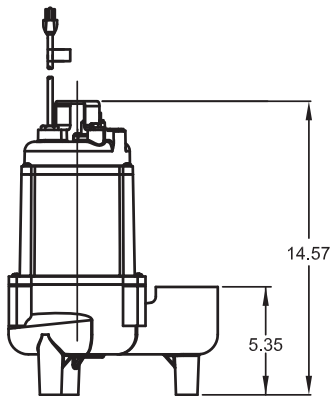
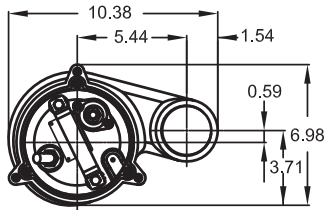
MODEL	HP	VOLTS	PHASE	HZ	RPM	FULL LOAD AMPS	LOCKED ROTOR AMPS	WINDING RESISTANCE MAIN -- START	NEMA START CODE	CORD SIZE	CORD TYPE
PFS531TW	0.5	115	1	60	3450	10.0	26.0	1.85 -- 11.5	G	16/3	SJTW
PFS531TWA	0.5	115	1	60	3450	10.0	26.0	1.85 -- 11.5	G	16/3	SJTW
PFS531TWA1	0.5	115	1	60	3450	10.0	26.0	1.85 -- 11.5	G	16/3	SJTW

Mechanical Switch on "A" cord is 16/2, SJOW, Piggy-Back Plug.

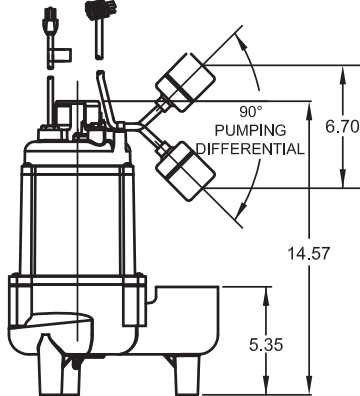
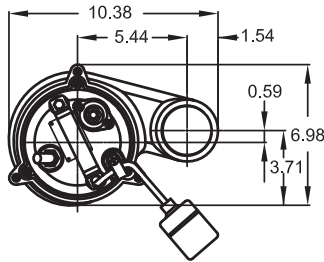


**Dimensions & Performance**

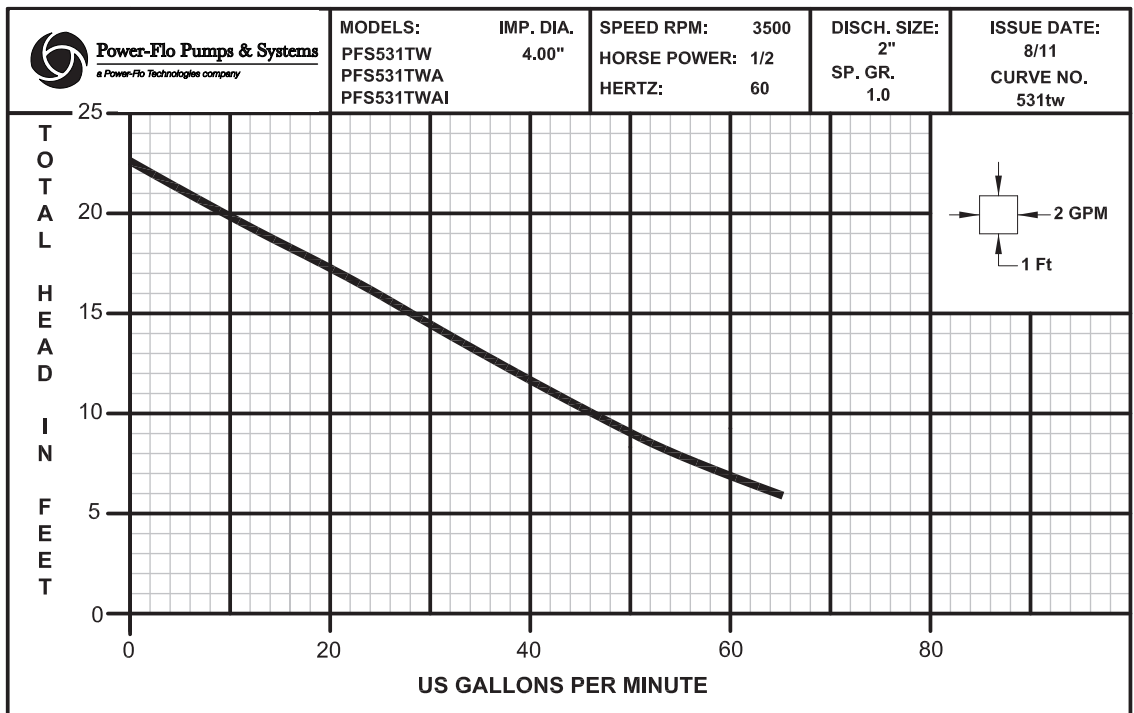
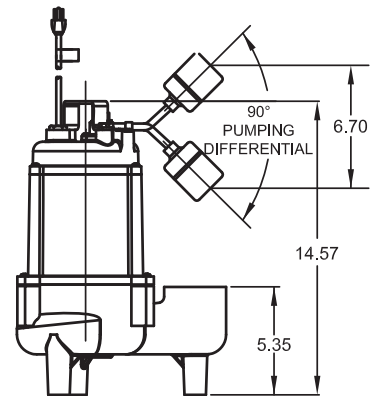
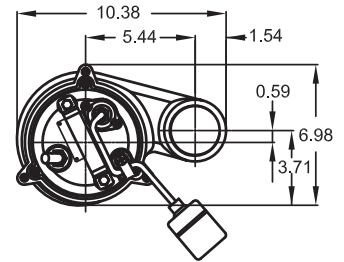
**PFS531TW without float**



**PFS531TWA wide angle float with piggy-back plug**



**PFS531TWA1 with integral float**



**Receiving & Installation**

**Receiving Inspection**

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

**Storage**

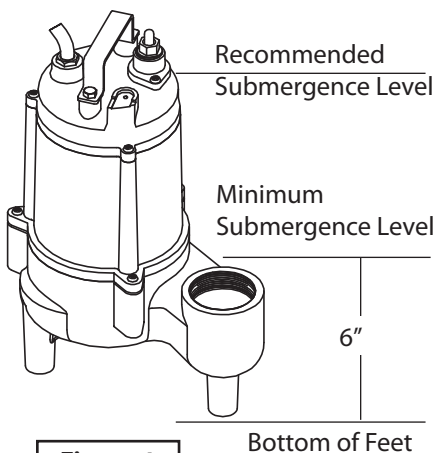
Any product that is stored for a period longer than six (6) months from the date of purchase should be bench tested prior to installation. A bench test consists of, checking the impeller to assure it is free turning and a run test to assure the motor (and switch if provided) operate properly. Do not pump out of liquid.

**Controls**

Manual models require a separate approved pump control device or panel for automatic operation. Be sure the electrical specification of the control selected properly match the electrical specifications of the pump.

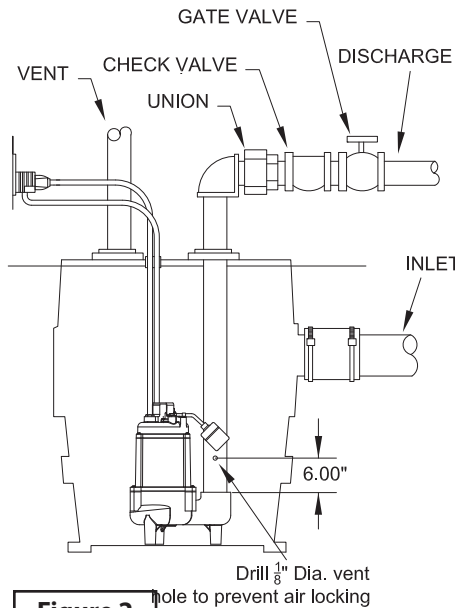
**Submergence**

The pump should always be operated in the submerged condition. The minimum sump liquid level should never be less than above the pump's volute (See Figure 1).



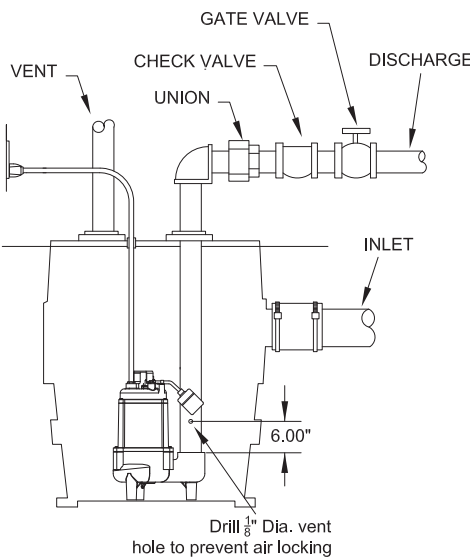
**Figure 1**

**Typical Installation for "TWA" with Wide Angle Level Control**



**Figure 2**

**Typical Installation for "TWA" with Integral Wide Angle Level Control**



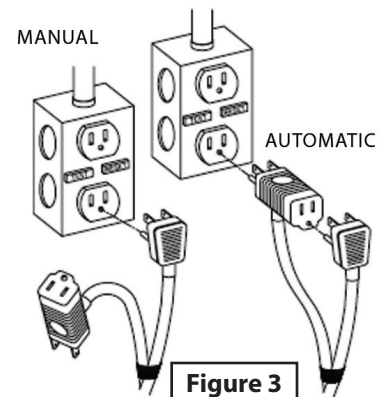
**Figure 2**

**Liquid Level Controls**

**Typical Discharge Pipe Mounted:**

Refer to Figure 2 below which shows a typical installation of a 1 phase 115 volt pump using a level control mounted to the discharge piping with a piggy-back plug. The level control should have adequate clearance so it cannot hang up in it's swing and that the pump is completely submerged when the level control is in the "Off" mode. By adjusting the cord tether the control level can be changed.

**For "TWA" with Wide Angle Level Control**

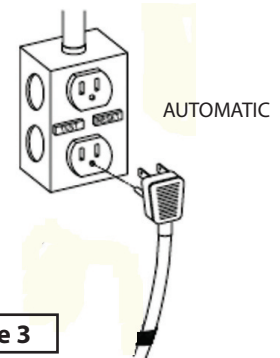


**Figure 3**

**Automatic:** Plug float cord into GFI outlet, then plug pump cord into float cord.

**Manual:** Plug pump cord directly into GFI outlet.

**For "TWA" with Integral Wide Angle Level Control**



**Figure 3**



**Installation & Service**

**Level Control Basic Instructions:**

Plug the level control plug into the GFI receptacle, then plug the pump into the piggy-back plug (See Figure 3). One cycle of operation should be observed, so that any potential problems can be corrected.

It is recommended that the level control float should be set to insure that the liquid in the sump never drops below the top of the motor housing or a minimum level of 6 inches above the basin floor.

**Installation**

These pumps are recommended for use in a sump or basin. The sump or basin shall be sealed and vented in accordance with local plumbing codes. **This pump is designed to pump effluent or wastewater, nonexplosive and noncorrosive liquids and shall NOT be installed in locations classified as hazardous in accordance with the National Electrical Code (NEC) ANSI/NFPA 70 or Canadian Electric Code (CEC).** The pump should never be installed in a trench, ditch, or hole with a dirt bottom. The legs will sink into the dirt and the suction will become plugged.

The installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, remove the check valve and size the basin to accommodate the additional backflow volume.

**Discharge Piping**

Discharge piping should be as short as possible and sized no smaller than the pump discharge. **Do not reduce the discharge pipe size below that which is provided on the pump.** Both a check valve and a shut-off valve are recommended for each pump. The check valve is used to prevent backflow into the sump. The shut-off valve is used to manually stop system flow during pump servicing.

**Electrical Connections**

**Power cable:**

The power cable mounted to the pump must not be modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be made in accordance with the electric codes. It is recommended that a junction box, if used, be mounted outside the sump or be of at a minimum Nema 4 construction if located within the wet well. **DO NOT USE THE POWER CABLE TO LIFT PUMP.**

Always rely upon a Certified Electrician for installation.

**Overload Protection:**

**Single Phase** - The stator in-winding overload protector used is referred to as an inherent overheating protector and operates on the combined effect of temperature and current. This means that the overload protector will trip out and shut the pump off if the windings become too hot, or the load current passing through them becomes too high.

**IMPORTANT!** - The overload will then automatically reset and start the pump up after the motor cools to a safe temperature. In the event of an overload, the source of this condition should be determined and corrected immediately.



**WARNING! - DO NOT LET THE PUMP CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS!**

If current through the temperature sensor exceeds the values listed, an intermediate control circuit relay must be used to reduce the current or the sensor will not work properly.

TEMPERATURE SENSOR ELECTRICAL RATINGS		
Volts	Continuous Amperes	Inrush Amperes
110-120	3.00	30.0

**Replacement Parts:**

Shunt Plug, washer & nut - PF103477-A

Shunt plug cable gland, o-ring, two screws - PF103477-C

**Wire Size:**

If longer power cable is required consult a qualified electrician for proper wire size.

**Pre-Operation**

1. **Check Voltage and Phase**  
Compare the voltage and phase information stamped on the pump name plate.
2. **Check Pump Rotation** - Improper motor rotation can result in poor pump performance and can damage the motor and/or pump. Incorrect rotation for Single-Phase pumps is unlikely. If the rotation is incorrect contact factory.
3. **Name Plate** - Record the information from the pump name plate to drawing in front of manual for future reference.
4. **Insulation Test** - An insulation (megger) test should be performed on the motor. Before the pump is put into service. The resistance values (ohms) as well as the voltage (volts) and current (amps) should be recorded.
5. **Pump-Down Test** - Be sure pump has been properly wired, lowered into the basin, sump or lift station, check the system by filling with liquid and allowing the pump to operate through its pumping cycle. The time needed to empty the system, or pump-down time along with the volume of water, should be recorded.

**Maintenance**

No lubrication or maintenance is required. Perform the following checks when pump is removed from operation or when pump performance deteriorates:

- a). Inspect motor chamber for oil level and contamination - 11.8 oz.
- b). Inspect impeller and body for excessive build-up or clogging.
- c). Inspect motor and bearings.
- d). Inspect seal for wear or leakage.

Wide Angle Float for TWA - PF512040

Wide Angle Float for TWAI - PF060M25002





**Trouble Shooting Chart**



**Risk of electric shock. Always disconnect the pump from the power source before handling inspections or repairs.**

Symptom	Possible Cause(s)	Corrective Action
Pump will not run	Blown fuse or other interruption of power; improper voltage.  Switch is unable to move to the "turn ON" position due to interference with the side of basin or other obstruction  Insufficient liquid level  Defective level control	Check that the unit is securely plugged in. Have an electrician check all wiring for proper connections and adequate voltage and capacity.  Position the pump or switch so that it has adequate clearance for free operation.  Make sure the liquid level is allowed to rise enough to activate level control(s).  Remove and replace level controls
Pump will not turn off	Discharge is blocked or restricted  Check valve is stuck closed or installed backwards  Gate or ball valve is closed  Total lift is beyond pump's capability  Pump impeller is jammed or volute casing is plugged	Check the discharge line for foreign material, including ice if discharge line passes through or into cold areas  Remove check valve(s) and examine for freedom of operation and proper installation  Open gate or ball valve  Try to route piping to a lower level. If not possible, a larger pump may be required. Consult the factory  Disconnect unit electrically. Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Rotate impeller by hand. Reassemble and reinstall
Pump will not turn off	Level control(s) unable to move to the "turn OFF" position due to interference with the side of basin or other obstacle  Defective level control	Position the pump or level control so that it has adequate clearance for free operation  Remove and replace level control
Pump runs periodically when fixtures are not in use	Check valve is stuck open or is leaking  Fixtures are leaking	Remove check valve(s) and examine for freedom of operation and proper installation  Repair fixtures as required to eliminate leakage
Pump operates noisily	Debris in the impeller cavity  Damaged impeller  Worn bearings  Piping attachments to building are too rigid	Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall  Consult the factory for information regarding replacement of impeller  Return pump to the factory or authorized repair station for repair  Replace a portion of the discharge line with rubber hose or connector

**NOTE:** Power-Flo Pumps & Systems assumes no responsibility for damage or injury due to disassembly in the field. Disassembly of the pumps or supplied accessories other than at Power-Flo Pumps & Systems or its authorized service centers, automatically voids warranty.



## 2 YEAR WARRANTY

Manufacturer warrants, to the purchaser and subsequent owner during the warranty period, new pump product to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of 2 years from date of sale. The date of sale shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of the return is more than 2 years from the date of manufacturer. Product will be repaired, replaced or remanufactured at Manufacturer's option. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement. This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all pumping applications. The warranty set out in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

**Contact Manufacturer at: 1-877-24PUMPS or [www.powerflopumps.com](http://www.powerflopumps.com), Attention: Customer Service Department, to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty. MANUFACTURER EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.**

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

