



ELECTRICAL



Certified to NSF/ANSI/CAN 50

PIPELINE PUMPS® INSTRUCTION MANUAL INSTALLATION AND USER'S GUIDE



My pump is the PLP300S or PLP150S and it was installed on _____ (date)
Installed by _____ (company/contact)

FOR YOUR SAFETY

Read, understand and follow all warning notices and instructions before installing, using, or servicing this pump. Failure to follow warning notices and instructions may result in property damage, serious injury, or death.

SAVE THESE INSTRUCTIONS

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1.0 IMPORTANT SAFETY INFORMATION





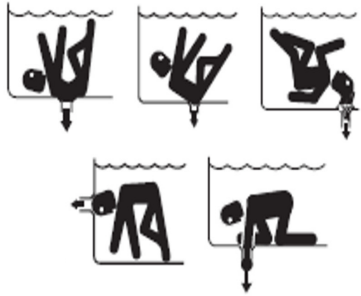

IMPORTANT NOTICE

This guide provides installation and operation instructions for this pump. Consult AquaStar Pool Products, Inc. with any questions regarding this equipment.

Attention Installer: These instructions contain important information about the installation, operation and safe use of this product. This information should be given to the owner/operator of this equipment after installation or left on or near the pump. This pump is for use with permanent swimming pools and spas. It may also be used with hot tubs if so marked.

Attention User: This manual contains important information about the installation, operation, servicing and safe use of this product. Keep this manual for future use. Replace worn or damaged pump parts immediately. To reduce risk of injury, do not permit children to use or climb on this product. Closely supervise children at all times. Components such as the filtration system, pumps, and heaters must be positioned to prevent children from using them as a means of access to the pool or spa.

Section 1.0 Important Safety Information

 DANGER	 DANGER	 DANGER
		
<p>RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.</p> <p>Always disconnect power to the pump at the circuit breaker before servicing the pump.</p> <p>Failure to do so could result in death or serious injury to service people, users or others due to electric shock.</p>	<p>RISK OF SUCTION ENTRAPMENT.</p> <p>Keep away from drain covers and suction outlets. Do not enter water if drain covers are missing, broken, loose or not sized for use with this pump.</p> <p>Failure to do so could result in death or serious injury to users due to pump suction.</p>	<p>HAZARDOUS PRESSURE.</p> <p>Stand clear of pump and filter during pump start up. Open filter air relief valve and stand clear before starting pump.</p> <p>Failure to do so could result in death or serious injury to service people, users or others.</p>

1.2 INSTALLATION SAFETY INSTRUCTIONS

ATTENTION INSTALLER



⚠ DANGER

RISK OF ELECTRICAL SHOCK OR ELECTROCUTION! When installing this electrical equipment, basic safety precautions provided below should always be followed. **FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH.**

RISK OF FIRE, ELECTRIC SHOCK, OR INJURIES TO PERSONS. Install this equipment in accordance with the National Electric Code® (NEC), the Occupational Safety and Health Act (OSHA), and all applicable laws, codes and ordinances. Copies of the NEC may be ordered from the National Fire Protection Association, 1 Battery-march Park, Quincy, Massachusetts USA 02169-7471.

Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.

Test the GFCI before connecting the pump motor wiring. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective and the problem must be corrected by a qualified service representative before using.

Connect the motor bonding lug to the pool or spa electrical bonding structure. Failure to bond pump to pool or spa structure will increase risk for electrocution and could result in injury or death.

AquaStar Pool Products recommends installing a surge protection device on the supply power to the pump. Damage caused by power surges are not covered under warranty.

Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.

This pump is not submersible.

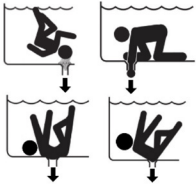
Incorrectly installed equipment may fail, causing severe injury.

Though this product is designed for outdoor use, it is strongly advised to protect the electrical components from the weather. Select a well drained area, one that will not flood when it rains. It requires free circulation of air for cooling. Do not install in a damp or non-ventilated location.

Fire and burn hazard. Motors operate at high temperatures and if they are not properly isolated from any flammable structures or foreign debris they can cause fires, which may cause severe personal injury or death.

Risk of overheating. If installed within an enclosure or inside hot tub or spa enclosure, adequate ventilation and free circulation of air must be provided to prevent overheating of the motor.

ATTENTION INSTALLER



RISK OF SUCTION ENTRAPMENT. Only install this pump on suction systems that have been evaluated and found in conformance with the Virginia Graeme Baker Pool & Spa Act, and all warning notices and instructions that accompany the product. **FAILURE TO PROTECT USERS FROM ALL FIVE SUCTION ENTRAPMENT HAZARDS CAN RESULT IN SERIOUS INJURY OR DEATH.**

This pump is not equipped with Automatic Pump Shut-off or Safety Vacuum Release System (SVRS) protection. It does not protect against body or limb entrapment, disembowelment, or hair entanglement.



RISK OF HAZARDOUS PRESSURE. Before installing this pump, read and follow all warning notices and instructions that accompany the product. **FAILURE TO FOLLOW WARNINGS AND INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH.**

Do not install pump on/off switches or controls near filters. Trapped air in the system can cause the filter lid to be blown off when the pump starts up, which can result in death, or serious injury.

Do not use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

This pump is capable of high pressure that may exceed the limits of other equipment. Confirm all equipment installed on the pressure-side of this pump has a working pressure rating of 50 psi or greater. If the working pressure of other equipment does not meet this requirement, do not install this pump unless the other equipment is removed or replaced first.

Separation Hazard. Failure to follow safety and operation instructions could result in violent separation of pump components. Strainer cover must be properly secured to pump housing with strainer cover lock ring.

Pressure Testing Hazards. To minimize the risk of severe injury or death, the pump should not be subjected to the piping system pressurization test. Do not connect the system to an unregulated city water system or other external source of pressurized water producing pressures greater than 35 PSI. Local codes may require the pool piping system to be subjected to a pressure test, however, these requirements are generally not intended to apply to the pool equipment such as pumps, filters, heaters, or in-line sanitizing systems.

NEVER PRESSURE TEST WITH COMPRESSED AIR!

1.3 USER SAFETY INSTRUCTIONS

ATTENTION USER

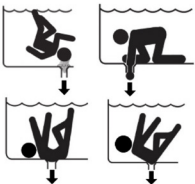


RISK OF HAZARDOUS PRESSURE. Before installing this pump, read and follow all warning notices and instructions that accompany the product. **FAILURE TO FOLLOW WARNINGS AND INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH.**

Before servicing the pump or filter, switch OFF power to the pump by disconnecting the main circuit to the pump.

This pump is capable of high flow rates that may exceed the limits of other equipment. **Do not change the high speed programming of the pump without confirming all other equipment can handle the increased flow and pressure.**

This pump is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the pump by a person responsible for their safety.



RISK OF SUCTION ENTRAPMENT! Keep away from drain covers and suction outlets. Do not enter water if drain covers are missing, broken, loose or they are not sized for use with this pump. **FAILURE TO DO SO COULD RESULT IN DEATH OR SERIOUS INJURY.**

BEFORE USING THIS PUMP CONFIRM THE SUCTION SYSTEM IS COMPLIANT WITH THE VIRGINIA GRAEME BAKER POOL & SPA SAFETY ACT (VGBA) AND THE FOLLOWING GUIDELINES: THE SUCTION SYSTEM MUST PROVIDE PROTECTION AGAINST THE HAZARDS OF SUCTION ENTRAPMENT.

This pump is not equipped with Automatic Pump Shut-off or Safety Vacuum Release System (SVRS) protection. It does not protect against body or limb entrapment, disembowelment, or hair entanglement. Only install this pump on suction systems that have been evaluated and found in conformance with the Virginia Graeme Baker Pool & Spa Act, and all warning notices and instructions that accompany the product. Failure to protect users from all five suction entrapment hazards can result in serious injury or death.

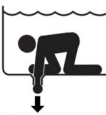
Certified Drain Covers. Before using this pump confirm all drain covers are certified to the U.S. Consumer Product Safety Standard titled ANSI/APSP/ICC-16 2017, or its predecessor standard ANSI/APSP-16 2011. Acquire proof of conformance by contacting the drain cover manufacturer who is required to provide a General Certificate Of Conformity (GCC). Proof of compliance GCC, flow rating specifications, and installation instructions for drain covers manufactured by AquaStar Pool Products are available at www.aquastarpoolproducts.com or by calling (877) 768-2717.

ATTENTION USER

SUCTION-RELATED HAZARDS:



Hair Entanglement: When the hair tangles or knots in the drain cover, trapping the swimmer underwater. This hazard is present when the VGBA flow rating of the drain cover is too small for the pump or pumps.



Limb Entrapment: When a limb is sucked or inserted into an opening resulting in a mechanical bind or swelling. This hazard is present when a drain cover is missing, broken, loose, cracked or not properly secured.



Body Entrapment: When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard may be present when the drain cover is not VGBA certified, installation instructions were not followed, or is missing, broken or the cover flow rating is not high enough for the pump or pumps.



Evisceration/Disembowelment: When a person sits on an open pool (particularly a child wading pool) or spa outlet and suction is applied directly to the intestines, causing severe intestinal damage. This hazard may be present when the drain cover is missing, loose, cracked, or not properly secured.

Identifying VGBA-2017 Compliant Drain Covers. Products compliant with ANSI/APSP/ICC-16 2017 standard will be permanently marked VGBA-2017. This U.S. Consumer Product Safety Standard applies to all drain covers manufactured or imported into the United States on or after the law's May 24, 2021 effective date.

Drain covers compliant with the previous version of the U.S. Consumer Product Safety Standard may also be used in compliance with the VGBA (those manufactured or imported before May 24, 2021) provided they were installed according to their installation instructions and have not exceeded their installed service life.

Drain covers compliant with the previous version of the standard will be marked with one or more of the following; ANSI/APSP-16 2011; VGB-2008, or ASME/ANSI A112.19.8 - 2007, 2008a, or 2009b.

Drain covers with no markings and those marked with "ASME/ANSI A112.19.8M" are not VGBA compliant and should be replaced.

Drain Cover Service Life. REPLACE OLD DRAIN COVERS BEFORE USING THIS PUMP. Drain covers have a limited service life, losing important strength over time because of sunlight and chemicals. They should be replaced before they expire, and they must be replaced if missing, broken, loose, or are not certified to one of the VGBA drain cover standards identified above. VGBA compliant drain covers will also be marked with a service life designation, e.g., LIFE: 5 YEARS. This is to help assure drain covers are strong enough to protect users from the pump's suction over time.

DRAIN COVER INSTALLATION NOTES:

1.4 SERVICING SAFETY INSTRUCTIONS

ATTENTION SERVICER



HAZARDOUS PRESSURE. Before servicing this pump, read and follow all warning notices and instructions that accompany the product. **FAILURE TO FOLLOW WARNINGS AND INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH.**

Before servicing the pump or filter, switch OFF power to the pump by disconnecting the main circuit to the pump.

This pump is capable of high flow rates that may exceed the limits of other equipment. Do not change the high speed programming of the pump without confirming all other equipment can handle the increased flow.

This pump is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the pump by a person responsible for their safety.

1.5 PRODUCT DAMAGE WARNINGS

NEVER run the pump dry! Running the pump dry will damage seals, causing leakage and flooding. Fill the pump with water before starting.

Repair suction system air leaks. Air entering the pump may collect in filters causing pressurized air hazards that could damage the pump, reduce pump performance, increase pump noise, and decrease the life of the pump. Air can enter the pump if the pump unions and strainer basket lid O-Ring are not clean, lubricated and properly tightened. Suction-side control valves, air venting Safety Vacuum Release Systems (SVRS), and Vacuum-Limiting Vent Systems may also be the source of air entering the pump.

2.0 PUMP OVERVIEW

The AquaStar PipeLine Variable Speed Pump can be programmed to run at specific speeds and time intervals for maximum operating efficiency and energy conservation.

- The pump can be adjusted from the control panel to run at any speed between 800 RPM to 3400 RPM for different applications.
- The pump comes equipped with a programmable freeze protection function that will circulate water in the pool when temperature reaches a set point.
- Pump control panel will display Over Voltage, Under Voltage, Over Current, Overheating and No Water Flow Warnings.
- Programmable self-priming settings allow for priming customization for each unique pool.
- Compatible with most cleaning systems, filters, and jet action spas.

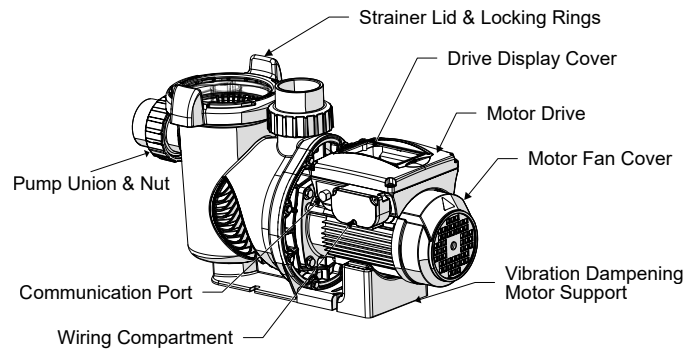


FIGURE 1

EXTERNAL CONTROL

AquaStar PipeLine Pumps come with optional Smart Communication Functionality.

- Smart pump models come equipped with a RS-485 connection port which will work with any automation system that supports Pentair® Intelliflo VS Pumps or Modbus Protocol Pumps.*
- Smart pump models come equipped with WiFi capability that allows full control of pump speeds and schedules with the free AquaStar PipeLine Connect App.

MOTOR FEATURES

- High-Efficiency Permanent Magnet Synchronous Motor (PMSM).
- Operates at lower temperatures due to high efficiency.
- Designed to withstand outdoor environment.
- Totally Enclosed Fan Cooled (TEFC) Motor.
- 56 Square Flange.
- Low noise.

DRIVE FEATURES

- High-efficiency speed controls.
- Thermostat driven freeze protection.
- Customizable variable flow setting for water features.
- Built in run time scheduling.
- No flow protection.

3.0 INSTALLATION INSTRUCTIONS

Only a qualified plumbing professional should install the PipeLine Pump. Refer to "Installation Safety Instructions" on pages 6-7 for additional installation and safety information.

Note: The PipeLine Pump cannot be connected in series with other pumps.

CAUTION: The pump and its packaged components may have shifted during transport. When unpacking the pump at the installation site, carefully remove the pump to avoid damaging it. Inspect the pump for any damage before beginning the following installation procedures.

*Pentair® is a registered trademarks of Pentair Flow Services AG

3.0 INSTALLATION INSTRUCTIONS CONTINUED

CAUTION

Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shutdown, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- The pump will only function correctly if it is properly sized to the specific application and properly installed.

WARNING: Pumps improperly sized or installed or used in applications other than for which the pump was intended can result in severe personal injury or death. These risks may include but not be limited to electric shock, fire, flooding, suction entrapment or severe injury or property damage caused by a structural failure of the pump or other system component.

3.1 PUMP LOCATION

Note: Do not install this pump within an outer enclosure or beneath the skirt of a hot tub or spa unless marked accordingly.

Note: Ensure that the pump is mechanically secured to the equipment pad.

Be sure the pump location meets the following requirements:

1. Install the pump as close to the pool or spa as possible. To reduce friction loss and improve efficiency, use short, direct suction piping returns.
2. Install a minimum of 5 feet (1.52 meters) from the inside wall of the pool and spa. Canadian installations require a minimum of 9.8 feet (3 meters) from pool water level.
3. Install the pump a minimum of 3 feet (.9 meters) from the heater outlet.
4. Do not install the pump more than 8 feet (2.4 meters) above the water level.
5. Install the pump in a well ventilated location protected from excessive moisture (i.e., rain gutter downspouts, sprinklers, etc.)
6. Install the pump with a rear clearance of at least 3-inches (76.2 mm) so that the motor can be removed easily for maintenance and repair. See Figure 2.
7. Install the pump on a level, vibration free surface.
8. Make sure that floor drainage is adequate to prevent flooding.

3.2 PIPING

1. For improved pool plumbing efficiency, it is recommended to use the largest pipe size available. Pipeline Pumps come with a recommended 2-1/2" union.
2. Plumbing size on the suction side of the pump should be the same or larger than the return line size.
3. Total plumbing run on the suction side of the pump should be as short as possible in order minimize pump cavitation.
4. AquaStar recommends plumbing the suction side of the pump with a straight run of pipe equal to (5) times the pipe diameter before any valve, elbow, or tee. See Figure 2.
Example: A 2 1/2" pipe requires a 12.5" (318 mm) straight run
5. For most installations, AquaStar recommends installing a valve on both the pump suction and return lines so that the pump can be isolated during routine maintenance.

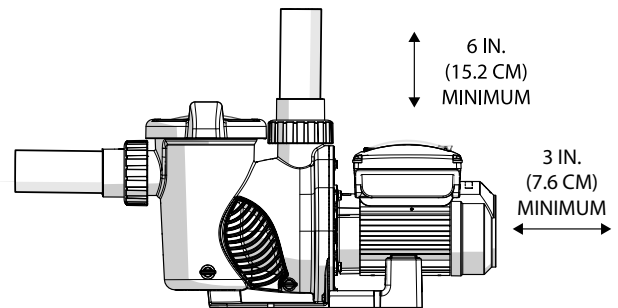


FIGURE 2

Note: Do not install 90° elbows directly into the pump inlet or outlet.

3.3 ELECTRICAL INSTALLATION



SHOCK OR ELECTROCUTION. This pump must be installed by a licensed or certified electrician or a qualified service professional in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to service people, users or others due to electric shock. Read all servicing instructions before working on the pump.

Note: ALWAYS reinstall the cover onto the field wiring compartment when leaving the pump unsupervised during servicing. This will prevent foreign matter (i.e. rainwater, dust, etc.) from accumulating in the drive.

Note: When connecting the pump to an automation system, continuous power must be supplied to the pump by connecting it directly to the circuit breaker. When using an automation system, be sure that no other lights or appliances are on the same circuit.

Note: When controlling the pump with a relay, or timer be sure to use two-pole devices so that power is always supplied and removed to both HOT LINES simultaneously

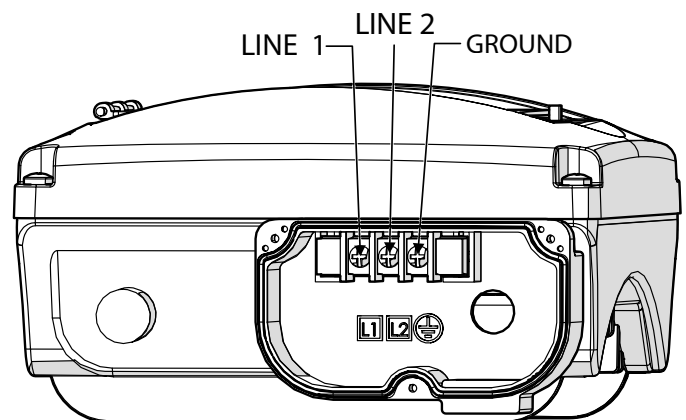


FIGURE 3

Note: If GFCI circuit breaker protection is required, the pump should be ground wired on its own independent circuit. AquaStar Pool Products recommends using a Siemens Class A Double Ground Fault Circuit Interrupter.

3.3 ELECTRICAL INSTALLTION CONTINUED

Power Supply Wiring:

1. Ensure that the supply voltage is within required range listed on the motor nameplate.
2. Make sure that the pump is disconnected from power source and all electrical breakers are switched off.
3. Unscrew and remove the wiring compartment cover on the side of the motor. Be sure not to remove the red gasket seal.
4. Make the required wiring connections inside of this wiring compartment per the National Electric Code and any required local codes. See Figure 3 for connection locations.
5. Connection terminals labeled L1 & L2 are the two hot lines and should be connected to a properly protected supply circuit using the correct wire size and type as per the National Electric Code.
6. Connection terminal labeled with the ground symbol should be connected to an electrical service ground using the correct wire size and type as per the National Electric Code.
7. Be sure to cut and strip wires to the proper length to prevent wire shorting.
8. Use an appropriate watertight strain relief in the ½" NPT connection on the bottom of the wiring compartment in order to create a permanent electrical connection.
9. Once wiring is complete, reinstall the wiring compartment cover and tighten the 3 cover screws. Be sure the red gasket seal has remained in place.

Bonding Connection:

1. Bond the motor to the pool structure using a solid copper conductor and the Bonding Lug on the side of the motor, as shown in Figure 4, in accordance with the National Electrical Code.
2. Use no smaller than 8 AWG conductor for US installations and no smaller than 6 AWG conductor for Canadian installations.
3. Connect this bonding wire to all metal parts of the swimming pool, spa, and/or hot tub. This includes, but is not limited to, any and all metal structural components, all electrical equipment, all metal conduit, pool heaters, and any metal piping within 5 feet (1.52 meters) of the inside walls of the swimming pool, spa, and/or hot tub.

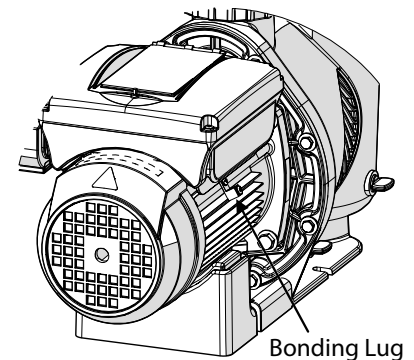


FIGURE 4

4.0 OPERATION INSTRUCTIONS

WARNING

Always **STOP PUMP** and **RELEASE ALL PRESSURE** from pump and piping system before servicing. NEVER tighten or loosen bolts while the pump is operating. Do not block the pump suction.

DANGER



HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP.

Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover, filter lid, and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be property secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service.
Turn off all power to the pump.

4.0 OPERATION INSTRUCTIONS CONTINUED

IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved. Before starting the system, fully open the manual air relief valve and place all system valves in the “open” position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

4.1 START UP

MANUAL FILL

1. Ensure power to the pump is off at the breaker and that the motor is not running dry.
2. Ensure that the two drain plugs are installed and tight.
3. Close valves on the inlet and outlet side of the pump.
4. Turn the locking ring counter-clockwise to remove the strainer lid and locking ring
5. Fill the basket side of the pump housing with water. Slowly let water fill the impeller side of the pump housing by continuing to add water until basket side is completely full.
6. Reinstall the strainer lid and locking ring, turning clockwise to hand tighten.

PRIMING THE PUMP

1. With the strainer lid installed, open the valves on inlet and outlet side of the pump.
2. Open the air bleed valve on the pool filter.
3. Turn on power to the pump at the breaker.
4. Be sure the control panel display is active and press the “Run” button to begin priming. See Figure 5.
5. Close the air bleed valve on the pool filter once all air has escaped.
6. The pump default prime settings are 2900 RPM for 2 minutes. If the pump is not fully primed after this 2 minute cycle, press the “Speed 4” button, which is preprogrammed at 2900 RPM and let the pump continue to run at this speed until priming is complete.
7. For instructions on how to customize your prime settings, see section 4.3.7 “Pump Priming Set Up.”
8. If the pump cannot reach full flow prime when running at 3400 RPM within 10 minutes, stop the pump and see the Troubleshooting Guide in section 6.

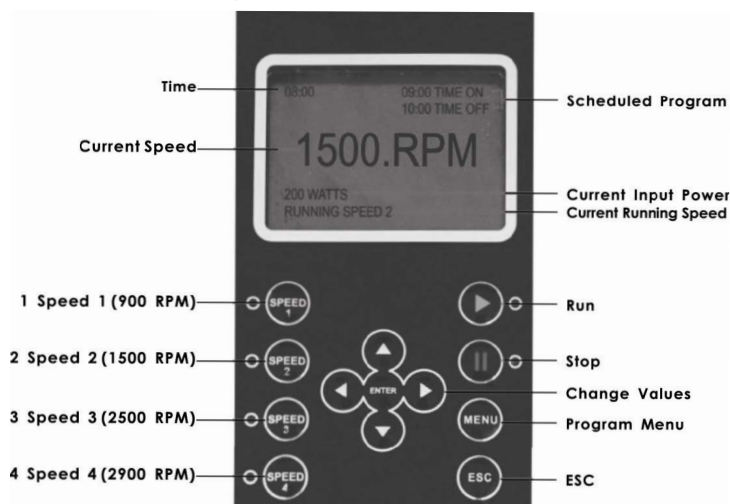


FIGURE 5

Time: Built-in time clock.

Current Speed: Shows operating speed. Expressed in RPM.

Scheduled Program: Shows current operating schedule.

Current Running Speed: Shows current operating speed. Four pre-set speeds available.

LCD Display back-light will switch off after 60 seconds if no button is pressed. It can be turned on again by pressing any button.

4.2 DISPLAY INTERFACES

Up
Increase value

Down
Decrease value

Left
Move cursor left

Right
Move cursor right

ENTER
Enter sub-menus or save setting

Speed 1
Select Speed 1
Preset to 900 RPM

Speed 2
Select Speed 2
Preset to 1500 RPM

SPEED 3
Speed 3
Select Speed 3
Preset to 2500 RPM

SPEED 4
Speed 4
Select Speed 4
Preset to 2900 RPM

Start
Start the motor

Stop
Stop the Motor

Menu
Enter settings menu,
only accessible when the
motor is not running

ESC
Back / Cancel

PUMP STOPPED
12:00
0 RPM
0. W
Speed 2

RUNNING SPEED
12:00
1500 RPM
210. W
Running Speed 2

COMMUNICATION ERROR
**COMM
ERROR**

UNDER VOLTAGE
FAULT CODE:
UV

MENU SETTINGS
SETTINGS
1. Time
2. Speeds
3. Schedules

4.3 PROGRAMMING INSTRUCTIONS

Note: The internal system clock is used to program operating schedules. If the power supply is disconnected, the controller memory and programmed settings will be maintained for approximately 7 days.

Note: Ensure the pump is in the off position before modifying any pump setting.

4.3.1 SET TIME

Time is set using a 24 hour clock (hr:min)

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight "Time" and press "Enter."
- Press "Enter" again to modify, then using "Up," "Down," "Left," and "Right" buttons, set local time and press "Enter."
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

Normal Time to 24-Hour Time Chart

NORMAL TIME	24-HOUR TIME	NORMAL TIME	24-HOUR TIME	NORMAL TIME	24-HOUR TIME	NORMAL TIME	24-HOUR TIME
12:00 AM	00:00	6:00 AM	06:00	12:00 PM	12:00	6:00 PM	18:00
1:00 AM	01:00	7:00 AM	07:00	1:00 PM	13:00	7:00 PM	19:00
2:00 AM	02:00	8:00 AM	08:00	2:00 PM	14:00	8:00 PM	20:00
3:00 AM	03:00	9:00 AM	09:00	3:00 PM	15:00	9:00 PM	21:00
4:00 AM	04:00	10:00 AM	10:00	4:00 PM	16:00	10:00 PM	22:00
5:00 AM	05:00	11:00 AM	11:00	5:00 PM	17:00	11:00 PM	23:00

4.3.2 SPEED SET UP

There are 4 speed settings available. To program speeds:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight "Speeds" option and press "Enter."
- Use buttons "Up" and "Down" to highlight desired speed to modify and press "Enter."
- Press "Enter" again to modify, then using "Up" and "Down" buttons, adjust the speed to desired RPM and press "Enter."
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

4.3 PROGRAMMING INSTRUCTIONS CONTINUED

4.3.3 SCHEDULE SET UP

Note: The pump is supplied with the pre-set schedules for an easier start-up. If necessary, these parameters can be changed. Pre-set schedule settings are as follows:

Schedule 1 - Disabled / Time on 8:30 / Time off 11:30 / Speed 1

Schedule 2 - Disabled / Time on 14:30 / Time off 17:30 / Speed 1

Schedule 3 - Disabled / Time on 19:30 / Time off 21:30 / Speed 1

To enable or disable a schedule:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Schedules" option and press "Enter."
- Use buttons "Up" and "Down" to highlight desired schedule to modify and press "Enter."
- Use buttons "Up" and "Down" to highlight the "Function" option and press "Enter."
- Press "Enter" again to modify, then using "Up" and "Down" buttons highlight "Enable" or "Disable" and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

To adjust "Time On" or "Time Off" settings:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Schedules" option and press "Enter."
- Use buttons "Up" and "Down" to highlight desired schedule to modify and press "Enter."
- Use buttons "Up" and "Down" to highlight the "Time On" or "Time Off" option and press "Enter."
- Use buttons "Up," "Down," "Left," and "Right" to set desired schedule time and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

Note: Schedule settings can also be adjusted within the AquaStar Pipeline Connect App.

4.3.4 VARIABLE SPEED SET UP

This function allows the pump to cycle through a predefined speed profile in order to create varying flow patterns which are particularly useful for creating visual effects on water features.

To adjust Variable Speed settings:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Variable Speed" option and press "Enter."
- Use buttons "Up" and "Down" to highlight:
 - The "Function" option and press "Enter" to "Enable" or "Disable" this feature.
 - The "Time On" option to schedule the time to start this function.
 - The "Time Off" option to schedule the time to stop this function.
 - The "Min Speed" option to adjust the minimum speed of the flow profile.
 - The "Max Speed" option to adjust the maximum speed of the flow profile.
 - The "Step" option to adjust the RPM increments the flow profile will step between.
 - The "Rhythm" option to adjust the time, in seconds, that the profile will cycle through each step.
- Use buttons "Up," "Down," "Left," and "Right" to adjust these settings and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

4.3.5 LANGUAGE SET UP

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Language" option and press "Enter."
- The symbol ">" indicates the language in use.
- Press "Enter" again to enter into editing mode and use "Up" and "Down" buttons to select the required language.

4.3 PROGRAMMING INSTRUCTIONS CONTINUED

4.3.5 LANGUAGE SET UP (continued)

- Press "Enter" to save the setting. The interface will be shown in the selected language immediately. Otherwise, press "ESC" to exit the editing mode.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

4.3.6 "NO FLOW" SET UP

This function stops the pump automatically when it detects a "No Flow" condition. This feature is only available for motor speeds of 1800 RPM or more and is set up through the following parameters:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "No-Flow" option and press "Enter."
- Use buttons "Up" and "Down" to highlight:
 - The "Function" option and press "Enter" to "Enable" or "Disable" this feature (it is disabled by default).
 - The "Alarm Time" option to set the time frame that defines a No-Flow condition. Min. setting is 5 minutes.
 - The "Sensitivity" option to adjust the detection sensitivity expressed in a %. Min. setting is 0.01%.
- Press "Enter" to edit and then use "Up," "Down," "Left," and "Right" buttons to adjust these settings and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

Note: If system detects a "No Flow" condition the motor will stop and the display will show the Fault Code "NF"

4.3.7 PUMP PRIMING SET UP

This function creates a self priming program to be run whenever pump is started. To customize self priming settings:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Priming" option and press "Enter."
- Use buttons "Up" and "Down" to highlight:
 - The "Function" option and press "Enter" to "Enable" or "Disable" this feature (which is set to "Enabled" by default).
 - The "Priming Time" option to set the time, in minutes, that the pump will run to achieve prime.
Default time: 2 minutes, Min. Time: 1 minute, Max. Time: 20 minutes.
 - The "Priming Speed" option to adjust speed the pump will run at to achieve prime.
Default Speed: 2900 RPM, Min. Speed: 2900 RPM, Max. Speed: 3400 RPM
- Press "Enter" to edit and then use "Up," "Down," "Left," and "Right" buttons to adjust these settings and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

4.3.8 FREEZE PROTECTION

This function turns the pump on when the outside temperature is below a set point to prevent water from freezing:

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "Freeze" option and press "Enter."
- Use buttons "Up" and "Down" to highlight:
 - The "Function" option and press "Enter" to "Enable" or "Disable" this feature (which is set to "Enabled" by default)
 - The "Duration" option to set the run time, in hours, that the pump will run after triggered.
Default time: 1 hours, Min. Time: 1 hour, Max. Time: 8 hours.
 - The "Speed" option to adjust speed the pump will run at to prevent freeze.
Default Speed: 1700 RPM, Min. Speed: 900 RPM, Max. Speed: 3400 RPM
 - The "Temperature" option to adjust temperature that will trigger the pump to run the freeze program.
Default Temperature: 4° C (39° F), Min. Temperature: 0° C (32° F), Max. Temperature: 10° C (50° F)
- Press "Enter" to edit and then use "Up," "Down," "Left," and "Right" buttons to adjust these settings and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

4.3 PROGRAMMING INSTRUCTIONS CONTINUED

4.3.9 WIFI FUNCTION

This function is only available on Smart Model PipeLine Pumps. This feature allows for connection to the AquaStar PipeLine Connect Mobile App.

- Press “Menu” button to enter the settings menu.
- Use buttons “Up” and “Down” to highlight the “WiFi” option and press “Enter.”
- Use buttons “Up” and “Down” to highlight the “Function” option and press “Enter” to “Enable” or “Disable” this feature (which is set to “Enabled” by default).
- Selecting the “WiFi Reset” option and pressing “Enter” will return the WiFi settings to factory default.
- Press “ESC” button to return to the previous screen or repeatedly press to return to the home screen.

4.3.9.1 WIFI DIRECT CONNECTION TO PIPELINE CONNECT APP

Note: Pipeline Connect App only works with “Smart” WiFi enabled Pipeline Pumps

- Install the “AquaStar Pipeline Connect App” from App Store or Play Store.
- Ensure the WiFi function is “Enabled” (see previous section 4.3.9).
- Go to Wi-Fi setting on mobile device and select the network “EPVSPV-WiFi” and enter the password “VS__PUMP”
- Open the “AquaStar Pipeline Connect App” and follow prompts.

Note: While connected to the pump WiFi Direct Network, Internet access is disabled.

4.3.9.2 CHANGING SSID AND PASSWORD

To change the SSID and password for the WiFi Direct network:

- While connected to the “EPVSPV-WiFi” network enter the IP address “192.168.8.1:88” into a web browser.
- Select SSID & Password on the right side of the screen.
- Enter your new SSID Name, Password, and Repeat Password then press “Submit.”
- Disconnect from “EPVSPV-WiFi” network and reconnect to the newly named network.

WiFi Specifications:

Compliant to IEEE 802.11b/b/n

1T1R 2.4GHz with support for a 150Mbps PHY data rate

Security: WEP64/128, TKIP, AES, WPA, WPA2, WAPI

AP and STA mode

25m distance transmission

Built-in antenna

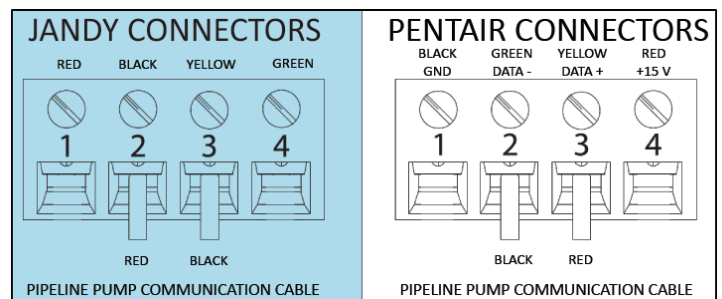


FIGURE 6

4.3.10 RS485 COMMUNICATION WIRING

- Turn off Power at the Breaker.
- Take the Communication Cable that came with your “Smart” PipeLine Pump and feed it into the low voltage side of your load center.
- Connect the Black and Red wires from this cable to an unoccupied Communication port in the load center per the wiring diagram shown in Figure 6.
- Plug the connector end of the cable into the “Communication Port”, located on the side of your pump. See Figure 1 for location.
- Repeat the above process for each pump you are connecting. Note: you may connect multiple pumps to the same load center Communication port.

For connecting to a Hayward® Omni Automation Controller, you will need to use the OmniHub® Converter Board. Follow the Hayward instructions for connecting to a Pentair® Intelliflo® VS pump. Attach your pump communication cable to the OmniHub® Converter Board and wire communication port per the Jandy® diagram in Figure 6.

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4.3 PROGRAMMING INSTRUCTIONS CONTINUED

4.3.11 COMMUNICATIONS SETUP

This pump can be controlled by external automation systems via an RS485 connection. PipeLine Smart Pumps will work with any automation system that supports Pentair® Intelliflo® VS Pumps or Modbus Protocol Pumps.*

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "RS485" option and press "Enter."
- Baud rate is set to 9600 bps. Do not modify this setting.
- Use buttons "UP" and "Down" to highlight the Pump Address and press "Enter" to modify.
 - The Pump Address is a unique pump ID to be used on external automation systems when multiple pumps are being controlled. This is set to "1" by default.
 - If multiple pumps are being controlled on the same system ensure that each pump has its own unique Pump Address .
 - Press "Enter" to edit and then use buttons "Up," "Down," "Left," and "Right" to adjust these settings and press "Enter" to save.
- Press "ESC" button to return to the previous screen or repeatedly press to return to the home screen.

RS485 Specifications:

Max baud rate 9600bps

Protocols, Modbus & Pentair® Intelliflo® VS

4.3.12 LOCK OUT

This function will lock the display panel and sets a unique password to unlock.

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "LOCK OUT" option and press "Enter."
- Use buttons "Up" and "Down" to highlight:
 - The "Function" option and press "Enter" to "Enable" or "Disable" this feature (Which is set to "Disabled" by default).
 - The "Password" option and press "Enter" to edit. Press "Enter" again to highlight the code and use the "Up" and "Down" arrows to change this password. Only digits 1-4 can be used. Press "Enter" to accept and save password. (Default password 1111)
- To Activate the "LOCK OUT" function from the home screen, press and hold the "ESC" button for 3 seconds.
- To Deactivate the "LOCK OUT" function, press and hold the "ESC" button for 3 seconds. Then using the 4 speed buttons, enter your unique password.

4.3.13 QUICK CLEAN

This function will place the pump into a pre-programmed cleaning cycle and then return to normally scheduled functions.

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "QUICK CLEAN" option and press "Enter".
 - Select the "Function" option and press "Enter". Select "Enable" or "Disable" and press "Enter". (Default "Disabled")
 - Select the "Time" option and press "Enter" to edit. Press "Enter" again and edit time in minutes. Use the "Up" and "Down" arrows to set the desired time on. Press "Enter" to accept and save time. (Default 30 Min.)
 - Select the "Speed" option and press "Enter" to edit. Press "Enter" again to select and edit speed. Use the "Up" and "Down" arrows to set the desired pump RPM. Press "Enter" to accept and save speed. (Default 3400 RPM)
- To Activate a "Quick Clean" cycle from the home screen, press and hold the "Enter" button for 3 seconds. The cycle will run and the pump will return to it's normal schedule.

Note: A Quick Clean cycle can be stopped at any time by pressing the "Stop" button.

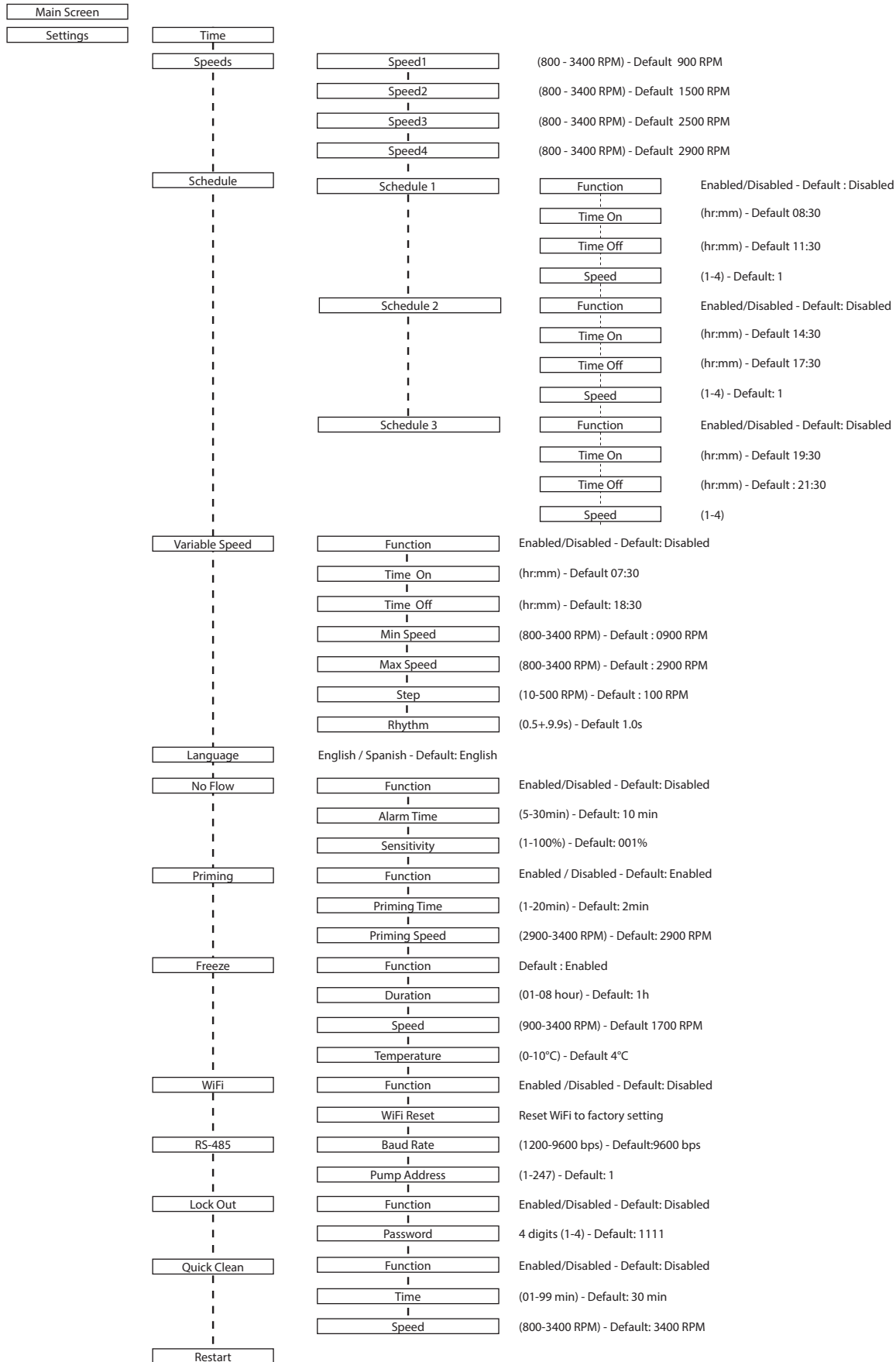
4.3.14 SYSTEM RESET

This function will reset all the user settings to the factory default and can not be undone.

- Press "Menu" button to enter the settings menu.
- Use buttons "Up" and "Down" to highlight the "RESET" option and press "Enter."
- Press "Enter" to reset system.

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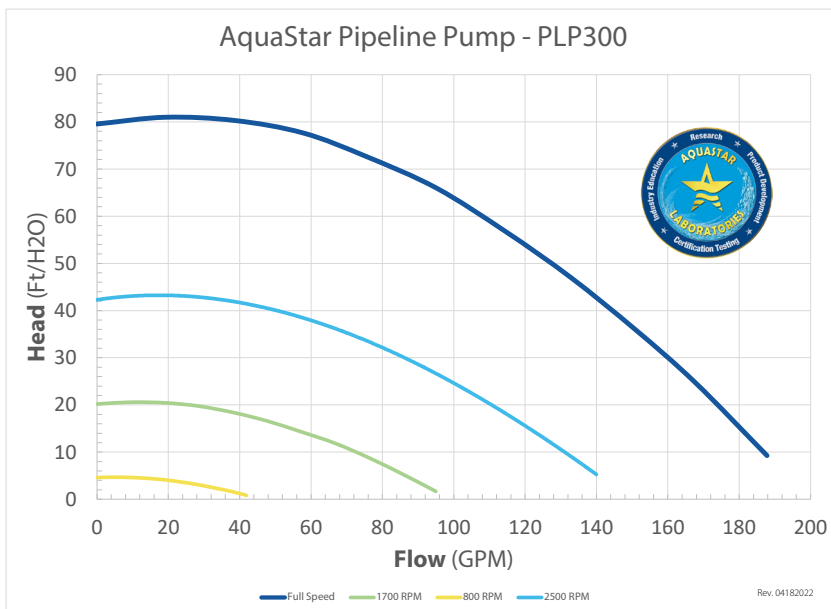
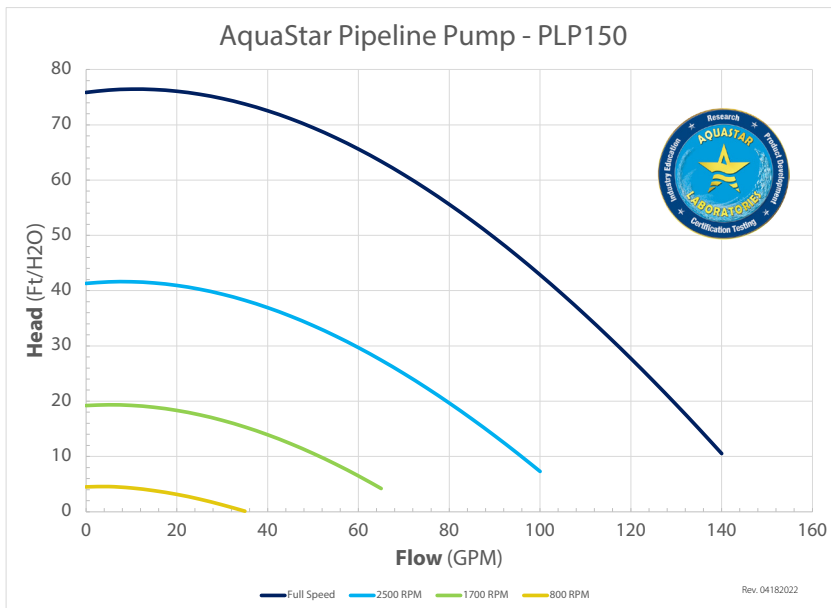
4.4 PROGRAMMING FLOW CHART



5.0 PUMP PERFORMANCE & SPECIFICATIONS

Model	Connection Size	Voltage / Frequency	Maximum Input Power (W)	Total Power (THP)	WEF	Weight (Lbs.)	Amp Ratings
PLP150	2" Socket or 2-1/2" Socket	220-240 VAC 50/60Hz Single Phase	1500	1.5	7.20 kgal/kWh	48	7.0A
PLP300			2200	3.0	6.5 kgal/kWh	50	10.0A

Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.



Note: Refer to the pump motor label, and all national and local electrical codes, for specific electrical requirements and specifications.

6.0 TROUBLESHOOTING

Error codes	UV	Electrical line under-voltage	Have a licensed electrician: Check voltage at motor terminals and at panel while pump is running. If voltage at panel is 10% below the rated voltage on the motor nameplate, consult your power company. If the voltage at motor terminals is below this limit check for excessive voltage drop caused by undersized wiring or loose connections.
	OV	Electrical line over-voltage	Have a licensed electrician: Check voltage at motor terminals and at panel while pump is running. If the voltage is 10% over the rated voltage on the motor nameplate, consult your power company.
	OC	Electrical over-current	Have a licensed electrician: Check voltage at motor terminals and at panel while pump is running. If voltage at panel is 10% below the rated voltage on the motor nameplate, consult your power company. If the voltage at motor terminals is below this limit check for excessive voltage drop caused by undersized wiring or loose connections. If voltage is within range, turn off power to pump at breaker, and manually check for free rotation of motor shaft with a flat head screwdriver through access hole on the motor fan cover. If motor is not rotating freely, pump must be disassembled and checked for obstructions (Contact a qualified repair professional).
	OH	Motor temperature overheating	Have a licensed electrician: Ensure that the voltage at motor terminals is no more or less than 10% of the rated voltage on the motor nameplate. Check that all wiring connections are tight and secure. Check ambient temperature and verify against motor nameplate limit (40° C / 104° F). Ensure that the motor fan inlet has at least 3" of clearance as shown in Figure 2 and that the air flow is not obstructed with debris. Turn off power to pump at breaker, and manually check for free rotation of motor shaft with a flat head screwdriver through access hole on the motor fan cover. If motor is not rotating freely, pump must be disassembled and checked for obstructions (Contact a qualified repair professional).
	NF	No water flow detected	Check that the water level in the pool is not below the skimmer inlet or other suction fittings. Ensure that the strainer side of the pump is full with water, if not refer to the MANUAL FILL section of these START UP instructions.
	Comm Error	Communication error	Have a licensed electrician: Ensure that the power terminals are connected and secured. Reset the system by turning off the power supply at the breaker and leaving it off for 5 minutes before powering the pump on again. If using RS485 communication port, verify all wiring connections are secure. If problem persists, contact your AquaStar Pool Products service agent.

6.0 TROUBLESHOOTING CONTINUED

Motor does not start	No power to the motor	Have a licensed electrician: Check that the circuit breaker is in the "ON" position. Check that all wiring connections are tight, secure, and in the right location.
	The motor experienced an error	Power cycle the pump by turning off the power supply at the breaker and leaving it off for 5 minutes before powering the pump on again. Perform a SYSTEM RESET as described in PROGRAMMING INSTRUCTIONS. Warning: This function will reset all the user settings to the factory default and cannot be undone.
	Improper voltage	Have a licensed electrician: Ensure that the voltage at motor terminals is no more or less than 10% of the rated voltage on the motor nameplate.
	Motor is obstructed	Manually check for free rotation of motor shaft with a flat head screwdriver through access hole on the motor fan cover. If motor is not rotating freely, pump must be disassembled and checked for obstructions (Contact a qualified repair professional).
	Motor has failed	If none of the above solutions solve the problem contact your AquaStar Pool Products service agent.
Pump does not reach full speed	Electrical line under-voltage	Have a licensed electrician: Check voltage at motor terminals and at panel while pump is running. If voltage at panel is 10% below the rated voltage on the motor nameplate, consult your power company. If the voltage at motor terminals is below this limit, check for excessive voltage drop caused by undersized wiring or loose connections. Note: If the pump senses a low voltage condition it will limit the full speed RPM's in order to protect the motor.
GFCI breaker trips	Power supply or bonding wiring connections issues	Have a licensed electrician: Ensure that all steps in "Electrical Installation" section of this manual have been followed.
	GFCI breaker failure	Have a licensed electrician: Test the GFCI Breaker to ensure it is operating properly. Note: AquaStar Pool Products recommends using a Seimens Class A Double Ground Fault Circuit Interrupters
Pump is not flowing water or has low flow condition	Pump is not primed	Ensure that the strainer side of the pump is full with water, if not refer to the MANUAL FILL section of these START UP instructions.
	Undersized pool piping	Ensure that the proper size plumbing is being used (Contact a qualified pool professional).
	Closed valve	Check suction and discharge lines and verify that all valves are fully open.

Note: If the above suggestions do not solve your particular problem(s), please contact your local service agent for further assistance.

6.0 TROUBLESHOOTING CONTINUED

	Air leakage on suction system	<p>With pump off, remove the strainer lid and lock ring. Ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace strainer lid and lock ring and tighten.</p> <p>With pump off, remove union connections and ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace union connections and tighten by hand.</p> <p>With pump off, remove drain plugs and ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace drain plugs and tighten by hand.</p> <p>Check all plumbing connections on suction side of pump for leaks.</p>
	Clogged pump	<p>With pump off, empty and clean strainer basket. Check suction inlet port and diffuser inlet for clogged debris.</p> <p>If basket is clean and ports are not clogged then the pump must be disassembled and checked for obstructions (Contact a qualified repair professional).</p>
	Plugged or restricted discharge line	<p>Check filter for high pressure readings and clean per manufacturer's instructions if necessary.</p> <p>Check all components on pressure side of pump for obstructions.</p>
Leakage of water	Failed shaft seal	If water is leaking from the center of the seal plate where motor shaft attaches then the shaft seal will need to be replaced (Contact a qualified repair professional).
	Failed seal plate seal	If water is leaking from the gap between the seal plate and pump housing, then the seal plate and/or seal plate O-ring will need to be replaced (Contact a qualified repair professional).
Excessive pump noise	Pump not adequately mounted	Ensure that the motor is securely bolted to a flat concrete surface.
	Pump cavitation	<p>Ensure pump is fully primed.</p> <p>Improve suction conditions by increasing pipe size and/or reducing flow restrictions on the suction side.</p> <p>Inspect suction side plumbing for air leaks.</p>
	Foreign matter in pump	Turn off power to pump at breaker, disassemble the pump, and inspect for foreign matter. Inspect impeller and diffuser for damage (Contact a qualified repair professional)..
Pump will not prime	Air leakage on suction system	<p>With pump off, remove the strainer lid and lock ring. Ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace strainer lid and lock ring and tighten.</p> <p>With pump off, remove union connections and ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace union connections and tighten by hand.</p> <p>With pump off, remove drain plugs and ensure that the O-ring is not damaged, properly seated in O-ring groove, and properly lubricated. Replace drain plugs and tighten by hand.</p> <p>Check all plumbing connections on suction side of pump for leaks.</p>
	Not enough water in pump housing	Ensure that the strainer side of the pump is full with water, if not refer to the MANUAL FILL section of these START UP instructions.

6.0 TROUBLESHOOTING CONTINUED

	Prime settings not fast or long enough	See "Pump Priming Set Up" for instructions on customizing prime settings. Adjust prime settings to the maximum 3400 RPM for 10 minutes.
	Pump strainer basket is clogged	With pump off, remove the strainer lid and lock ring. Remove the strainer basket and clean out all debris trapped within. Fill strainer side of pump housing with water and replace basket, lid, and locking ring.
	Pump located above max. prime height	Measure the height from the pool water surface to the centerline of the pump. If this height exceeds the maximum prime height listed on the pump nameplate label consult a qualified repair professional.
	Suction side plumbing clogged	Contact a qualified pool repair professional to inspect plumbing for blockages.

7.0 MAINTENANCE

! WARNING

DO NOT open the strainer pot if the Pipeline Pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water.

Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, be sure the suction and discharge valves are open and the strainer pot temperature is cool to the touch, then open with extreme caution.

7.0.1 CLEANING PUMP STRAINER BASKET

The strainer basket is located on the inlet side of the pump housing. This basket must be kept relatively clean and free of debris. Inspect the basket through the clear lid on a weekly basis and follow the procedure below to clean as necessary.

- Press "Stop" button on the pump and turn off power at the circuit breaker. Remove communication cable if installed.
- Relieve pressure in pump housing by opening filter air relief valve or removing a drain plug from the pump housing.
- Rotate the locking ring and lid counter-clockwise to remove from the pump strainer pot.
- Remove the strainer basket from the pot. Empty strainer basket and rinse clean.
- Inspect strainer basket for damage and replace if necessary.
- Inspect strainer pot for debris and clean out if necessary.
- Place strainer basket back into strainer pot. Be sure to align strainer basket inlet with pump housing inlet port.
- Fill the pump housing with water to the bottom edge of the inlet port. Note: If drain plug was removed, replace before filling.
- Clean the locking ring, lid, O-ring, and sealing surface of the strainer pot.
- Ensure O-ring is well lubricated using a silicone O-ring grease.
- Reinstall the locking ring and lid onto the strainer pot and rotate clockwise. Hand tighten locking ring. Note: Handles may not be perpendicular to pump axis.
- Turn the power back on at the circuit breaker and reconnect the communication cable to the pump if used.
- Open the manual air relief valve on the filter and stand clear while any pressure is relieved.
- Press the "Start" button on the motor to begin priming the pump.
- Once all air has exited the system a steady stream of water will begin flowing from the filter air relief valve. Close the valve and the system is ready for normal operation.

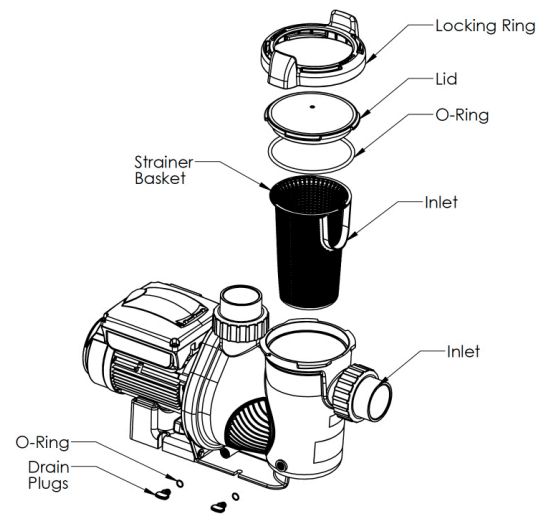


FIGURE 7

7.0.2 WINTERIZING

Pipeline Pumps come with an enabled freeze protection that can help protect the pump from freeze damage when temperatures drop below freezing. This feature is not intended to protect the system plumbing from freeze damage although it could help in some cases. If temperatures are expected to drop below freezing, follow the procedure below to protect your Pipeline Pump.

- Turn off power at the circuit breaker.
- Drain the water out of the pump housing by removing the two drain plugs from the pump housing.
- Cover the pump to protect it from severe rain, snow, and ice.

Note: If winterizing the pool pump, it is recommended to winterize the entire pool plumbing system as well per the manufacturer's recommendations.

7.1 SERVICING

⚠️ WARNING

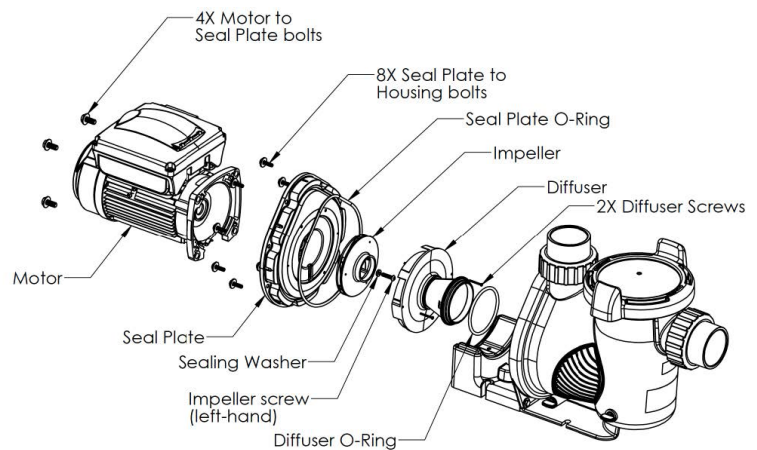
Always disconnect power to the Pipeline Pump at the circuit breaker and disconnect the communication cable before servicing the pump. Failure to do so could result in death or serious injury. Read all service instructions before working on the pump. DO

NOT open or disassemble the motor or variable speed drive. This component is not serviceable and will void the warranty.

7.1.1 DISASSEMBLING THE PUMP

On occasion it may become necessary to remove debris from the impeller/diffuser, or replace internal pump components. In order to access these internal components follow the instructions below. For specific replacement instructions, follow the instructions included with your replacement kit.

- Press "Stop" button on the pump and turn off power at the circuit breaker. Remove communication cable if installed.
- Close valves on inlet and outlet of pump.
- Turn the locking ring and lid counter-clockwise and remove from pump housing. Then remove the drain plugs from the pump housing, this will allow water to empty from housing.
- Using a 7/16" wrench remove the eight (8) seal plate bolts and set aside.
- Gently pull the motor / seal plate subassembly out of the pump housing.
- Using a #1 Phillips screwdriver remove the two screws that retain the diffuser.
- Using a #2 Phillips screwdriver rotate the left-hand impeller screw clockwise to remove and set aside.
- Insert a 3/8" slotted screwdriver into the hole on the fan end of the motor. This will keep the motor shaft from rotating as you unthread the impeller from the motor shaft.



⚠️ CAUTION

The pump impeller may have sharp edges that could potentially cut or scratch the user's hands. Use safety gloves when holding or rotating the impeller.

- Using a 9/16" wrench, remove the four (4) bolts that hold the motor to the seal plate.
- Note: Use caution not to scratch or damage the shaft seal. These surfaces must maintain a high polish in order to maintain a seal.

7.1.2 Reassembling of pump

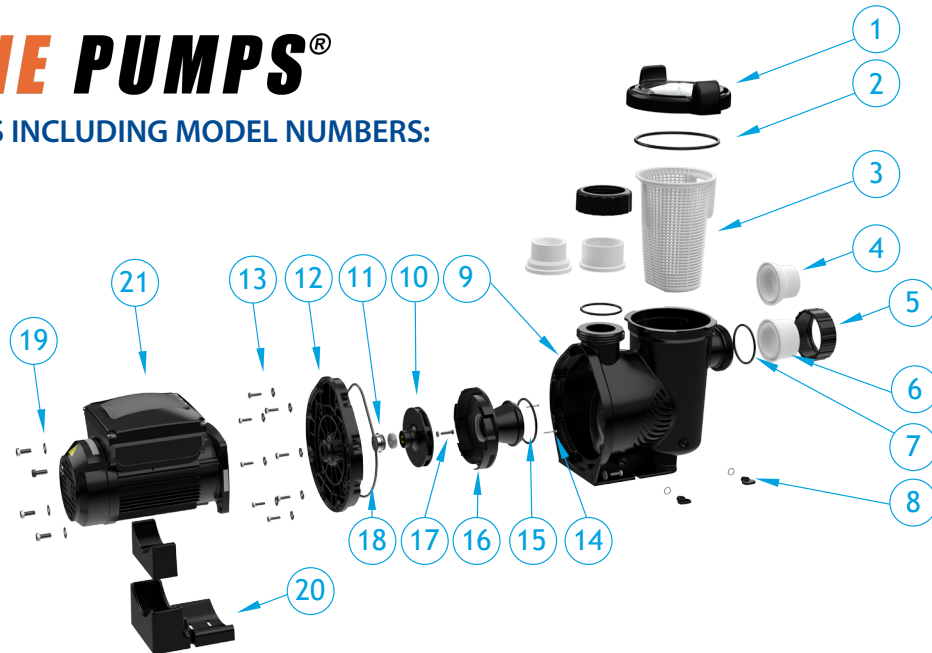
To reassemble the pump, simply reverse the disassembly process with a few important notes.

- When reinstalling the motor to the seal plate, torque the four (4) bolts to 80 in-lbs.
- When reinstalling the impeller to the motor shaft, lightly hand tighten.
- When reinstalling the impeller retainer left-hand screw, ensure that the sealing washer is in good condition and in place then hand tighten the screw turning counter-clockwise.
- When reinstalling the diffuser, ensure that the four (4) alignment holes on the seal plate match up with the four (4) posts on the diffuser. Hand tighten the two (2) Phillips screws to retain the diffuser.
- Inspect and lubricate the diffuser O-ring and the seal plate O-ring. Replace these O-rings if damaged.
- When reinstalling the motor / seal plate subassembly, finger tighten all eight (8) bolts and then torque each bolt to 80 in-lbs alternating in a star pattern as each bolt is fully tightened.
- Follow 4.1 Startup instructions.

8.0 REPLACEMENT PARTS

PIPELINE PUMPS®

FOR 1.5HP PUMPS INCLUDING MODEL NUMBERS:
PLP150S

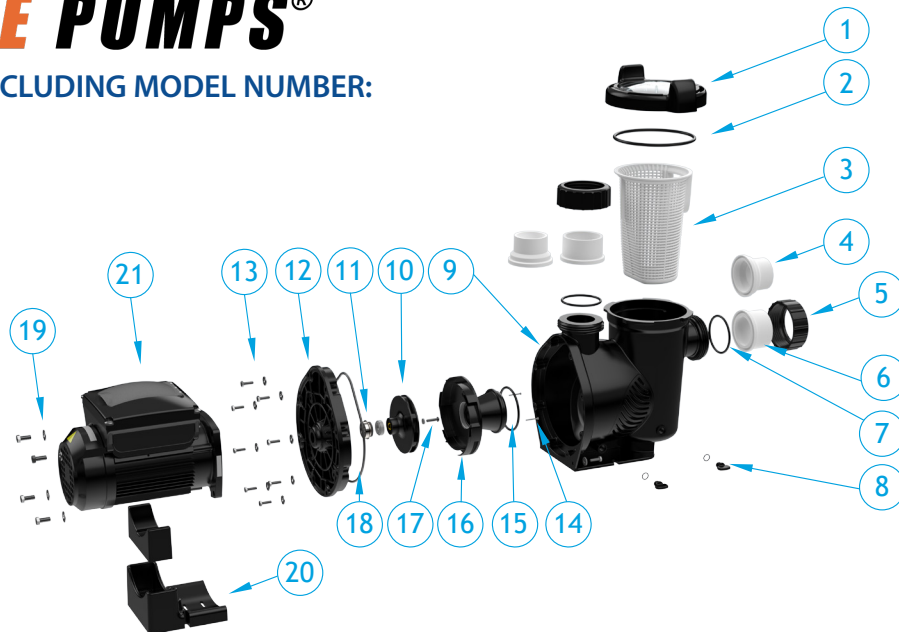


ITEM NO.	PART NO.	DESCRIPTION
1	AP1101	PUMP LOCKING RING AND COVER
2	O-RING-439-EPDM	O-RING, #439, EPDM
3	AP1009	PUMP BASKET
4	AP1102	PUMP UNION, 2" SOCKET, QTY 2
5	AP1103	NUT, UNION, 2.5", QTY 2
6	AP1104	PUMP UNION, 2.5" SOCKET, QTY 2
7	O-RING-338-EPDM	O-RING, #338 EPDM
8	AP1105	DRAIN PLUG AND O-RING, #014,A EPDM
9	AP1005	PUMP HOUSING
10	AP1036	IMPELLER ASSEMBLY, 1.5 HP
11	AP1051	SEAL, CERAMIC, PS-3865R
12	AP1006	SEAL PLATE, PUMP
13	AP1106	SCREW, 1/4"-20 X 7/8" LG, HEX HEAD, 18-8 SS AND WASHER, 3/4" OD X 5/16" ID, USS, 18-8 SS, QTY 8
14	AP1107	SCREW, 4-40 X 1-1/8" LG., PAN HEAD PHILL. 316SS, QTY 2
15	O-RING-341-EPDM	O-RING, #341, EPDM
16	AP1017	DIFFUSER, PUMP
17	AP1108	1/4-20 X 1" LG, LEFT THD, BUTTON SCREW, 316 SS AND WASHER, .5" OD X .23" ID X .1" THK., EPDM RUBBER
18	O-RING-370-EPDM	O-RING, #370 EPDM
19	AP1109	SCREW, 3/8"-16 X 1" LG., HEX HEAD, 18-8 SS AND WASHER, 7/8" OD X .4" ID X .05" THK., 18-8 SS, QTY 4
20	AP1110	BUMPER AND FOOT, MOTOR SUPPORT
21a	AP150B	1.5 HP, VARIABLE SPEED, BASE MODEL
21b	AP150S	1.5 HP, VARIABLE SPEED, SMART MODEL
21c	AP150B-SVRS	1.5 HP, VARIABLE SPEED, BASE MODEL WITH SVRS
21d	AP150S-SVRS	1.5 HP, VARIABLE SPEED, SMART MODEL WITH SVRS

8.0 REPLACEMENT PARTS CONTINUED

PIPELINE PUMPS®

FOR 3HP PUMPS INCLUDING MODEL NUMBER:
PLP300S



ITEM NO.	PART NO.	DESCRIPTION
1	AP1101	PUMP LOCKING RING AND COVER
2	O-RING-439-EPDM	O-RING, #439, EPDM
3	AP1009	PUMP BASKET
4	AP1102	PUMP UNION, 2" SOCKET, QTY 2
5	AP1103	NUT, UNION, 2.5", QTY 2
6	AP1104	PUMP UNION, 2.5" SOCKET, QTY 2
7	O-RING-338-EPDM	O-RING, #338 EPDM
8	AP1105	DRAIN PLUG AND O-RING, #014,A EPDM
9	AP1005	PUMP HOUSING
10	AP1040	IMPELLER ASSEMBLY, 3 HP
11	AP1051	SEAL, CERAMIC, PS-3865R
12	AP1006	SEAL PLATE, PUMP
13	AP1106	SCREW, 1/4"-20 X 7/8" LG, HEX HEAD, 18-8 SS AND WASHER, 3/4" OD X 5/16" ID, USS, 18-8 SS, QTY 8
14	AP1107	SCREW, 4-40 X 1-1/8" LG., PAN HEAD PHILL. 316SS, QTY 2
15	O-RING-341-EPDM	O-RING, #341, EPDM
16	AP1017	DIFFUSER, PUMP
17	AP1108	1/4-20 X 1" LG, LEFT THD, BUTTON SCREW, 316 SS AND WASHER, .5" OD X .23" ID X .1" THK., EPDM RUBBER
18	O-RING-370-EPDM	O-RING, #370 EPDM
19	AP1109	SCREW, 3/8"-16 X 1" LG., HEX HEAD, 18-8 SS AND WASHER, 7/8" OD X .4" ID X .05" THK., 18-8 SS, QTY 4
20	AP1110	BUMPER AND FOOT, MOTOR SUPPORT
21a	AP300S	3 HP, VARIABLE SPEED, SMART MODEL
21b	AP300S-SVRS	3 HP, VARIABLE SPEED, SMART MODEL WITH SVRS

AquaStar's Limited Warranty

To original purchasers of this equipment, AquaStar warrants PipeLine Pumps from defects in materials and workmanship for a period of THREE years from the date of purchase.

The limited warranty excludes damage from freezing, power surges, negligence, improper installation, improper use or care or any Acts of God. Parts that fail or become defective during the warranty period shall be repaired or replaced, at AquaStars' discretion, within 90 days of the receipt of defective product, barring unforeseen delays, without charge. Proof of purchase is required for warranty service. In the event proof of purchase is not available, the manufacturing date of the product will be the sole determination of the purchase date. To obtain warranty service, please contact the place of purchase. AquaStar shall not be responsible for removal, repair or installation labor or any other such costs incurred in obtaining warranty replacements or repair.

The AquaStar warranty does not apply to components manufactured by others. For such products, the warranty established by the respective manufacturer will apply. The express limited warranty above constitutes the entire warranty of AquaStar with respect to its pool products and is in lieu of all other warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose. In no event shall AquaStar be responsible for any consequential, special or incidental damages of any nature.



PIPELINE PUMPS[®]
INSTRUCTION MANUAL
INSTALLATION AND USER'S GUIDE

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