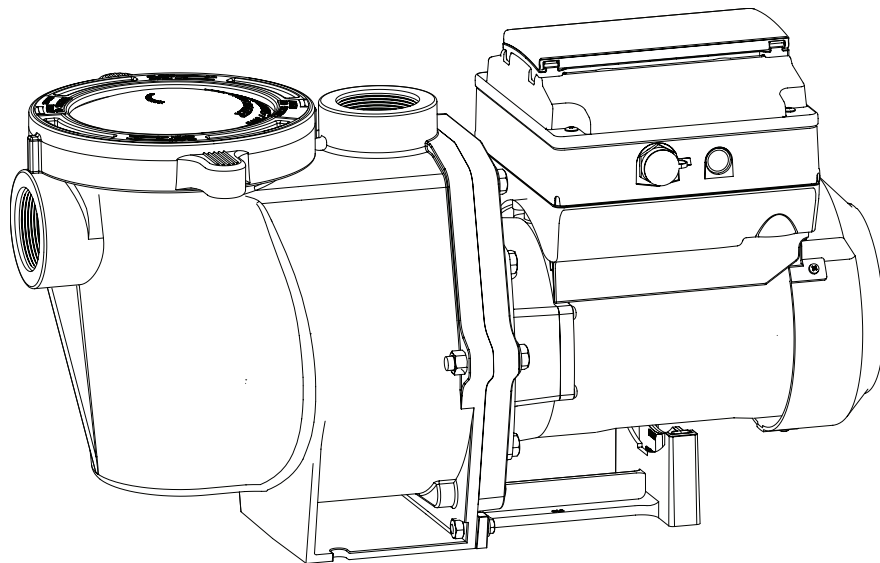




INTELLIFLO® VS+SVRS INTELLIPRO® VS+SVRS VARIABLE SPEED PUMP

WITH SAFETY VACUUM RELEASE SYSTEM (SVRS) PROTECTION



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

CUSTOMER SERVICE / TECHNICAL SUPPORT

If you have questions about ordering Pentair replacement parts, and pool products, please contact:

Customer Service and Technical Support, USA

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Phone: (800) 831-7133

Fax: (800) 284-4151

Web site

Visit www.pentair.com for more information about Pentair products.*

Sanford, North Carolina (8 A.M. to 4:30 P.M. ET)

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* Translated versions of this manual are available online at / La versión en español de este manual del producto, se puede encontrar en línea a /
 La version française de ce manuel est disponible à :
https://www.pentair.com/en/products/pool-spa-equipment/pool-pumps/intelliflo_vs_svrsvariablespeedpumps.html

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS



IMPORTANT NOTICE

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the pump.

Attention User: This manual contains important information that will help you in operating and maintaining this product. Please retain it for future reference.

Please refer to www.pentair.com for all warnings and instructions related to the pump.

READ AND FOLLOW ALL INSTRUCTIONS SAVE THESE INSTRUCTIONS



This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

⚠ DANGER

Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

⚠ WARNING

Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

⚠ CAUTION

Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE

Indicates special instructions not related to hazards.

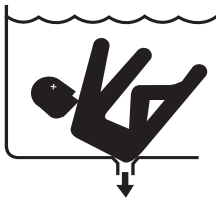
Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

⚠ WARNING

Before installing this product, read and follow all warning notices and instructions which are included.

Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 831-7133 for additional free copies of these instructions. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

These instructions contain information for a variety of pump models and therefore some instructions may not apply to a specific model. All models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.



General Warnings

- 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.
- The pump is not submersible.
- The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for electrical connection differ from country to country, state to state, as well as local municipalities. Install equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Before servicing the pump; switch OFF power to the pump by disconnecting the main circuit to the pump.
- This appliance 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 appliance by a person responsible for their safety.

⚠ DANGER

This pump produces high levels of suction, which can pose extreme danger if a person comes in close proximity to an open pool or spa drain or a loose or broken drain cover or grate. The pump, when installed according to the manufacturer's instructions, is designed to help prevent injuries caused by body entrapment in pools. This pump does not, however, protect against limb entrapments, disembowelments (when a person sits on a broken or uncovered pool drain) or hair entanglements.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

(A) A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:

- (i) A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or
- (ii) A properly designed and tested suction-limiting vent system or
- (iii) An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

- (A) A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or
- (B) A properly designed and tested suction-limiting vent system, or
- (C) An automatic pump shut-off system, or
- (D) Disabled submerged outlets, or
- (E) Suction outlets shall be re-configured into return inlets.

For more information about the Act, contact the Consumer Product Safety Commission at 301-504-7908 or visit www.cpsc.gov.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

⚠ DANGER

This pump is not a substitute for properly installed and secured pool drain covers. An ANSI/ASME A112.19.8 approved anti-entrapment drain cover must be used for each drain. Pools and spas should utilize two drains per pump. If a drain cover becomes loose, broken or is missing, close the pool or spa immediately and shut off the pump until an approved anti-entrapment drain cover is properly installed with the manufacturer's supplied screws.

⚠ DANGER

The SVRS (Safety Vacuum Release System) feature of this pump is inactive during priming. The SVRS feature is an integral part of a complete safety system. During priming mode, the pump does not monitor blocked suction or discharge system conditions. Swimmers should not be allowed in the pool during the "inactive" SVRS mode. When "SVRS" text is not displayed on the control panel screen, the SVRS system is disabled.

Entrapment Avoidance Notice:

⚠ DANGER



The covers used on suction outlets should be approved and listed as conforming to the currently published edition of ANSI/ASME A112.19.8 Standard. These covers should be inspected regularly and replaced if cracked, broken or older than the design lifetime indicated on them by the manufacturer. The

maximum possible flow rate of this pump should be less than or equal to the maximum approved flow rate indicated on the suction outlet cover by the manufacturer. **THE USE OF UNAPPROVED COVERS OR ALLOWING USE OF THE POOL OR SPA WHEN COVERS ARE MISSING, CRACKED OR BROKEN CAN RESULT IN BODY OR LIMB ENTRAPMENT, HAIR ENTANGLEMENT, EVisCERATION AND DEATH.**

⚠ WARNING

RISK OF ELECTRICAL SHOCK. 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.

⚠ WARNING

This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. 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. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

RISK OF ELECTRICAL SHOCK OR ELECTROCUTION

⚠ DANGER



This pool pump must be installed by a licensed or certified electrician or a qualified pool service person in accordance with the current 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 pool users, installers, or

others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker and remove the RS-485 communication cable from the pump before servicing the pump. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electric shock.

⚠ DANGER



Water temperature in excess of 100° Fahrenheit may be hazardous to your health. Prolonged immersion in hot water may induce hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above normal body temperature of 98.6° F. (37° C.).

⚠ DANGER

The effects of hyperthermia include:

- 1) Unawareness of impending danger.
- 2) Failure to perceive heat.
- 3) Failure to recognize the need to leave the spa.
- 4) Physical inability to exit the spa.
- 5) Fetal damage in pregnant women.
- 6) Unconsciousness resulting in danger of drowning.

⚠ WARNING

- Suction check valves and hydrostatic valves shall not be used with this pump;
- When check valves are installed on the discharge side of the pump a SVRS Check Valve Kit (P/N 350250Z) must be installed.

⚠ WARNING

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

⚠ WARNING

The pump is capable of 174 GPM or 104 feet of head; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.

⚠ WARNING

SVRS (Safety Vacuum Release System) feature is DISABLED during priming. When "SVRS" text is not displayed on the control panel screen, the SVRS feature is disabled.

⚠ 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 properly 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. **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.

⚠ WARNING

SVRS devices shall only be installed in conjunction with ASME A112.19.8 suction fitting, or a 12 in. x 12 in. (305 mm x 305 mm) drain grate or larger, or an approved channel drain system at each suction outlet or drain outlet.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

⚠ WARNING All SVRS devices shall be factory set or field adjusted to site-specific hydraulic conditions. Once installed, the system shall be tested by simulating an entrapment event.

⚠ WARNING A ball, butterfly, or sliding gate valve shall be installed within 2 ft. (0.6m) upstream from the SVRS (between the SVRS and the protected suction outlet), or a test mat shall be used to cover the suction outlet to simulate an entrapment event. There shall be three simulated entrapment tests conducted to verify proper adjustment and operation of the device.

⚠ WARNING The pump has been designed to specifically operate with Pentair control systems. Operating the pump with other manufacturers' controllers may cause software failure of the pump, drive or other system components. Such failure can result in severe personal injury (i.e., failure of the SVRS system, electrical shock) or death. If installed properly, an IntelliComm® Communication Center may be used to integrate other manufacturer's controllers.

⚠ WARNING **HAZARDOUS PRESSURE: Stand Clear of Pump and Filter During Startup**



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 systems startup, shutdown or servicing of the system filter.

⚠ WARNING **The presence of a hydrostatic valve in the suction piping has been shown to prolong the high vacuum present at the drain, even through the drain was protected by an SVRS device.**

⚠ 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.

⚠ WARNING The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.

⚠ WARNING Do not permit children to use this product.

⚠ WARNING For units intended for use in other than single-family dwellings, a clearly labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 5 feet (1.52m) away, adjacent to, and within sight of, the unit.

⚠ WARNING A clearly labelled emergency shut-off switch for the pump must be in an easily accessible, obvious place. Make sure users know where it is located and how to use it in case of emergency.

⚠ WARNING When setting up pool water turnovers or flow rates the operator must consider local codes governing turnover as well as disinfectant feed ratios.

⚠ CAUTION Install the pump a minimum of five (5) feet from the inside wall of the pool and spa. Canadian installations require a minimum of three (3) meters from pool water.

⚠ CAUTION A No. 8 AWG or larger conductor must be wired to the motor bonding lug.

⚠ CAUTION This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. 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 may be readily disassembled for storage and reassembled to its original integrity and has a maximum dimension of 18 feet (5.49m) and a maximum wall height of 42 inches (1.07m).

⚠ CAUTION For hot tubs and spa pumps, do not install within an outer enclosure or beneath the skirt of a hot tub or spa unless so marked.

⚠ CAUTION Pump is capable of generating systems pressures up to 50 psi. Installers must ensure that all system components are rated to withstand at least 50 psi. Over pressurizing the system can result in catastrophic component failure or property damage.

Two Speed Pump Controls Notice (Title 20 Compliance)

Please read the following important Safety Instructions (See page 16 for pump speed setup). When using two-speed pumps manufactured on or after January 1, 2008, the pump's default circulation speed **MUST** be set to the **LOWEST SPEED**, with a high speed override capability being for a temporary period not to exceed one normal cycle, or two hours, whichever is less.

SAVE THESE INSTRUCTIONS

PUMP OVERVIEW

IntelliFlo VS+SVRS® and IntelliPro® VS+SVRS Variable Speed Pumps with safety vacuum release system (SVRS) protection are well suited for all of your pool, spa, waterfall and other applications. The pumps can run up to eight speeds which can be programmed at specific speeds and time intervals.

IntelliFlo outperforms all conventional pumps in its class. Advanced energy conservation features ensure that your filtration system is operating at peak efficiency.

This pump is intended to be used as part of a complete pool safety system. It complies with the ASME/ANSI A112.19.17-2010 SVRS standard which defines how fast the pump must stop on a suction blockage event. This pump was tested with a single functioning suction outlet.

Note: This pump is designed to release body entrapment. It may mitigate evisceration (prolapse) or limb entrapment. It does not prevent hair or mechanical entrapment.

The operator must ensure that all suction and return fittings are clean and unobstructed whenever the pump is started. If SVRS auto restart is enabled and an SVRS event occurs, the pump is allowed to restart automatically after the preset time period. **The operator must ensure that any SVRS blockage event is quickly evaluated to confirm that all suction and return fittings are clean and unobstructed.** When the pump restarts after a high vacuum event it will slowly ramp up to speed. If the pump senses a blockage it will shut down.

- The pump can operate from 1100 RPM to 3450 RPM with four preset speeds of 1100, 1500, 2350 and 3110 RPM
- The pump can be adjusted from the control panel to run at any speed between 1100 RPM to 3450 RPM for different applications
- Pump control panel alarm LED and error messages warn the user against under and over voltage, high temperature, over current, suction blockage and other events through user-defined minimum and maximum speed presets
- Communicates with EasyTouch, IntelliTouch or SunTouch control systems or an IntelliComm communication center via a two-wire RS-485 cable connection
- Programmable priming mode with automatic detection of prime for easy start-up
- Compatible with most cleaning systems, filters, and jet action spas
- WEF 6.9 THP 3.95

External Control

IntelliTouch®, EasyTouch®, SunTouch® Control Systems and IntelliComm® Communication Centers can remotely control the IntelliFlo VS+SVRS pump. The pump's communications address and other functions are accessible from the pump's control panel.

- RS-485 communication cable included
- IntelliTouch systems control 8 IntelliFlo pumps using 8 speeds per pump.
- EasyTouch systems control 2 IntelliFlo pumps using 8 speeds per pump.
- SunTouch systems control one IntelliFlo pump using 8 speeds.
- IntelliComm systems control one IntelliFlo pump using the 4 External Control programs.

Motor Features

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

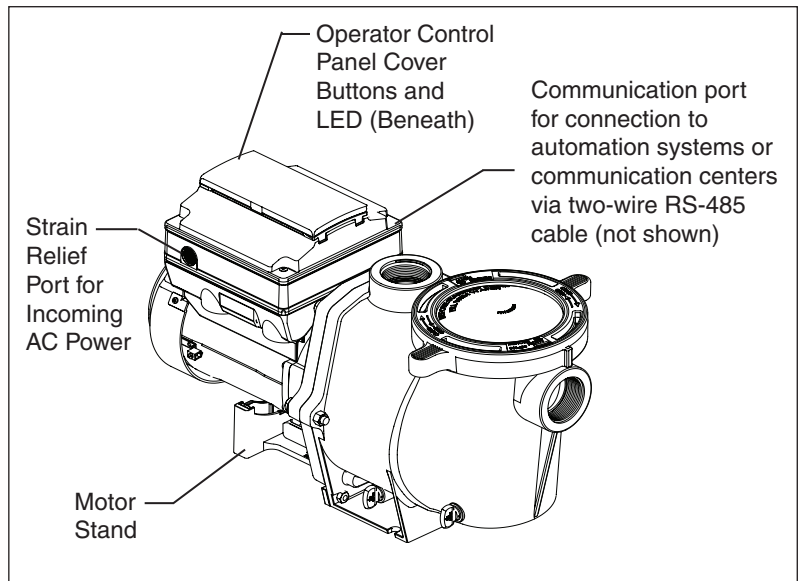
Drive Features

- Active Power Factor Correction
- Rotatable Keypad
- Easy Overhead Wiring
- High Drive Operational Efficiency

Drive Assembly and Control Panel

The IntelliFlo® VS+SVRS Variable Speed Pump drive is designed to produce maximum motor operational efficiency. The drive controls the motor's rotational speed by controlling the frequency of the supplied current. It also protects the motor and pump from operating outside of their intended operating parameters.

The control panel can be mounted on the pump in four different directions in order to provide the user the best access. The control panel can also be mounted in a more convenient location with the help of the keypad relocation kit (see "*Optional Keypad Relocation Kit*" on the next page).



Variable Speed Drive Assembly

INSTALLATION

Only a qualified plumbing professional should install the IntelliFlo® VS+SVRS Variable Speed Pump. Refer to “Important Pump Warning And Safety Instructions” on pages ii - iv for additional installation and safety information.

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.

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 (1.5 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 (0.9 meters) from the heater outlet.
4. Do not install the pump more than 10 feet (3.1 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 1**.

Optional Keypad Relocation Kit

In special cases when the user lacks easy or convenient access to the IntelliFlo VS+SVRS Variable Speed Pump, a Keypad Relocation Kit (P/N 356904Z [Almond] or 356905Z [Black]) may be purchased from your local pool equipment supplier. This kit allows the user to remove the keypad from the top of the drive and mount the keypad in a fixed location with better access.

For installation instructions refer to the *Keypad Relocation Kit Installation Instructions* provided with the kit.

Electrical Requirements

- Install all equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- A means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Piping

1. For improved pool plumbing, it is recommended to use a larger pipe size. When installing the inlet and outlet fittings (male adaptors), use thread sealant.
2. Piping on the suction side of the pump should be the same or larger than the return line diameter.
3. Plumbing on the suction side of the pump should be as short as possible.
4. For most installations Pentair recommends installing a valve on both the pump suction and return lines so that the pump can be isolated during routine maintenance. We also recommend a valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five (5) times the suction line pipe diameter. See **Figure 2**.

Example: A 2 inch pipe requires a 10 inch (254 mm) straight run in front of the suction inlet of the pump). This will help the pump prime faster and last longer.

Note: DO NOT install 90° elbows directly into the pump inlet and outlet.

5. When first starting the pump, confirm that the suction pressure does not exceed 25 Inches of Mercury (inHg) or 12.2 PSI. Run the pump at the highest speed with the provided suction pressure gauge installed in the front drain plug port on the pump strainer housing. The suction pressure must be lower than 25 inHg or SVRS event detection will not function properly.

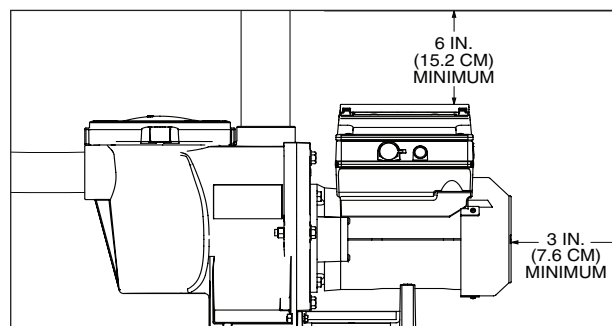


Figure 1: Pump Rear and Overhead Clearance

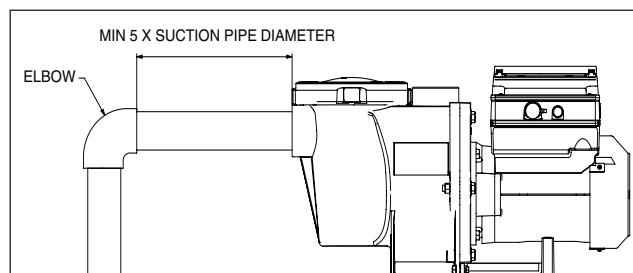


Figure 2: Recommended Piping

Fittings and Valves

1. Do not install 90° elbows directly into pump inlet.
2. Flooded suction systems should have gate valves installed on suction and discharge pipes for maintenance, however, the suction gate valve should be no closer than five times the suction pipe diameter as described in this section.

Check and Bypass Valves

Avoid the use of check or bypass valves in an SVRS equipped system. An operating check or bypass valve will cause changes in system flow that the pump may interpret as a suction blockage event, resulting in consistent tripping and resets of the pump.

There are some cases where back-flow prevention is necessary, such as in systems where a chlorinator or heater is present. Below are a few ways to control back-flow:

1. A Hartford loop can be installed in the system plumbing. A Hartford loop is a small section of plumbing that is built above the highest point of the system's waterline. This loop causes the water head to equalize and prevents the water from draining back into the filter and pump. See **Figure 3** below for an example of this installation.

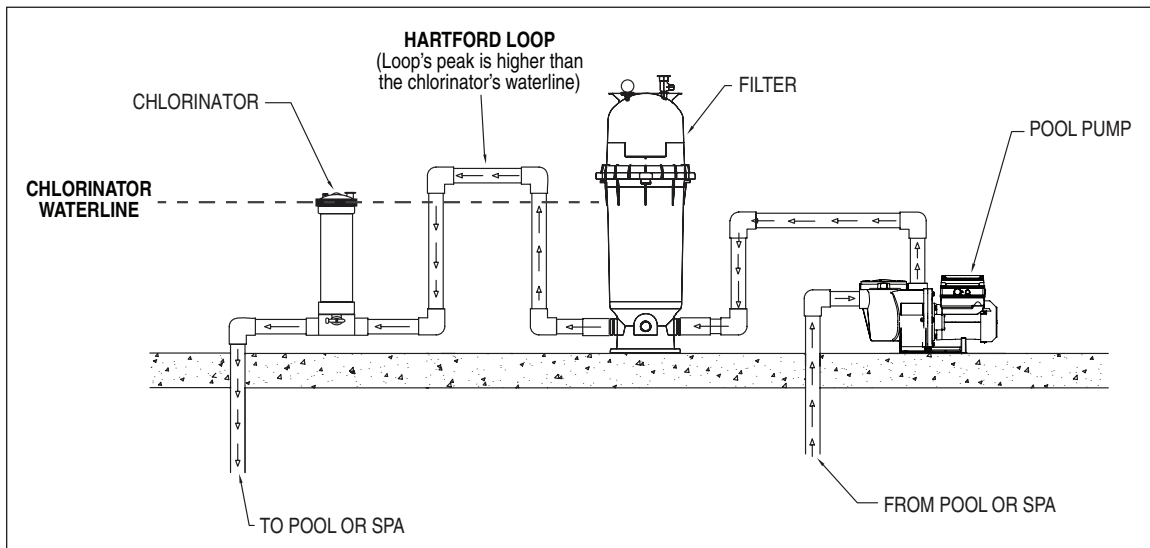


Figure 3: Example of a Hartford Loop Installation

2. If a check or bypass valve must be installed, the minimum speed will need to be set higher than the speed at which the valve opens. This will prevent the pump from passing through the speed range that activates the valve. See page 10, *Set Minimum Speed (RPM)* for instructions on setting the pump's minimum speed.

Electrical Installation

WARNING



RISK OF ELECTRICAL 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 drive lid 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 (IntelliTouch®, EasyTouch®, SunTouch® Control Systems and IntelliComm® Communication Center), 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.

Wiring

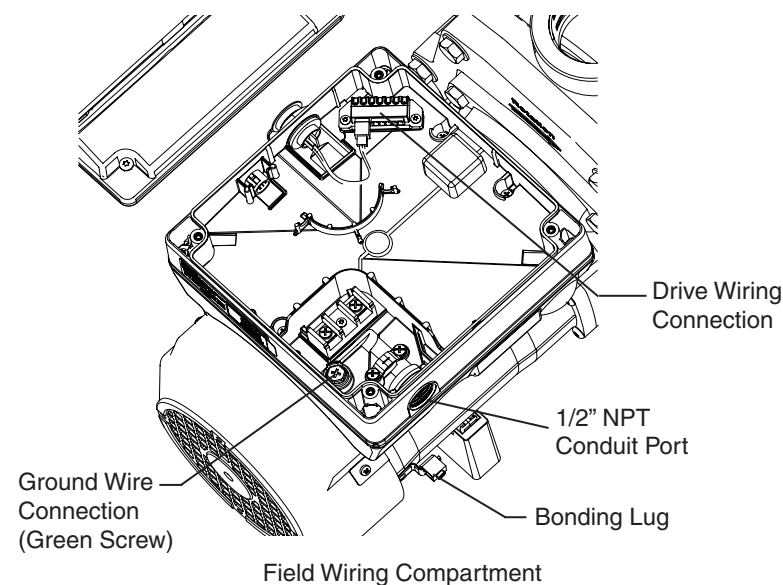
1. Be sure all electrical breakers and switches are turned off before wiring motor.

WARNING

STORED CHARGE - Wait at least sixty (60) seconds before servicing.

2. Be sure that the supply voltage meets the requirements listed on the motor nameplate. If these requirements are not met, permanent motor damage may occur.
3. For wiring sizes and general guidelines for proper electrical installation, please follow the specifications defined in the National Electric Code and any local codes as required.
4. Use strain relief and be sure all electrical connections are clean and tight.
5. Cut the wires to the appropriate length so they do not overlap or touch when connected.
6. Reinstall the keypad after wiring the pump by plugging the cover back into the drive wiring connection and re-seating the keypad in the desired orientation with the four (4) corner screws.

Note: Ensure that the keypad cable is not pinched between the drive and keypad during re-seating.



Grounding

1. Permanently ground the motor using the green ground screw, as shown below. Use the correct wire size and type specified by National Electrical Code. Be sure the ground wire is connected to an electrical service ground.
2. The pump should be permanently connected to either a circuit breaker, 2-pole timer or 2-pole relay.

Note: If AC power is supplied by a GFCI circuit breaker, the pump should be wired on its own independent circuit **unless the pump is operated in tandem with a Pentair salt chlorine generator.**

Bonding

1. Bond the motor to the structure in accordance with the National Electrical Code. Use a solid copper bonding conductor not smaller than 8 AWG. For Canadian installations, a 6 AWG or larger solid copper bonding conductor is required. Run a wire from the external bonding screw or lug to the bonding structure.
2. Connect the wire from the accessible bonding lug on the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.52 meters) of the inside walls of the swimming pool, spa, or hot tub. Run a wire from the external bonding screw or lug to the bonding structure.

Note: When the pump is started and stopped by removing power with a relay or timer, a two-pole device should be used to apply and remove power to both POWER LINE TERMINALS.

Pentair offers 2-Pole 20 Amp GFCI breakers (P/N PA220GF) which offer 6 milliamp personnel protection while meeting 2008 to current NEC Standards for Pool Pumps.

OPERATING THE PUMP

NOTE: Speed 1 is the default filtration speed.

NOTE: When setting up the IntelliFlo® VS+SVRS Variable Speed Pump, the user must set the pump's internal clock and establish an operation schedule by following the steps in this manual. Please refer to user's guide sections: 'Set Time' (page 10) and 'Set Speeds 1-8 in Schedule Mode' (page 13) to schedule a time to run the pump.

CAUTION

This pump is shipped with Priming mode ENABLED. Unless the Priming settings are changed in the menu, **be aware that the pump will speed up to the maximum speed when the pump is powered on for the first time, and the Start/Stop button is pressed.** To change the maximum speed of the pump, refer to page 10.

Before turning the pump ON, be sure the following conditions are met:

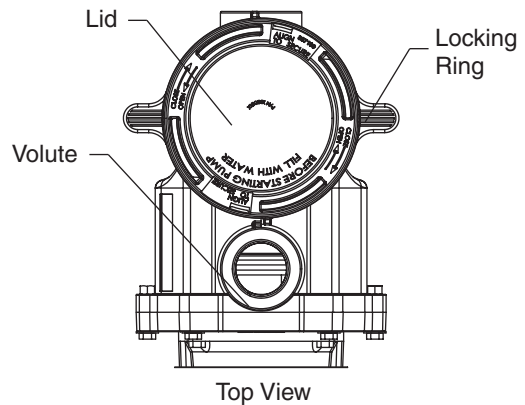
1. Open filter air relief valve.
2. Open valves.
3. Pool return is completely open and clear of any blockages.
4. Water in the pump basket.
5. Stand clear of the filter or other pressurized vessels.

Priming the Pump

Prime the pump before starting the pump for the first time. Remove the lid and fill the basket with water. The pump basket must be filled with water before initial start up or after servicing.

Follow the steps below to prime the pump for start up:

1. Press **Start/Stop** to stop the pump. Disconnect the pump main power supply and communication cable.
2. Close all valves in suction and discharge pipes. Relieve all pressure from the system.
3. Remove the pump lid and locking ring.
4. Fill the pump strainer pot with water.
5. Reassemble the pump lid and locking ring onto the strainer basket. The pump is now ready to prime.
6. Open all valves in suction and discharge pipes.
7. Open the filter air relief valve and stand clear of the filter.
8. Connect power to the pump. Be sure green power light is on.
9. Press **Start/Stop** to start the pump. The pump will enter into priming mode (if enabled) and speed up to the maximum speed set in the pump menu settings.
10. When water comes out of the filter air relief valve, close the valve. The system should now be free of air and recirculating water to and from the pool
11. Do not allow your pump to run longer than 30 minutes time without developing full flow. If the pump does not prime, check your priming settings on the control panel or see the "Troubleshooting" section on pages 27-29.



Priming Features

The default priming setting is ENABLED. The pump also allows you to set the following from the operator control panel:

- Priming speed
- Priming range (1-10)
- Priming delay

Set up instructions on page 17.

CAUTION

Do not add chemicals to the system directly in front of pump suction. Adding undiluted chemicals may damage the pump and will void the warranty.

CAUTION

This is a variable speed pump. Typically the lower speeds are used for filtration and heating. The higher speeds can be used for spa jets, water features, and priming.

CAUTION

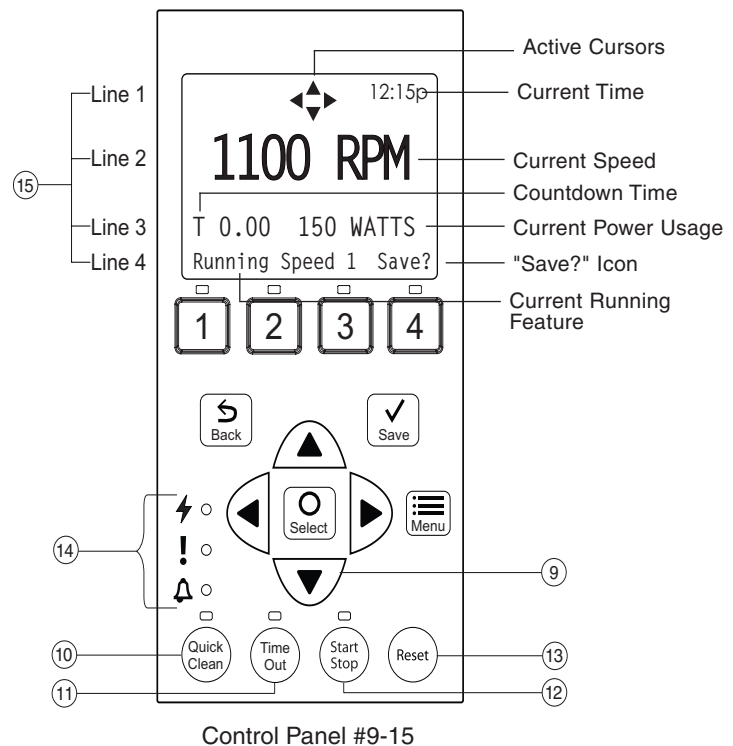
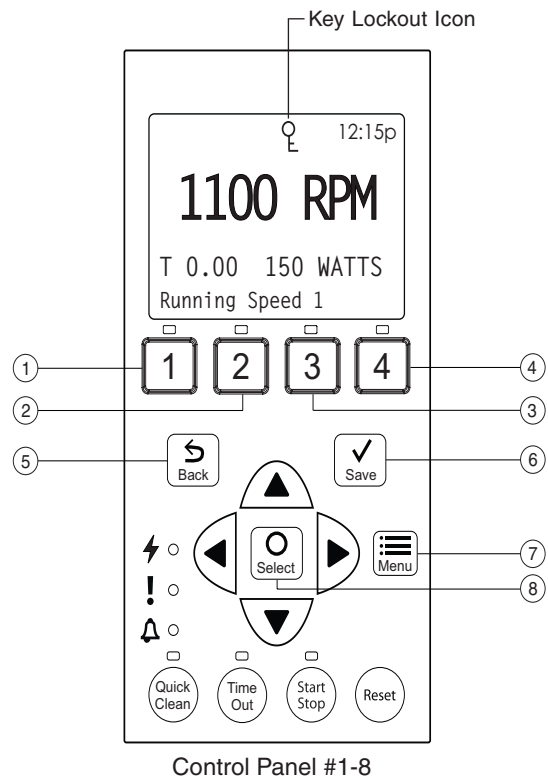
DO NOT run the pump dry. If the pump is run dry, the mechanical seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced. ALWAYS maintain proper water level in your pool (half way up skimmer opening). If the water level falls below the skimmer opening, the pump will draw air through the skimmer, losing the prime and causing the pump to run dry, resulting in a damaged seal. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal and may cause property and personal injury.

Using the Operator Control Panel

Use the operator control panel to start and stop the IntelliFlo® VS+SVRS Variable Speed Pump, program, set, and change speeds (RPM), and access pump features and settings.

Controls and LEDs on Keypad

- ① **Button 1:** Press to select Speed 1 (1100 RPM). LED on indicates Speed 1 is active.
- ② **Button 2:** Press to select Speed 2 (1500 RPM). LED on indicates Speed 2 is active.
- ③ **Button 3:** Press to select Speed 3 (2350 RPM). LED on indicates Speed 3 is active.
- ④ **Button 4:** Press to select Speed 4 (3110 RPM). LED on indicates Speed 4 is active.
- ⑤ **Back:** Goes one step back in menu; exits without saving current setting.
- ⑥ **Save:** Saves current menu item setting. When a parameter has been adjusted the "Save?" icon will be displayed.
- ⑦ **Menu:** Accesses the menu items when and if the pump is stopped.
- ⑧ **Select:** Press to select the currently displayed option on the screen.
- ⑨ **Arrow buttons:**
 - **Up arrow:** Move one level up in the menu or increase a digit when editing a setting.
 - **Down arrow:** Move one level down in the menu or decrease a digit when editing a setting.
 - **Left arrow:** Move cursor left one digit when editing a setting.
 - **Right arrow:** Move cursor right one digit when editing a setting.
- ⑩ **Quick Clean:** Pump increases to a higher RPM (for vacuuming, cleaning, adding chemicals, etc.). LED light is on when active.
- ⑪ **Time Out:** Allow the pump to remain in a stopped state for a set period of time before resuming normal operation. LED is on when active.
- ⑫ **Start/Stop button:** To start or stop the pump. When LED is on, the pump is running or in a mode to start automatically.
- ⑬ **Reset button:** Reset alarm or alert.
- ⑭ **LEDs:**
 - ⚡ **On:** Green light when pump is powered on.
 - ! **Warning:** On if warning condition is present.
 - 🔔 **Alarm:** Red LED on if alarm condition occurs. See "Alerts and Warnings" on page 27.
- ⑮ **Control Panel LCD Screen:**
 - **Line 1:** Key icon indicates password protection mode is active. If password protect is not enabled, no key icon is displayed. Also shows current time of day. Active cursors display when arrow key input is available.
 - **Line 2:** Displays current pump speed (RPM).
 - **Line 3:** Countdown time and watts
 - **Line 4:** Current pump status and current feature. "Save?" will display on this line when a parameter adjustment can be saved.



Note: Always close the keypad cover after using the keypad.

Note: Using screwdrivers or pens to program the pump will damage the keypad overlay. Use your fingers only when programming the pump.

Pre-Startup SVRS Test

After installation, and before anyone is allowed to use the pool, the SVRS function must be tested. To perform a proper SVRS test the pump must be fully primed and running at the maximum filtration speed, and all valves must be set for normal operation.

There are two ways to ensure the pump's SVRS protection is operating properly:

1. Use an SVRS test mat to block the suction outlet or outlets and simulate an entrapment event. If functioning properly, the pump will stop and the drive will display an SVRS alarm.
If using this method, refer to the instructions included with the test mat for correct SVRS test procedures.
2. Use a gate or ball valve installed in the suction line between the pool drains or suction outlets and the inlet of the pump.
With the pump operating normally, close the suction line gate or ball valve. If functioning properly, the pump will stop and the drive will display an SVRS alarm.

After resetting the SVRS alarm, manually restart the pump or wait for the set SVRS Auto Restart period to complete.

Stopping and Starting the Pump

Starting the Pump

1. Be sure the pump is powered on and the green power LED is on.
2. Select one of the speed buttons, then press the **Start/Stop** button (LED on) to start the pump. The pump will go into priming mode if priming feature is enabled.

Stopping the Pump

1. Press **Start/Stop** to stop the pump.

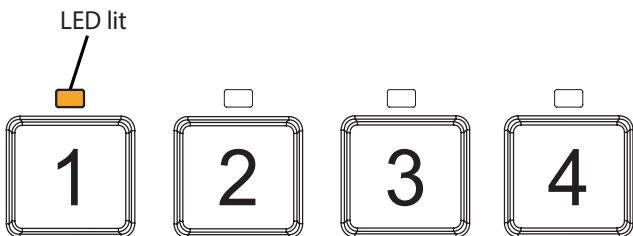
When servicing equipment (filters, heaters, chlorinators etc.), disconnect the communication cable, and switch OFF circuit breaker to remove power from the pump.

Note: The pump can automatically restart if the communication cable is connected.

Operating the Pump at Preset Speeds

The pump is programmed with four default speeds of 1100, 1500, 2350 and 3110 RPM. Speed buttons 1-4 are for each of the preset speeds as shown below.

1. Be sure the pump is powered on and the green power LED is on.
2. Press the **Speed** button (1- 4) corresponding to the desired preset speed and release quickly. The LED above the button will turn on.
3. Press **Start/Stop**. The pump will change to the selected preset speed.



Adjusting and Saving a Pump Speed

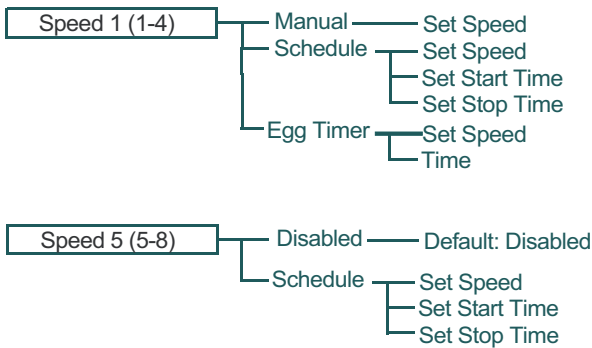
1. While the pump is running, press the **Up** or **Down** arrow to adjust to desired speed setting.
2. Press and hold down a **Speed** button (1-4) for three (3) seconds to save speed to the button or press **Save** to save the speed.

Pump Operating Modes

The IntelliFlo® VS+SVRS Variable Speed Pump can be programmed in three different modes:

Manual, Schedule, and Egg Timer.

Speeds 1-4 can be programmed in all three modes. Speeds 5-8 can only be programmed in Schedule mode since there are no buttons on the control panel for Speeds 5-8. The default setting for Speeds 5-8 is "Disabled".



Speed Menu Tree Options

Manual

Assigns a speed to one of the four Speed buttons on the control panel. This mode can only be used for speeds 1-4. Speeds 1 and 2 are Manual by default.

To operate in Manual mode, press one of the four speed buttons and then press the **Start/Stop** button. The pump will run the assigned speed for that speed button.

Egg Timer

Speeds 1-4 can be programmed to run at a certain speed and for a duration of time once a speed button is pressed.

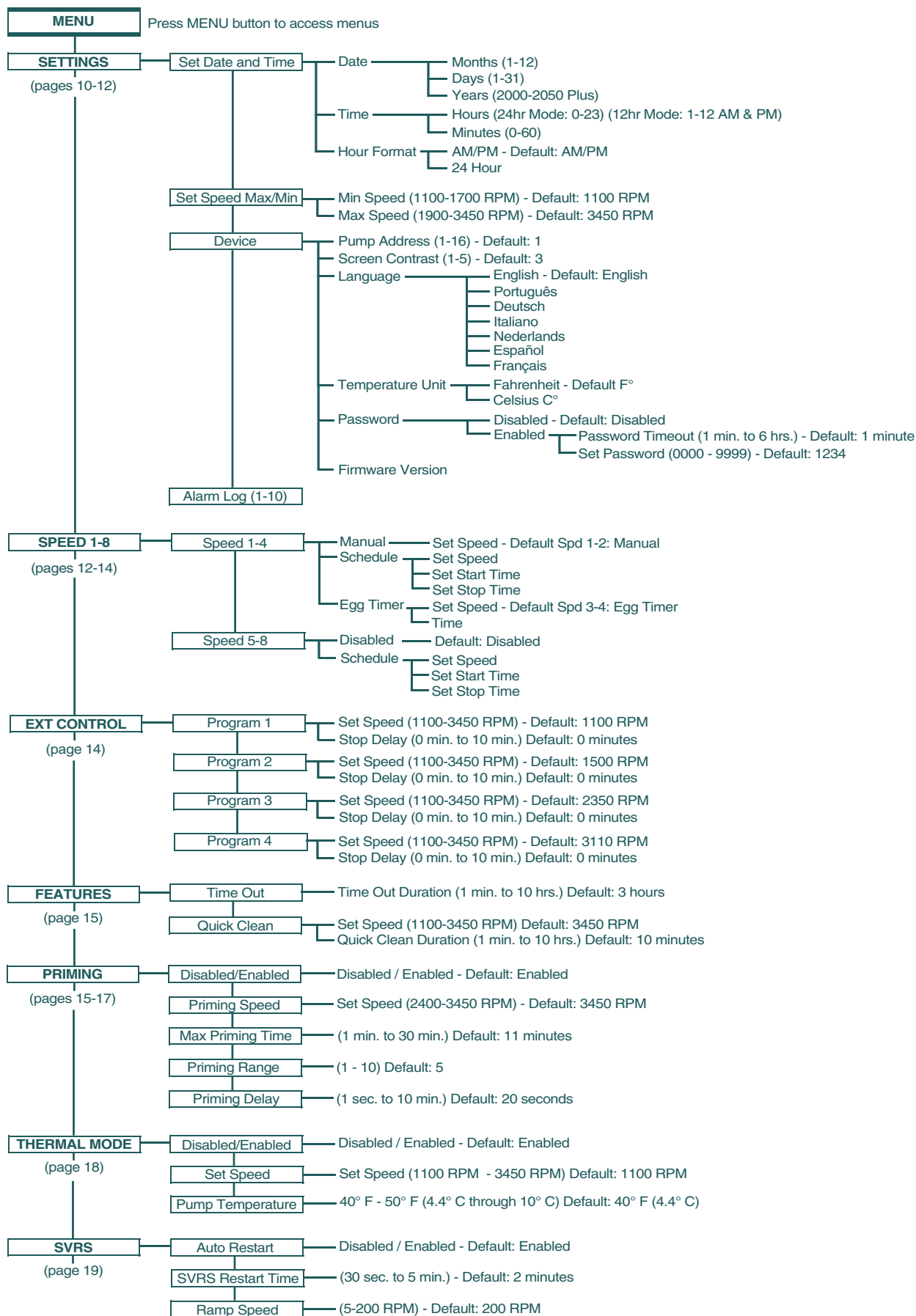
Speeds 3 and 4 are Egg Timers by default. This prevents the pump from running at a speed higher than half of the maximum speed indefinitely. If you desire a different method of operation, speeds 3 and 4 can be changed to Manual mode in the control menu.

To operate in Egg Timer mode, press a speed button and then press **Start/Stop**. The pump will run that speed for the set amount of time and then turn off.

Schedule

Program speeds 1-8 start and stop at a specific time during a 24 hour period. Speeds programmed in Schedule mode will override any manually selected speed once the next schedule command commences.

Operator Control Panel: Pump Menu Guide



MENU

SETTINGS

Pump Menu: Settings

Set Date and Time

The time controls all scheduled times, functions, and programmed cycles and stores the correct time for up to 96 hours after power is turned off. Reset if the power is off longer than 96 hours.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrows to scroll to "Date and Time" and press **Select**.
5. Press **Select** again and use **Up** or **Down** arrows to set the date.
6. Press **Save** to save user input and return to "Date and Time."
7. Use the **Up** or **Down** arrows to scroll to "Time" and press **Select**.
8. Use the **Up** or **Down** arrows to scroll to set the time.
Note: To set AM/PM or a 24 hour clock see the next section "Set AM/PM or 24 Hour Clock."
9. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
10. Press **Back** to exit.

Set AM/PM or 24-Hour Clock

To change the time from a 12 hour clock (AM/PM) to a 24 hour clock:

1. Press **Menu**.
2. Press **Select** to select "Settings".
3. Use the **Up** or **Down** arrows to scroll to "Date and Time" and press **Select**.
4. Use the **Up** or **Down** arrows to scroll to "AM/PM" and press **Select**.
5. Use the **Up** or **Down** arrows to scroll to choose between 24 hr. and AM/PM.
6. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
7. Press **Back** to exit.

Set Minimum Speed (RPM)

The minimum pump speed can be set from 1100 RPM to 1700 RPM. The default setting is 1100 RPM.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrows to scroll to "Min/Max".
5. Use the **Up** or **Down** arrows to scroll to "Set Min Spd".

6. Press **Select** to change the setting. The cursor will appear in the first number column (ones).
7. Press the **Up** or **Down** arrows to change the minimum speed setting from 1100 to 1700 RPM.
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Set Maximum Speed (RPM)

The maximum speed can be set from 1900 RPM to 3450 RPM (default is 3450). Use this setting to set the maximum running speed of the IntelliFlo® VS+SVRS Variable Speed Pump.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrows to scroll to "Min/Max".
5. Use the **Up** or **Down** arrows to scroll to "Set Max Spd".
6. Press **Select** to change. The cursor will appear in the first number column (ones).
7. Press **Up** or **Down** arrows to change the maximum speed setting from 1900 to 3450 RPM.
8. Press **Save** to save. Press **Back** to exit. To cancel, press the **Back** to exit without saving.

Note: Maximum Speed will limit Priming Speed, except in one case. If the Maximum Speed is set below the lowest available Priming Speed (2400 RPM) then the pump will exceed the Maximum Speed while the priming feature is running. This prevents the pump from having trouble priming if the Maximum Speed is set this low. If this is a problem, priming can be disabled in the Priming Menu (see "Priming" section on page 15).

Pump Address

The default pump address is #1 and only needs to be changed when there is more than one pump on an automation system. Change the address to allow the automation system to send a command to the correct pump.

Use this setting if your pump is connected via the RS-485 COM port to an IntelliTouch®, EasyTouch®, SunTouch® Control System or IntelliComm® Communication Center. For EasyTouch, SunTouch or IntelliComm systems, the pump only communicates with address #1. The pump address can be set from 1-16. The IntelliTouch system can communicate to only four (1-4) pumps.

Note: IntelliFlo VS+SVRS pumps cannot be connected in series with other pumps.

1. Be sure the green power LED is on and the pump is stopped.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrows to scroll to "Device" and press **Select**.



Pump Address (cont.)

5. Use the **Up** or **Down** arrows to scroll to "Pump Address" and press **Select**.
6. Press **Up** or **Down** arrows to change the address number from 1-16.
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit.

Set Screen Contrast

The default setting for the LCD screen is 3. Screen contrast levels can be adjusted from 1 to 5 units for low or high lighting conditions.

Note: Changes to the contrast setting do not update instantaneously. Changes to this setting must be saved before the contrast level changes.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrow to scroll to "Device" and press **Select**.
5. Use the **Up** or **Down** arrow to scroll to "Contrast Level."
6. Press **Select**. Screen will show current contrast setting number. Use **Up** or **Down** to change number.
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press the **Back** button to exit.

Set Control Panel Language

To access the language menu:

1. Check that the green power LED is on.
2. Press **Menu** and press **Select** to select "Settings".
3. Use the **Up** or **Down** arrows and scroll to "Device" and press **Select**.
4. Use the **Up** or **Down** arrows to scroll to "Select Language and press **Select**.
5. Use the **Up** or **Down** arrows to choose the desired language.
6. Press **Save** to select the control panel language. To cancel any changes, press **Back** to exit without saving.
7. Press **Back** to exit.

Set Temperature Unit

The default setting is Fahrenheit (°F). The pump can be set to either Celsius (°C) or Fahrenheit (°F).

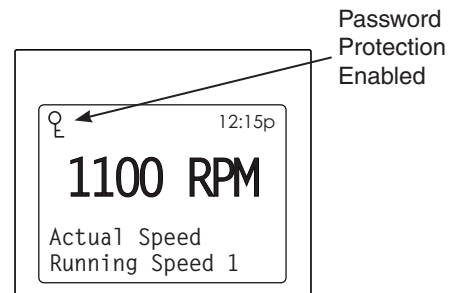
1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrows to scroll to "Device" menu item. Press **Select**.
5. Use **Up** or **Down** arrows to scroll to "Temperature Units" and press **Select**.
6. Use **Up** or **Down** arrows to choose Celsius (°C) or Fahrenheit (°F).
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit.

Password Protection

The default setting for password protection is disabled. When this feature is enabled, the IntelliFlo® VS+SVRS Variable Speed Pump display will prompt for the password before allowing access to the control panel and buttons.

The entered password is any combination of four (4) digits.

- The pump can always be stopped by pressing **Start/Stop**, even when password protection is enabled.
- If the pump has been stopped, the pump cannot be turned back on with **Start/Stop** while running in manual mode.
- Pressing **Start/Stop** when the pump is off will return it back to the Running Cycles Mode and run at the next scheduled run time. If the present time is within the scheduled run time, the pump will run the scheduled speed.
- All functions including programming are disabled in Password Protection Mode.
- Screen will read "Enter Password" if any button other than the **Start/Stop** button is pressed
- Key icon displayed in the upper left side of the screen when Password Protection is on.





Setting Password

1. Check that the green power LED is on.
2. Press **Menu**. Press **Select** to select “Settings”.
3. Use the **Up** or **Down** arrow to scroll to “Device”.
4. Press **Select**.
5. Press **Up** or **Down** arrow to scroll to “Password”. The default setting is “Disabled”.
6. Press **Select**.
7. Press **Up** or **Down** arrow to change the setting to “Enabled”. Press **Save** to save.
8. Press the **Down** arrow. “Password Timeout” will be displayed. The factory default time is 1 minute. This means the IntelliFlo® VS+SVRS Variable Speed Pump will go into Password Protection mode 1 minute after the last control panel key is pressed.
9. Press **Select** to change time setting from 1 minute to 6 hours and press **Save** to save.
10. Press the **Down** arrow and then press **Select** on “Enter Password” to change the setting.
11. Press the **Left** or **Right** arrows to move cursor and press the **Up** or **Down** arrow to change the password number to desired setting.
12. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.

Entering Password

1. Press any button (besides the speed button) to prompt the screen for a password.
2. To enter password, use the **Left** and **Right** arrows to move the cursor and the **Up** and **Down** arrow button to scroll through the digit then press **Save** to confirm.

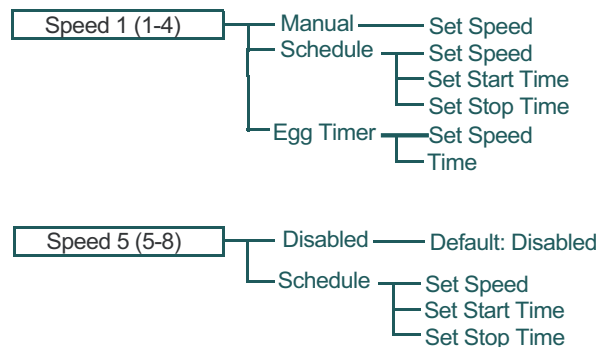


Pump Operating Modes

The IntelliFlo® VS+SVRS Variable Speed Pump can be programmed in three different modes:

Manual, Schedule, and Egg Timer.

Speeds 1-4 can be programmed in all three modes. Speeds 5-8 can only be programmed in Schedule mode since there are no buttons on the control panel for Speeds 5-8. The default setting for Speeds 5-8 is “Disabled”.



Speed Menu Tree Options

Manual

Assigns a speed to one of the four Speed buttons on the control panel. This mode can only be used for speeds 1-4. Speeds 1 and 2 are Manual by default.

To operate in Manual mode, press one of the four speed buttons and then press the **Start/Stop** button. The pump will run the assigned speed for that speed button.

Egg Timer

Speeds 1-4 can be programmed to run at a certain speed and for a duration of time once a speed button is pressed.

Speeds 3 and 4 are Egg Timers by default. If you desire a different method of operation, speeds 3 and 4 can be changed to Manual mode in the control menu.

To operate in Egg Timer mode, press a speed button and then press **Start/Stop**. The pump will run that speed for the set amount of time and then turn off.

Schedule

Program speeds 1-8 start and stop at a specific time during a 24 hour period. Speeds programmed in Schedule mode will override any manually selected speed once the next schedule command commences..

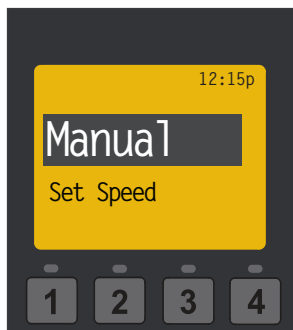


Set Speeds in Manual Mode (Speeds 1-4 Only)

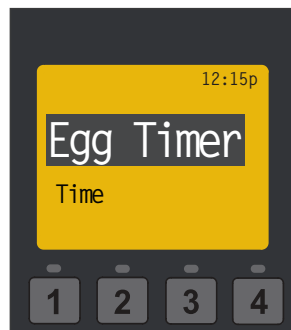
1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to "Speed 1-8", then press **Select**.
3. Use **Up** or **Down** arrows to find the speed (1-4) you wish to program, then press **Select**.
4. Speeds 1-2 default setting is Manual. Speeds 3-4 default setting is Egg Timer. To set a speed in Manual mode, press the **Down** arrow ("Set Speed" will display) and press **Select** to change. Use the **Up** or **Down** arrow to adjust speed.
5. Press **Save** to save the new speed setting.

Set Speeds in Egg-Timer Mode (Speeds 1-4 Only)

1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to "Speed 1-8", then press **Select**.
3. Use **Up** or **Down** arrow to find the speed (1-4) you wish to program, then press **Select**.
4. Use the **Up** or **Down** arrows to scroll to "Egg-Timer", then press **Select**.
5. To set a speed in Egg-Timer mode, press the **Down** arrow ("Set Speed" will display) and press **Select** to change. Use the **Up** or **Down** arrow to adjust speed.
6. Press **Save** to save the new speed setting.
7. Now press the **Down** arrow ("Set Time" will display) and press **Select** to change. Use the **Up** or **Down** arrows to adjust the time.
8. Press **Save** to save the new time setting.



Manual Mode Menu Screen



Egg Timer Menu Screen

Set Speeds 1-8 in Schedule Mode

In Schedule mode, Speeds 1-8 can be programmed to run a certain speed at a certain time of day. To run a scheduled speed, press **Start/Stop**. The screen will display "Running Schedules" when it is ready to run a scheduled speed. If **Start/Stop** is pressed while a scheduled speed is running, the IntelliFlo® VS+SVRS Variable Speed Pump will stop running the scheduled speed. The pump will not continue to run the scheduled speed until the **Start/Stop** button is pressed again.

1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to "Speed 1-8", then press **Select**.
3. Use **Up** or **Down** arrows and press **Select** for the speed you wish to set and schedule.
4. Press **Select** (display will be highlighted) and scroll to "Schedule".
5. Press **Save**.
6. Press **Down** arrow ("Set Speed" will display) and press **Select** to change. Use the **Up** or **Down** arrow to adjust speed.
7. Press **Save** to save the new speed.
8. Press the **Down** arrow again, "Set Start Time" will display. Press **Select** - the cursor will highlight the minute column.
9. Use the **Up** or **Down** arrow to change the time and the **Left** or **Right** arrow to move cursor from minutes to hours.
10. Press **Save** to save the new start time setting.
11. Press **Down** arrow - "Set Stop Time" will display. Press **Select**. Repeat Steps 8-9 to set stop time.
12. Press **Save** to save the new stop time setting.
13. Press **Start/Stop**.

The pump will prime and begin to run the programmed schedule at the specified start time.

When running in Schedule or Egg Timer mode, the countdown time (T 00:01) showing the hours and minutes remaining is displayed.



Set Speeds 1-8 in Schedule Mode (cont.)

Programming Schedule for Constant Run

A speed cannot be programmed with the same start and stop times. To run a speed without stopping, set the Start time one minute after the stop time.

Example: A single speed will run non stop if programmed with a Start Time of 8:00 AM and a Stop time of 7:59 AM.



Note: The pump will not run the scheduled speeds until the **Start/Stop** button is pressed (LED on) to place the pump in Schedule mode.

Note: When two speeds are scheduled during the same run time the pump will run the higher RPM Speed regardless of Speed # in use.

Note: The most recent command, Manual or Schedule, takes priority regardless of speed number RPM.



External Control

This function is for programming speeds that will run when the IntelliComm® Communication Center sends it a command. For example, Terminal 3 and 4 in the IntelliComm system will correspond to External Control Program #1. (5 and 6 to Ext Ctrl #2).

The Stop Delay feature allows the user to program the pump to run a Program Speed after the External Control has been deactivated. This feature can be used to provide a cooling down period for the pump after a trigger signal from an installed heater has been deactivated. Each individual Program Speed can have a Stop Delay of 1 to 10 minutes programmed.

Use the External Control feature to program the IntelliComm system power center.

To access the External Control menu:

1. Check that the green power LED is on.
2. Press the **Menu** button.
3. Use **Up** or **Down** arrow to scroll to "Ext. Ctrl".
4. Press **Select**. "Program 1" is displayed.
5. Press **Select**. "1100 RPM" is displayed.
6. Press **Select**. The "RPM" number will highlight.
7. Press **Up** or **Down** arrow to change the RPM setting.
8. Press **Save** to save the setting.
Note: To cancel any changes, press the **Back** button to exit without saving.
9. If you do not wish to program a Stop Delay, continue to step 13. If you do wish to program a Stop delay press **Up** or **Down** arrow to scroll to "Stop Delay".
10. Press **Select** to set Stop Delay.
11. Press **Up** or **Down** arrows to change the Stop Delay setting. Stop Delay can be set from 0 minutes (disabled) to 10 minutes.
12. Press **Save** to save the setting.
Note: To cancel any changes, press the **Back** button to exit without saving.
13. Press **Back** to return to set Program 2.
14. Use **Up** or **Down** arrow to scroll to "Program 2".
15. Repeat Steps 5 through 13 to set Program 2, 3, and 4.



Time Out

The Time Out feature keeps the pump from running its programmed speeds for a set duration adjustable in the menu. The Time Out feature is displayed in hours and minutes (Hrs:Mins).

Once Time Out is finished, the pump will return to its previous mode of operation, the Start/Stop LED will be lit and ready to turn on at the next scheduled run time.

To access the Time Out menu:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Use **Up** or **Down** arrows to scroll to "Features", then press **Select**.
4. Press **Select** to choose "Timeout".
5. Then press **Select** again to choose "Timeout Duration".
6. Press **Select** to change the time. The cursor will highlight the minutes column.
7. Press the **Left** arrow to move cursor to the hours column. Time out can be set from 1 minute to 10 hours.
8. Press **Save** to save the setting.

Note: To cancel any changes, press **Back** to exit without saving.
9. Press **Back** to exit the menu.

Quick Clean

This feature can be used to increase the pump speed for vacuuming, cleaning, adding chemicals, after a storm for extra skimming capability.

Press the **Quick Clean** button (LED on) and then **Start/Stop** to start. When the Quick Clean cycle is over, the pump will resume regular schedules if programmed and return to "Schedule" mode.

To access the Quick Clean menu:

1. Check that the green power LED is on and the pump is stopped.
2. Press **Menu**.
3. Use **Up** or **Down** arrows to scroll to "Features", then press **Select**.
4. Press the **Down** arrow and press **Select** for "Quick Clean".
5. Press **Select** to choose "Set Speed".
6. Press **Select** to highlight the "RPM" first (ones) column and change the speed.
7. Use **Up** or **Down** arrows to change the speed.
8. Press **Save** to save the speed.
9. Press the **Down** arrow again, and press **Select** for "Time Duration".

10. Press **Select** to change the time. The cursor will highlight the minutes column.
11. Use **Up** or **Down** arrows to change the time from 1 minute to 10 hours.
12. Press **Save** to save the time.
13. Press **Back** to exit the menu.



WARNING Do not allow anyone in the pool while the pump is in priming mode. SVRS protection is not enabled during the priming and will not provide protection from entrapment hazards.

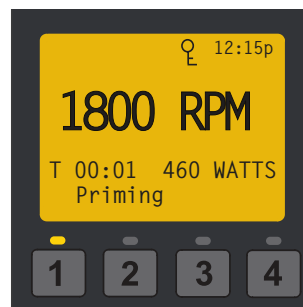
The default setting for Priming is ENABLED. This setting allows the pump to automatically detect if it is primed for startup.

The priming feature increases the pump speed to 1800 RPM and pauses for three (3) seconds. If there is sufficient water flow in the pump basket, the pump will go out of priming mode and run its commanded speed.

If the water flow is not sufficient, the pump speed will increase to the "Priming Speed" setting and remain for the priming delay time (default 20 seconds). If there is sufficient water flow in the pump basket at this time, it will exit priming mode and transition to the commanded speed.

If there is still insufficient flow in the pump basket, as determined by the Priming Range setting, the pump will try to prime at the "Priming Speed" for the amount of time set in the "Maximum Priming Time" menu. Once the pump achieves prime, it will resume normal operation after the preset priming delay.

Note: It is possible to set "Maximum Speed" too low for the pump to properly prime. Maximum Speed will limit Priming Speed, except in one case. If the Maximum Speed is set below the lowest available Priming Speed (2400 RPM) then the pump will exceed the Maximum Speed while the priming feature is running. This prevents the pump from having trouble priming if the Maximum Speed is set this low. If this is a problem, priming can be disabled in the Priming Menu.



Display during priming



Priming Features

DISABLED/ENABLED	Default: <i>ENABLED</i> Allows IntelliFlo® VS+SVRS Variable Speed Pump to automatically detect if pump is primed for startup. The pump will speed up to 1800 RPM and pause for three (3) seconds - if there is enough water in the basket, the pump will go out of priming mode and run the commanded speed.
SET SPEED	Default: <i>3450 RPM</i> The priming speed can be set between 2400 RPM and 3450 RPM. If the pump is on an equipment pad that is close to the water level, it will not need to run at 3450 RPM to successfully prime. The setting can be lowered to prevent running at a higher speed than necessary. Day to day factors (i.e. local ambient pressure, water/air temperatures, amount of water retained from last system run) can effect priming performance. Because of the frequently changing nature of these factors the priming speed should be set high enough to accommodate environmental and mechanical changes to ensure that the pump can successfully prime. Finding the most effective and efficient speed for your specific needs may take careful testing and evaluation of priming performance.
MAX PRIMING TIME	Default: <i>11 minutes</i> The maximum priming time can be set from 1 - 30 minutes. This setting is the amount of time the pump will try to prime before it gives a priming error. If this occurs, fill the pump basket with water and restart the pump.
PRIMING RANGE	Default: <i>5</i> Priming range can be set from 1-10. The smaller the range, the more water the pump has to be moving to detect that it is primed. At larger ranges, the pump will detect that it is fully primed while moving less water. If the range is set too high, then the pump may exit Priming mode before it has fully primed. The range will automatically adjust with the priming set speed because the flow rates of the pump will be lower at lower speeds.
PRIMING DELAY	Default: <i>20 seconds</i> Priming delay can be set from 1 second to 10 minutes. If the pump does not have enough water after the automatic priming mode, the pump will increase to the Priming Speed (under “Setting Priming Feature” on page 17) and run for 20 seconds (or for the time set). You may need to increase the priming delay to allow the system to stabilize before the pump starts running speeds. If pump continues to show a priming error, increasing the priming delay time might correct this issue.

MENU

PRIMING

Pump Menu: Priming

Setting Priming Features

Note: Priming features are only accessible if priming is “Enabled”.

1. Press **Menu**.
2. Use **Down** arrow to scroll to “Priming” and press **Select**.
3. The factory default is set to priming “Enabled”. To disable, press **Select**.
4. Press **Save** if you have changed the setting - this will save the selection.
5. Press the **Down** arrow - the screen will read “Max Priming Time”.
6. To change from factory default, press **Select**. The cursor will highlight.
7. Use the **Up** or **Down** arrows to change the time from 1 minute to 30 minutes.
8. Press **Save** to save.
9. Press the **Down** arrow - the screen will read “Priming Range”. Default is “5”.
10. Press **Select** to change the priming range. The cursor will highlight the number.
11. Use the **Up** or **Down** arrows to change from 1 to 10. Increasing the number allows the drive to detect prime with less water flow.
12. Press **Save** to save.
13. Press the **Down** arrow - the screen will read “Priming Delay”. Default is 20 seconds.
14. Press **Select** to change the priming delay time.
15. Use the **Up** or **Down** arrows to change from 1 second to 10 minutes.

CAUTION: Increasing the time causes the pump to stay in the priming mode longer.

16. Press **Save** to save the setting.

17. Press **Back** to exit.

Disabling Priming with an Automation System

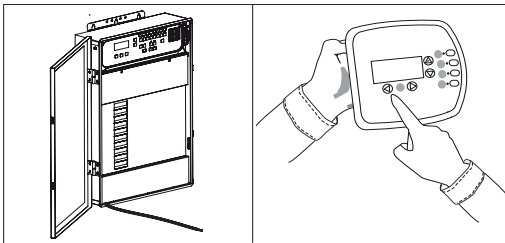
When the IntelliFlo® VS+SVRS Variable Speed Pump is connected to an automation control system, (IntelliTouch®, EasyTouch® or SunTouch® Control Systems), ***the priming feature on the pump cannot be disabled by the external automation control system only. It must also be disabled on the pump itself.***

If priming is enabled on start up, the pump responds to its internal settings *before* responding to commands from an automation control system.

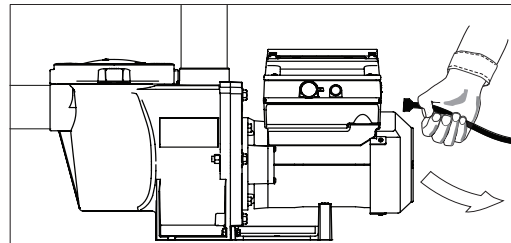
If the pump is connected to an automation control system and priming is not desired, ***disable the priming feature on both the pump and the automation control system.***

To disable priming with an automation system:

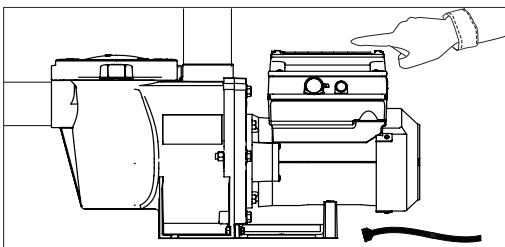
1. Disable the priming feature on the automation control system at the load center or using an IntelliTouch or EasyTouch system remote. (Refer to the automation control system user’s guide for additional information).
2. Temporarily disconnect the RS-485 communication cable.
3. Open the lid to the control panel to disable priming on the pump. Press **Menu**, use the **Arrow** buttons to scroll and select “Priming”, then select “Disabled” (the factory default is set to “Enabled”). Press **Back** to exit the menu.
4. Once priming is disabled, reinstall the RS-485 communication cable.



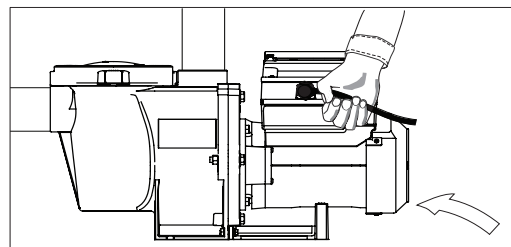
1. Disable priming on automation control system.



2. Disconnect the RS-485 communication cable.



3. Disable priming on pump.



4. Reinstall the RS-485 communication cable.

MENU

THERMAL MODE — Pump Menu: Thermal Mode

The sensor for Thermal Mode is in the drive, on top of the motor. This feature allows you to set a speed (1100 RPM - 3450 RPM) that runs when the IntelliFlo® VS+SVRS Variable Speed Pump goes into Thermal Mode. The temperature level that you wish Thermal Mode to start can also be set.

IMPORTANT NOTE: This feature is for protection of the pump. Do not depend on the Thermal Mode feature for freeze protection of the pool. Certain situations could cause the pump to sense a different temperature than actual air temperature.

Your automation systems air temperature sensor should be used to sense actual temperature. For example, if the pump is located indoors, the temperature of the room does not indicate the outdoor temperature. The pump does not sense the water temperature.

To access the Thermal Mode menu:

- 1. Check that the green power LED is on.
- 2. Press **Menu**.
- 3. Use the **Down** arrow to scroll to “Thermal Mode” and press **Select**.
- 4. The factory default for Thermal Mode is “Enabled”. To disable Thermal Mode, press **Select** to highlight “Enabled”.
- 5. Press the **Up** arrow - “Disabled” is displayed.
- 6. Press **Save** to save.

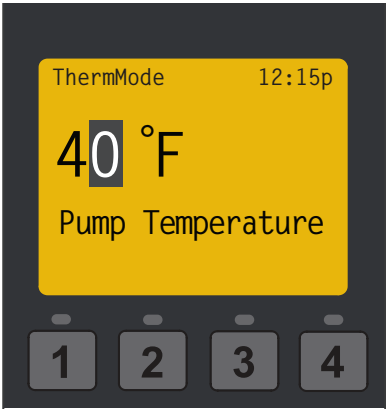


Setting the Thermal Mode Pump Speed

To Set Thermal Mode Speed and Pump Temperature:

Note: Thermal Mode features are only accessible if Thermal Mode is “Enabled”.

- 1. With “Thermal Mode” displayed on the screen, press the **Down** arrow - “Set Speed” is displayed. The factory default is 1100 RPM.
- 2. Press **Select** to change the speed. The cursor will highlight the first column (ones).
- 3. Use the **Up** or **Down** arrows to set speed (1100 - 3450 RPM).
- 4. Press **Save** to save the speed.
- 5. Press the **Down** arrow to Pump Temperature (the temperature the pump will activate Thermal Mode, default is 40° F/4.4° C).
- 6. Press **Select** to change the setting. The cursor will highlight the first column. Can be set from 40° F to 50° F (4.4° C - 10° C).
- 7. Press **Save** to save the temperature setting.
- Note:** To cancel any changes, press **Back** to exit without saving.
- 8. Press **Back** to exit.



Setting the Thermal Mode Pump Temperature



Thermal Mode Menu Options



SVRS Auto Restart

⚠ CAUTION

The IntelliFlo VS+SVRS pump can be sensitive to air in the circulation system and cause it to give a false SVRS alarm, a blockage alarm when there is no blockage present. It is always recommended to bleed the air off of the filter when starting the pump. Suction side air leaks in the system can contribute to false SVRS alarms.

The SVRS Auto Restart means that after the IntelliFlo® VS+SVRS Variable Speed Pump shuts down due to blockage alarm, it will restart automatically after two (2) minutes. The default setting is two (2) minutes. When the setting is enabled it can be set from 30 seconds to five (5) minutes or to "Manual Restart". Manual Restart does not disable this feature, it requires you to manually reset the pump after a blockage alert. Check your local codes and ordinances before changing this feature.

IMPORTANT NOTE: If SVRS Auto Restart is enabled: After a SVRS alarm the pump will attempt to soft prime after the amount of time set in the SVRS Restart Time. During the soft prime the pump starts at the Minimum RPM setting of the pump and slowly ramps up to the desired speed setting. If it senses a blockage it will shut off and soft prime again. It will do this ten (10) times before attempting a full prime at which time the SVRS will be off and a blockage will go undetected.

IMPORTANT NOTE: Disabling this setting does not mean that the SVRS suction blockage feature is being disabled. When this setting is "Disabled" it means that when the pump shuts down for a blockage alarm it will not automatically restart. The pump will have to be manually restarted by pressing the **Reset** button, and the **Start/Stop** button.

SVRS Ramping Speed

The rate that the pump changes speeds can be reduced to increase the resistance to SVRS Alarm tripping on false event detection. When the pump is changing speed from one to another, it will take small steps that are called "Ramp Speed" to get there.

If there are things that change in the plumbing system as the pump speed increases, such as bypass and check valves, this value can be decreased to help avoid detecting the valve opening as an event and triggering alarm while the pump changes speeds.

To Enable/Disable SVRS Auto Restart:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Use the **Down** arrow to scroll to "SVRS" and press **Select**.
5. Press the **Select** button. "Enabled Auto Restart" is displayed.

*To Disable the setting, press the **Select** button to highlight "Enabled" and press the **Down** arrow to change the setting to "Disabled," then press the **Save**, and the **Back** button.*

To Set SVRS Restart Time:

1. While in the SVRS menu, press the **Down** arrow to display "SVRS Restart Time." This is the duration of time, in minutes and seconds, that "SVRS Auto Restart" is set to.
2. Press the **Select** button to enter edit mode. The cursor will appear in the time column.
3. Press **Up** or **Down** arrow to change the auto restart time from 30 seconds to 5 minutes.
4. Press the **Save** button to save the setting. To cancel any changes, press the **Back** button to exit edit mode without saving.

To Set Ramp Speed:

1. While in the SVRS menu, press the **Down** arrow to scroll to "Ramp Speed". This is the ramp speed that the SVRS Auto Restart will reach during the initial restart.
2. Press the **Select** button to enter edit mode. The cursor will appear in the RPM column.
3. Press **Up** or **Down** arrow to set the ramp speed from 5 to 200 RPM.
4. Press the **Save** button to save the setting. To cancel any changes, press the **Back** button to exit edit mode without saving.
5. Press **Back** to exit.

CONNECTING TO AN AUTOMATION SYSTEM

External Control with IntelliComm® Communication Center

Use the RS-485 communications cable to remotely control the IntelliFlo® VS+SVRS Variable Speed Pump from an IntelliComm communication center. The IntelliComm system provides four (4) pairs of input terminal connections. These inputs are actuated by either 15 - 240 VAC or 15 - 100 VDC. Use the device inputs, to control the programmed pump speeds.

Note: For the pump to accept commands from the IntelliComm system, the pump must be in the “Running Schedules” mode (LED above Start/Stop button is on). If more than one input is active, the highest number will be communicated to the pump. The IntelliComm system will always communicate to pump using ADDRESS #1.

Program Number Priority

If programs 1 and 2 are activated, program 2 will run, regardless of the assigned speed (RPM). The higher program number will always take priority.

Refer back to page 14 for instructions for setting up Programs in the External Control menu.

External Control is for programming speeds that will run when the IntelliComm communication center controller sends it a command.

For example, Terminal 3 and 4 in IntelliComm system will correspond to External Control Program #1. (5 and 6 to Ext Ctrl #2). Use the External Control feature to program the IntelliComm communication center.

Wiring Terminal Descriptions for IntelliComm Communication Center

Terminal Number	Terminal Name	Voltage	Max. Current	Phase Type	Frequency
1-2	Power Supply	100 - 240 VAC	100 mA	1 Input	50/60 Hz
3-4	Program 1	15 -240 VAC or 15 - 100 VDC	1 mA	1 Input	50/60 Hz
5-6	Program 2	15 -240 VAC or 15 - 100 VDC	1 mA	1 Input	50/60 Hz
7-8	Program 3	15 -240 VAC or 15 - 100 VDC	1 mA	1 Input	50/60 Hz
9-10	Program 4	15 -240 VAC or 15 - 100 VDC	1 mA	1 Input	50/60 Hz
11 12	RS-485 + Data: Yellow - Data: Green	-5 to +5 VDC	5 mA	1 Out-put	N/A
	Ground				

Connecting to EasyTouch® and IntelliTouch® Control Systems

The pump can be controlled by an EasyTouch or IntelliTouch system via the RS-485 communication cable. The EasyTouch and/or IntelliTouch control system starts, stops and controls the speed of the pump.

EasyTouch and/or IntelliTouch systems rewrite the pump memory when a command is given. This can take several seconds and can cause a delay until the pump physically responds.

The pump control panel is disabled when communicating with an EasyTouch and/or IntelliTouch system. **The EasyTouch and/or IntelliTouch system will not start communicating with the pump until the pump is assigned to a circuit.** The default pump address is “1” (only address for EasyTouch system).

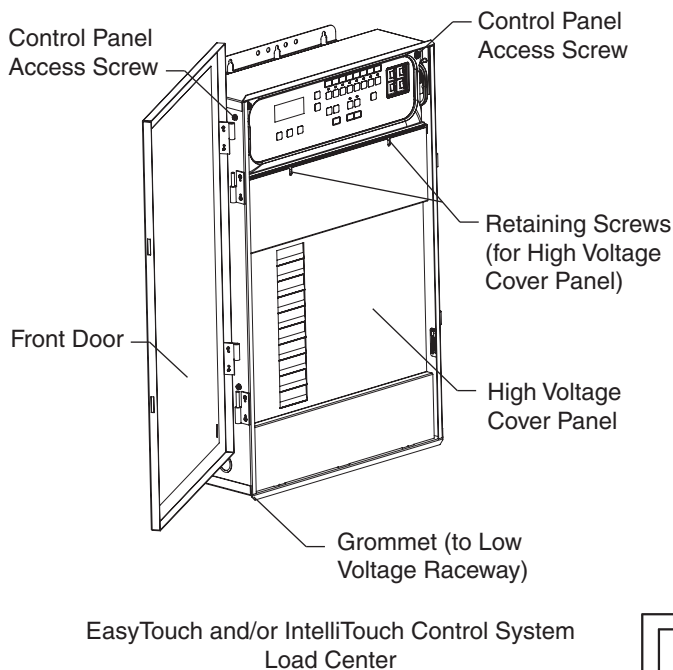


IntelliComm Communication Center

See page 10 for details about how to check and or set the pump address.

To connect the IntelliFlo® VS+SVRS Variable Speed Pump communication cable to EasyTouch® or IntelliTouch® Control System load center:

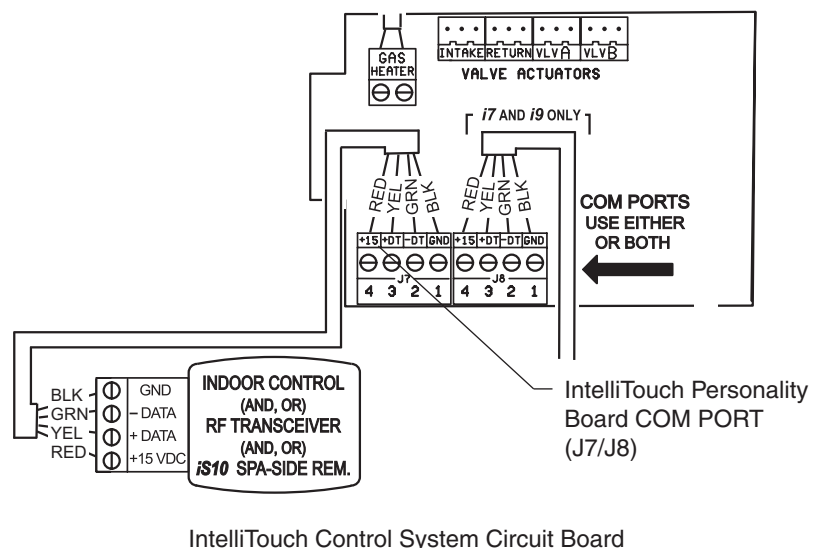
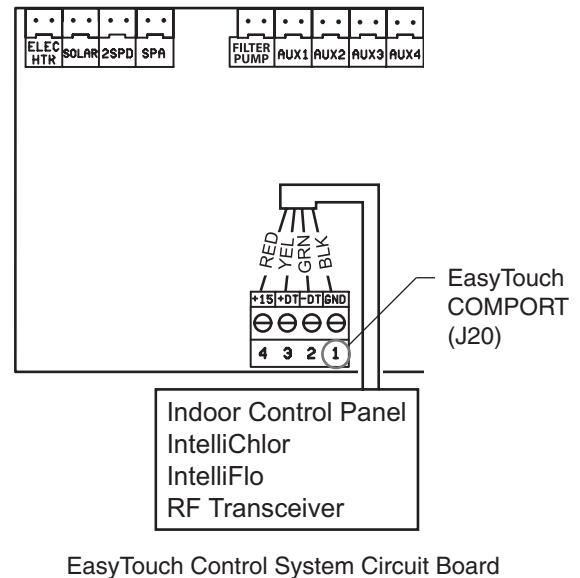
1. Switch the main power off to the load center.
2. Unlatch the two enclosure door spring latches, and open the door.
3. Remove the two retaining screws securing the high voltage cover panel, and remove it from the enclosure.
4. Loosen the two access screws securing the control panel.
5. Lower down the hinged control panel to access the EasyTouch or IntelliTouch control system circuit board.
6. Route the communication cable into the plastic grommet (located on the lower left side of the load center), up through the low voltage raceway to the EasyTouch or IntelliTouch system circuit board.
7. Strip back the cable conductors 6 mm (1/4"). Insert the two wires into the COM port screw terminals on the EasyTouch and/or IntelliTouch system circuit board. Secure the wires with the screws.
8. **EasyTouch COM port (J20):** Connect the GREEN (#2) and YELLOW (#3) wires to the COM port screw terminals (#2 and #3). Be sure to match the color coding of the wires; YELLOW to YELLOW and GREEN to GREEN. The Red wire is not connected. Secure the wires with the screws.



IntelliTouch COM port (J7/8): Connect the GREEN (#2) and YELLOW (#3) wires to the COM port (J20) screw terminals (#2 and #3). Be sure to match the color coding of the wires; YELLOW to YELLOW and GREEN to GREEN. The Red wire is not connected. Secure the wires with the screws.

Note: Multiple wires may be inserted into a single screw terminal.

9. Close the control panel into its original position and secure it with the two screws.
10. Install the high voltage cover panel and secure it with the two retaining screws.
11. Close the load center front door. Fasten the spring latch.
12. Switch the power on to the load center.



Connecting the Pump to a SunTouch® Control System

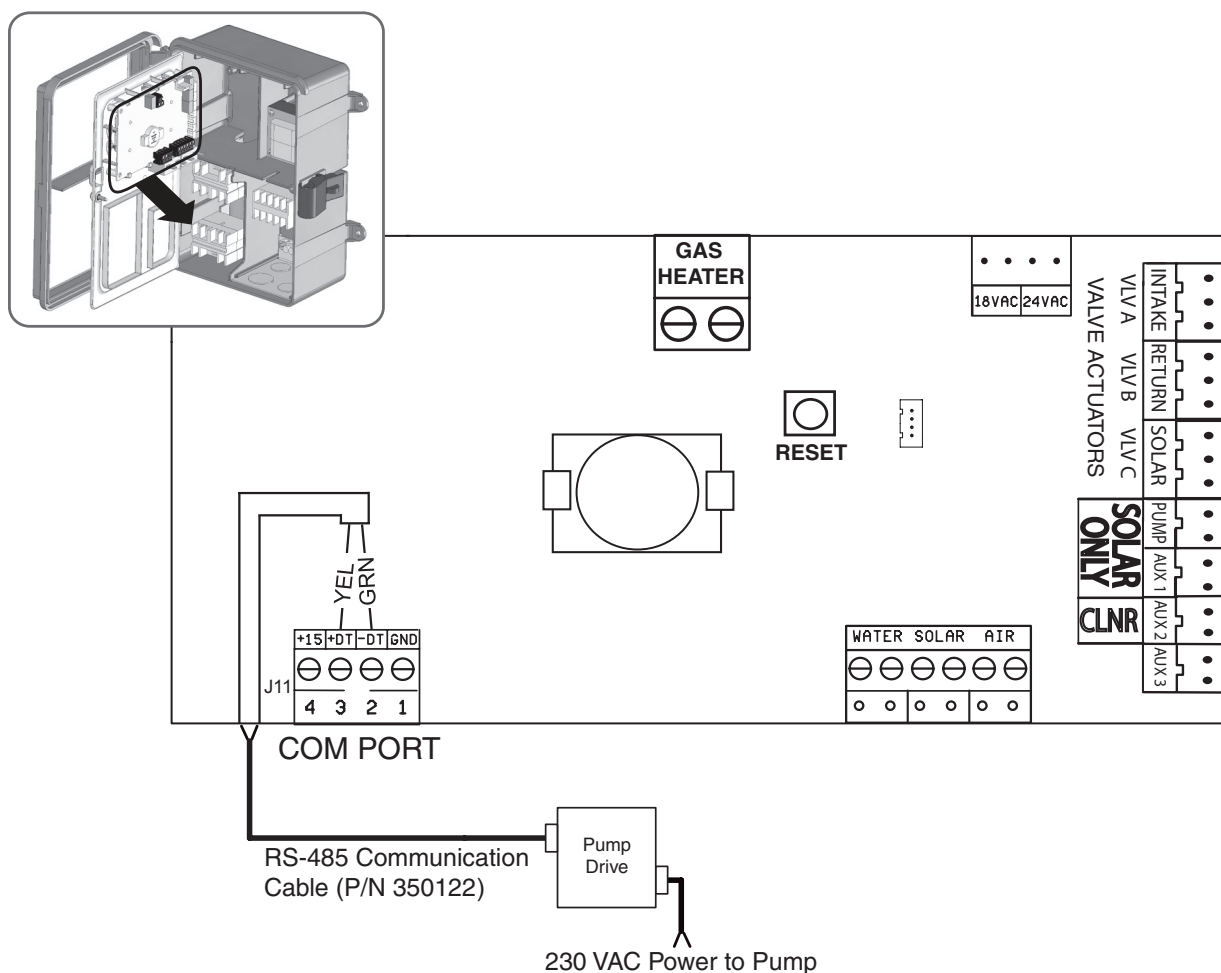
The IntelliFlo® VS+SVRS Variable Speed Pump can be controlled by a SunTouch system via the RS-485 communication cable.



WARNING Switch OFF main system power to the SunTouch system power center before making any connections.

To connect the pump RS-485 communication cable to the SunTouch control system circuit board:

1. Unlatch the front door of the SunTouch system power center and open the door.
2. Loosen the retaining screw on front panel. Open the hinged front panel to access the electronics compartment.
3. Route the two conductor cables up through the power center grommet opening located on the left side, and up through the low voltage raceway to the motherboard.
4. Strip back the cable conductors 6 mm (1/4"). Insert the wires into the screw terminals (provided). Secure the wires with the screws. Be sure to match the color coding of the wires; YELLOW to YELLOW and GREEN to GREEN.
5. Insert the connector on the COMPORT (J11) screw terminal on the SunTouch system circuit board.
6. Close the control panel and secure it with the retaining screw.
7. Close the front door. Fasten the spring latch.



SunTouch Control System Circuit Board

MAINTENANCE

⚠ WARNING DO NOT open the strainer pot if IntelliFlo® VS+SVRS Variable Speed 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 strainer pot temperature is cool to touch, then open with extreme caution.

⚠ CAUTION To prevent damage to the pump and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

Pump Strainer Basket

The strainer basket (or 'strainer pot'), is located in front of the pump housing. The strainer basket must be kept clean and free of debris. Inspect basket through the lid on the top of the housing. Be sure to visually inspect the strainer basket at least once a week. Dirty strainer baskets reduce filter and heater efficiency and put abnormal stress on the pump motor.

Cleaning the Pump Strainer Basket

1. Press **Start/Stop** button on the pump and turn off the pump at the circuit breaker. Disconnect communication cable from pump.
2. Relieve pressure in the system.
3. Turn the lid and clamp counter-clockwise and remove from the pump.
4. Remove debris and rinse out the basket. Replace the basket if it is cracked.
5. Put the basket back into the housing. Be sure to align the notch in the bottom of the basket with the rib in the bottom of the volute.
6. Fill the pump pot and volute up to the inlet port with water.
7. Clean the lid and clamp, O-ring, and sealing surface of the pump pot.
Note: It is important to keep the lid O-ring clean and well lubricated.
8. Reinstall the lid by placing the clamp and lid on the pot. Be sure the lid O-ring is properly placed.
Seat the clamp and lid on the pump then turn clockwise until the locking ring handles are perpendicular to the inlet.
9. Turn the power "ON" at the circuit breaker. Reconnect communication cable from pump.
10. Open the manual air relief valve on the top of the filter. Stand clear of the filter.
11. Wait until all pressure is relieved. Start the pump.
12. Bleed air from the filter until a steady stream of water comes out of the filter air relief valve. Close the manual air relief valve.

⚠ WARNING THIS SYSTEM OPERATES UNDER HIGH PRESSURE. When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow above instructions.



Winterizing

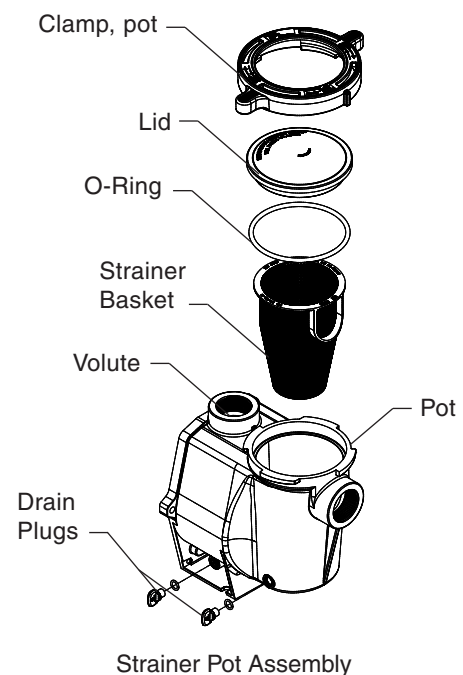
To protect the pump electronics from freeze damage, the pump will switch on to generate internal heat as the temperature drops below freezing if Thermal Mode is enabled. *The Thermal Mode feature on the pump is not intended to protect the system plumbing from freezing.*

- In mild climate areas, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.
- You are responsible for determining when freezing conditions may occur. If freezing conditions are expected, take the following steps to reduce the risk of freeze damage. **Freeze damage is not covered under warranty.**

To prevent freeze damage, follow the procedures below:

1. Shut off electrical power for the pump at the circuit breaker.
2. Drain the water out of the pump housing by removing the two thumb-twist drain plugs from the housing. Store the plugs in the pump basket.
3. Cover the motor to protect it from severe rain, snow and ice.

Note: The motor may be covered during a storm, winter storage, etc., but never when operating or expecting operation. Never wrap motor with plastic or other air tight materials during winter storage.



⚠ WARNING Always disconnect power to the IntelliFlo® VS+SVRS Variable Speed 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 to service people, users or others due to electric shock. Read all servicing instructions before working on the pump.

⚠ WARNING **DO NOT** open the strainer pot if 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 strainer pot temperature is cool to touch, then open with extreme caution.

⚠ CAUTION Be sure not to scratch or mar the polished shaft seal faces; seal will leak if faces are damaged. The polished and lapped faces of the seal could be damaged if not handled with care.

Motor and Drive Care

Protect from heat

1. Shade the motor from the sun.
2. Any enclosure must be well ventilated to prevent overheating.
3. Provide ample cross ventilation.
4. Provide a minimum clearance of three (3) inches behind the motor fan for proper circulation.

Protect against dirt

1. Protect from any foreign matter.
2. Do not store (or spill) chemicals on or near the motor.
3. Avoid sweeping or stirring up dust near the motor while it is operating.
4. If a motor has been damaged by dirt it may void the motor warranty.

Protect against moisture

1. Protect from continuous splashing or continuous sprayed water.
2. Protect from extreme weather such as flooding.
3. If motor internals have become wet - let it dry before operating. Do not allow the pump to operate if it has been flooded.
4. If a motor has been damaged by water it may void the motor warranty.
5. Be sure to close the keypad cover after every use.

Shaft Seal Replacement

The Shaft Seal consists primarily of two parts, a rotating ceramic seal housed in the impeller and a stationary spring seal in the sealplate. The pump requires little or no service other than reasonable care, however, a shaft seal may occasionally become damaged and must be replaced.

Note: The polished and lapped faces of the seal could be damaged if not handled with care.

Pump Disassembly

Tools required:

- 3/32 inch Allen head wrench
- Two (2) 9/16 inch open end wrenches
- 1/4 inch Allen head wrench\
- No. 2 Phillips head screwdriver
- Adjustable wrench

To remove and repair the motor subassembly, follow the steps below:

1. Turn off the pump circuit breaker at the main panel.
2. Disconnect the RS-485 communication cable from the pump (if connected to pump).
3. Drain the pump by removing the drain plugs. No tools are required.
4. Remove the four (4) Phillips head screws from the outer corners of the keypad.
5. Disconnect the keypad from the drive and set it to the side in a safe place.
6. Remove the three (3) Phillips head screws, located inside the drive, that anchor the drive to the motor.
7. Remove the drive by lifting upwards to separate it from the motor.
8. Use the 9/16 inch wrenches to remove the six (6) bolts that hold the housing (strainer pot/volute) to the rear subassembly.
9. Gently pull the two pump halves apart, removing the rear subassembly.
10. Use a 3/32 inch Allen head wrench to loosen the two (2) holding screws located on the diffuser.
11. Hold the impeller securely in place and remove the impeller lock screw by using a Phillips head screwdriver. The screw is a left-handed thread and loosens in a clockwise direction.

⚠ CAUTION

The pump impeller may have sharp edges that could potentially cut or scratch the user's hands. Pentair recommends that safety gloves be worn when holding the impeller during disassembly and reassembly.

12. Use a 1/4 inch Allen head wrench to hold the motor shaft. The motor shaft has a hex-shaped socket on the end which is accessible through the center of the fan cover.
13. To unscrew the impeller from the shaft, twist the impeller counterclockwise.
14. Remove the four (4) bolts from the seal plate to the motor, using a 9/16 inch wrench.
15. Place the seal plate face down on a flat surface and tap out the carbon spring seat.
16. Clean the seal plate, seal bore, and the motor shaft.

Illustrated parts view on the next page

Pump Reassembly

1. When installing the replacement shaft seal, use silicone sealant on the metal portion before pressing into the seal plate as shown. **Note:** Use extreme care when applying sealant. Be sure no sealant contacts the seal plate surface or the ceramic seal. Allow sealant to cure overnight before reassembling.
2. Before installing the rotating portion of the seal into the impeller, be sure the impeller is clean. Use a light density soap and water to lubricate the inside of the seal. Press the seal into the impeller with your thumbs and wipe off the ceramic and carbon faces with a clean cloth.
3. Remount the seal plate to the motor.
4. Screw in the impeller lock screw (counterclockwise to tighten).
5. Remount the diffuser onto the seal plate. Be sure the plastic pins and holding screw inserts are aligned.
Note: Ensure that the seal plate o-ring is clean and free of debris.
6. Grease the diffuser o-ring and seal plate gasket prior to reassembly.
7. Assemble the motor subassembly to the pump housing by using the two (2) through bolts for proper alignment. Do not tighten the through bolts until all six (6) bolts are in place and finger tightened.
Note: Ensure that the seal plate gasket is properly seated inside of the pump assembly. The seal gasket can be pinched between the seal plate and the pump housing while tightening these six (6) screws, preventing a proper seal and producing a slow leak when the pump is restarted.
8. Reinstall the drive onto the top of the motor.
9. Fill the IntelliFlo® VS+SVRS Variable Speed Pump with water.

10. Reinstall the pump lid and plastic clamp. See “Cleaning the Pump Strainer Basket” on page 23 for details
11. Reconnect the RS-485 communication cable to the pump.
12. Turn on the pump circuit breaker at the main panel.
13. Prime the pump; refer to “Priming the Pump” on page 6.

Drive Assembly Removal



WARNING To avoid dangerous or fatal electrical shock hazard, switch OFF power to motor before working on pump or motor.

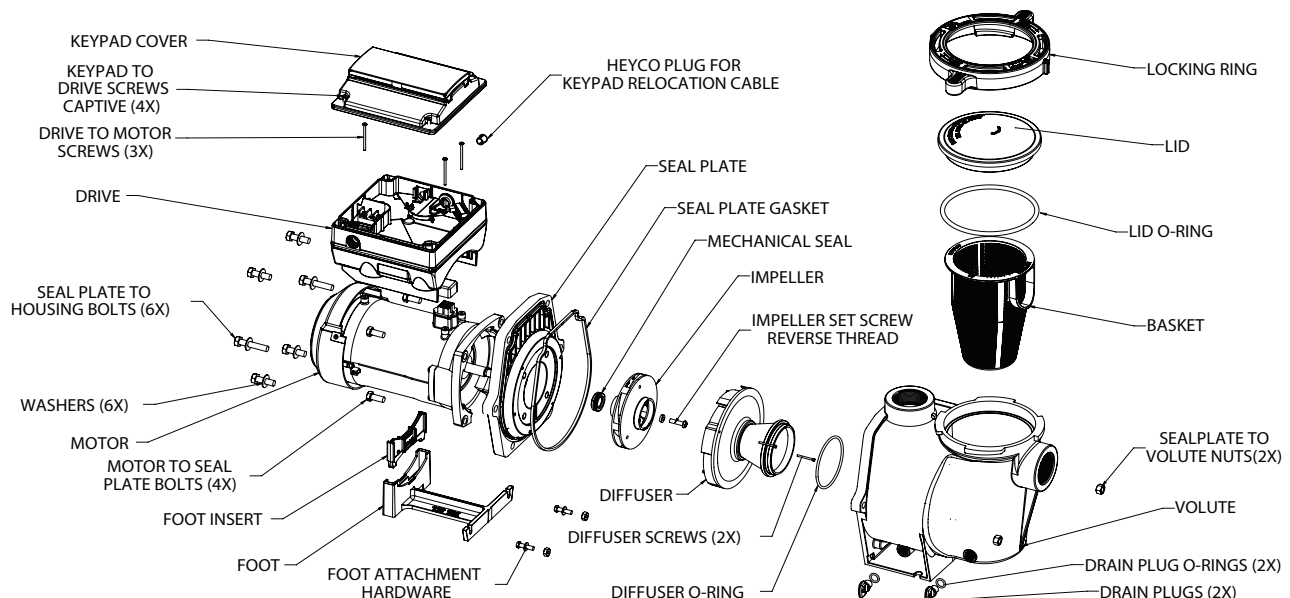


CAUTION To avoid electrical hazard, never remove the four torx-head screws from the intermediate drive cover. There is a capacitor bank that holds an electrical charge even when there is no power supplied to the pump.

To remove the drive and control panel from the motor assembly:

1. Be sure all electrical breakers and switches are turned off before removing the control panel.
2. Disconnect the RS-485 communication cable from the pump.
3. Remove the four (4) Phillips head screws from the outer corners of the keypad.
4. Unplug the keypad from the drive and set it to the side in a safe place.
5. Remove the three (3) Phillips head screws, located inside the drive, that anchor the drive to the motor.
6. Lift up the drive assembly and remove it from the motor adapter located on top of the motor assembly.

Note: Be careful not to remove the gasket between the drive and motor, it is critical in keeping moisture out of the drive and motor. Replace the gasket if damaged. Do not reassemble with a damaged or missing gasket.



Illustrated Parts View

Drive Assembly Installation,

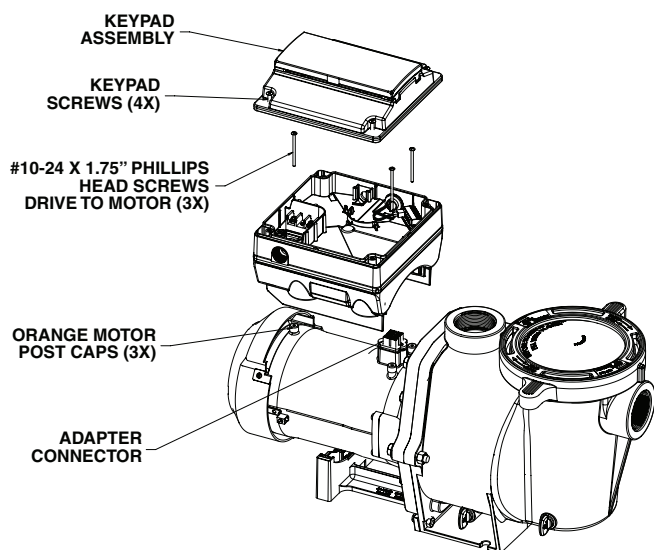


Before installing this product, read and follow all warning notices and instructions on page ii - iv.

To install the drive assembly onto the motor assembly:

1. Be sure all electrical breakers and switches are turned off before installing the drive.
2. Be sure that the gasket between the drive and motor is in place. It is critical in keeping moisture out of the drive and motor. Replace the gasket if damaged. Do not reassemble with a damaged or missing gasket.
3. Verify that the three (3) orange motor post caps are in position before placing the drive on the motor assembly.
4. Align the drive assembly with the motor adapter and seat the drive on the motor assembly.
5. Secure and tighten the drive assembly with the three (3) Phillips head screws.
6. Plug the keypad back into the drive.
7. Place the keypad in the desired orientation on the drive and reattach the four (4) screws in the corners of the drive.

Note: Ensure that the keypad cable is not being pinched between the drive and keypad.



Drive Assembly and Removal



FIRE and BURN HAZARD - The pump motor may run at a high temperatures. To reduce the risk of fire, do not allow leaves, debris, or foreign matter to collect around the pump motor. To avoid burns when handling the motor, shut off the motor and allow it to cool for 20 minutes before servicing. The pump provides an automatic internal cutoff switch to protect the motor from heat damage during operation.

TROUBLESHOOTING

WARNING



Always disconnect power to the 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 to serviceman, pool users or others due to electric shock. DO NOT attempt to adjust or service without consulting your dealer or a qualified pool technician. Read the entire Installation & User's Guide before attempting to use, service, or adjust the pool filtering system or heater.

Alerts and Warnings

The IntelliFlo® VS+SVRS Variable Speed Pump displays all alarms and warnings on the control panel display. When an alarm or warning condition exists, the corresponding light will be lit on the display.

All control panel buttons are disabled until the alarm or warning is acknowledged with the **Reset** button. Pressing the **Reset** button will clear the alarm once the fault condition has been resolved.

Note: The pump will not start if the impeller is rotating.

Power Out/OFF

The incoming supply voltage is less than required. The drive faults to protect itself from over current. The drive contains capacitors that keep it powered up long enough to save the current run parameters. If power is restored during this process, approximately 20 seconds, the drive will not restart until completed.

Priming Failure

If the pump is not defined as primed within the "Max Priming Time" it will stop and generate a "Priming Alarm" for 10 minutes, then attempt to prime again. The "Max Priming Time" is set by the user on the priming menu as discussed on page 15. If the pump cannot prime within five attempts it will generate a permanent alarm that must be manually reset.

Overheat

If the drive temperature gets above 54.4° C (130° F) the pump will slowly reduce speed until the over temperature condition clears.

Thermal Mode

When active, the motor will run at the preset RPM until the drive internal temperature increases above the minimum. The pump's internal thermal protection is disabled when connected to an automation system. Thermal protection is provided by selecting YES at the ON WITH FREEZE portion of the circuit function menu in the IntelliTouch® Control System. To re-enable the internal thermal protection, the power to the drive must be cycled off then back on. **Important: See explanation of Thermal Mode on page 18.**

Over Current

Indicated that the drive is overloaded or the motor has an electrical problem. The drive will restart 20 seconds after the over current condition clears.

Over Voltage

Indicates excessive supply voltage or an external water source is causing the pump and motor to rotate thereby generating an excessive voltage on the drives internal DC buss. The drive will restart 20 seconds after the over voltage condition clears.

Internal Error

Indicates that the self-monitoring motor control software has encountered an error. Clear the alarm and restart the pump. If this alarm persists, contact Pentair Technical Service at 1-800-831-7133.

SVRS Alarm

This Alarm indicates that the motor drive software has detected an event consistent with an Entrapment event. The pump was immediately turned off once the event was detected, and may restart according to settings in the SVRS Settings section on page 19.

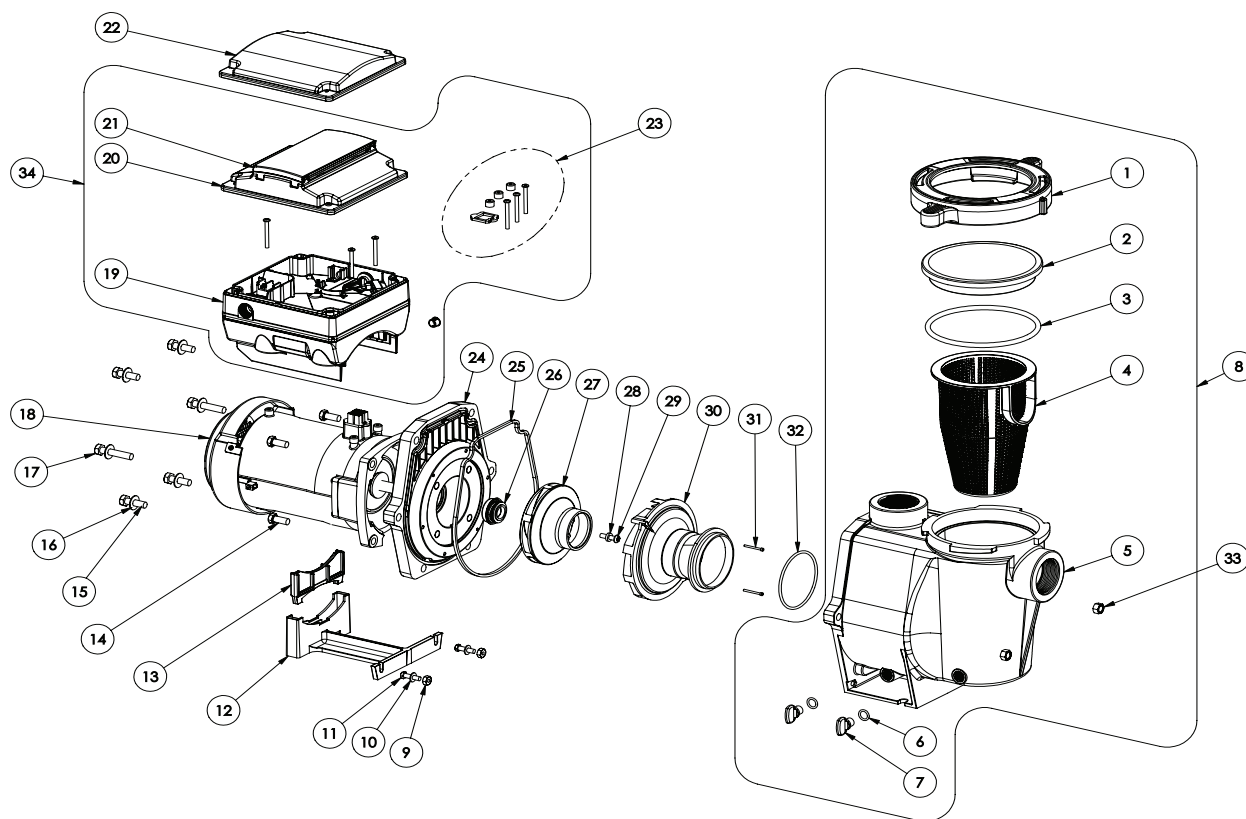
Troubleshooting Chart

Problem	Possible Cause	Corrective Action
SVRS Alarm.	Blocked suction/Blocked discharge. System flow too high. System changing flow too quickly. Vacuum level too high. Priming not enabled. Air in system. Suction cleaner.	Check for blockages in the inlet or outlet plumbing, pump strainer basket and pool skimmer basket(s). Clear any blockages found. A blocked discharge will cause the same problems as a blocked suction line. Reduce system flow, change operating speed. Reinstall the pressure gauge supplied with this pump into the front suction drain port in the strainer side of the housing. Run the pump at the maximum speed and confirm that the suction pressure has not exceeded 25 inHg. The more vacuum on the suction side of the pump, the higher the chance of cavitation in the impeller causing power changes that will be mistaken as entrapment events. If possible adjust plumbing and valves to reduce the vacuum levels on the suction side of the pump. Enable Priming from the "Priming" menu as shown on page 17. Bleed air from filter. Ensure that air bubbles are not visible coming into pump strainer basket. Suction cleaners can cause flow changes that the pump interprets as a suction event. Lower the speed of the pump and ensure that the suction vacuum level is not too high while operating the cleaner. If there is too much heavy debris in the pool, it may need to be manually cleaned before the suction cleaner can be run normally.
Repetitive SVRS alarms, and there is no blockage present.	In floor cleaning system issues. System pressure changes like those caused by opening check valves or internal bypass valves. Dirty filter.	In floor cleaning systems must be designed with balanced hydraulic losses on all legs. Some In floor systems are incompatible with SVRS. Lowering ramp speed below 200 RPM or addition of external manual valve controls, may resolve the issue. A dirty filter causes a higher operating pressure for the filtration system. It is harder for the SVRS detection to tell the difference between a true suction event and normal operation when the pressure of the system is high, especially if it is near shutoff pressure for the speed that the motor is running.
Repetitive SVRS Alarm during speed changes.	Issues related to other equipment, such as, Heat Pumps and Heaters with internal valves that move.	Adjust the ramping speed as shown on page 19. A lower ramp speed will solve some problems caused by tripping during speed changes. There may be a check valve or bypass valve in the system that is opening and causing the SVRS detection to sense an event. If the alarm always happens at a low speed while starting or changing speed, the minimum speed of the pump can be raised to avoid the trouble speed range. See page 10 to adjust the Min Speed.
Electrical problem. (For alert display messages, refer to Alerts and Warning on page 27).	Could appear as a "Low Voltage" alarm. Could appear as "Over Heat" alert.	Check voltage at motor terminals and at panel while pump is running. If low, see wiring instructions or consult power company. Check for loose connections. Check line voltage; if less than 90% or more than 110% of rated voltage consult a licensed electrician. Increase ventilation. Reduce ambient temperature. Tighten any loose wiring connections. Motor runs too hot. Turn power to motor off. Check for proper voltage. Check for proper impeller or impeller rubbing.
Inadequate circulation. (For alert display messages, refer to Alerts and Warning on page 27).	Filter or pump basket dirty. Suction/discharge piping is too small. Speed is set too slow for proper filtration cycle.	Check trap basket; if plugged, turn pump off and clean basket. Check and clean pool filter. Increase piping size. Increase filtration run time.

Troubleshooting Chart, (continued)

Problem	Possible Cause	Corrective Action
Reduced capacity and/or head. (For alert display messages, refer to Alerts and Warnings on page 27).	Air pockets or leaks in suction line. PRIMING FAILURE may be displayed. Clogged impeller. PRIMING FAILURE may be displayed. Pump strainer pot clogged. PRIMING FAILURE may be displayed.	Check suction piping and valve glands on any suction gate valves. Turn off electrical power to the pump and isolate the pump from the rest of the system. Remove the (6) bolts that holds the housing (strainer pot/volute) to seal plate. Slide the motor and seal plate away from the volute. Clean debris from impeller. If debris cannot be removed, complete the following steps: 1. Remove diffuser and o-ring. 2. Remove reverse-thread impeller screw and o-ring. 3. Remove, clean and reinstall impeller. 4. Reinstall reverse-thread impeller screw and o-ring. Reinstall diffuser, and o-ring. Reinstall motor and seal plate into volute. Reinstall seal plate nuts and volute and tighten securely. Clean suction trap. Clean pump strainer pot.
Pump failure. (For alert display messages, refer to Alerts and Warnings on page 27).	Pump will not prime - Air leak in suction. PRIME ERROR may be displayed. Pump will not prime - Not enough water. Pump does not come out of priming mode. Pump completes priming mode too early, and/or there is still a large amount of air in the housing. Pump stainer basket is clogged. Pump strainer gasket is defective.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air. Be sure the suction lines, pump, strainer, and pump volute are full of water. Adjust priming range to a higher setting (default setting is 5). Adjust priming range to a lower setting (default setting is 5). Clean pump strainer pot. Replace gasket.
Control panel LCD screen displays sporadically or flickers on/off.	Loose drive wiring connection.	Check the connection between the drive and keypad. See image on page 5. The drive wiring connection should be tight.
Mechanical troubles and noise.	The pump motor is running but with loud noise. Foreign matter (gravel, metal, etc.) in pump impeller. Cavitation. Speaking noise, especially evident at pump start-up or slow down.	If suction and discharge piping are not adequately supported, pump assembly will be strained. Do not mount pump on a wooden platform! Securely mount on concrete platform for quietest performance. Disassemble pump, clean impeller, follow pump service instructions for reassembly. Improve suction conditions. Increase pipe size. Decrease number of fittings. Increase discharge pressure. Inspect motor slinger and motor shaft seal behind the slinger (NOT the pump's mechanical seal). Apply lubrication to the motor shaft rubber seals.
Pump does not respond to IntelliTouch, EasyTouch, SunTouch, IntelliComm system commands.	Improper automation setup. Communication network inoperative.	1. Be sure that the communication cable is connected at both ends. 2. Check that the pump local address matches with the address used in the IntelliTouch control system. 3. Check that the pump has been assigned a circuit name on the IntelliTouch control system. 4. Ensure that the pump display says "DISPLAY NOT ACTIVE". A defective device on the network can inhibit the proper operation of other network device. Devices should be disconnected sequentially until the network starts working.

REPLACEMENT PARTS



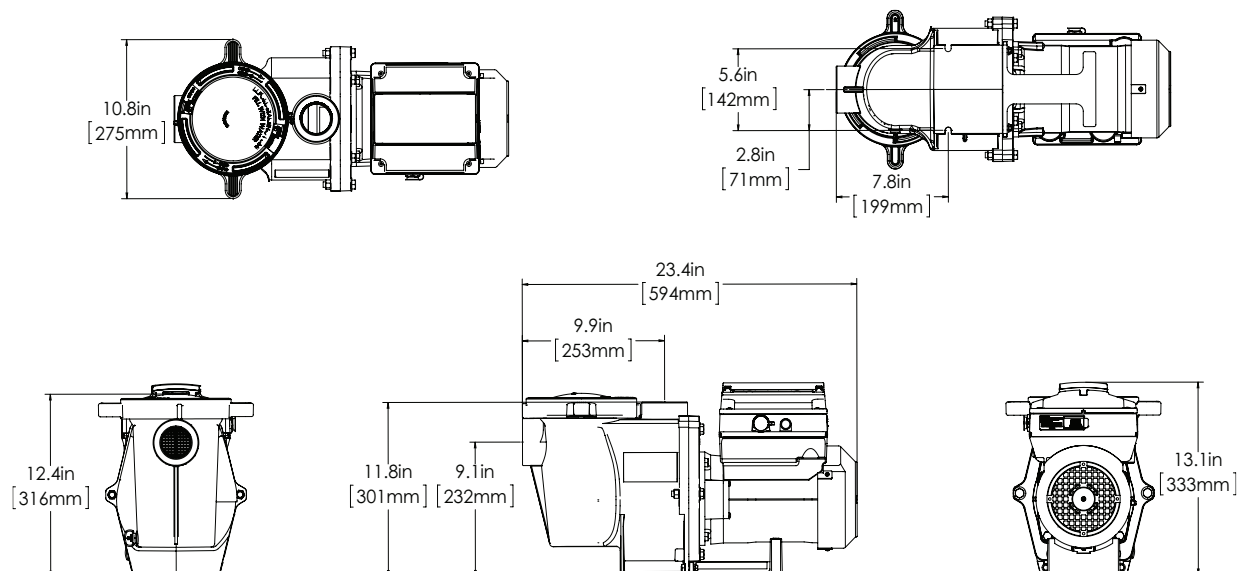
Item No.	Description	Almond Part #	Black Part #
1	Clamp, Cam and Ramp	357199	357150
2	See Through Lid	357151	
3	Lid O-ring	350013	
4	Stainer Basket	070387	
5	Volute	350015	357157
6	O-ring 112 for Drain Plug (Qty2)	192115	
7	Drain Plug (Qty2)	071131	357161
8	Volute Kit (Includes Item #1-7)	357243	357244
9	Nut, 1/4-20 Hex. SS (Qty2)	071406	
10	Washer, Flat 1/4" ID x 5/8" OD (Qty2)	072183	
11	Screw, 1/4-20 x 1" Hex Cap SS (Qty2)	071657	
12	Foot	070927	357159
13	Foot Insert, Pump Motor Support	070929	357160
14	Bolt, Hex Head 3/8-16 x .875" (Qty4)	070429	
15	Bolt, Hex Head 3/8-16 x 1.25" (Qty4)	070430	
16	Washer, Flat 3/8" ID x 7/8" OD (Qty6)	072184	
17	Bolt, Hex Head 3/8-16 x 2" (Qty2)	070431	
18	Motor, 3.2kW 10 Pole	350305S	350306S
19	Drive, Variable Speed	356910Z	356912Z
20	Keypad Assembly Kit (Includes Item #21)	357527Z	358527Z
21	Keypad Cover	400100	401100
22	Keypad Relocation Kit (Includes Relocation Cable and Blank Cover)	356904Z	356905Z

Item No.	Description	Almond Part #	Black Part #
23	Drive Hardware Kit (Includes Screws, Gasket and Screw Caps)	355685	
24	Seal Plate	074564	357158
25	Seal Plate Gasket	357100	
26	Mechanical Seal	071734S	
	Mechanical Seal, Ozone/Salt Resistant	071732S	
27	Impeller (Mfg. before 11/20)	073131	
	Impeller (Mfg. after 11/20)	356237	
28	Rubber Washer, Impeller Set Screw	075713	
29	Impeller Set Screw, 1/4-20 LH Thread	071652	
30	Diffuser (Mfg. before 11/20)	072928	
	Diffuser (Mfg. after 11/20)	356238	
31	Diffuser Set Screw, 4-40 x 1-1/8 (Qty2)	071660	
32	Diffuser O-ring	355227	
33	Nut, 3/8-16 Brass, Nickel Plated (Qty2)	071403	
34	Drive Kit Assembly (Includes Item #19-21 & 23)	356911Z	356913Z
-	50 Ft. Communication Cable	350122	
-	Seal Plate Kit w/ Mechanical Seal (Includes Item #24-26)	350202	350203
-	Volute and Seal Plate Kit (Includes Item #1-7 & 24-26)	357149	Not Available

(-) Not Shown

TECHNICAL DATA

Pump Dimensions



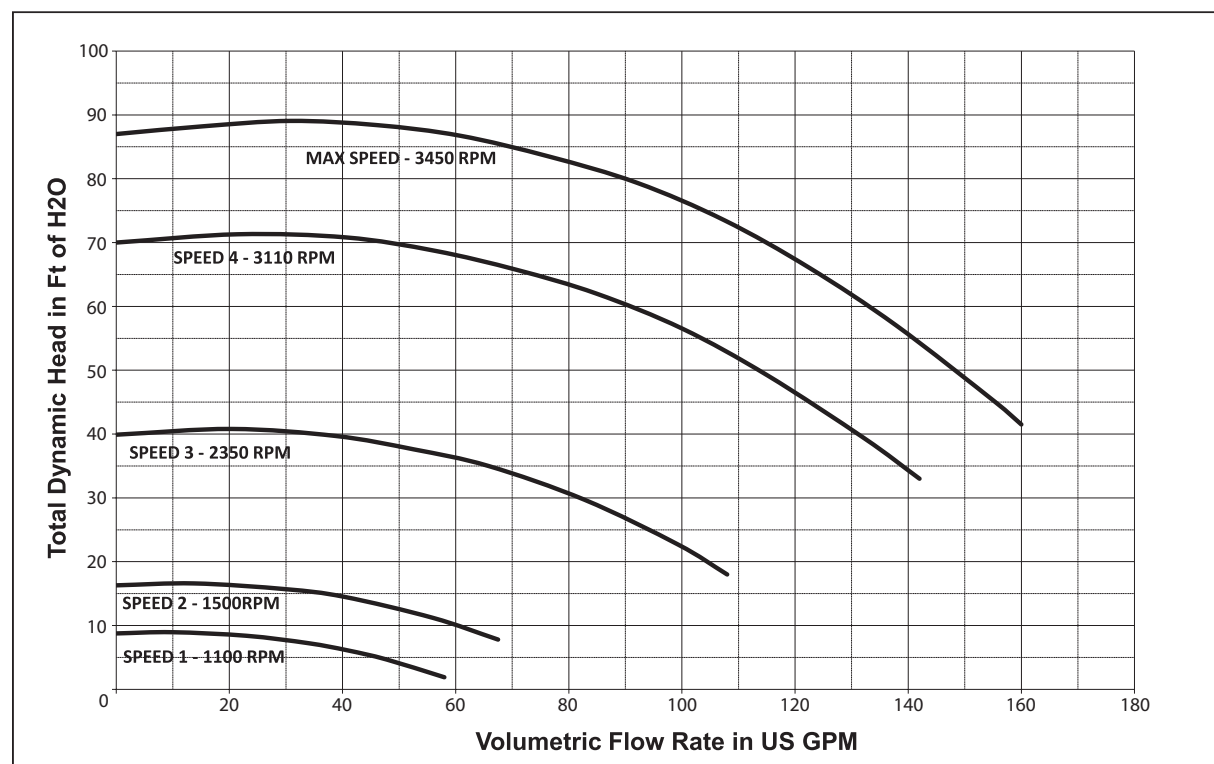
Electrical Specifications

Circuit Protection: Two-pole 20 AMP device at the Electrical Panel.

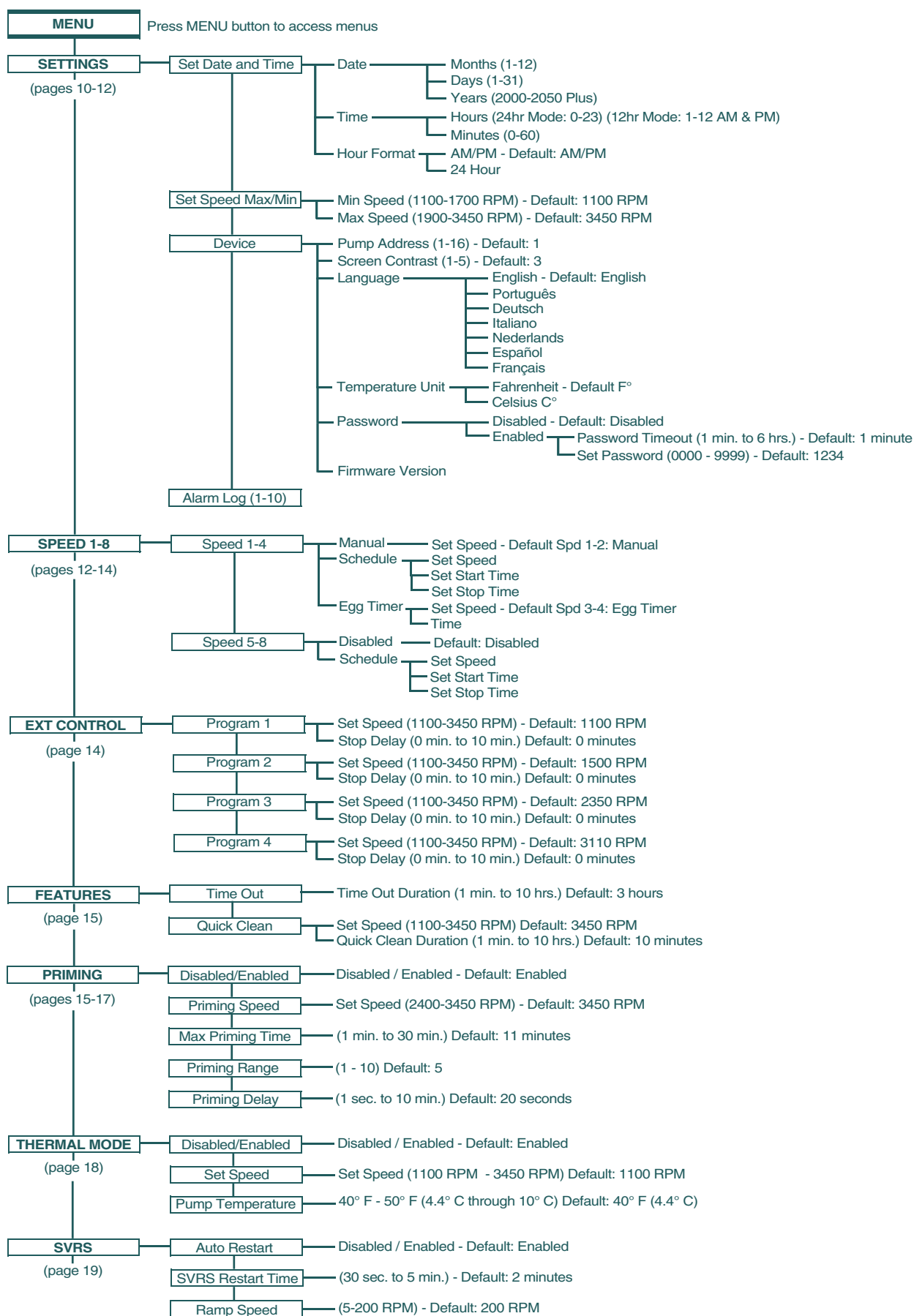
Input: 230 VAC, 50/60 Hz, 3200 Watts Maximum, 1 phase

WEF 6.9 THP 3.95

Pump Performance Curves



Operator Control Panel: Pump Menu Quick Reference Guide



NOTES

NOTES



LIT. PKG. P/N 356917



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