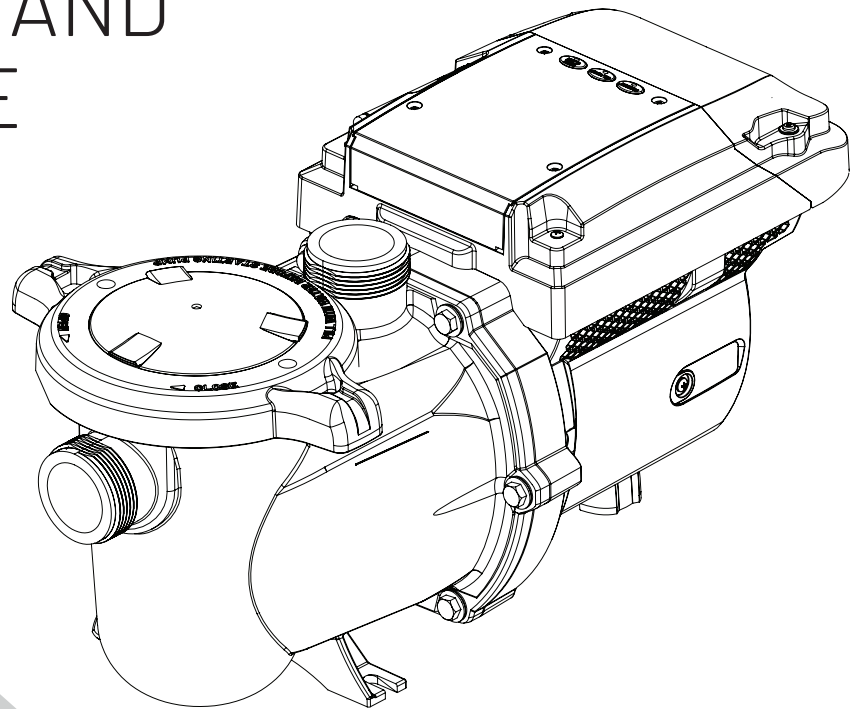




# INTELLIFLO3™ VSF

VARIABLE SPEED AND FLOW PUMP

## INSTALLATION AND SERVICE GUIDE



IMPORTANT SAFETY INSTRUCTIONS  
READ AND FOLLOW ALL INSTRUCTIONS  
SAVE THESE INSTRUCTIONS

# IMPORTANT SAFETY INSTRUCTIONS



## IMPORTANT NOTICE

This guide provides installation and operation instructions for this pump. Consult Pentair with any questions regarding this equipment.

**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.

## 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.

When installing and using this electrical equipment, basic safety precautions should always be followed, include the following:

**⚠ WARNING** Do not permit children to use this product.

**⚠ WARNING** **RISK OF ELECTRICAL SHOCK.** The pump must only be connected to sockets that have been installed properly in accordance with the regulations and are protected with a FI-safety switch (Residual-current device - RCD, 30mA).

**⚠ WARNING** This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (RCD). Such an RCD should be provided by the installer and should be tested on a routine basis. To test the RCD, push the test button. The RCD should interrupt power. Push the reset button. Power should be restored. If the RCD fails to operate in this manner, the RCD is defective. If the RCD 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.

### **⚠ CAUTION**

This pump is for use with permanent swimming 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 is capable of being readily disassembled for storage and reassembled to its original integrity.

### **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 IEC 60364 (Low-voltage electrical installations), IEC 60364-7-702 (Requirements for special installations or locations - Swimming pools and other basins) 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.
- Children should not be allowed to play with the appliance.

### **⚠ DANGER**

**FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH. THIS PUMP SHOULD BE INSTALLED AND SERVICED ONLY BY A QUALIFIED POOL SERVICE PROFESSIONAL. INSTALLERS, POOL OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS IN THE OWNER'S MANUAL BEFORE USING THIS PUMP. THESE WARNINGS AND THE OWNER'S MANUAL MUST BE LEFT WITH THE POOL OWNER.**

### **⚠ DANGER**

**SUCTION ENTRAPMENT HAZARD: STAY OFF THE MAIN DRAIN AND AWAY FROM ALL SUCTION OUTLETS!**



THIS PUMP PRODUCES HIGH LEVELS OF SUCTION AND CREATES A STRONG VACUUM AT THE MAIN DRAIN AT THE BOTTOM OF THE BODY OF WATER. THIS SUCTION IS SO STRONG THAT IT CAN TRAP ADULTS OR CHILDREN UNDER WATER IF THEY COME IN CLOSE PROXIMITY TO A DRAIN OR A LOOSE OR BROKEN DRAIN COVER OR GRATE.

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, BODY ENTRAPMENT, EVISCERATION AND/OR DEATH.

# IMPORTANT SAFETY INSTRUCTIONS

The suction at a drain or outlet can cause:

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

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

**Body Entrapment:** When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard is present when the drain cover is missing, broken or the cover flow rating is not high enough for the pump or pumps.

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

**Mechanical Entrapment:** When jewelry, swimsuit, hair decorations, finger, toe or knuckle is caught in an opening of an outlet or drain cover. This hazard is present when the drain cover is missing, broken, loose, cracked, or not properly secured.

**NOTE: ALL SUCTION PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL AND LOCAL CODES, STANDARDS AND GUIDELINES.**

**⚠ WARNING** TO MINIMIZE THE RISK OF INJURY DUE TO SUCTION ENTRAPMENT HAZARD:

- A properly installed and secured ANSI/ASME A112.19.8 approved anti-entrapment suction cover must be used for each drain.
- Each suction cover must be installed at least 1 meter apart, as measured from the nearest point to nearest point.
- Regularly inspect all covers for cracks, damage and advanced weathering.
- If a cover becomes loose, cracked, damaged, broken or is missing, replace with an appropriate certified cover.
- Replace drain covers as necessary. Drain covers deteriorate over time due to exposure to sunlight and weather.
- Avoid getting hair, limbs or body in close proximity to any suction cover, pool drain or outlet.
- Disable suction outlets or reconfigure into return inlets.

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

**For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)**

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



## ⚠ 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.

### General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- Install to provide drainage of compartment for electrical components.
- 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.

**⚠ 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 pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

## CUSTOMER SERVICE / TECHNICAL SUPPORT

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

### Customer Service

Customer service PISA, ITALY (8:30 AM to 4:30 PM CET)  
 +39 050716166 / +39 050716169  
 orders.pooleu@pentair.com  
 poolemea@pentair.com  
 www.pentairpooleurope.com

### Technical Support

e-mail: techsupport.poolemea@pentair.com  
 Hotline: +33 184280940

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\* Translated versions of this manual are available online at: <https://www.pentairpooleurope.com/>



# GENERAL INFORMATION

The IntelliFlo3 VSF Variable Speed and Flow Pump can be programmed to run at speeds or constant flow rates over set periods of time. This provides maximum operating efficiency and energy conservation for a variety of inground pools.

- The pump can operate at a percentage of maximum motor speed, or can be set to control its own speed and maintain a constant flow rate.
- Simply set a pump Flow Program to the desired flow rate, and the pump automatically adjusts to maintain the programmed flow rate. Programs can be set between 5 and 20 m<sup>3</sup>/h (1.5 HP models) or 5 and 32 m<sup>3</sup>/h (3 HP models).
- Up to 8 customizable programs that can be set for constant flow or speed in either Manual, Timer or Schedule modes.
- Programmable priming cycle with automatic detection of prime for easy start-up and automatic detection of loss of prime.
- Compatible with most cleaning systems, filters, and jet action spas.

## Available Accessories

- Drive-mounted Touchscreen Controller (P/N 356159Z - Almond, P/N 356348Z - Black)
- Relay Control Board (P/N 356365Z)
- Retrofit Riser Base Kits

Model	Replacing	Kit P/N
1.5 HP	UltraFlo	357831Z
	WhisperFlo	357831Z
	5P6R/La STA-RITE HD	357832Z
	Challenger	357832Z
3 HP	5P6R/La STA-RITE HD	357833Z
	Challenger	357833Z

## Motor Features

- Permanent-magnet, totally enclosed fan-cooled (TEFC) motor.
- Operates at lower temperatures due to high efficiency
- Designed to withstand outdoor environment
- Low noise

## Drive Features

The 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.

- WiFi and Bluetooth® Wireless Technology Connectivity
- Pentair Home App Compatibility
- RS-485 Digital Automation Connection
- Dry Startup Detection
- Loss of Prime Detection
- Smart Priming Control

# INSTALLATION

Only a qualified plumbing professional should install the pump. Refer to *IMPORTANT SAFETY INSTRUCTIONS*, page ii for additional installation and safety information.

**Note:** The pump should not be connected in series with other pumps.

## Location

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

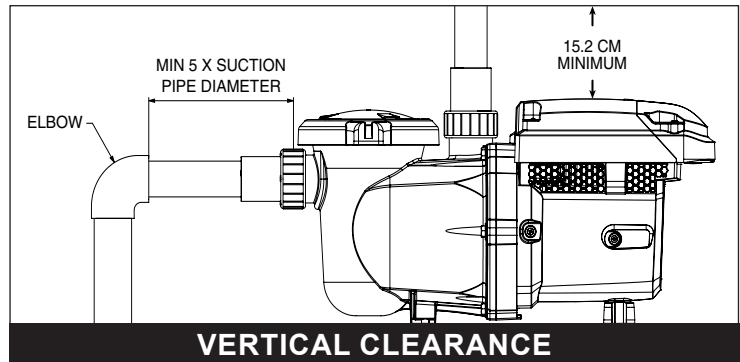
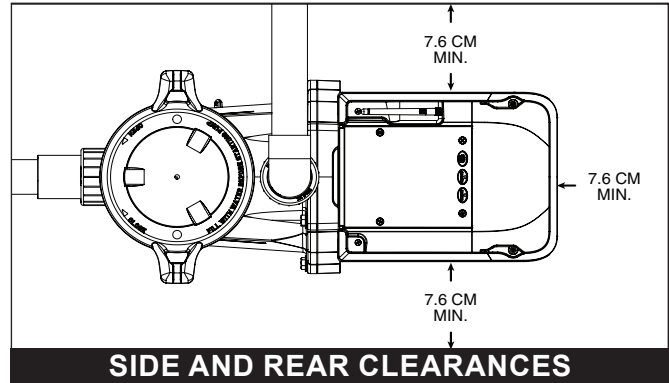
**Note:** Ensure that the pump is mechanically secured to the equipment pad.

**Be sure the pump location meets the following requirements:**

1. Install the pump a minimum of 1.5 m from the inside wall of the pool.
2. Install the pump a minimum of 0.9 m from a heater outlet.
3. Do not install the pump more than 3.1 m above the pool water level.
4. Provide at least 7.6 cm of side and rear clearance for motor disassembly and removal.
5. Provide at least 15.2 cm of top clearance for drive disassembly and removal.
6. Install the pump in a well ventilated location protected from excessive moisture, dirt and heat (i.e., rain gutter downspouts, sprinklers, etc.)

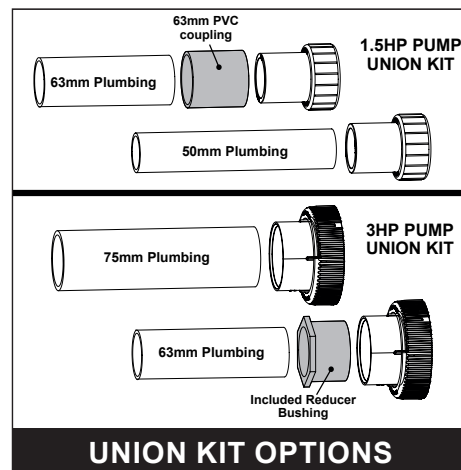
## Plumbing and Fittings

1. Provided union kit allows for easy plumbing to a variety of pipe diameters. See *UNION KIT OPTIONS*.
2. For improved plumbing a larger pipe size should be used.
3. To reduce friction loss and improve efficiency, short and direct suction and return lines are best.
4. Suction line diameter should be the same or larger than the return line diameter.
5. Do not install 90° elbows directly into the pump inlet or outlet.
6. Valves, elbows or tees installed in the suction line should be no less than 5 times the suction pipe diameter from the pump inlet.



## Valves

1. Flooded suction systems should have valves installed in both the pump suction and return lines. This allows the pump to be isolated during routine maintenance.
2. Install a check valve in the return line when using this pump for any application where there is significant height to the plumbing after the pump.
3. Install check valves when plumbing in parallel with another pump. This helps prevent reverse rotation of the impeller and motor.



# 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 IEC 60364 (Low-voltage electrical installations), IEC 60364-7-702 (Requirements for special installations or locations - Swimming pools and other basins) 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 wiring cover onto the field wiring compartment when leaving the pump unsupervised. This will prevent foreign matter (i.e. water, dust, etc.) from accumulating in the drive.

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

## Electrical Specifications

Model	Voltage (VAC)	Max Amps	Input (Hz)
1.5 HP	115/208-230	12.0/6.4-5.9	50/60
3 HP	208-230	12.4-11.2	50/60

**Circuit Protection:** Require RCD protection device, in accordance with IEC 60364 (Low-voltage electrical installations), IEC 60364-7-702 (Requirements for special installations or locations - Swimming pools and other basins) and local electrical codes. The drive will operate on 2-Phase Line-Line-Ground, as well as Line-Neutral-Ground electrical systems.

## Wiring

1. Ensure all appropriate electrical breakers and switches are turned off before wiring the motor.

## ⚠ WARNING

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

2. Ensure the supply voltage meets the requirements listed on the motor nameplate. If these requirements are not met, permanent motor damage may occur.
3. The pump should be permanently connected to its own independent RCD-protected circuit.
4. For wiring sizes and general electrical guidelines, please follow the specifications defined in IEC 60364 (Low-voltage electrical installations), IEC 60364-7-702 (Requirements for special installations or locations - Swimming pools and other basins) and any local codes as required.
5. Use strain reliefs and ensure all electrical connections are clean and tight.
 

**Note:** Any unused conduit openings should be sealed with the provided conduit plugs.
6. Cut all wires and conductors to appropriate lengths to help prevent conductors from arcing or overlapping once connected.

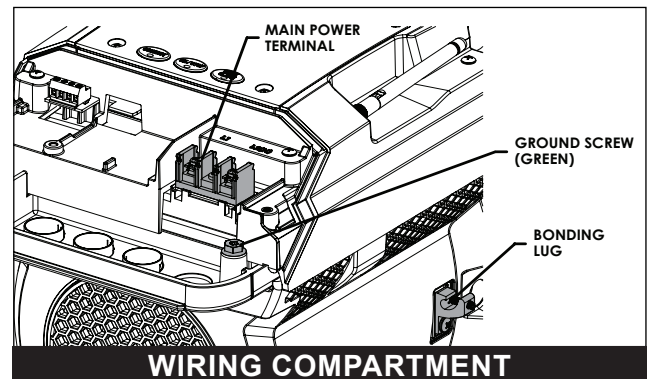
## Grounding

1. Permanently ground the drive using the green Ground Wire Screw and ensure the ground wire is connected to an electrical service ground.

## Bonding

1. Bond the motor to the structure in accordance with IEC 60364 (Low-voltage electrical installations), IEC 60364-7-702 (Requirements for special installations or locations - Swimming pools and other basins).
2. Use a solid copper bonding conductor not smaller than 2.5 mm<sup>2</sup>.
3. Run a wire from the bonding lug, found on the side of the motor, to the bonding structure.

Connect the wire to all metal parts of the pool, electrical equipment, metal conduit, and metal piping within 1.5 m of the inside walls of the pool.



## Connecting to an Automation System

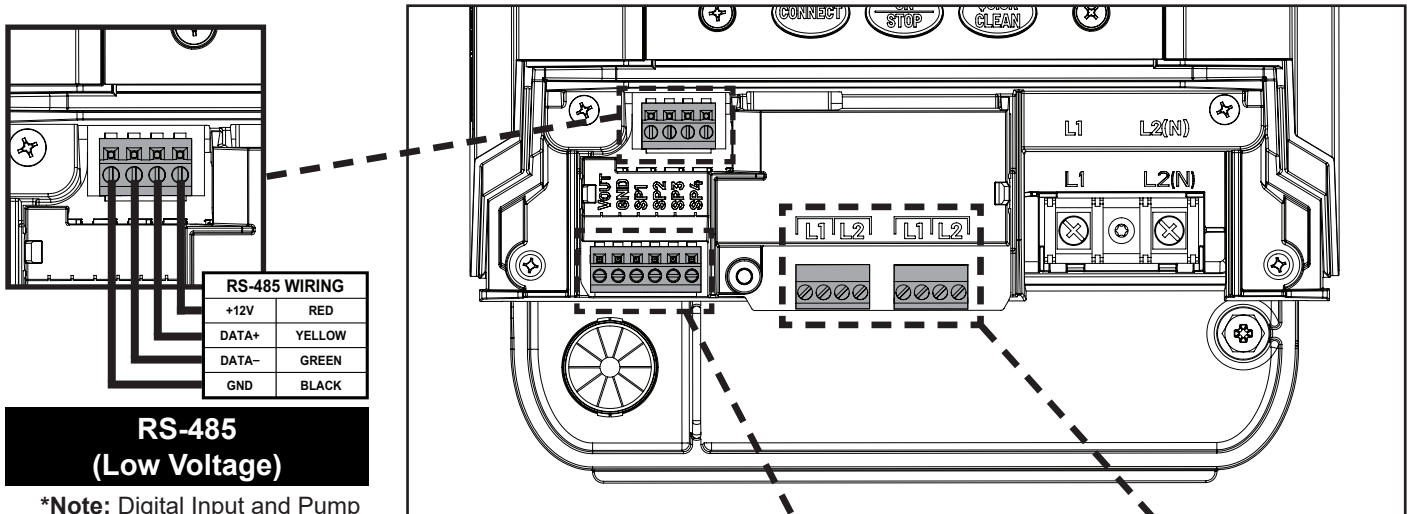
All IntelliFlo3 VSF pumps are compatible with Pentair IntelliPool®. (Firmware 5.10 or later revision)

For more information on the update procedure and to get latest firmware, please visit: <https://www.intellipool.eu/pool/poolLogin>

Use a 0.25 to 0.75 mm<sup>2</sup> two-conductor cable to connect a Pentair automation system to the pump.

Refer to the automation system manual for further details on connecting your pump to a specific automation system.

**WARNING** If operating the pump with a Pentair automation system, when the pump is disconnected from automation or in service mode it will continue operating according to the factory default programs/schedules. Ensure programs/schedules are edited or disabled before servicing the pump.



### RS-485 (Low Voltage)

\*Note: Digital Input and Pump Relay connections are only available if the optional Relay Control Board (P/N 356365Z) is installed.

## Relay Control Board Digital Inputs

If the optional Relay Control Board Kit (P/N 356365z) is installed, the board's digital inputs can be connected to an automation system in order to control four customizable speed or flow programs.

**Note:** If multiple external input triggers are received, programs will follow the following priority:

PROGRAM 4 > 3 > 2 > 1.

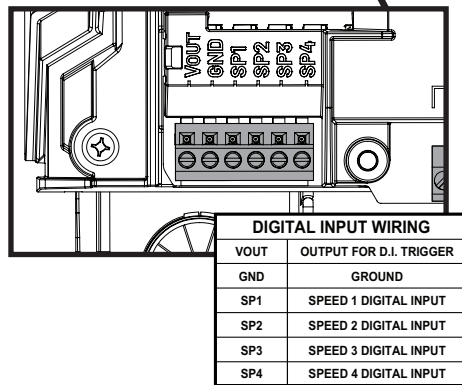
**Note:** If the pump has been stopped via the ON/STOP button (ON/STOP LED is solid red), ON/STOP must be pressed again before the pump will operate.

When a low voltage signal is received by a control board digital input, the pump will run the program set to that specific digital input. This digital input program will override any scheduled programs, automation or manual input.

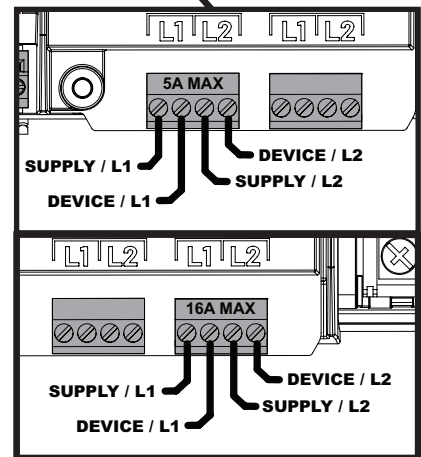
**Note:** Refer to the Pentair Home User's Guide for instructions on viewing and editing the pump programs.

The Relay Control Board also provides a +12V Output Signal (marked VOUT) that can be used to trigger its own Digital Inputs. This output signal is the recommended input for Speed Digital Inputs.

The output signal will need to be switched via an External Control (i.e. automation relay, external system component switch) to activate the disired speed program.



### DIGITAL INPUTS\* (Low Voltage)



### PUMP RELAYS\*

#### Common Devices Wired to Relays

5A (Left-side)	Salt Chlorine Generator
	Pool Light / Transformer
16A (Right-side)	Booster Pump
	Single Speed Pump
	Spa Blower

# OPERATION

**⚠ WARNING** Before starting the pump, ALWAYS follow the instructions below. Failure to follow these instructions could result in property damage and/or personal injury.

1. Open the filter's air relief valve.
2. Open all suction and return line valves.
3. Ensure pool return line is completely open and clear of any blockages.
4. Ensure the strainer pot is filled with water.
5. Stand clear of the filter or other pressurized vessels.

**⚠ CAUTION** Never allow the pump to run without both halves of the motor shroud installed. Operating the pump without motor shrouds installed may cause the drive to overheat and damage the drive.

## Drive Controls/Buttons

Refer to *Drive LED Indicators*, page 18 for a list of drive LED behaviors.

**CONNECT:** Press to connect the pump to the Pentair Home app. Refer to the *IntelliFlo3 VSF User's Guide* for instructions.

**ON/STOP:** Press to enable or disable the pump. Pressing this button will either begin the priming cycle and then run the appropriate program or deactivate the pump. If the pump is deactivated, the ON/STOP button must be pressed again before the pump will operate.

**QUICK CLEAN:** Press to manually start the Quick Clean program. This program can be edited through the optional touchscreen or within the Pentair Home app.

## Priming the Pump

**⚠ WARNING** Do NOT run the pump dry. If the pump is run dry, the shaft seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced.

**⚠ WARNING** 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.

This pump is shipped with Priming ENABLED. Unless the priming settings are changed, the pump will speed up to the maximum speed when the pump is powered on for the first time, and the ON/STOP button is pressed.

The pump must be filled with water and primed before initial startup and after servicing. To avoid permanent damage to the pump, follow the instructions below.

Refer to the *IntelliFlo3 VSF User's Guide* for a list of Pentair Home priming settings and programming instructions.

**Note:** If programming priming via the optional Drive-mounted Touchscreen Controller, refer to *Priming Parameters*, page 11.

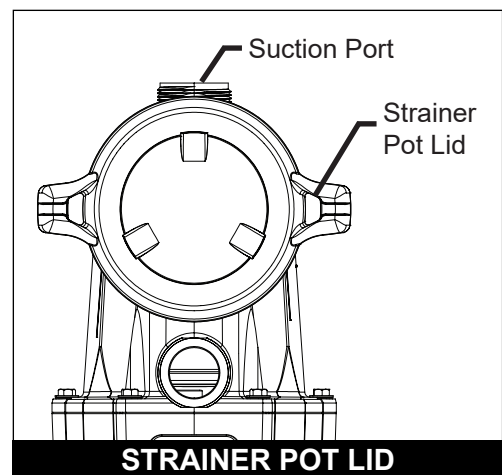
### TO PRIME THE PUMP:

1. Press ON/STOP to stop the pump and disconnect all power to the pump at the circuit breaker.
2. Close all valves in suction and return lines.

3. Open the filter's air relief valve and relieve all pressure from the filtration system.
4. Turn the Strainer Pot Lid counter-clockwise and remove it from the pump.
5. Fill the strainer pot up to the Suction Port with water.
6. Place the lid onto the strainer pot and tighten until the lid handles are perpendicular to the suction port.
 

**Note:** Ensure the lid O-ring is properly seated and is not being pinched between the lid and strainer pot.
7. Open all valves in suction and return lines.
8. Open the filter's air relief valve and stand clear of the filter.
9. Reestablish power to the pump at the circuit breaker.

- Continue to the next page -



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

**⚠ CAUTION** This is a variable speed pump. Typically lower speeds are used for filtration and heating. Higher speeds can be used for spa jets, water features, and priming.




## Priming the Pump (continued)

10. Press ON/STOP to start the pump.  
The pump will begin to prime (if enabled) and ramp up to the programmed priming speed.
11. When a steady stream of water appears from the air relief valve, close the valve.
12. Do not allow your pump to run longer than 30 minutes without successfully priming.  
If the pump does not prime, check your priming settings or refer to *TROUBLESHOOTING*, page 18.

## Optional relay control board (P/N 356365Z)

Follow the instructions below to ensure proper installation and relay wiring.

Installing the Relay Control Board allows for remote control of the IntelliFlo3 pump via digital input connections.



**⚠ WARNING** RISK OF ELECTRICAL SHOCK OR ELECTROCUTION. 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.

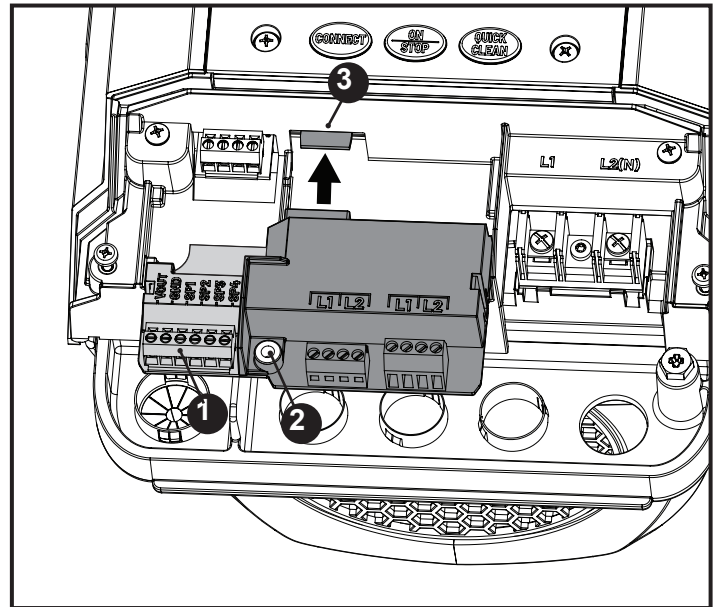
## Installing the Relay Control Board

The relay control board is shipped as a complete assembly. Ensure the Low Voltage Terminal (1) and Retaining Screw (2) are in place before installing the control board.

1. Disconnect all power to the pump at the main circuit breaker.

**⚠ WARNING** STORED CHARGE - Wait at least sixty (60) seconds before opening the wiring compartment.

2. Unfasten the two screws securing the wiring compartment cover to the pump.
3. Remove the wiring compartment cover and place it aside.
4. Remove the Control Board from its packaging.
5. Position the Control Board into the wiring compartment as shown to the right.
6. Gently slide the Control Board onto the pump's Drive Connector (3).
7. Firmly press the Control Board onto the Drive Connector (3).
8. Secure the Control Board to the pump using the included Retaining Screw (2).
9. Continue to Wiring the Control Board.



## Wiring the Control Board

All wiring conductors should be 4 mm<sup>2</sup>.

### Low Voltage Terminal

The left side of the control board features a 6-pin terminal intended for low voltage communication signals.

1. Strip the cable 9 mm.
2. Strip each conductor 6.4 mm.
3. Wire the low voltage device to the board as described to the right.

### High Voltage Terminals

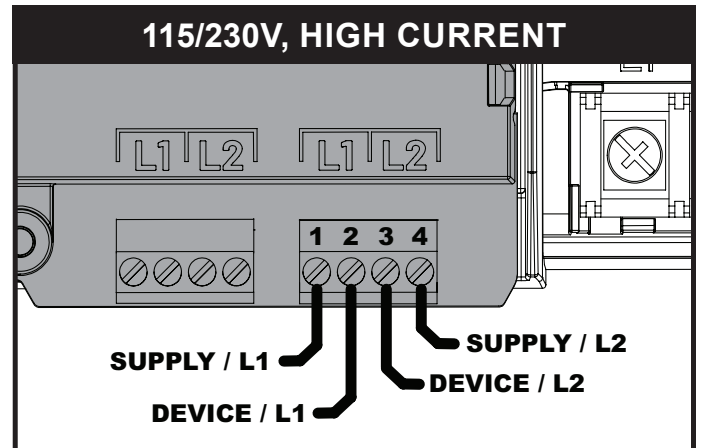
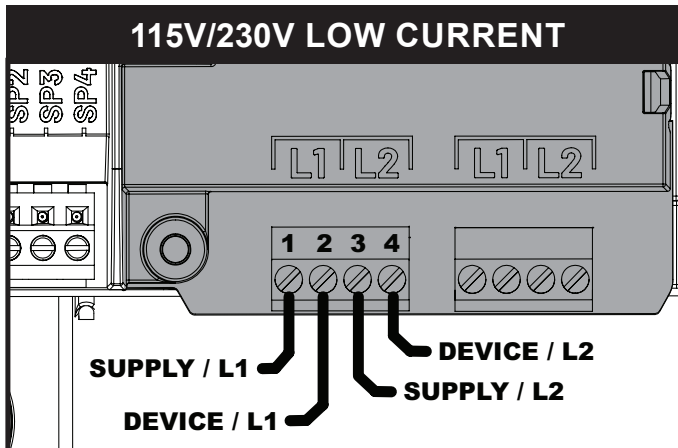
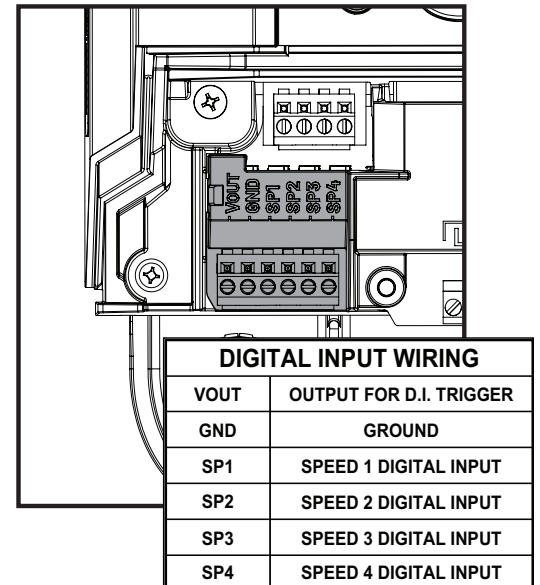
The right side of the control board features two 4-pin terminals, intended for incoming and outgoing 115VAC and/or 230VAC.

1. Verify the amperage of the device you are connecting to the board and determine the appropriate terminal.

The **left terminal block** is rated to a maximum of 5A and should be used for lower current connections.

The **right terminal block** is rated to a maximum of 16A and should be used for higher current connections.

2. Strip each conductor 6.4 mm.
3. Wire the device to the appropriate terminal as illustrated below..



## Optional Touchscreen Operation

Pentair offers an optional Drive-mounted Touchscreen Controller (Almond - P/N 356159Z, Black - P/N 356348Z) for the IntelliFlo3 VSF pump.

The touchscreen controller allows you to edit and program your pump settings from the equipment pad. The following sections provide instructions for using your touchscreen.

### Pump Dashboard

The Pump Dashboard is your pump's home screen. Basic pump info, run status and programming can be viewed from this screen.

If any pump alerts and problems are present they will also display on this screen as well.

**1- Alerts Status:** Display active pump alerts and warnings.

**2- See Running Programs:** View and edit your pump's current programs. Refer to *Program Setup, page 9*.

**3- Current Run Data:** Displays the current pump state and program run data when the pump is running.

**4- Relay Status:** Displays the status (ON/OFF) of devices connected to the pump's 5A and/or 16A relay terminals.

**Note:** Relay statuses will only display if the optional Relay Control Board (P/N 356365Z) is installed.

**5- Pump Dashboard (🏠):** Return to the Pump Dashboard (this screen) from any screen.

**6- Alerts (⚠️):** Display active pump alerts and warnings from any screen.

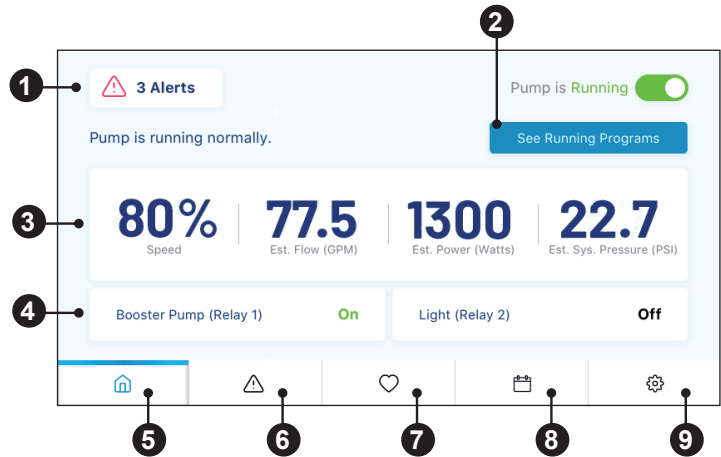
A dot to the right of the alert icon signifies an active alert or warning.

**7- Favorite Programs (♡):** Display favorited programs from any screen.

A program can be favorited by tapping the Heart icon in the top right corner of a program editing screen. Refer to *Program Setup, page 9*.

**8- Schedules (📅):** View and edit programs from any screen. Refer to *Program Setup, page 9*.

**9- Device Settings (⚙️):** View and edit device settings from any screen. Refer to *Limits Parameters, page 12*.



## Program Setup

### Pump Dashboard > See Running Programs

All pump programs can be individually set and edited from the See Running Programs screen, accessed from the Pump Dashboard screens.

### PUMP DASHBOARD SCREEN

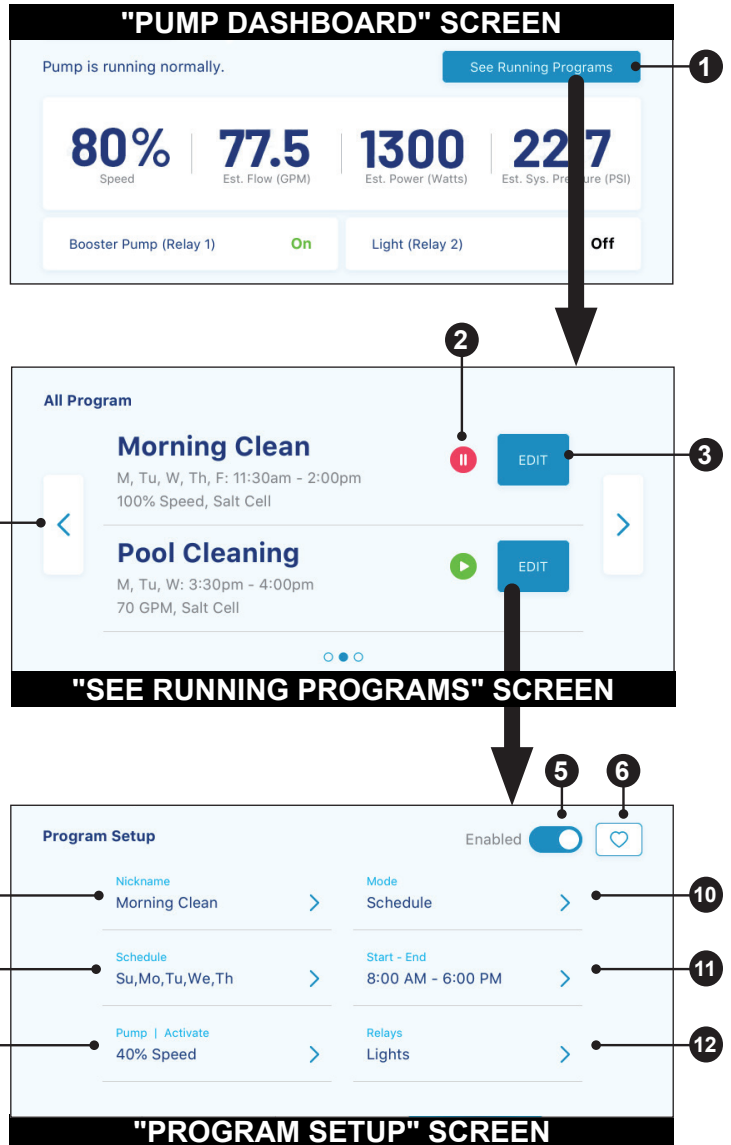
- 1- **See Running Programs:** View and edit your pump's current programs.  
Opens the See Running Programs screen.

### SEE RUNNING PROGRAMS SCREEN

- 2- **Activate/Deactivate Program:** Tap the Pause Icon (⏸) to deactivate a program. The program will not run until it is reactivated.  
Tap the Run Now Icon (▶) to activate a program.
- 3- **Edit Program:** Edit or view a particular program.  
Opens the Program Setup screen.
- 4- **Scroll Programs:** Scroll through both active and inactive programs currently programmed for the pump.

### PROGRAM SETUP SCREEN

- 5- **Enable/Disable Program:** Enable or disable the program currently being edited.
- 6- **Favorite Program:** Add/remove programs to or from your list of favorites. The program will show up in your list of favorited programs accessed from the (♡) icon.
- 7- **Nickname:** Set the program nickname. This will be the name the program displays on the See Running Programs and Pump Dashboard screens.
- 8- **Schedule:** Set which days of the week the program will activate the pump.  
**Note:** This option will only appear when editing a Schedule program.  
**Note:** If setting a Timer program, "Schedule" will be replaced by "Timer".
- 9- **Pump | Activate:** Set the speed or flow that a program will run when activated.
- 10- **Mode:** Select which type of program you wish to setup.  
MANUAL and TIMER programs will not resume after they are overridden by another program or manually stopped by the user.
  - **Manual:** The program will only run, at the set speed or flow, when manually activated.
  - **Timer:** The program will only run, at the set speed or flow and duration, when manually activated.
  - **Schedule:** The program will run on the days and times, and at the speed or flow, that are programmed.
- 11- **Start - End:** Set the time of day, on the days of the week, that a Schedule program will activate and deactivate the pump.  
**Note:** This option will only appear when editing a Schedule program.
- 12- **Relays:** Set which relay devices will activate when the program is running.  
**Note:** This option will only display if the optional Relay Control Board (P/N 356365Z) is installed.

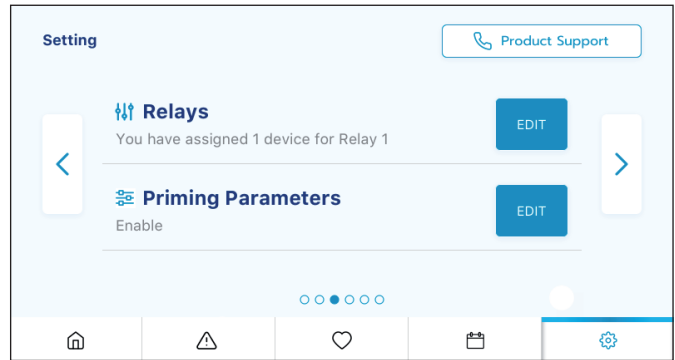


## Device Settings

Device Settings can be accessed by pressing the Device Settings gear icon (⚙️) in the bottom-right of the Pump Dashboard.

**Tap EDIT to enter any of the menus described below:**

- 1- **Product Overview:** View general information about your IntelliFlo3 VSF such as device nickname, address or software version.
- 2- **Screen Orientation:** Choose how the screen is displayed.  
The screen can be shifted to four different orientations to best fit a specific install.
- 3- **WiFi:** View WiFi network information and signal strength.
- 4- **Brightness and Delays:** View and edit screen brightness, dimming and timeout settings.
- 5- **Relays:** View and edit your current pump relay device settings.  
Refer to *Relay Settings, page 11*.  
**Note:** This option will only display if the optional Relay Control Board (P/N 356365Z) is installed.
- 6- **Priming Parameters:** View and edit your pump's priming settings.  
Refer to *Priming Parameters, page 11*.
- 7- **Limits Parameters:** View and edit your pump's speed, flow and pressure limits.  
Refer to *Limits Parameters, page 12*.
- 8- **Thermal Mode:** View and edit the your pump's Thermal Mode temperature set point and speed/flow settings.
- 9- **Automation Configuration:** View and edit the pump address associated with your automation system.  
**The pump address entered on this screen must match the address in the automation system. If addresses do not match, the pump can not communicate with an automation system.**
- 10- **Ramping Speed:** Determine how quickly your pump will ramp up or down on startup or when changing speeds/flows.  
Ramping Speed can be set to FAST, MEDIUM or SLOW.
- 11- **Languages:** Select the language you wish your touchscreen controller to display.





## Relay Settings

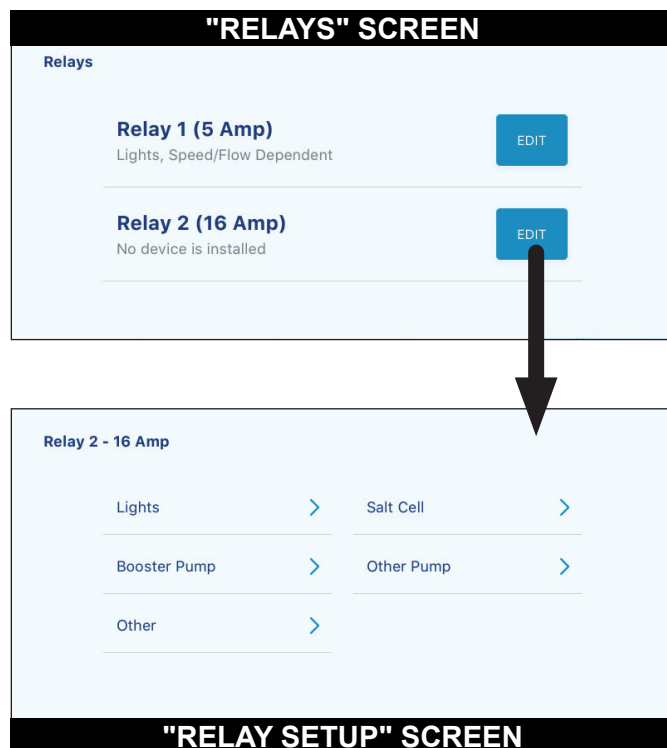
### Pump Dashboard > Device Settings > Relays

The following functionality is only available if the Pentair Relay Control Board (P/N 356365Z -- sold separately) has been installed on your pump.

The relay board includes two high-voltage terminals capable of controlling pool lights, salt chlorine generators, booster pumps or other filtration system components. One terminal is intended for 5A max low-current connections and the other for 16A max high-current connections.

#### Tap **EDIT** to view and edit your connected devices:

- 1- Device Type:** Select the device connected to a particular relay.
  - **RELAY 1 Options:** Lights, Salt Cell or Other
  - **RELAY 2 Options:** Lights, Salt Cell, Booster Pump or Other
- 2- Device Nickname:** Enter the name you want your device to display on Program Setup screens.
- 3- Speed/Flow Dependent:** Check this box to ensure the relay is only activated when the pump is running.



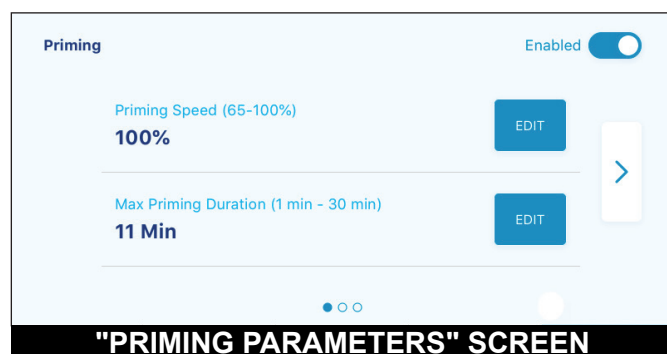
## Priming Parameters

### Pump Dashboard > Device Settings > Priming Parameters

All priming settings can be edited and set from this screen.

#### Tap **EDIT** to view and edit the following priming settings:

- 1- Enabled/Disabled:** ENABLED allows the pump to detect whether or not the system is properly primed for pump startup.  
**If prime is not detected the pump will enter a priming cycle, based on the settings below.**
- 2- Priming Speed:** Set the speed the pump will run during a priming cycle.
- 3- Max Priming Duration:** Set the maximum amount of time the pump will attempt to prime.  
 If the pump does not achieve prime during this time a priming error will display and the pump will stop.
- 4- Priming Range:** Set the sensitivity of pump prime detection.  
 Lower settings require higher flow to detect a successful prime.
- 5- Priming Delay:** Set the amount of time the pump remains at priming speed before transitioning to the selected program.
- 6- Loss of Prime:** ENABLED allows the pump to detect low-flow or no-flow situations while running.  
 If a loss of prime is detected the pump will pause and attempt to prime, based on the settings above. If priming is successful the pump will continue programmed operation.



## Limits Parameters

### Pump Dashboard > Device Settings > Limits Parameters

Set and edit pump speed, flow and pressure limits. These settings will ensure your pump does not operate outside of the programmed parameters.

Tap **EDIT** to view and edit the following speed, flow and pressure limits:

**1- Minimum/Maximum Speed:** Set the absolute minimum and maximum speeds the pump will be allowed to run. Pump run speed will never run under or over these two settings.

**2- Minimum/Maximum Flow:** Set the absolute minimum and maximum flow rate the pump will be allowed. Pump flow rate will never fall under or exceed these two settings.

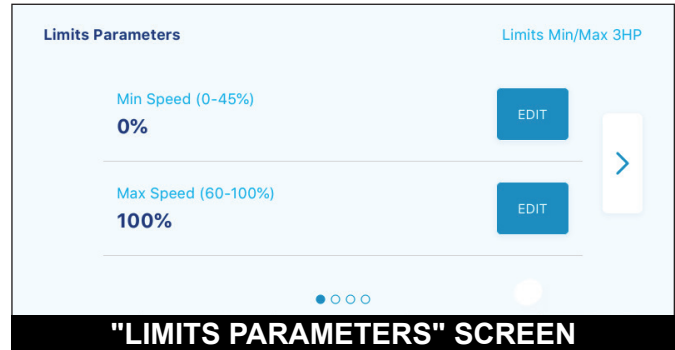
**Note:** These minimum and maximum flow rates only apply to Flow Programs. To apply these settings to Speed Programs as well, the next setting (Flow Limit - Speed Programs) must be enabled.

**3- Flow Limit (Speed Programs):** Enable or disable minimum and maximum flow rate limits for Speed Programs.

**4- Max Pressure:** Set the absolute maximum system pressure the pump will be allowed to produce. Pump flow rate will never exceed this setting.

**Note:** The maximum pressure setting only applies to Flow Programs. To apply these settings to Speed Programs as well, the next setting (Pressure Limit - Speed Programs) must be enabled.

**5- Pressure Limit (Speed Programs):** Enable or disable maximum system pressure limit for Speed Programs.



# MAINTENANCE

**⚠ WARNING** Always disconnect power to the pump at the circuit breaker and relieve pressure in the filtration system 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 and Maintenance Guide before attempting to use, service, or adjust the pool filtering system or heater.

**⚠ WARNING** Do NOT open the pump 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, ensure the suction and return 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 pot is located at the front of the pump and houses the pump strainer basket.

The strainer basket can be viewed through the strainer pot lid and should be visually inspected at least once a week. Regularly emptying and cleaning the strainer basket will lead to higher filter and heater efficiency and prevent unnecessary stress on the pump motor.

### TO CLEAN THE STRAINER BASKET:

1. **Press ON/STOP to stop the pump and disconnect all power to the pump at the circuit breaker.**
2. **Open the filter's air relief valve and relieve all pressure from the filtration system.**
3. Turn the strainer pot lid counter-clockwise and remove it from the pump.
4. Remove debris and rinse out the basket. Replace the basket if it is cracked or damaged.
5. Place the basket into the strainer pot. Ensure the opening in the front of the strainer basket is aligned with the suction outlet.
6. Fill the strainer pot up to the suction port with water.
7. Clean the lid O-ring and sealing surface of the strainer pot.

**Note:** It is important to keep the lid O-ring clean.

8. Reinstall the lid by placing it onto the strainer pot and tightening clockwise until the lid handles are perpendicular to the suction port.

**Note:** Ensure the lid O-ring is properly placed and is not being pinched between the lid and strainer pot.

9. Open the filter air relief valve and stand clear of the filter.
10. Reestablish power to the pump at the circuit breaker and start the pump.
11. When a steady stream of water flows from the filter air relief valve, close the valve.

**⚠ WARNING** **THIS SYSTEM OPERATES UNDER HIGH PRESSURE.** When any part of the circulating system 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

**⚠ CAUTION** Do NOT rely solely on Thermal Mode to protect your filtration system from freezing temperatures. Thermal Mode is based on the internal drive temperature and may not reflect actual air temperature.

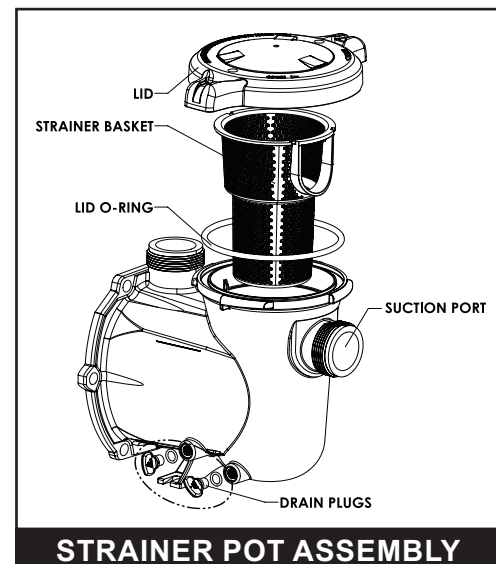
You are responsible for determining when freezing conditions may occur. If freezing conditions are expected, take the following steps to reduce the risk of freeze damage. **Freeze damage is not covered under warranty.**

In mild climate areas, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.

### TO PREVENT FREEZE DAMAGE:

1. **Press ON/STOP to stop the pump and disconnect all power to the pump at the circuit breaker.**
2. **Open the filter's air relief valve and relieve all pressure from the filtration system.**
3. Remove both drain plugs from the bottom of the strainer pot and drain the pump. Store the plugs in the strainer basket.
4. Cover the motor to protect it from severe rain, snow and ice.

**Note:** Do not wrap motor with plastic or other air tight materials during winter storage. Never cover the motor when operating or expecting operation.



**STRAINER POT ASSEMBLY**

# SERVICING

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**⚠ WARNING** 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 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 and Maintenance Guide before attempting to use, service, or adjust the pool filtering system or heater.

**⚠ WARNING** Do NOT open the pump 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, ensure the suction and return 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. Maintain a minimum clearance of 7.6 cm behind the motor fan to allow proper circulation and pump maintenance.

### Protect against dirt and chemicals

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.
5. Periodically check for debris under the motor shrouds and clean it out. Refer to *Pump Disassembly, page 15*.

### 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. If the optional drive-mounted touchscreen is installed, ensure the cover is closed when not in use.

## Pump Disassembly

### TOOLS REQUIRED:

- Socket Wrench and 9/16" Socket
- 1/4-inch Hex-head Wrench
- No. 2 Phillips-head Screwdriver

### TO DISASSEMBLE THE PUMP:

1. **Press ON/STOP to stop the pump and disconnect all power to the pump at the circuit breaker.**
2. Close all valves in suction and return lines.
3. **Relieve all system pressure using the filter air relief valve.**
4. Remove both Drain Plugs from the Strainer Pot and drain the pump.
5. Using a 9/16" wrench, remove the six or eight Strainer Pot Bolts securing the Strainer Pot to the Motor/Hydraulic Assembly.
6. Gently separate the Motor/Hydraulic Assembly from the Strainer Pot.
7. Remove the two or three Phillips-head Diffuser Screws. Remove the Diffuser from the Motor/Hydraulic assembly.
8. At the rear of the motor, insert a 1/4" hex-head driver into the hole in the middle of the motor fan cover.
9. While holding the motor shaft in place with the 1/4" driver, remove the Impeller by rotating it counter-clockwise.
10. Loosen the two captive Phillips-head Wiring Cover Screws. Remove the Wiring Cover from the drive.
11. Disconnect main power wiring from the drive.
 

**Note:** If the optional Relay Control Board (P/N 356365Z) is installed, remove the automation terminal blocks from relay board and disconnect any relay connections.
12. Remove the four Phillips-head Drive Cover Screws. Remove the Drive Cover from the drive.
13. Remove the four Phillips-head Drive-to-Motor Screws.
14. Gently separate the drive from the motor and place it aside.
15. Disconnect the bonding wire from the bonding lug.
16. Remove two Phillips-head Shroud Screws on each side of the motor and remove both halves of the Motor Shroud from the motor.
17. Using a 9/16" wrench, remove the four Motor Bolts securing the Seal Plate to the motor.
18. Remove the Spring Seal from the motor shaft and place it aside.
19. If replacing the Shaft Seal, place the Seal Plate face down and tap out the white Ceramic Seal.

## Pump Reassembly

1. If installing a new Shaft Seal:



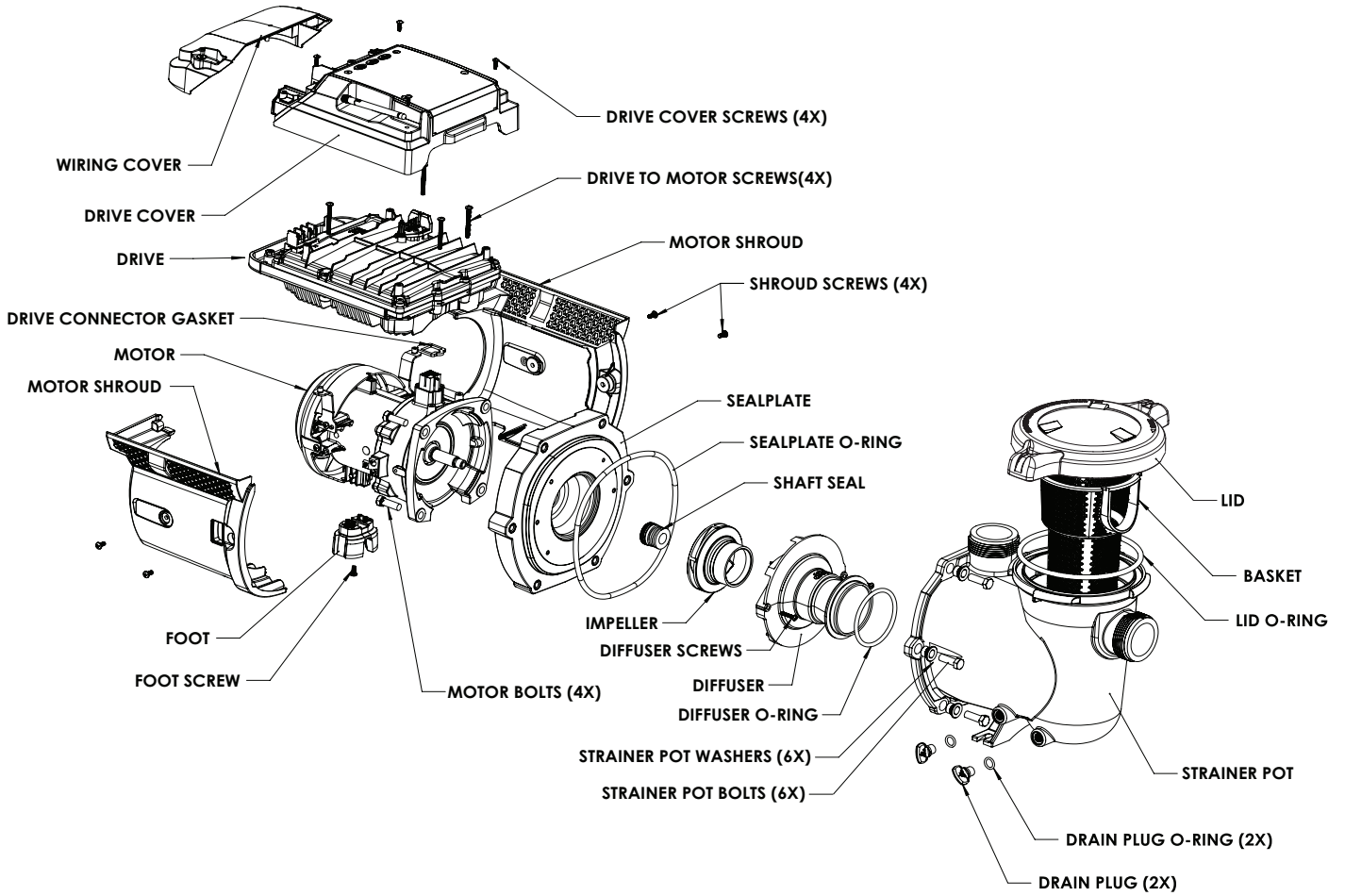
Scratching, marring or otherwise damaging the polished shaft seal faces will cause the seal to leak. Always handle the shaft seal faces with care and clean them thoroughly before reassembling the pump.

- a. Clean the seal plate's seal cavity and the motor shaft using mild detergent and water.
  - b. Lubricate the black rubber portion of the ceramic seal with water.
  - c. With the white ceramic face outwards, press the seal into the seal plate with your thumbs.
2. Reinstall the seal plate onto the motor.
  3. Reinstall both halves of the Motor Shroud onto the motor.
  4. Using a clean cloth, remove any debris from the face of the Ceramic Seal.
  5. With the flat metal face outwards, place the Spring Seal onto the motor shaft. The carbon face should seat against the Ceramic Seal.
  6. While holding the motor shaft in place with a 1/4" driver, reinstall the impeller onto the motor shaft.
  7. Reinstall the Diffuser onto the Seal Plate.
  8. Ensure the gasket is properly seated onto the drive connector and reinstall the drive onto the motor.
  9. Reconnect the main power and bonding lines to the pump.
 

**Note:** If the optional Relay Control Board (P/N 356365Z) is used, reinstall the automation terminal blocks onto the relay board and reconnect any relay connections.
  10. Reinstall the Drive Cover onto the drive.
  11. Reinstall the Wiring Cover onto the drive.
  12. Ensure the Diffuser and Seal Plate O-rings are clean and seated properly.
  13. Reinstall the hydraulic assembly to the Strainer Pot, tightening the bolts in a criss-cross pattern.
  14. Reinstall the drain plugs into the strainer pot.
  15. Reprime the pump according to *Priming the Pump on page 5*.



# Pump Disassembly/Reassembly Diagram



## Drive Removal and Installation

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

**⚠ WARNING** **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.

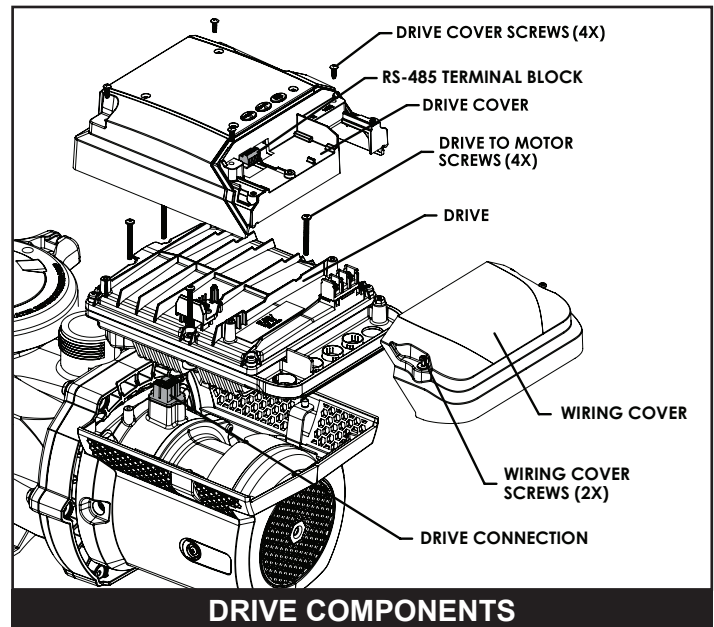
**⚠ CAUTION** To avoid electrical hazard, do NOT remove the four torx-head screws from the drive.

### TO DISASSEMBLE AND REMOVE THE DRIVE:

1. Press ON/STOP to stop the pump and disconnect all power to the pump at the circuit breaker.
2. Loosen the two captive Phillips-head Wiring Cover Screws. Remove the Wiring Cover from the Drive.
3. Disconnect main power wiring and remove the Automation Terminal Blocks from the drive.
4. Remove the four Phillips-head Drive Cover Screws. Remove the Drive Cover from the Drive.
5. Remove the four Phillips-head Drive-to-Motor Screws.
6. Gently separate the Drive from the Motor/Hydraulic Assembly and place it aside.

### TO INSTALL THE DRIVE:

1. Ensure the drive connection gasket is not damaged and is in place.  
Do not reassemble with a damaged or missing gasket. Replace the gasket if damaged.
2. Align the Drive with the Drive Connection and seat the drive onto the motor.
3. Secure the Drive to the motor with the four Drive to Motor Screws.
4. Reinstall the Drive Cover and secure it with the four Drive Cover Screws.
5. Rewire automation and power cables that were disconnected during drive removal. Refer to *Electrical Installation*, page 3 and *Connecting to an Automation System*, page 4.
6. Reinstall the Wiring Cover and secure it with the two Wiring Cover Screws.



**DRIVE COMPONENTS**

## Relocating the WiFi Antenna

The pump communicates wirelessly via a *Bluetooth*<sup>®</sup> Wireless Technology connection with your personal device, or a 2.4ghz WiFi connection with your home router.

The drive's WiFi antenna features a male SMA bulkhead connector on the outside of the top cover and can be removed by loosening the antenna connector.

An SMA extension cable can be used to remotely mount the antenna in an area where it can receive a better signal.

An extension cable is only recommended in order to relocate the antenna to a more favourable location; such as outside of a masonry enclosure or around the corner of a building. In most other cases using an extension cable will harm the signal.

# TROUBLESHOOTING

## ⚠ WARNING



Always disconnect power to the pump at the circuit breaker and relieve pressure in the filtration system 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 and Maintenance Guide before attempting to use, service, or adjust the pool filtering system or heater.

## Drive LED Indicators

Each button on the drive; CONNECT, ON/STOP and QUICK CLEAN features an LED indicator.

Refer to the table to the right for a list of LED behaviors and what they are indicating.

■ = Solid LED

▣ = Blinking LED

◻ = Pulsing LED

LED	BEHAVIOR	INDICATES	
CONNECT	Green	Pulsing	Attempting to establish WiFi connection
		Solid	Active WiFi connection
	Blue	Blinking	Attempting to establish a <i>Bluetooth</i> ® connection
		Solid	Active <i>Bluetooth</i> ® connection
	Yellow	Pulsing	Pump requires provisioning
		Blinking	Pump update in progress
Magenta/Pink	Solid	Automation system control is active	
ON/STOP	Green	Solid	Pump running
		Blinking	Priming cycle
		Pulsing	Pump in Thermal Mode
	Red	Solid	Pump disabled
		Blinking	Alarm detected
	Green/Yellow	Blinking	Warning detected
	Yellow	Solid	Pump is idle

## Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
<b>Connection Issue Pump is Offline Alert</b>	Pump is not powered	Ensure the pump is receiving power. If the pump is receiving power, the ON/STOP button will illuminate.
	Home internet service is out or inaccessible	Confirm that the home router is active and connected to the internet.
	Intermittent WiFi or network connection	<ol style="list-style-type: none"> <li>Restart the home router. This can clear up many typical home networking issues.</li> <li>Cycle power to the pump. Disconnect power to the pump at the main breaker, Wait for 1 minute and reconnect power.</li> <li>Check the signal strength in WiFi Settings of the Pentair Home App. If the signal strength is insufficient, refer to the Poor WiFi Signal section of this troubleshooting chart.</li> </ol>
	Bluetooth® connectivity issues	<ol style="list-style-type: none"> <li>Stand closer to the pump when operating via Bluetooth®.</li> <li>Restart the Pentair Home app</li> <li>Adjust the pump antenna.</li> <li>Ensure smartphone permissions are given to the pump.</li> </ol>
<b>Connection Issue - Pump is Offline Alert</b>	Poor WiFi signal to router	<ol style="list-style-type: none"> <li>The WiFi antenna can be relocated from the top cover of the drive to a location with better WiFi signal. The antenna bulkhead on the cover has a SMA Female connector, and the antenna has a SMA Male connector. A SMA extension cable can be used to move the antenna to a more favorable location such as around the corner of a wall or outside of an enclosure.</li> <li>Consider operating the pump in Bluetooth® Wireless Technology control mode. Refer to the Pentair Home User's Guide (P/N 3560888) for instructions.</li> </ol>

## Troubleshooting Chart (continued)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
<b>Priming Issue</b>	Air leak in suction	<ol style="list-style-type: none"> <li>1. Check suction piping and suction valve seals.</li> <li>2. Check pool water level and ensure the skimmer is not drawing in air.</li> <li>3. Check and clean the pump strainer pot lid o-ring.</li> </ol>
	Not enough water in strainer pot	Fill the strainer pot up to the suction port with water.
	Priming speed too low	Adjust priming parameters/settings (speed, duration, delay, priming range) until the pump consistently primes. Refer to <i>Priming Parameters</i> on page 11 for instructions.
	Priming alerts	Refer to <i>Alarms and Warnings</i> on page 20 for information regarding specific alarms.
<b>Reduced Capacity and/or Head</b>	Clogged pump strainer basket	Clean the pump strainer basket. Refer to <i>Pump Strainer Basket</i> on page 13 for instructions.
	Air pockets or leaks in suction line	Inspect all piping and seals in the suction line.
	Clogged impeller	Disassemble the pump and remove debris from the impeller. Refer to <i>Pump Disassembly</i> on page 15 and <i>Pump Reassembly</i> on page 15 for instructions.
	Pump not running required speed	Check the pump drive interface and/or Pentair Home for alerts or warnings. Refer to <i>Alarms and Warnings</i> on page 20 for information regarding specific alarms.
<b>Pump Runs then Stops</b>	Over temperature FAULT	Ensure the fan guard is clean. Use compressed air to remove any dirt, debris or blockages.
	Over current FAULT	Disassemble the pump and check rotating parts for blockages or debris build-up. Clean if necessary. Refer to <i>Pump Disassembly</i> on page 15 and <i>Pump Reassembly</i> on page 15 for instructions. The pump will automatically attempt to restart after 1 minute.
<b>Pump is Noisy or Operating Loudly.</b>	Debris in contact with cooling fan	Ensure the fan guard is clean. Use compressed air to remove any dirt, debris or blockages.
	Clogged impeller	Disassemble the pump and remove debris from the impeller. Refer to <i>Pump Disassembly</i> on page 15 and <i>Pump Reassembly</i> on page 15 for instructions.
	Too much debris in strainer basket causing cavitation	Clean the pump strainer basket. Refer to <i>Pump Strainer Basket</i> on page 13 for instructions.
	Motor speed too high	Consider reducing the speed if possible.
<b>Pump is Leaking (from Strainer Pot - Seal Plate Joint)</b>		<ol style="list-style-type: none"> <li>1. Ensure the seal plate O-ring is not pinched between the seal plate and strainer pot.</li> <li>2. Tighten the bolts joining the strainer pot and the seal plate.</li> <li>3. If leak persists, disassemble the pump. Inspect all O-rings and seals for damage or debris build-up. Replace or clean the seals if necessary. Refer to <i>Pump Disassembly</i> on page 15 and <i>Pump Reassembly</i> on page 15 for instructions.</li> </ol>
<b>Pump is Leaking (from Strainer Pot Lid)</b>		<ol style="list-style-type: none"> <li>1. Ensure the strainer pot lid is installed correctly (lid handles are perpendicular to the suction port) and is compressing the strainer pot lid O-ring.</li> <li>2. Refer to <i>Pump Strainer Basket</i> on page 13 and remove the strainer pot lid. Inspect the strainer pot lid O-ring for damage or debris build-up. Replace or clean the O-ring if necessary.</li> </ol>
<b>Pump is Leaking (from Underneath Motor)</b>		Disassemble the pump and inspect the shaft seal. The shaft seal is a wearable part and will need to be replaced after prolonged operation. Refer to <i>Pump Disassembly</i> on page 15 and <i>Pump Reassembly</i> on page 15 for instructions.
<b>Pump Increases Speed During Pool Cleaner Operation</b>	Constant FLOW program is running	Schedule a constant SPEED Program to run during expected cleaning cycles.

## Alarms and Warnings

When an alarm is triggered the drive's ON/STOP LED will blink RED and a fault code will display. The pump will stop until the alarm is resolved.

When a Warning is triggered the drive's ON/STOP LED will blink GREEN/YELLOW and a fault coded will display.

**Depending on your particular setup, fault codes will display on one or more of the user interfaces:**

- Pentair Home App
- Automation System Interface
- Optional Touchscreen Controller (Almond - P/N 356159Z, Black - P/N 356348Z)

ALARM / WARNING	DESCRIPTION	DEFINITION
Weak Wi-Fi Connection	Weak Wifi connection detected.	Pump antenna may be obstructed or too far away from your router. The antenna wire can be extended. Refer to <i>Relocating the WiFi Antenna</i> on page 17.
Offline	The pump is offline.	The Pentair cloud cannot connect to your pump. This could be caused by a power outage at the pump or router, or a loss of WiFi signal to the pump.
Priming Failure	The pump has reported a Priming Failure Alarm.	Priming failure can be caused by lack of water in the volute strainer basket.
Overheat	The pump has reported an Overheat Condition.	The pump motor has detected an abnormally high internal temperature. This can be caused by a blockage of the cooling fan inlet or outlet, or by excessively high ambient air temperature. The pump will attempt to protect itself by reducing the motor speed to give the motor and drive a chance to cool down.
Over Current	The pump has reported an Over Current Condition.	Load has increased on the motor; due to debris, part interference, temperature issues, age of parts, or supplied voltage. Refer to <i>Pump Disassembly</i> on page 15 and inspect the rotating parts of the pump for blockages or debris buildup.
Over Voltage	The pump has reported an Over Voltage Alarm.	Supplied voltage is outside of the proper range. When voltage returns to the normal the alert will clear and the pump will resume operation.
Under Voltage	The pump has reported an Under Voltage Alarm.	Supplied voltage is outside of the proper range. When voltage returns to the normal the alert will clear and the pump will resume operation.
Speed Limit	The pump has reported a Speed Limit Warning.	The pump is operating at the programmed maximum speed in order to achieve the desired speed/flow. Refer to <i>Limits Parameters</i> on page 12 for instructions on adjusting the Speed Limit. If this alert displays and the Speed Limit is already set to 100%, then the pump may not be capable of achieving the desired flow rate.
Pressure Limit	The pump has reported a Pressure Limit Warning.	The pump is operating at the programmed maximum system pressure. The pump monitors Total Dynamic Head, and not outlet pressure, so it may differ from the reading on the filter gauge. Refer to <i>Limits Parameters</i> on page 12 for instructions on adjusting the pump Pressure Limit.
Flow Limit	The pump has reported a Flow Limit Warning.	The pump is operating at the programmed maximum flow rate. Refer to <i>Limits Parameters</i> on page 12 for instructions on adjusting the pump Flow Limit.
Internal Fault	The pump has an internal error.	This alert can be caused by a few different types of internal hardware or software errors in the drive. Disconnect power to the pump and reconnect after one minute. If the alert remains, contact a qualified pool professional.
Drive is Derating (Warning)	The pump is slowing down to prevent the drive from overheating.	This alert usually accompanies an Overheat or Over Current alert. It is intended to note that the pump will continue to operate at a reduced speed as long as possible. After the drive has cooled enough it will automatically resume normal operation.
Derating Alarm - Exceeded & Cut Off	The pump has stopped to prevent the drive from overheating.	The motor and drive are not able to reduce speed enough to protect themselves. The motor will stop and Pentair Home will display this alarm. When the drive has cooled enough, it will automatically resume operation and attempt to run the requested program.
Thermal Mode	The pump operating in Thermal Mode.	The pump is operating in Thermal mode. Thermal Mode is controlled by the drive's internal temperature, not water temperature. <b>This is intended to keep motor components from freezing, but should not be solely relied on for full filtration system freeze protection.</b>



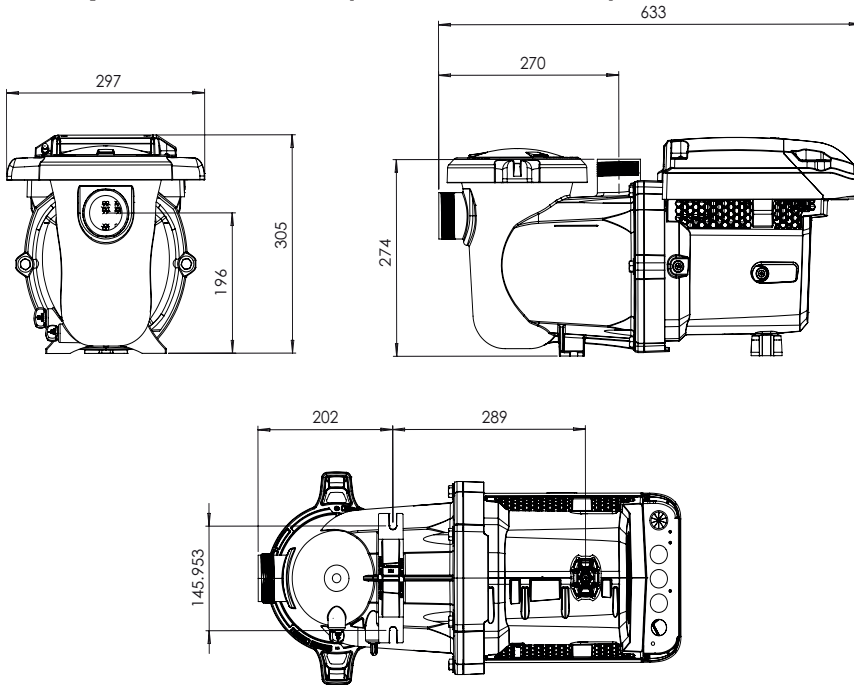
# TECHNICAL DATA

## Technical Specifications (1.5 HP Models)

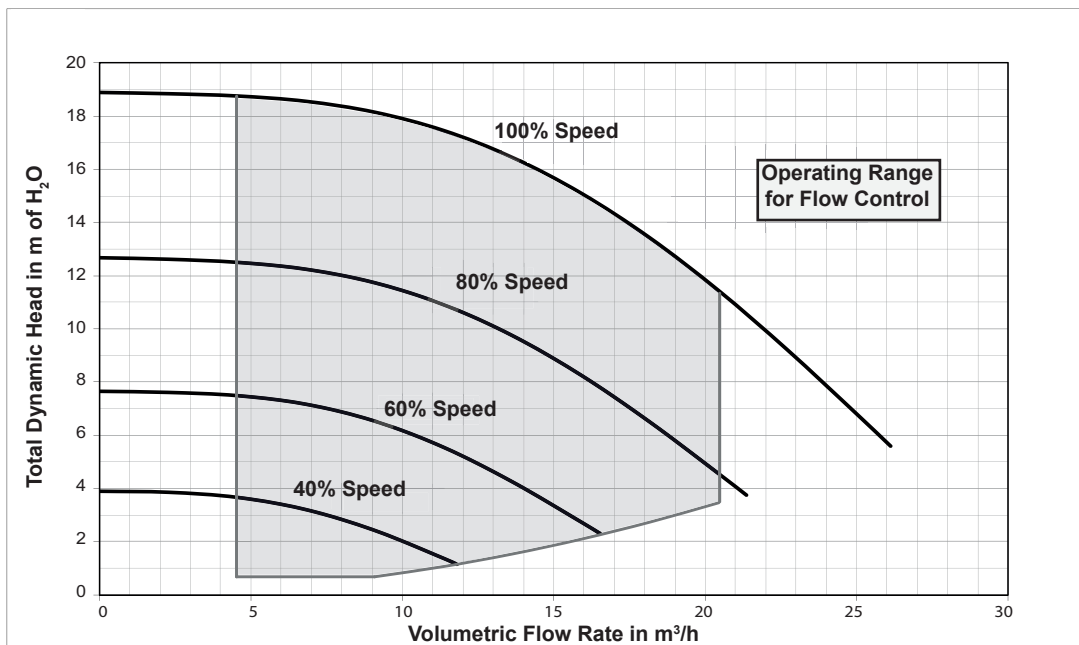
Input Voltage Nominal	115/208-230 VAC
Input Current	12.0/6.4-5.9 Amps
Input Frequency	1Ph, L1-L2 or L-N, 50 or 60 Hz
Max Input Watts	1350 W
Max Shaft Horsepower	1.5 HP
Speed Range	400 - 4000 RPM

Environmental Enclosure Rating	NEMA Type 3 / IPX5
Ambient Condition Range	
Storage	-40°C to +60°C (-40°F to 140°F)
Operating	0-50°C (32-122°F)
Humidity	Relative 0-95% Non-Condensing

## Pump Dimensions (1.5 HP Models)



## Performance Curves (1.5 HP Models)

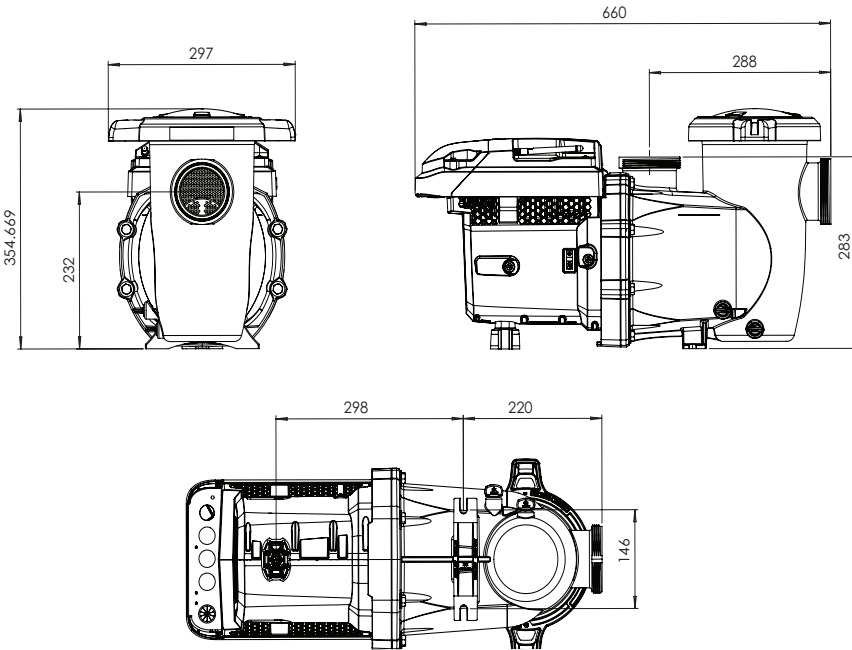


### Technical Specifications (3 HP Models)

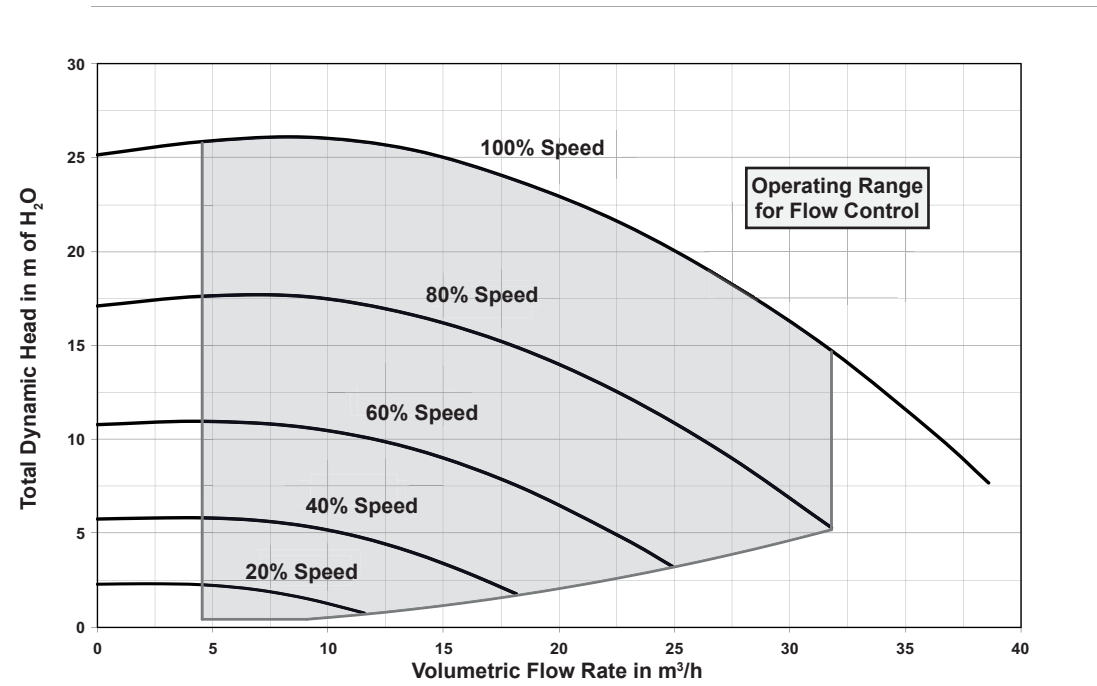
Input Voltage Nominal	208-230 VAC
Input Current	12.4/11.2 Amps
Input Frequency	1Ph, L1-L2 or L-N, 50 or 60 Hz
Max Input Watts	2590 W
Max Shaft Horsepower	3.0 HP
Speed Range	450 - 3450 RPM

Environmental Enclosure Rating	NEMA Type 3 / IPX5
Ambient Condition Range	
Storage	-40°C to +60°C (-40°F to 140°F)
Operating	0-50°C (32-122°F)
Humidity	Relative 0-95% Non-Condensing

### Pump Dimensions (3 HP Models)

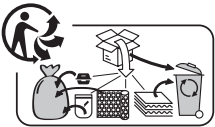


### Performance Curves (3 HP Models)



**Notes:**

CE



**Waste treatment of electronic devices at the end of their service life:**

The crossed-out bin placed on the main parts which make up the product indicates that it must not be disposed of together with the household waste. It must be returned to an appropriate collection point for electronic device recycling (information available from the local household waste collection service). This product contains potentially dangerous substances which may have adverse effects on the environment and human health.



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