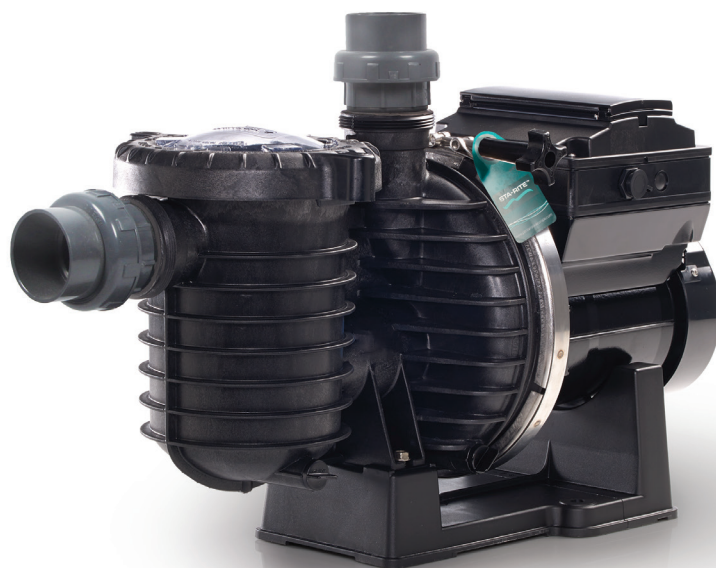




INTELLIFLO® VSD2

VARIABLE SPEED PUMP

OPERATING MANUAL 



SW5P6R-VSD2



UFL-VSD2



IMPORTANT SAFETY INSTRUCTIONS. READ, FOLLOW AND SAVE THESE INSTRUCTIONS

AQUATIC SYSTEMS | P-INSB-VSD2 (REV. NOVEMBER 2017)

INTRODUCTION

We would like to thank you for buying our IntelliFlo® VSD2 pump.

We are convinced that this Pentair pump will be a reliable, userfriendly and cost-efficient product for keeping your pool running. The variable speed technology of this pump allows you to run your pump at low speeds. This reduces dramatically the energy consumption of your pool.

TECHNICAL FICHE

In case you would need technical information, please have a look at the product's app or at our website www.pentairpooleurope.eu. By scanning below QR code you will be immediatly directed to our Pentair website.



CUSTOMER SERVICE

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

Customer Service Pisa, Italy (8.30 AM to 4.30 PM CET)

Phone number: +39 050 71 61 66 or +39 050 71 61 69

E-mail: orders.pooleu@pentair.com or poolemea@pentair.com

Website: www.pentairpooleurope.com

 **Please note that the full manual is available at our website.**

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WARNINGS AND SAFETY INSTRUCTIONS 1/3

 This guide mentions the installation- and user guidelines for the IntelliFlo® VSD2. Contact Pentair if you have any questions regarding this product.

 **Attention installer:** This manual 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 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.

Warnings and safety instructions for Pentair Aquatic System pumps and other related products are available at our website: www.pentairpooleurope.com

WARNING - ENTRAPMENT AVOIDANCE NOTICE



The suction outlet connected to a swimming pool or spa pump can pull a high vacuum if it is blocked. Therefore, if only one suction outlet smaller than 46 cm x 58 cm is used, anyone blocking the suction outlet with their body can be trapped and held against the suction outlet. An abdominal wound or drowning can result. Therefore, if small suction outlets are used with this pump, to prevent this entrapment and possible death, install at least two suction outlets in the body of water. Separate these suction outlets as described in the International Residential Code (IRC), the International Business Code (IBC), the Consumer Products Safety Council (CPSC) Guidelines for Entrapment Hazards: Making Pools and Spas Safer or ANSI/IAF-7 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins. If suction outlets are not used, additional entrapment avoidance measures as described in the CPSC Guidelines or ANSI/IAF-7 should be employed.

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 covering Suction Fittings for Use in Swimming Pools, Wading Pools, Spas and Hot Tubs. 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 CRACKED OR BROKEN CAN RESULT IN HAIR ENTANGLEMENT WHICH CAN RESULT IN DEATH.**

WARNING - RISK OF ELECTRICAL SHOCK OR ELECTROCUTION



This pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with 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 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

WARNINGS AND SAFETY INSTRUCTIONS 2/3



WARNING - WATER TEMPERATURE

Water temperature in excess of 38° C (100° F) 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 37° C (98.6° F). The symptoms of hyperthermia include: drowsiness, lethargy, dizziness, fainting, and an increase in the internal temperature of the body.

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.

OTHER WARNINGS


- The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.
- To reduce the risk of injury, do not permit children to use this product.
- 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 1.52m (5 feet) away, adjacent to, and within sight of the unit.
- When setting up flow rates, the operator must consider local codes governing turnover as well as disinfectant feed ratios.
- Before servicing the system, switch the main power OFF and remove the communication cable from the pump.
- Install the pump a minimum of 1.5m (5 feet) from the inside wall of the pool and spa.
- 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 5.49m (18 feet) and a maximum wall height of 1.07m (42 inches).
- 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.
- IntelliFlo® VSD2 is capable of generating system pressures up to 30 meters. Installers must ensure that all system components are rated to withstand at least 30 meters. Over pressurizing the system can result in catastrophic component failure or property damage.

WARNINGS AND SAFETY INSTRUCTIONS 3/3

GENERAL WARNINGS

- Never open the inside or the motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.
- The IntelliFlo® VSD2 pump is not submersible.
- The IntelliFlo® VSD2 pump is capable of 35 m³/hr or 30 meters of head. Use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for the electrical connection differ from country to country. Install equipment in accordance with all applicable local codes and ordinances.
- Always press the stop button and disconnect the communication cable before performing maintenance.
- Sufficient equipotential bonding (min. 4.5mm² recommended), in accordance with local regulations, is required on all metal components of the pool including the pool pump. It is required for electrical safety as well as to reduce the risk of corrosion.

GENERAL INSTALLATION INFORMATION

- 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 components.
- 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. 
- In a domestic environment, this product may cause radio interference in which case supplementary mitigation measures may be required.
- Do not install on IT (insulated terra) mains network (marine applications).
- Fitting a non-return valve after the pump on installation will prevent the impeller from unwinding and is strongly recommended.

NOTE — If required by local building codes, the pump is to be supplied by an isolating transformer or supplied through a residual current device (RCD) having a residual operating current not exceeding 30 mA.

NOTE — Use RCD/GFCI type A or B.

- 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.

PUMP OVERVIEW (1/3)

INTRODUCTION

The IntelliFlo® VSD2 pump is well suited for all of your pool, spa, cleaner, waterfall and other water applications. Using the control panel, IntelliFlo® can use one of the four selectable preset speeds or the pump speed can be adjusted to run at a specific speed. Advanced energy conservation features ensure that your filtration system is operating at peak efficiency.

The IntelliFlo® pump is a variable speed pump that can use up to eight speeds that can be adjusted to run at specific speeds and time intervals. The IntelliFlo® VSD2 pump outperforms all conventional pumps in its class.

The pump can operate from 450 RPM to 3450 RPM with preset speeds of 750, 1500, 2350 and 3110 RPM. The pump can be adjusted from the control panel to run at any speed between 450 RPM to 3450 RPM for different applications. The pump control panel alarm LED and error messages warn the user against under and over voltage, high temperature, over current and freeze protection with user defined minimum and maximum speed presets.

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 (to be sold separately: P/N R356905).

EXTERNAL CONTROL

The IntelliFlo® VSD2 pump can communicate with an IntelliPool control system or the IntelliComm® communication center via a two-wire RS-485 communication cable. The communication cable is included with the control system. IntelliComm® can remotely control the IntelliFlo® variable speed four preset speeds. The IntelliPool system can be configured to control speed in function of pool temperature, size and active features.

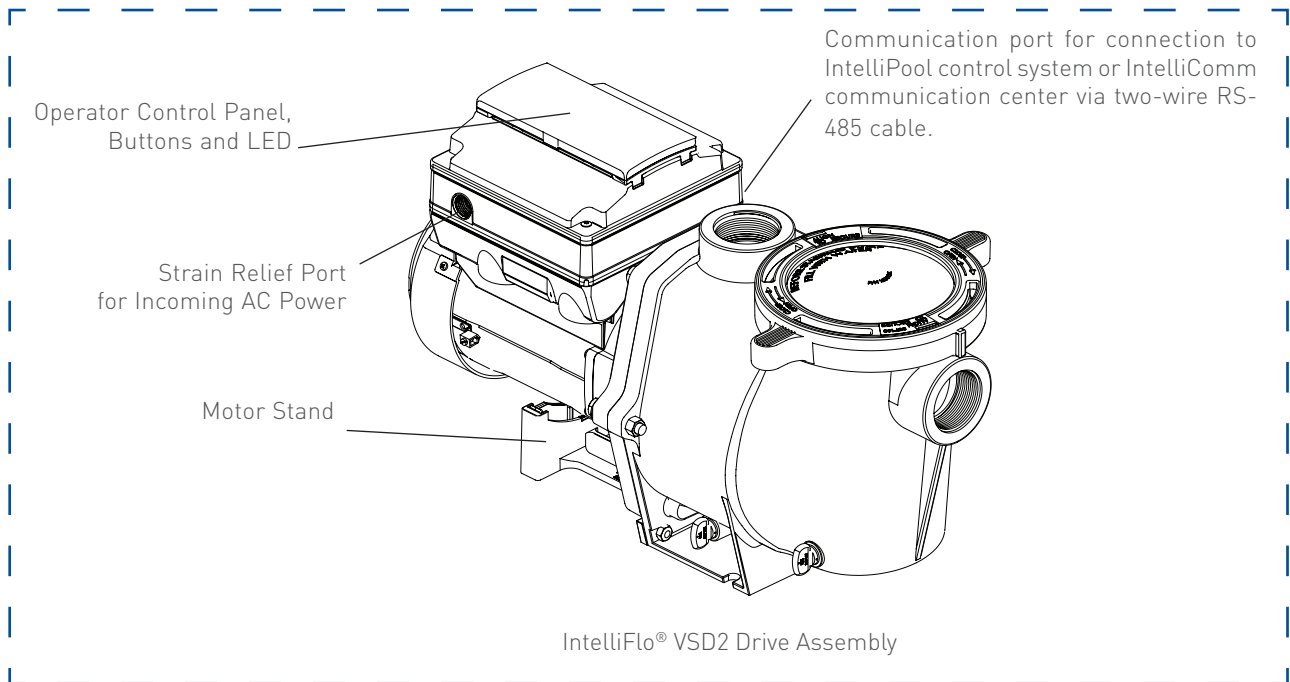
FEATURES

- Adjusts to various pool sizes
- Prevents thermal overload
- Detects and prevents damage from under and over voltage conditions
- Protects against freezing
- Communicates with IntelliPool control system or an IntelliComm communication center
- Easy to use operator control panel
- Operator control panel buttons for speed control
- Built-in strainer pot and volute
- Ultra energy-efficient TEFC Square Flange Motor
- Compatible with most cleaning systems, filters, and jet action spas
- Motor assembly features permanent magnet synchronous motor
- Heavy-duty, durable construction designed for long life
- 12 Programmable Speeds
 - Speed 1-4: manual, egg timer or schedule
 - Speed 5-8: schedule
 - Four IntelliComm speed modes
- Priming Feature
 - Load Sensing
 - Enable or Disable
- Lockout Protection
 - Four Digit password
 - Enable or Disable
- LCD Display
 - Power and Speed / Flow
 - Text Alerts
- Antifreeze Protection
 - Adjustable Speed / Flow
 - Adjustable Temperatures
 - Enable and Disable in stand alone
- Additional Features
 - Clock and Timer
 - Maximum and Minimum Speed / Flow Limits
 - Quick Clean Mode
 - Timeout Mode
 - Rotatable Keypad

PUMP OVERVIEW (3/3)

DRIVE ASSEMBLY AND CONTROL PANEL

The IntelliFlo® drive assembly consists of an operator control panel and the system electronics that drive the motor. The drive microprocessor controls the motor by changing the frequency of the current it receives, together with changing the voltage to control the rotational speed.



MOTOR FEATURES

- Permanent Magnet Synchronous Motor (PMSM)
- High efficiency (3450 RPM 92% and 1000 RPM 90%)
- Superior speed control
- Operates at lower temperatures due to high efficiency
- Same technology as deployed in hybrid electric vehicles
- Designed to withstand outdoor environment
- Totally enclosed fan cooled
- 10-Pole
- Low noise

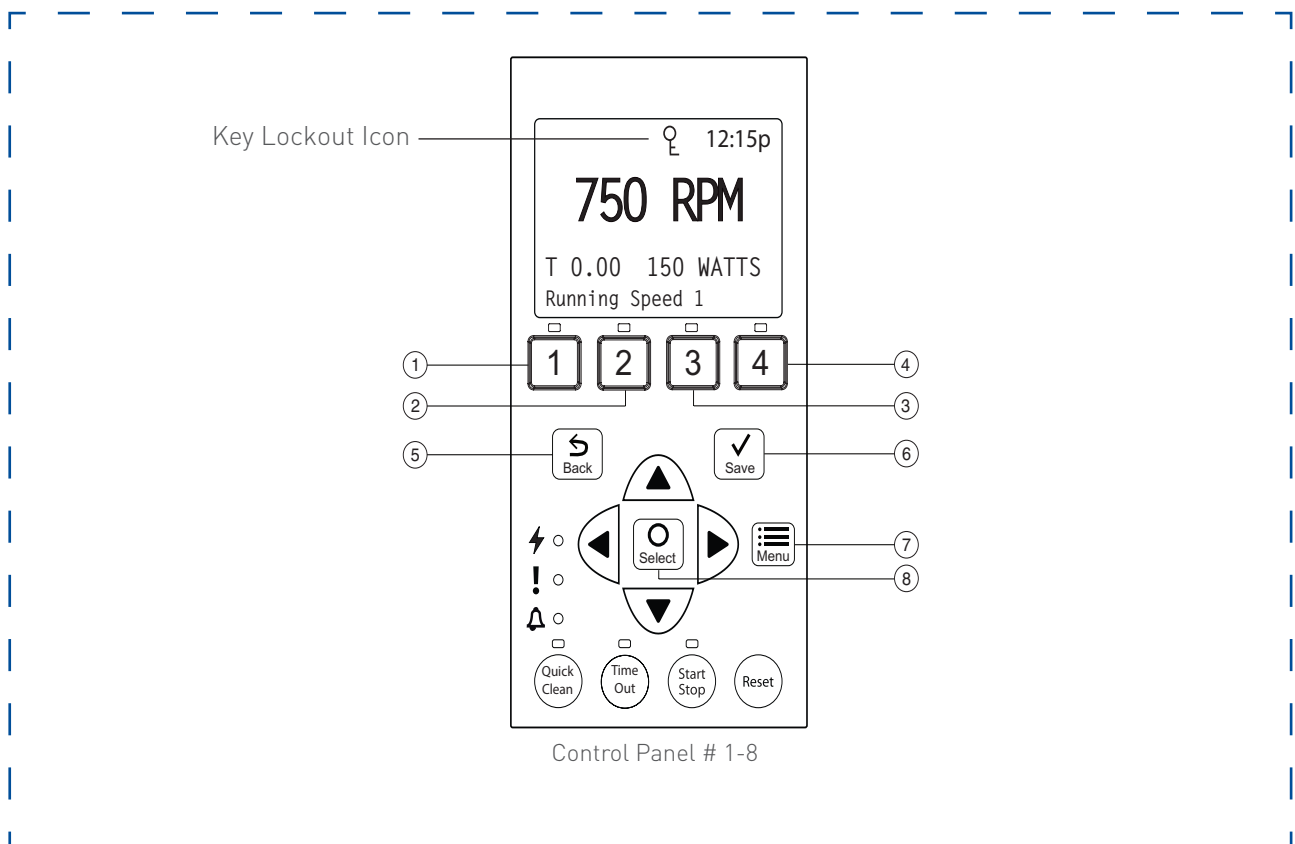
OPERATOR CONTROL PANEL (1/2)

USING THE OPERATOR CONTROL PANEL

Use the operator control panel to start and stop the IntelliFlo® VSD2 Variable Speed Pump, set, and change speeds (RPM), and access pump features and settings.

CONTROLS AND LEDS ON KEYPAD

- ① **Button 1:** Press to select Speed 1 (750 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.



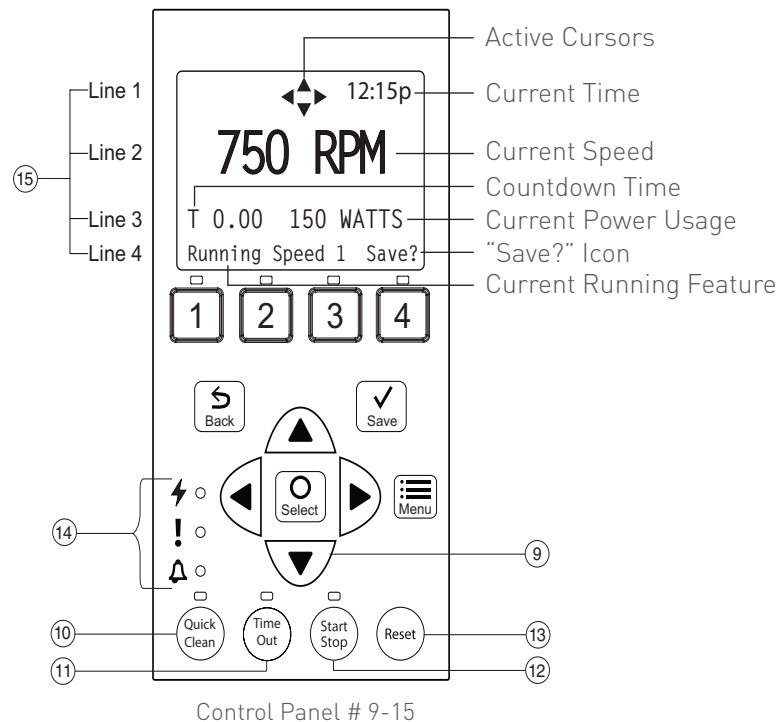
Note: Always close the keypad cover after using the keypad.

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

OPERATOR CONTROL PANEL (2/2)

CONTROLS AND LEDS ON KEYPAD - CONTINUED

- ⑨ **Arrow Buttons:** Move to different menu levels and increase or decrease digits (up + down)
Move cursor left or right one digit when editing a setting. (left + right)
- 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.
- 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.



OPERATING THE PUMP (1/20)

This section describes how to operate the IntelliFlo® VSD2 pump using the control panel buttons and menu features.

STARTING THE PUMP

To start 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

To stop the pump:

- Press the **Start/Stop button** to stop the pump.

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

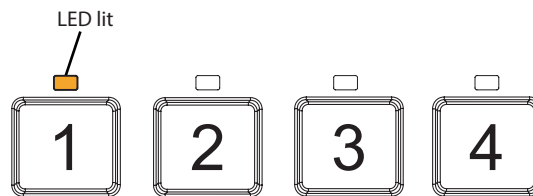
- When servicing equipment (filters, heaters, chlorinators, etc.), disconnect the communication cable, and switch OFF circuit breaker to remove power from the pump.

OPERATING THE PUMP AT PRESET SPEEDS

The IntelliFlo® VSD2 pump is programmed with four default speeds of 750, 1500, 2350, 3110 RPM. Speed buttons 1-4 are for each of the preset speeds as shown below.

To operate the pump at one of the four preset speeds:

1. Be sure the pump is powered ON and the green 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 as shown.
3. Press the **Start/Stop button**. The pump will quickly change to the selected preset speed.



Adjusting the pump speed:

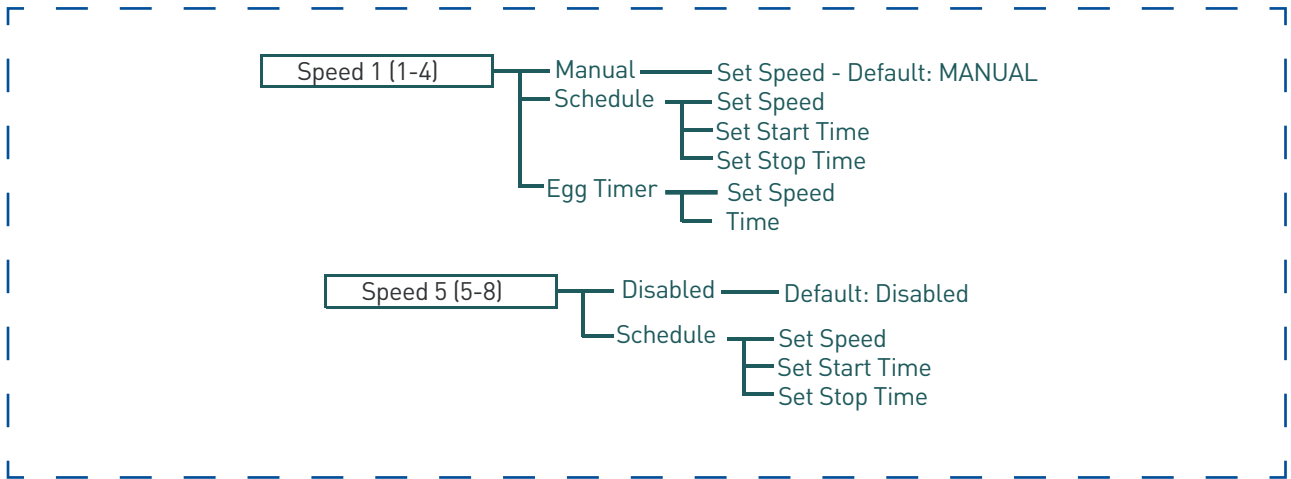
1. While the pump is running, press the **Up or Down Arrow** to adjust to desired speed setting.
2. Press and hold down a **Speed Button** for three (3) seconds to save speed to the button or press **Save** to save the speed.

OPERATING THE PUMP (2/20)

PUMP OPERATING MODES

The IntelliFlo® VSD2 Pump can be programmed in three different modes:

- 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”.



Program 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 assigned to 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 program button is pressed.

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

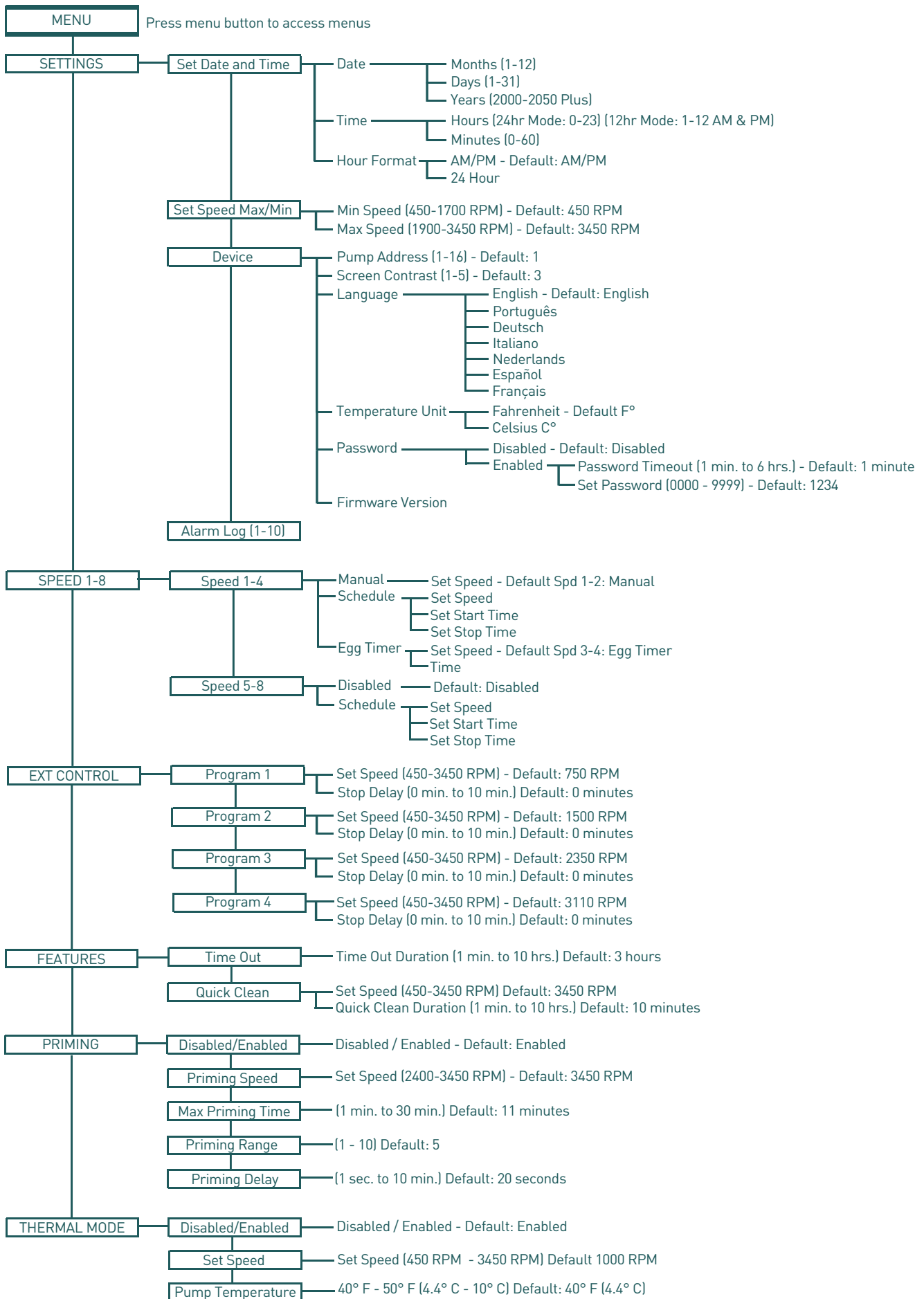
To operate in Egg Timer mode, press a **speed button** and then press **Start/Stop**. The pump will run that setting for the set amount of time and then turn off.

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.

OPERATING THE PUMP (3/20)

INTELLIFLO® VSD2 PUMP MENUS



OPERATING THE PUMP (4/20)

INTELLIFLO® VSD2 PUMP MENUS

The IntelliFlo® VSD2 pump menu descriptions are as follows:

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 "Setting".
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 hour 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 450 RPM to 1700 RPM.
The default setting is 450 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 Speed".
6. Press **select** to change the setting. The cursor will appear in the first number column.
7. Press the **up or down** arrows to change the minimum speed setting from 450 till 1700 RPM.
8. Press **save**, to save. To cancel, press **back** to exit edit mode without saving.
9. Press **back** to exit.

OPERATING THE PUMP (5/20)

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® VSD2 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 Speed".
6. Press **select** to change. The cursor will appear in the first number column.
7. Press **up or down** arrows to change the maximum speed setting from 1900 till 3450 RPM.
8. Press **save**, to save. Press **back** to exit. To cancel, press **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 later on this manual).

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 the IntelliPool® control system or IntelliComm® communication center. For IntelliPool® or IntelliComm® systems, the pump only communicates with address #1. The pump address can be set from 1-16. The IntelliPool® system can communicate to only four (1-4) pumps.

Note: IntelliFlo VSD2 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**.
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** arrows to scroll to "Device" and press select.
5. Use the **up or down** arrows to scroll to "Contract 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 to 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 pump can be set to either Celsius (°C) or Fahrenheit (°F = default).

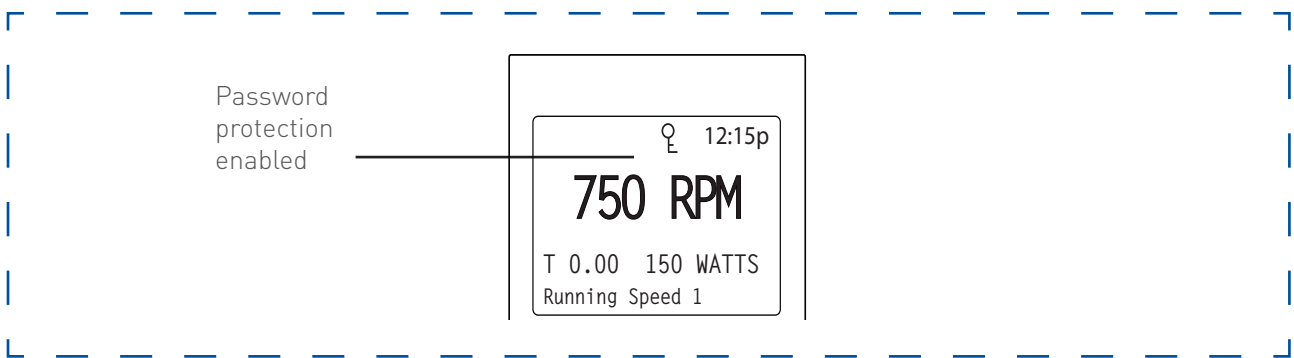
1. Check that the green power LED is on.
2. Press **menu**.
3. Press **select** to select "Settings".
4. Use the **up or down** arrows to scroll to "Device" menu item. Press **select**.
5. Use the **up or down** arrows to scroll to "Temperature Units" and press **select**.
6. Use the **up or down** arrows 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.

OPERATING THE PUMP (7/20)

PASSWORD PROTECTION

The default setting for password protection is disabled. When this feature is enabled, the 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 is 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** arrows to scroll to “Device” and press **select**.
4. Press the **up or down** arrow to scroll to “Password”. The default setting is “Disabled”. Press **select**.
5. Press the **up or down** arrow to change the setting to “Enabled”. Press **save** to save.
6. Press the **down** arrow. “Password Timeout” will be displayed. The factory default time is 1 minute. This means the IntelliFlo® VSD2 pump will go into password protection mode 1 minute after the last control panel key is pressed.
7. Press **select** to change time setting from 1 minute to 6 hours and press **save** to save.
8. Press the **down** arrow and then press **select** on “Enter Password” to change the setting.
9. Press the **left or right** arrows to move cursor and press the **up or down** arrow to change the password number to desired settings.
10. Press **save** to save. To cancel any changes, press **back** to exit without saving.

Entering password:

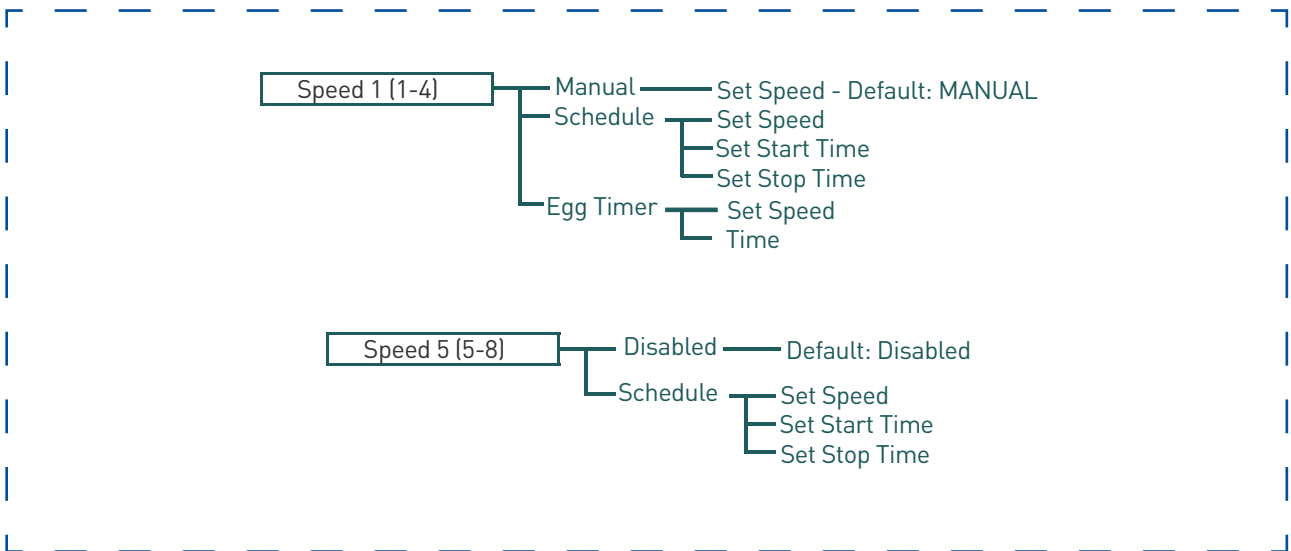
1. Press any button (besides the speed buttons) to prompt the screen for a password.
2. To enter password, use the **left and right** arrows to move the cursor and the **up or down** arrow button to scroll through the digit. Then press **save** to confirm.

OPERATING THE PUMP (8/20)

SPEEDS 1-8 (SCHEDULE A TIME TO RUN THE PUMP)

PUMP OPERATING MODES

The IntelliFlo® VSD2 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 (4) 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 to 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 time mode, press a speed button and then press start/stop. The pump will run that setting 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 begins.

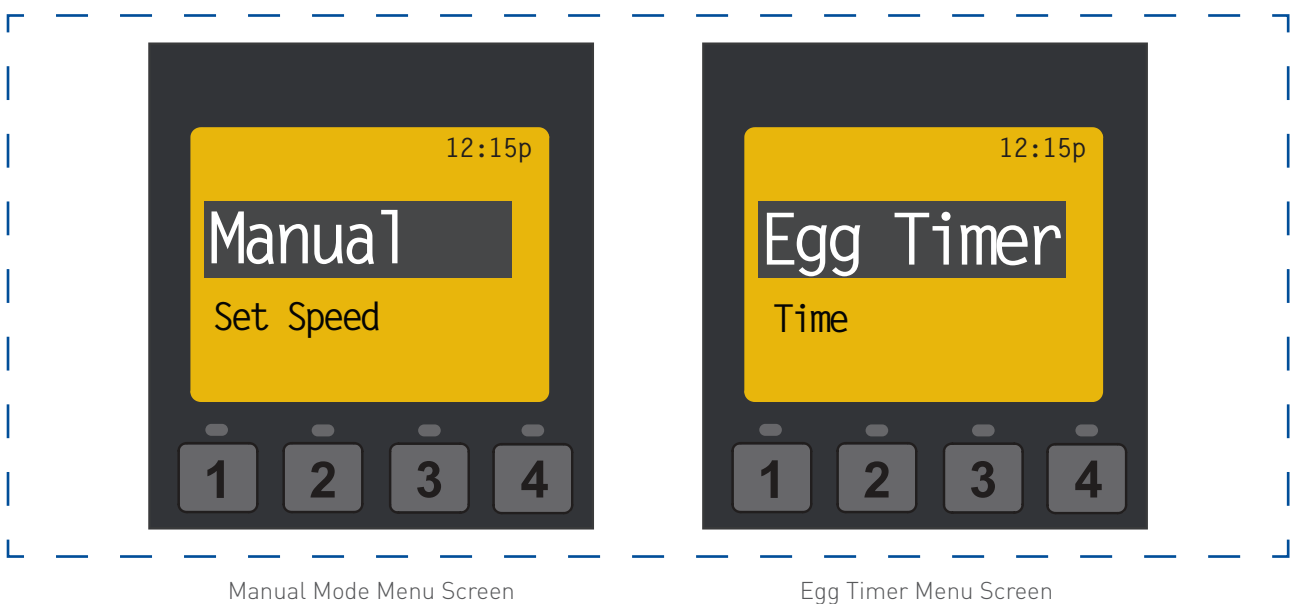
OPERATING THE PUMP (9/20)

SET SPEEDS IN MANUAL MODE (SPEEDS 1-4 ONLY)

1. Press **menu**.
2. Use **up or down** arrows to scroll to "Speeds 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** arrows 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.



OPERATING THE PUMP (10/20)

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 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** and use the **up or down** arrows to scroll to "Schedule". Press **save**.
5. Press 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. Press the **down** arrow again. "Start Time" will display. Press **select** - the cursor will highlight the minute column.
8. Use the **up or down** arrow to change the time and the **left or right** arrow to move cursor from minutes to hours.
9. Press **save** to save the new start time setting.
10. Press **down** arrow - "Stop Time" will display. Press **select**.
Repeat Steps 7-8 to set stop time.
11. Press **save** to save the new stop time setting.
12. Press **start/stop**.

The IntelliFlo® VSD2 Variable Speed 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.

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" will display.
5. Press **Select**. "750 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. Use the **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 settings.
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 4 through 11 to set Program 2, 3, and 4.

FEATURES: TIME OUT

The Time Out feature keeps the pump from running it's 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.

FEATURES: 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 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 Type". Use the **Up or Down** arrow to choose between "Speed". Press **Save**.
6. Use the **Up or Down** arrow to scroll to "Set Speed". Press **Select** and use the **Up or Down** arrow to adjust the speed settings. Press **Save**.
7. Press **Save** to save the speed setting.
8. Press the **Down** arrow and press **Select** for "Time Duration".
9. The cursor will highlight the minutes column. Use **Up or Down** arrows to change the time from 1 minute to 10 hours.
10. Press **Save** to save the time.
11. Press **Back** to exit the menu.

OPERATING THE PUMP (13/20)

PRIMING

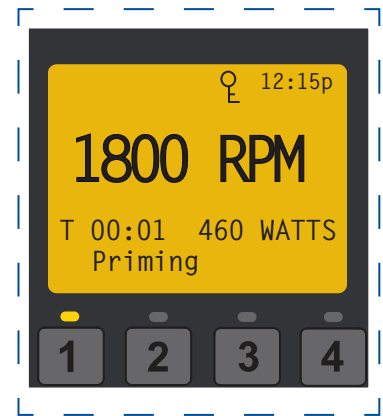
The default setting for Priming is **ENABLED**. This setting allows the pump to automatically detect if it is primed for startup.

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.



OPERATING THE PUMP (14/20)

PRIMING THE PUMP FOR THE FIRST TIME, OR AFTER SERVICE

The IntelliFlo® must be primed before starting the pump for the first time. To prime a pump means filling the pump and suction pipe with water. This process evacuates the air from all the suction lines and the pump. It may take several minutes to prime depending on the depth of water, pipe size and length. It is easier to prime a pump if you allow all the air to escape from the pump and pipes. The water cannot enter unless the air can escape. Pumps do not hold prime, the pool piping system has that task.


 **CAUTION** - To avoid permanent damage to the IntelliFlo® pump, before starting the pump, fill the IntelliFlo® housing strainer with water so that the pump will prime correctly. If there is no water in the strainer the pump will not prime.


- Do not allow the pump to run dry. Running the pump dry may damage the seals, causing leakage and flooding.
- 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.
- Open gate valves before starting system.
- Be sure to release all air from filter and piping system.
- The IntelliFlo® pump 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** - Before starting this procedure, first read the following:

Before removing the pump lid:

1. Press the Stop button if the pump is running before proceeding.
2. Disconnect the communication cable from the pump.
3. Disconnect main power supply
4. Close the gate valves in suction and discharge pipes.
5. Release all pressure from pump and piping system.
6. Never tighten or loosen the locking ring while the pump is operating.

 **WARNING** - If the pump is being pressure tested, release all pressure before removing trap cover. Do not block the pump suction while the pump is running. If a body part blocks the pump suction it may cause severe or fatal injury. Small children using the pool must ALWAYS have close adult supervision.

 **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 trying to work on it. The IntelliFlo® provides an automatic internal cutoff switch to protect the motor from heat damage during operation.

OPERATING THE PUMP (15/20)

PRIMING THE PUMP

NOTICE: If you replace the o-ring with a non-lubricated o-ring, you may need to apply a silicone based lubricant.

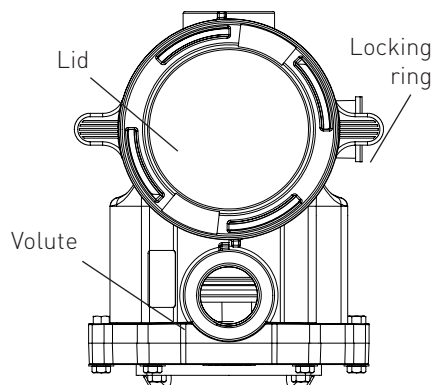
- Clean and inspect o-ring; reinstall on trap cover.
- Replace trap cover on trap; turn clockwise to tighten cover.

NOTICE: Tighten the pump lid by hand only (no wrenches).

Priming time will depend on vertical length of suction lift and horizontal length of suction piping. If pump does not prime, be sure that all valves are open, suction pipe end is under water, pump suction is below water level, and that there are no leaks in suction pipe.

To prime the IntelliFlo® pump:

1. Turn the locking ring in a counter-clockwise direction until it stops and remove them.
2. Fill the pump strainer pot with water.
3. Check the system and ensure water has an open path for free system flow.
4. Reinstall the locking ring and lid onto the strainer pot. The pump is now ready to prime.
5. Be sure all electrical connections are clean and tight.
6. Open the air release valve on the filter, and stand clear of the filter.
7. Switch the pump on at the circuit breaker. Ensure that the green power light is on.
8. Press the **Speed 1** button to select the pump speed of 750 RPM.
9. Press the **Start** button to start the pump. Use the **Up/Down** button to increase the speed as necessary to prime the pump.
10. When water comes out of the air release valve, close the valve. The system should now be circulating water back to the pool without air bubbles showing in either the hair and lint pot or at the pool return fittings.
11. Use the **Up/Down** button to adjust the operating speed as desired.



Top View

PRIMING FEATURES

Default: ENABLED

Allows IntelliFlo® VSD2 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.

Default: 3450 RPM

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.

Default: 11 minutes

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.

Default: 5

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.

Default: 20 seconds

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 "Pump Settings" on page 8) 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.

Disabled/Enabled

Priming Speed

Max Priming Duration

Priming Range

Priming Delay

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, scroll to “Disabled” and press **Select**. **Note:** All priming features are only accessible if priming is “Enabled”.
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**.
9. Press the **Down** arrow to scroll to “Priming Range”. Default = 5. Press **Select** to edit.
10. 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.
11. Press **Save**. Press the **Down** arrow to scroll to “Priming Delay”. Default is 20 seconds. Press **Select** to edit.
12. Use the **Up or Down** arrows to change from 1 second to 10 minutes. Press **Save**.
Caution: Increasing the time causes the pump to stay in the priming mode longer.
13. Press **Back** to exit the priming menu.

DISABLE PRIMING FEATURE ON THE PUMP

When the IntelliFlo® VSD2 pump is connected to an automation control system, the priming feature on the pump cannot be disabled by the external automation control system only. If the IntelliFlo® pump is connected to an automation control system and priming is not desired, disable the priming feature on the pump.

To disable priming with an automation control system:

1. Temporarily disconnect the RS-485 communication cable.
2. Open the LCD screen lid to disable priming on the pump. Press the **Menu** button, 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.
3. Once priming is disabled, reinstall the RS-485 communication cable.

OPERATING THE PUMP (18/20)

THERMAL MODE

The sensor for Thermal Mode is in the drive, on top of the motor. This feature allows you to set a speed (450-3450 RPM) that runs when the IntelliFlo® VSD2 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.

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 1000 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 (450-3450 RPM). Press save.
4. Press the **Down** arrow. "Temperature" will display. (This value will determine at what temperature the pump will activate Thermal Mode, default is 40° F/4.4° C).
5. Press Select to edit. Use the **Up or Down** arrow to adjust the settings.
6. Press **Save** to save the temperature setting.

Note: To cancel any changes, press **Back** to exit without saving.

7. Press **Back** to exit.



Thermal Mode Menu Options

OPERATING THE PUMP (19/20)

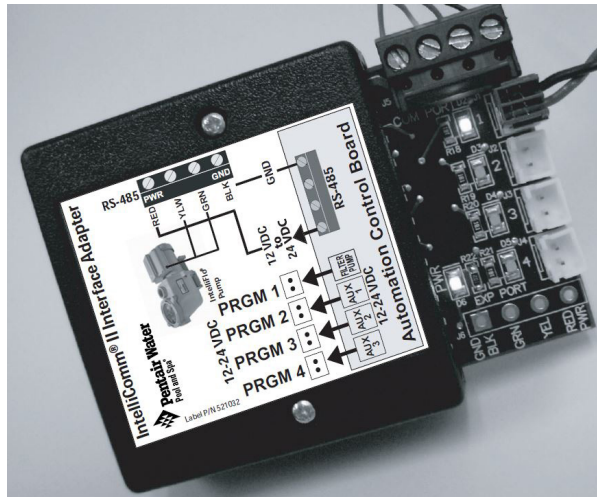
EXTERNAL CONTROL WITH INTELLICOMM® II COMMUNICATION CENTER

The IntelliFlo® pump can be remotely controlled by the Pentair IntelliComm II Communication Center using the RS-485 communications cable. The IntelliComm II provides four pairs of input terminal connections. These inputs are actuated by either 15 - 240 VAC or 15 - 100 VDC. Using the device's inputs, the programmed IntelliFlo® pump speeds can be controlled.


Note: For the IntelliFlo® pump to accept commands from IntelliComm, the pump must be in the "Running Schedules" mode (LED above the Start/Stop button lit).

If more than one input is active the highest number will be communicated to the IntelliFlo® pump. The IntelliComm will always communicate to pump using ADDRESS #1.

Program number priority is as follows; **Example:** If programs 1 and 2 are activated, program 2 will run, regardless of the assigned speed (RPM). The higher speed number (2 being higher) will always take priority. The following table shows the wiring terminal descriptions for IntelliComm.



IntelliComm II Communication Center

Terminal Number	Terminal Name	Voltage	Maximum 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 Output	N/A
	Ground				

OPERATING THE PUMP (20/20)

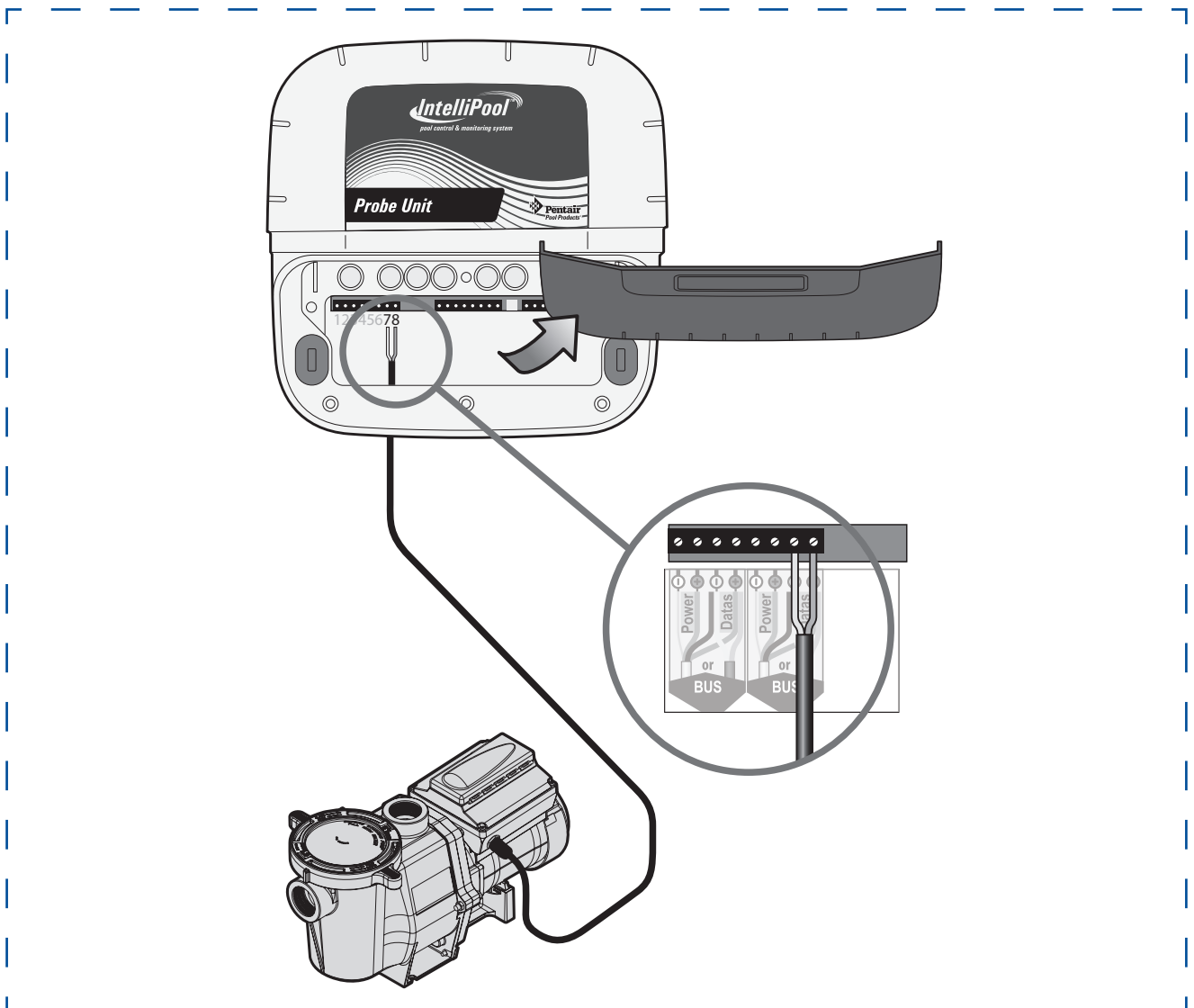
CONNECTING THE INTELLIFLO PUMP TO AN INTELLIPOOL SYSTEM

The IntelliFlo® pump can be controlled by an IntelliPool system via the RS-485 communication cable.

⚠ WARNING - Switch OFF main system power to the IntelliPool Control Center before making connections.

To connect the IntelliFlo® pump RS-485 communication cable to the IntelliPool circuit board:

1. Open the front of the IntelliPool control center.
2. Remove the red protective panel
3. Route the two conductor cable up through the control center grommet opening located on the right side, and up through the bus connector to the motherboard.
4. Strip back the cable conductors 6 mm (1/4"). Insert the wires into the screw terminals. Secure the wires with the screws. Be sure to match the color coding of the wires; YELLOW to COM (-) and GREEN to COM (+).
5. Close the control center.



USER MAINTENANCE (1/3)

The following information describes how to service and maintain the IntelliFlo® VSD2 pump. Illustrations apply to WhisperFlo IntelliFlo VSD.

PUMP STRAINER BASKET

The strainer, sometimes referred to as the “Hair and Lint Pot,” is in front of the of the pump. Inside there is a basket which must be kept clean of leaves and debris at all times. View the basket through the top see through lid to inspect for leaves and debris.

Regardless of the length of time between filter cleaning, it is most important to visually inspect the hair and lint pot basket at least once a week. A dirty basket will reduce the efficiency of the filter and possibly the heater.

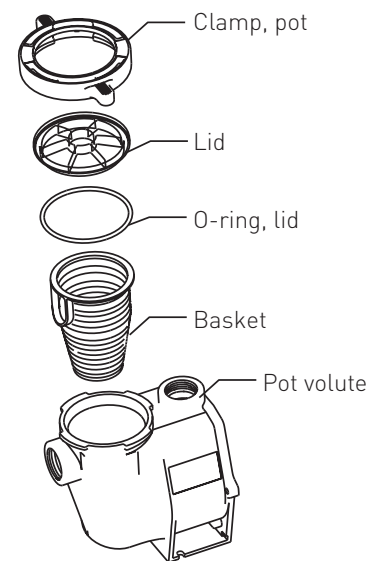
⚠ WARNING - DO NOT open the strainer basket if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and that the strainer pot is cool to the touch, then open with extreme caution.

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

Pump Strainer Basket Service

If the IntelliFlo® pump is installed below the water level of the pool, close the return and suction lines before opening the hair and lint pot on the pump.

1. Press the Stop button to stop the pump and switch off the pump at the circuit breaker.
2. Disconnect the communication cable from the IntelliFlo® pump.
3. Relieve pressure in the system.
4. Turn the locking ring and lid in a counter-clockwise direction until it stops.
5. Remove the locking ring and lid.
6. Remove the basket and put the debris into the trash and rinse out the basket. If the basket is cracked, replace the basket.
7. Replace the basket and fill the pump pot and volute with water up to the inlet port.
8. Clean the cover, o-ring, and sealing surface of the pump pot. Grease the o-ring with Teflon® or silicone lubricant.
9. Reinstall the lid by placing the locking ring and the lid on the pot.
10. Be sure that the lid o-ring is properly placed. Seat the locking ring and lid then turn clockwise until the handles are horizontal as shown.
11. Reconnect the communication cable to the pump if required.
12. Switch the power ON at the circuit breaker. Reset the pool time clock to the correct time





WARNING - FILTER 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 BLOW OFF WHICH CAN RESULT IN SEVERE INJURY, DEATH, OR PROPERTY DAMAGE. TO AVOID THIS POTENTIAL HAZARD, FOLLOW THESE INSTRUCTIONS.

13. Open the manual air relief valve on top of the filter.
14. Stand clear of the filter. Press the Start button on the pump.
15. Bleed air from the filter until a steady stream of water comes out.
16. Close the manual air relief valve.

MOTOR SERVICE

1. Protect from heat:

- Shade the motor and controller from the sun.
- Any enclosure must be well ventilated to prevent overheating. Particular attention should be paid to the motor fan cover and the cooling fins between the drive and the motor.
- Provide ample cross ventilation.

2. Protect against dirt:

- Protect from any foreign matter or splashing water.
- Do not store (or spill) pool chemicals near the motor.
- Avoid sweeping or stirring up dust near the motor while it is operating.
- If a motor has been damaged by dirt it voids the motor warranty.

3. Protect against moisture:

- Protect from splashing pool water.
- Protect from the weather.
- Protect from lawn sprinklers.
- If a motor has become wet, let it dry before operating. Do not allow the pump to operate if it has been flooded.
- If a motor has been damaged by water it voids the motor warranty.

Note: Do not wrap motor and controller with plastic or other air tight materials during winter storage. The motor and controller may be covered during a storm, winter storage, etc., but never when operating or expecting operation.

WINTERIZING

To protect the IntelliFlo® pump electronics from damage due to freezing conditions, the pump will switch itself on to generate internal heat when the air temperature drops below 4.4° C (40° F). The IntelliFlo® pump “Anti Freeze” feature is not intended to protect the system plumbing from freezing. The Anti Freeze temperature feature is adjustable and can be changed from 4.4° - 10° C (40° - 50° F).

1. If the air temperature drops below 4.4° C (40° F) the water in the pump can freeze and cause damage. Freeze damage is not warrantable.
2. To prevent freeze damage follow the procedures listed below.
 - Shut off electrical power for the pump at the circuit breaker.
 - Drain the water out of the pump by removing the two thumb-twist drain plugs located at the bottom of the volute. Store the plugs in the pump basket.
 - Cover the motor to protect it from severe rain, snow and ice.
 - Do not wrap the motor in plastic. It will cause condensation and rust on the inside of the motor.

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

PRIMING THE PUMP AFTER SERVICE

Before a system start-up, the pump and system must be manually primed. Be sure to reopen valves before operating. To prime IntelliFlo® pump, the strainer pot must be filled with water.



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. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal.

For instructions about how to prime the IntelliFlo® pump, refer to “Priming the pump for the first time or after service” on page 25.

INSTALLATION AND REMOVAL (1/5)

The following information describes how to install the IntelliFlo® pump.

INSTALLING THE INTELLIFLO PUMP

Only a qualified service person should install the IntelliFlo® pump. Refer to “Important Warning And Safety Instructions” on pages 4 to 6 for additional installation guidance and safety information.

IntelliFlo® Pump Kit Contents

IntelliFlo® VSD2 pump, grommet and quick start guide.

Location

1. Install the pump as close to the pool or spa as possible. To reduce friction loss and improve efficiency, use short and direct suction and piping returns.
2. Install a minimum of 1.52 meters (5 feet) from the inside wall of the pool and spa, or as required by local regulations.
3. Install the pump a minimum of 0.9 meters (3 feet) from the heater outlet.
4. Do not install the pump more than 2.5 meters (8 feet) above the water level.
5. Install the pump in a sheltered well ventilated location protected from excessive moisture, (i.e., rain, sprinklers, etc.).
6. For hot tubs and spas, do not install within an outer enclosure or beneath the skirt of a hot tub or spa.
7. Install the pump with a rear clearance of at least 80 mm (3 inches) so that the motor can be removed easily for maintenance and repair.

Piping

- 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.
- Do not install 90° elbows directly into pump inlet or outlet. A valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five times the suction line pipe diameter (i.e., 50 mm (2 inch) pipe requires a 250 mm (10 inch) straight run in front of the suction inlet of the pump). This will help the pump prime faster and last longer.
- 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 above.

Electrical

- A means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- If the supply cord is damaged, it must be replaced to avoid a hazard.
- The pump is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA. Use type A or B GFCI.

Optional Keypad Relocation Kit

In special cases when the user lacks easy or convenient access to the IntelliFlo VSD2 Pump, a Keypad Relocation Kit (P/N R356905) may be purchased from your local pool equipment supplier. This kit allows the user to remove the keypad from the top of the rive 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.

INSTALLATION AND REMOVAL (2/5)

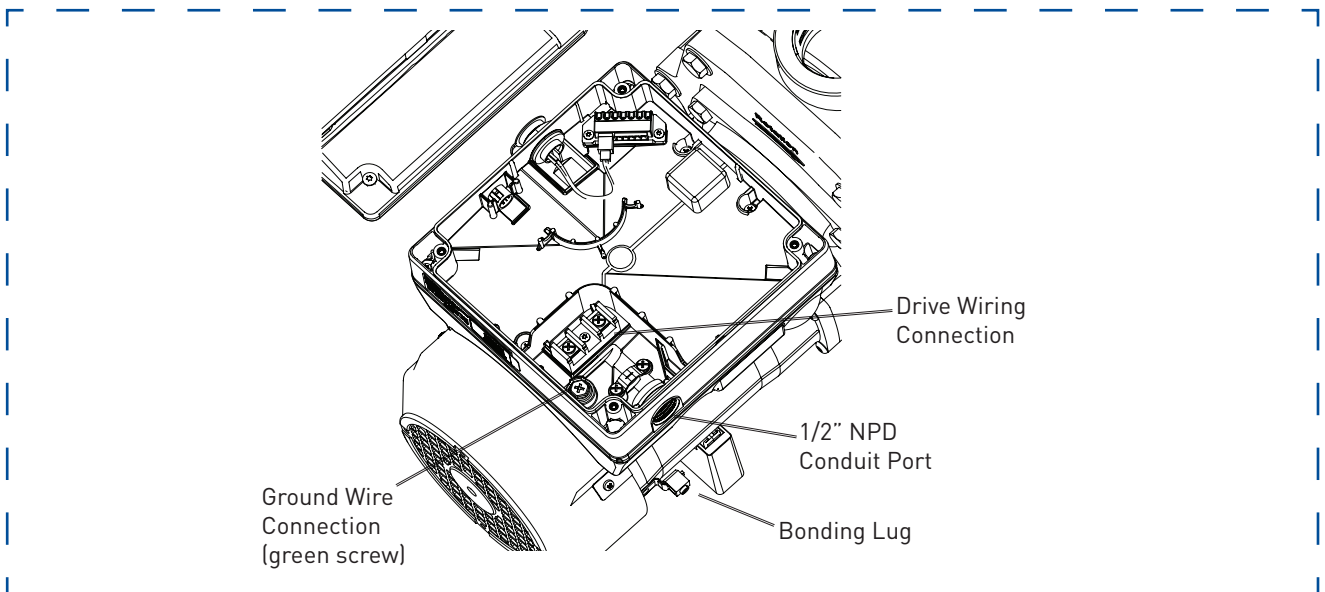
Wiring

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.



INTELLIFLO® ELECTRICAL SPECIFICATIONS

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

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

INSTALLATION AND REMOVAL (3/5)

PUMP DISASSEMBLY

⚠ WARNING - Always disconnect power to the pool 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. 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, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

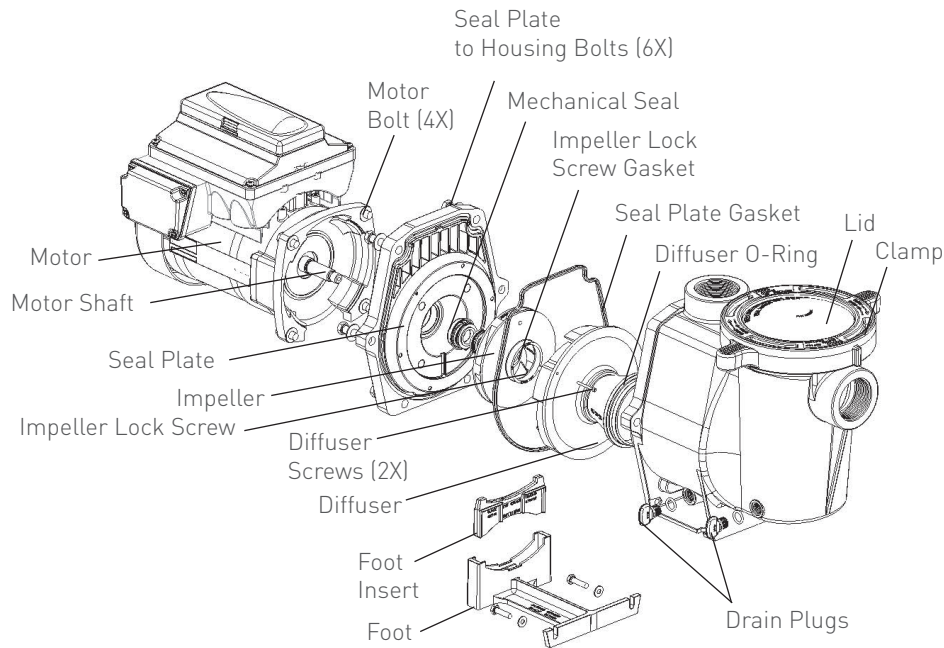
⚠ CAUTION - Be sure not to scratch the polished shaft seal faces; seal will leak if faces are damaged.

Illustrations refer to WhisperFlo IntelliFlo VSD. Disassembly will be slightly different on other models. Please refer to our spare part list or website (www.pentairpooleurope.com) for specific assembly drawings.

To remove and repair the pump mechanical seal, perform the following procedures:

1. Switch 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 required.
4. Remove the six bolts or band clamp that hold the housing (strainer pot/volute) to the rear subassembly.
5. Gently pull the two pump halves apart, removing the rear subassembly.
6. Loosen the holding screws located on the diffuser (not applicable for UltraFlow VSD2).
7. Hold the impeller securely in place and remove the impeller lock screw. The screw is a left-handed thread and loosens in a clockwise direction.
8. Use a flat blade screwdriver to hold the motor shaft. The motor shaft has a slot on the end which is accessible through the center of the fan cover.
Note: An adjustable wrench may be used to hold the screwdriver shaft in place. Use locking pliers instead if your screwdriver has a round shaft.
9. To unscrew the impeller from the shaft, twist the impeller counterclockwise.
10. If the seal needs replacing, remove the white-colored, rotating portion of the mechanical seal from the impeller.
11. Remove the four bolts from the seal plate to the motor.
12. Place the seal plate face down on a flat surface and tap out the mechanical seal.
13. Clean the seal plate, seal bore, and the motor shaft.

INSTALLATION AND REMOVAL (4/5)



SHAFT SEAL REPLACEMENT

The Shaft Seal consists primarily of two parts, a rotating member and a ceramic seal. 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 REASSEMBLY / SEAL REPLACEMENT

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. Ensure that 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. Grease the motor shaft thread and screw impeller onto the motor shaft.
5. Screw in the impeller lock screw (counterclockwise to tighten).
6. Remount the diffuser onto the seal plate. Be sure the plastic pins and holding screw inserts are aligned.
7. Grease the diffuser o-ring and seal plate gasket prior to reassembly.
8. Assemble the motor subassembly to the strainer pot-pump body.
9. Fill the pump with water.
10. Reinstall the pump lid and plastic clamp. See "Pump Strainer Basket Service" on page 32 for details.
11. Reconnect the RS-485 communication cable to the pump.
12. Prime the pump, see page 24.

INSTALLATION AND REMOVAL (5/5)

SPARE PARTS

Detailed spare parts list can be consulted at www.pentairpooleurope.com or our product catalog.

DRIVE ASSEMBLY REMOVAL AND INSTALLATION

⚠ 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, do not remove the four tamper proof bits from the motor assembly.

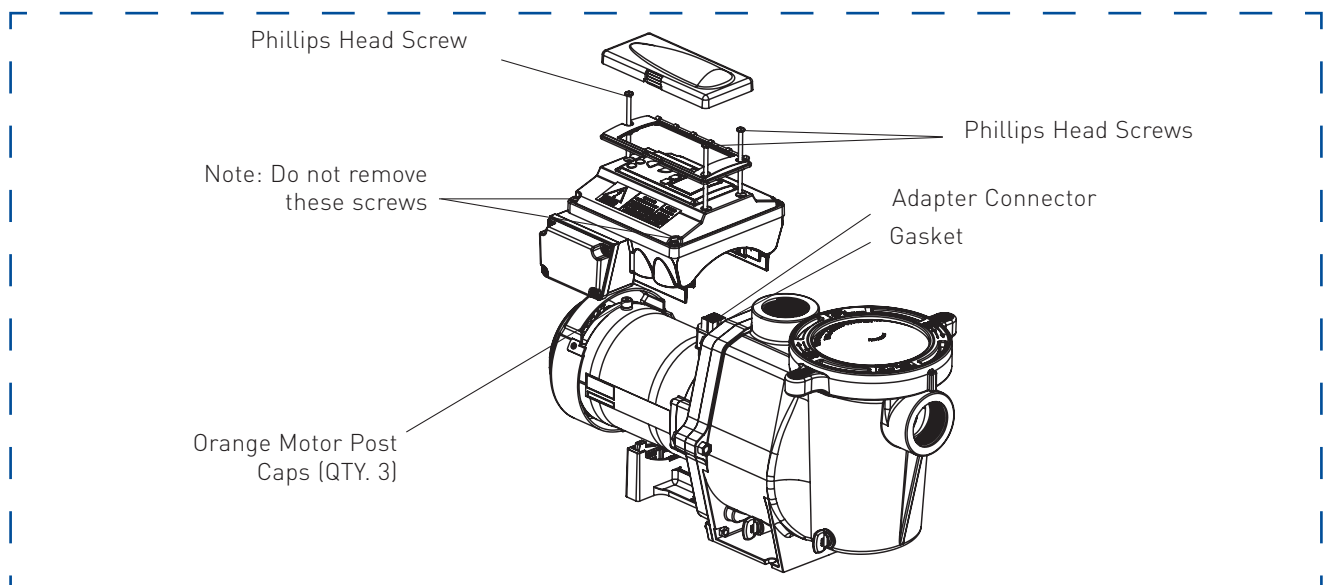
To remove the IntelliFlo® drive and control panel from the motor assembly:

1. Be sure all electrical breakers and switches are turned off before removing the drive.
2. Disconnect the RS-485 communication cable from the pump.
3. Open the control panel cover.
4. Remove the three Phillips head screws securing the drive to the motor assembly as shown.
5. 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.

To install the IntelliFlo® 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 Phillips head screws.




 **CAUTION** - Before installing this product, read and follow all warning notices and instructions on page 4 - 6.

ALERTS AND WARNINGS

The IntelliFlo® VSD2 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.

In the event of an alarm: The alarm light “” will illuminate and all control panel buttons will be disabled until the alarm is cleared. Pressing the Reset button will clear the alarm once the fault condition has been resolved.

In the event of a warning: The warning light “” will illuminate, but the pump will continue to run. The speed limit that is causing the warning must be adjusted in order to correct the warning.

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. 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 29.

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 (+32) 14.295.911.

TROUBLESHOOTING (2/3)

GENERAL TROUBLESHOOTING PROBLEMS

Use the following general troubleshooting information to resolve possible problems with your IntelliFlo® pump. **Note:** Turn off power to unit prior to attempting service or repair.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Pump failure. (For IntelliFlo® alert display messages, refer to Alerts and Warnings on page 45).	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 prime. Pump strainer gasket 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 prime sensitivity to a higher setting (default setting is 1%). Clean pump strainer pot. Replace gasket.
Reduced capacity and/or head. (For IntelliFlo® alert display messages, refer to Alerts and Warnings on page 45).	Air pockets or leaks in suction line. PRIME ERROR may be displayed. Clogged impeller. PRIME ERROR may be displayed. Pump strainer pot clogged. PRIME ERROR may be displayed.	Check suction piping and valve glands on any suction gate valves. Turn off electrical power to the pump. 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 left hand thread anti-spin bolt and o-ring. 3. Remove, clean and reinstall impeller. 4. Reinstall anti-spin bolt and o-ring. Reinstall diffuser, and o-ring. Reinstall motor and seal plate into volute. Reinstall clamp band around seal plate and volute and tighten securely. Clean suction trap
Inadequate circulation. (For alert display messages, refer to Alerts and Warnings on page 45)	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 (3/3)

Electrical problem. (For alert display messages, refer to Alerts and Warnings on page 45)	<p>Could appear as a "Low Voltage" alarm.</p> <p>Could appear as a "Over Heat" alert.</p>	<p>Check voltage at motor terminals and at panel while pump is running. If low, see wiring instructions or consult power company.</p> <p>Check for loose connections.</p> <p>Check line voltage; if less than 90% or more than 110% of rated voltage, consult a licensed electrician.</p> <p>Increase ventilation.</p> <p>Reduce ambient temperature.</p> <p>Tighten any loose wiring connection.</p> <p>Motor runs too hot. Turn power to motor off.</p> <p>Check for proper voltage.</p> <p>Check for proper impeller or impeller rubbing.</p>
Control panel LCD screen displays sporadically or flickers on/off.	<p>Loose drive wiring connection.</p>	<p>Check the connection between the drive and keypad. The drive wiring connection should be tight.</p>
Mechanical troubles and noise.	<p>The pump motor is running but with loud noise.</p> <p>Foreign matter (gravel, metal, etc. in pump impeller.</p> <p>Cavitation.</p> <p>Distinct noise, especially evident at pump start-up or slow-down.</p>	<p>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.</p> <p>Disassemble pump, clean impeller, follow pump service instructions for reassembly.</p> <p>Improve suction conditions.</p> <p>Decrease number of fittings.</p> <p>Increase discharge pressure.</p> <p>Inspect motor slinger and motor shaft seal behind the slinger (NOT the pump's mechanical seal). Apply lubrication to the motor shaft rubber seals.</p>
Pump does not respond to IntelliPool, IntelliComm system commands.	<p>Improper automation setup.</p> <p>Communication network inoperative.</p>	<ol style="list-style-type: none"> 1. Be sure that the communication cable is connected at both ends. 2. Check that the pump's local address matches with the address used in the control system. 3. Check that the pump has been assigned a circuit name on the control system. 4. Ensure that the pump display says "DISPLAY NOT ACTIVE". <p>A defective device on the network can inhibit the proper operation of other network devices. Devices should be disconnected sequentially until the network starts working.</p>



PENTAIR AQUATIC SYSTEMS

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