

### SOLAR OPERATIONS

**View Current Water and Solar Temperature:** In normal operating mode the main screen displays the current WATER temperature and TARGET temperature. The display also indicates if Solar Heat is ON or OFF. Press the **Enter button** to view the current Water and Solar temperatures.

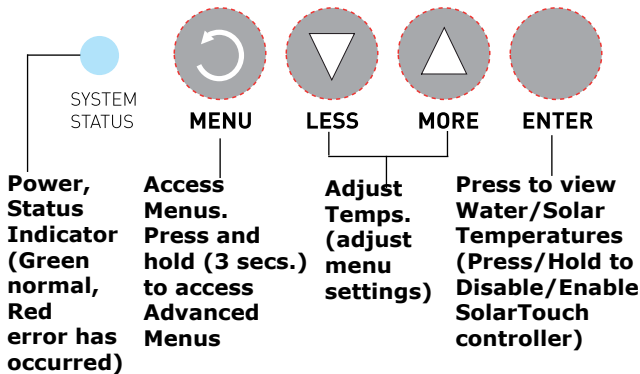
**Adjusting the Water/Solar Temperatures:** To adjust the water target temperature, press the Less (Down arrow) button or More (Up arrow) button to lower or raise the set temperature to the desired level. The water temperature can be adjusted from 40° F to 104° F (4° C to 40° C). This sets the solar system to heat the water up to the target temperature.

**Optimum Water Temperature:** To achieve optimum water temperature, the solar roof sensor must be 6° higher than the water temperature. The pump must be ON for a few minutes for operation. When the roof sensor and the water temperature are within for example 3° (default), solar heat will switch off. This differential setting is adjustable in the "Diff to Stop" setting and is factory set at 3°. This setting sets how close to the temperature to switch off solar heat. Adjust the start and stop temperature differential settings to start and stop solar water heating. Adjusting the differential will effect the performance of your solar system. Refer to your solar service professional for the optimum setting.

**Pool Pressure Cleaner Delay:** Whenever the solar system is turned on, an electronic delay automatically turns off the pool pressure cleaner for five minutes. This protects the pump from damage caused by air in the solar panels at system start-up. The pressure cleaner is connected to "Cleaner Interrupt" terminal on the SolarTouch® Controller circuit board which will be always set to on.

**Solar (Filter) Pump Timer:** The solar (filter) pump timer must be set so that the filter pump operates during the time of the day when solar energy is available.

### SolarTouch® Controller Control Buttons



**Main Screen:** In normal operating mode the main screen displays the current WATER temperature, TARGET Temperature and if SOLAR HEAT, NOCTURNAL COOLING or FREEZE is ON or OFF. Press the Enter button to view the current Water and Solar temperatures. If no menu activity is detected after two minutes, the main screen is displayed.

**Enter button:** This button has the following functions:

- During normal operation, when the display shows Water Temp, Target Temp and Solar Heat ON/OFF setting. Press and release the Enter button to view current Water and Solar Temperature.
- While in Main Menu or Advanced Menu, press the Enter button to view menu item settings and scroll through menus options.
- Press this button to select a menu item.
- Press this button to save a menu setting.

### MAIN SCREEN DISPLAY

#### Normal Operating Mode

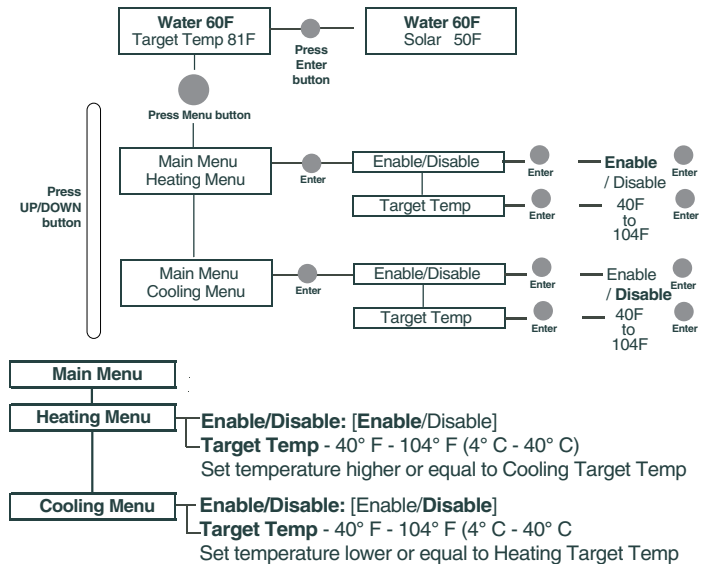
In normal operating mode the main screen displays the current WATER temperature, TARGET Temperature and if SOLAR HEAT, NOCTURNAL COOLING or FREEZE is ON or OFF. Press the Enter button to view the current water and solar temperatures. Degree units are displayed in either Fahrenheit or Celsius (Advanced menu). Effective solar heat depends on the solar and water temperature and the start and stop differentials, then SolarTouch® Controller will rotate the positive 3-way valve and turn on the solar booster pump or increase the RPM's if an IntelliFlo® or IntelliPro® Pump is present. This allows the water to flow to the solar collectors. The solar roof sensor must be 6° higher than the water temperature. The pump must be ON for a few minutes for operation. When the roof sensor and the water temperature are within 3° of each other, solar heat will switch off. The solar temperature start and stop differential settings are factory set at 6° and 3°. These differential settings are adjustable in the **Advanced Menu** settings. Refer to your solar service professional for the optimum setting.

**Nocturnal Cooling:** Provides automatic nocturnal cooling for pools in hot climates that overheat. Water circulates through the system when the collector temperature and the pool temperature is hotter than the target temperature setting. Circulation will stop when the collector temperature is 3° (Default) less than the pool temperature or when the pool temperature is cooler than the target temperature setting.

### MAIN MENU

Use the Main Menu for everyday solar operating features and the Advanced Menu for solar utility settings.

To access the Main Menu, press the **MENU button**. The Main Menu items are as follows:



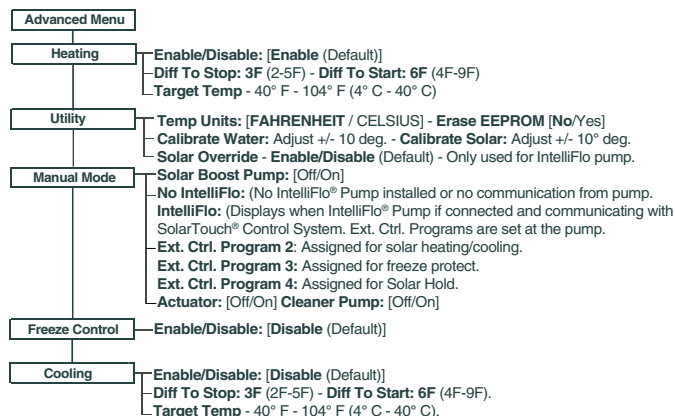
### DISABLE/ENABLE SOLARTOUCH CONTROLLER

#### Using the Enter Button to Disable/Enable SolarTouch Controller

For service purposes, the SolarTouch controller can disable Heating, Cooling and Freeze Protect. Press and hold the Enter button (3 secs.) to disable the system. The display shows "SolarTouch Disabled" - Press and Hold Enter To Re-Enable". **Press and hold the Enter button** again to enable the SolarTouch controller.

## Advanced Menu

To access the Advanced Menu, press hold (3 seconds) and release the MENU button. The Advanced Menu items are as follows:



## HEATING

The SolarTouch® Controller can heat the pool or spa by circulating water through the solar collectors. Heating must be ENABLED in the Heating Menu. The initial factory default setting is "Enabled." The Start and Stop temperature differentials for solar water heating are adjustable. Factory temperature differential settings are: Start (default 6°) and Stop (default 3°). The Heating Menu settings are accessed from the **Advanced menu** (see Advanced menu item above).

Heating will start when the Start differential conditions are met and the water temperature is below the Target Temp. When these conditions are satisfied heating is turned ON. Example: Water Temperature is 75°F; Target Temperature is 82°F. When the roof solar collectors temperature exceeds the water temperature by 6° (76°F), the solar valve rotates. If a solar booster pump is required, this pump will turn on. When using an energy efficient IntelliFlo®/IntelliPro® 4x160/VS-3050 Pump (current model); the pump will ramp up to the RPM's assigned to **Ext Ctrl\* Program 4 (Speed 4)**. If pool is plumbed with a pressure cleaner pump (i.e. pool cleaning system), this pressure pump will turn off for five (5) minutes. This allows the air in the solar collectors to be evacuated from the system without damage to the pump. When Heating turns ON; the solar booster pump will turn ON and valve actuator will rotate. After five (5) minutes the Cleaner Pump Relay will turn on.

**Note: Also see "Solar Hold" feature for heating or Cooling.**

**IntelliFlo® and IntelliPro® Pump Installed and communicating with SolarTouch Controller:** Ext Ctrl Program 2 default speed (1500 RPM) is assigned for solar heating or cooling.

**Heating will turn OFF under the following conditions:** Pool or spa has met the target temperature. • Cloud cover appeared and the stop differentials turn the system off. • No more thermal energy available. • External time clock turned system off. **When Heating turns OFF:** • The valve actuator will rotate. • Solar booster pump will turn off. • If IntelliFlo/IntelliPro pump is being used as either a filtration pump or a solar booster pump, RPM will change and resume to the timed program set speed (RPM). This could take up to one (1) minute. • **IntelliFlo/IntelliPro pump connected and communicating with SolarTouch controller:** The pump is not being controlled by SolarTouch controller at this time. • Pressure Cleaner pump will remain on only if the external time clock cycle is still on. The default pump speeds are as follow: Ext. Ctrl. Program 2 (1500 RPM), Program 3 (2350), and Program 4 (3110).

**(\* Note: Older IntelliFlo/IntelliPro 4x160/VS-3050 pumps do not have a control panel display) and do not display "Ext Ctrl."**

## SOLAR HOLD & SOLAR OVERRIDE

**Solar Hold Feature:** When SolarTouch controller calls for heat and solar heat is available, the IntelliFlo Variable Speed Pump will ramp up to the RPM's assigned to **Ext Ctrl\* Program 4 (Speed 4)**. The solar valve will maintain the closed position for the first five (5) minutes, the solar valve will move to the "open" position and the pump will continue to run an additional five (5) minutes. After 10 minutes, the pump reverts to the assigned speed for **Ext. Ctrl Program 2 (Speed 2)**.

**Cancel Solar Hold:** To cancel the Solar Hold feature, press either the UP or DOWN arrow button for about 3 sec. on the SolarTouch controller. Note: If pool is plumbed with a pressure cleaner pump (i.e. pool cleaning system), this pressure pump will turn off for five (5) minutes when the valve actuator turns on. This allows the air in the solar collectors to be evacuated.

**Solar Override:** This menu option is accessed from the Utilities/Advanced menu. The default setting is Disabled. When disabled the system only runs during the variable speed pumps programmed run schedule. When Enabled the system overrides the pumps schedule and runs anytime solar heat is available.

**Important Note: For the IntelliFlo 4x160/VS-3050 Pump, when the SolarTouch controller releases control of the pump, the pump will then in standalone mode and the pump will save the last manual speed setting. The last manual speed setting is the last speed 1-4 button pressed on the pump. Be sure the last manual speed setting is one you want the pump to run**

## COOLING

The SolarTouch controller can cool the pool/spa by circulating water through the solar panels when the solar collectors are at a lower temperature than the pool/spa water (typically at night). Cooling must be enabled in the Cooling Menu. The default setting is "Disabled." To start and stop cooling, adjust the start (default 6°) and stop (default 3°) temperature differential settings (see Advanced Menu).

**Note: Also see "Solar Hold" feature for Heating or Cooling.**

**Cooling turns ON;** when the water temperature is above the target temperature then cooling will be turned on and the Solar Pump Relay and Valve Actuator are activated (ON). After five minutes the Cleaner Pump will turn on.

**Cooling will turn OFF under the following conditions:** Cooling turns OFF; when the water temperature is below the target temperature the Solar Pump Relay and Valve Actuator are turned OFF. The Cleaner Relay remains on. When no more thermal cooling energy available or when the External time clock turned system off.

**When Cooling turns OFF:** The valve actuator will rotate.

- Solar booster pump will turn off.
- If IntelliFlo pump is being used as either a filtration pump or a solar booster pump, RPM will change and resume to the timed program set speed (RPM). This could take up to one (1) minute.
- IntelliFlo/IntelliPro pump connected and communicating with SolarTouch controller: The pump is not being controlled by SolarTouch controller at this time.
- Pressure Cleaner pump will remain on only if the external time clock cycle is present.

**IntelliFlo/IntelliPro Pump Installed: Speed #2** is the set default speed (1500 RPM) except for IntelliFlo VF (Press Manual button on pump to set RPM and GPM speeds. See the IntelliFlo VF Pump Manual (P/N 350075).

**IntelliFlo pump installed (standalone mode):** If an IntelliFlo pump is detected, it will go to stand-alone mode (may take up to two minutes). The pump is not being controlled by SolarTouch controller at this time.



## Rainbow Pool Products

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## FREEZE PROTECT

When the solar sensor temperature falls to 40°F (4°C) or below, the pool/spa water is automatically circulated through the system to prevent freezing. If the solar sensor is placed at the solar collectors and when the temperature in the solar collector reaches 42° F (6° C) and above, freeze protection will stop. The initial default setting is "Disabled". Note: Sensors have a +/- 1° variance.

**When Freeze Protect is turned ON;** the filter pump, solar booster pump or IntelliFlo®/IntelliPro® Pump (**Ext Ctrl Program 3**) will turn ON and valve actuator will rotate. After five (5) minutes the Cleaner Pump Relay will turn on. The filter pump, solar booster pump or IntelliFlo/IntelliPro pump (**Ext Ctrl Program 3**) will turn ON and valve actuator will rotate. After five (5) minutes the Cleaner Pump Relay will turn on.

**When Freeze Protect is turned OFF;** the filter pump, solar booster pump or IntelliFlo/IntelliPro pump and Valve Actuators are turned off. If an IntelliFlo pump is connected and communicating with SolarTouch controller, RPM will change and resume to the scheduled program speed (RPM). This could take up to one minute. The pump is not being controlled by SolarTouch controller at this time.

## MANUAL MODE

The "MANUAL MODE" To access the Manual mode menu from the Advanced menu, press and hold the MENU button for three (3) seconds. Manual mode is useful for system setup or service purposes. Manual mode settings will override existing SolarTouch controller settings. After you exit the Manual mode menu all previous system settings will resume. **Note: While in the Manual mode menu, the system will stay in Manual Mode until you manually exit back to the Advanced Menu.** In Manual Mode the SolarTouch controller relays actuators, single speed pump and IntelliFlo pump can be manually controlled. Manual Mode is only available in the Advanced Menu. Any changes made to settings while in Manual Mode will not affect previously saved settings. The Manual Mode Menu settings are as follows:

Menu Item	Action
Solar Booster Pump (single speed)	On / Off
IntelliFlo* Pump Off/Ext. Ctrl. Program 2 and Ext. Ctrl. Program 3 (set at pump).	
Pressure Cleaner Pump Actuator	On / Off On / Off
(*) "IntelliFlo" will only be displayed if an IntelliFlo or IntelliPro pump is connected and communicating with the SolarTouch controller.	

### Manual Mode Overview

Each relay remains in the state it was in when entering Manual Mode until it is manually changed. While in manual mode, each relay will stay in any state set by the user as long as they stay in Manual Mode.

**SolarTouch Controller Relays:** When exiting Manual Mode, all relays are turned off, and then set to the previously save settings.

**Cleaning your pool:** Turn SolarTouch controller OFF while manually vacuuming your pool/spa. Press and hold the Enter button for three (3) seconds to disable and re-enable the SolarTouch controller.

## RESET SYSTEM TO DEFAULT SETTINGS

### Factory Default Settings (ERASE EEPROM)

The SolarTouch® Controller factory default setting can be reset from the Erase EEPROM menu. To access the Erase EEPROM menu: **Press and hold the Menu button > Advanced Menu > Utility Menu > Erase EEPROM > Erase EEPROM? (No/Yes)**

Function	Setting
Heating	Enabled
Cooling	Disabled
Freeze	Disabled
Start Diff.	6° F (-15.5 C°)
Stop Diff.	3° F (-16.6° C)
Target Heating	80° F (26° C)
Target Cooling	90° F (32° C)
Solar Override	Disabled

## CLEANERS

### USING CLEANERS WITH SOLARTOUCH CONTROLLER:

Recommended for use in pool systems which utilize a "booster pump" pool cleaner. This feature automatically delays, turns off the pool cleaner pump for five (5) minutes whenever solar is initiated. This will protect the pump from damage caused by air in the solar panels at system start-up.

**Solar Hold Feature:** (Only Using IntelliFlo and IntelliPro 4x160/VS-3050 Pumps) - When SolarTouch controller calls for heat and solar heat is available, the IntelliFlo variable speed pump will ramp up to the RPM's assigned to **Ext Ctrl Program 4**. The solar valve will maintain the closed position for the first five (5) minutes, then the solar valve will move to the "open" position and the pump will continue to run an additional five (5) minutes. After these 10 minutes, the pump reverts to the assigned speed for **Ext Ctrl Program 2 (Speed 2)**.

**Cancel Solar Hold:** To cancel the Solar Hold feature, press either the UP or DOWN arrow button for approximately 3 seconds on the SolarTouch controller. Note: If pool is plumbed with a pressure cleaner pump (i.e. pool cleaning system), this pressure pump five (5) minute delay will be cancelled.

**Solar Booster Pump:** To increase water flow through the collector array, a high voltage relay for the solar booster pump can be used in addition to the main filter pump.

- Solar Booster Pump relay output on the SolarTouch® Controller circuit board is on whenever solar heat is available and off whenever solar heat is not available.
- Pressure Cleaner Booster pump is on whenever solar heat is unavailable.
- Pressure Cleaner Booster Pump: The cleaner is delayed for five minutes whenever solar heat, cooling or freeze turns on.

**Pool Cleaner Protection:** Recommended for use in pool systems which utilize a "booster pump" pool cleaner. This feature automatically delays, turns off the pool cleaner pump for five (5) minutes whenever solar is initiated. This will protect the pump from damage caused by air in the solar panels at system start-up.

## GENERAL INFORMATION

### SolarTouch Controller Auxiliary Outputs (pool filter pump, booster pump, cleaner and time clock)

**Pool Filter pump (Single Speed):** The pool filter pump is controlled externally by the time clock, which ensures the filter pump is running before the booster pump switches on.

**Time clock pool daily filtering override:** When using a single speed pump, or an IntelliFlo or IntelliPro VS 3050 / 4x160 pump, for daily pool filtering schedules SolarTouch controller requires the pump to be connected to an external 24 hour time clock. In order to override the daily pool filtering schedules, a two-pole timer or two-pole relay for switching the pump on or off is required.

**CAUTION!** All of the electrical wiring methods and materials used to complete the electrical installation of the pool/spa system must be in accordance with the current National Electrical Code (NEC) or the Canadian Electric Code, as well as any local electrical codes in effect at the time of installation.



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## INTELLIFLO®/INTELLIPRO® PUMP SETUP

**IntelliFlo/IntelliPro Pumps recommended for use with SolarTouch® Controller:** IntelliFlo/IntelliPro 4x160, VS-3050, Variable Speed - Sta-Rite® Variable Speed

**IntelliFlo Pumps not recommended for use with SolarTouch® Controller:** IntelliFlo/IntelliPro VF 3.2 Kilowatts, Sta-Rite® VS+SVRS, IntelliFlo VS+SVRS pump

**Using IntelliFlo & IntelliPro Pumps with SolarTouch**

**Controller: Note: SolarTouch controller supports one IntelliFlo or IntelliPro pump assigned to ADDRESS 1.**

The SolarTouch Controller communicates with the IntelliFlo/IntelliPro "Variable Speed" pumps via a two conductor RS-485 communication cable (P/N 350122) which is connected to the COM PORT on the SolarTouch controller circuit board. When using a Variable Speed pump with SolarTouch controller, set the desired speed at the pump from the Ext. Control Program 1-4 menu options. **Ext Ctrl\* Program 2 is assign for solar heating and cooling, Ext Ctrl Program 3 is assign for freeze control and Ext Ctrl Program 4 is assigned for Solar Hold.** IntelliFlo and IntelliPro pumps also support 8 internal programmed schedules (time clocks) for daily filtering schedules.

**IntelliFlo and IntelliPro 4x160/VS-3050 Pump**

**(Speed 2, 3 & 4) Overview - Also see "Solar Hold**

**Feature for Heating and Cooling" page 2**

The IntelliFlo and IntelliPro 4x160/VS-3050 pumps do not have a built in programmable scheduler (time clock) function, External Controls or LCD display on the pump. The SolarTouch controller assigns and controls the pump's **Ext Ctrl Program 2 (Speed 2 button) for solar heat/cooling, Ext Ctrl Program 3 (Speed 3 button) for freeze protection, and Ext Ctrl Program 4 (Speed 4 button) for Solar Hold** (see page 2). When the pump is used as the pool filter pump, the pump must be wired to an external time clock. When the time clock turns on the pump, **Ext Ctrl Program 1 (Speed 1 button)** is used for daily filtration. The LED indicator above the **Ext Ctrl Program 1 (Speed 1 button)** must be illuminated before the time clock turns off. For the external time clock and the 4x160 pump to operate **Ext Ctrl Program 1 (Speed 1 button)** for daily filtration, please take note of the following: • Time clock turns the pump on and off for daily use. • Set Speed 1 button (RPM) for everyday use and turn ON. • Speed 1 must be running when time clock turns off to ensure operation.

**Setting Speed 1 for Daily Filtration (IntelliFlo and IntelliPro 4x160/VS-3050):** Set the speed (RPM) on the IntelliFlo 4x160/VS-3050 pump for the daily filtration speed (RPM). Speed 1 must be running when the external time clock turns off. This will ensure when the next program start time on the time clock activates the pump, will turn on Speed 1.

**Setting Pump Speeds (IntelliFlo/IntelliPro VS Pumps)**

Setting the IntelliFlo Variable Speed (VS) pump speed for solar/cooling and freeze protect mode is setup in the pump's "Ext. Ctrl" menu. Note: The IntelliFlo pump must be in "Running Schedule" mode to communicate with the SolarTouch controller.

**Changing default pump speeds in Ext. Ctrl.\* Program 2 (1500 RPM default speed) or Program 3 (2350 default speed) and Program 4 (3110 default speed):**

To change the default pump speeds for Program 2,3, or 4:

1. From the pump's control panel, press the MENU button.
2. Press Up or Down arrow button until "EXT. CTRL." is displayed.
3. Press Select button.
4. Press the Up/Down arrow button to select Program 2 (cooling only). Enter the desired RPM for solar heat/cooling. Note: If Nocturnal cooling is required select Program 3 (freeze protect mode only). Select Program 4 (3110 RPM) for Solar Hold.
5. Press the Select button to change the current value.
6. To change the value, press the Left and Right arrow buttons to select which digit to modify, then use the Up and Down arrow buttons to change the selected digit.
7. When you are done, press the Enter button to save the changes. To cancel any changes, press the Escape button to exit edit mode without saving.

Note: Set freeze protection RPM's the same as solar heating to ensure proper flow.

**(\* ) Note: Older IntelliFlo/IntelliPro 4x160/VS-3050 pumps do not have a control panel display, and do not display "Ext Ctrl."**

## TROUBLESHOOTING

**Pool/Spa is not warm during sunny conditions**

- Check Solar Heating Target temperature, it may be set too low?
- Check external time clock settings are set to the best sunshine hours of the day.
- Solar Actuator Valve may be turned OFF or in the wrong position?
- The pool filter may be dirty or clogged. Check the filter PSI and flow strength at pool return outlets. No bubbles should be seen at the pool return line.
- Pump RPM's/Flow with IntelliFlo pump may need to be increased.
- Possible pool/spa water heat loss during nighttime. Install a pool cover to prevent heat loss.
- Not enough solar collectors. Add an additional solar collector.

**Bubbles in your pool/spa. Increase RPM's/Flow**

- Check 3 way valve for positioning.
- Clean filter. Check filter pressure with solar off then on. If the pressure is high (30 pounds or more) and does not increase with solar on, the filter needs cleaning.
- Check pool skimmer and pump basket for debris.

**SolarTouch controller valve actuator is not switching positions**

- Check toggle switch at rear of actuator. Actuator should be in position 1 or 2.
- Check or replace fuse 1A5 (1.5 A) on SolarTouch controller circuit board if necessary.

## ERROR MESSAGES

When the control panel LED indicator is solid red, a sensor error has occurred; a blinking LED indicates an IntelliFlo pump communication problem or the IntelliFlo pump has been manually stopped. If the water or solar temperature sensor is shorted or open, heating and cooling will stop and not restart until the condition is corrected.

**Note: The SolarTouch controller control panel menus can be accessed but will not affect the error condition. If one or both of the sensors is shorted or open and Freeze Protect is enabled, Freeze Protect will turn on.**

**The displayed sensor(\*) error messages are as follows:**

**Freeze Mode Disabled Freeze Mode Enabled**

Water Sensor Shorted	Water S Shorted Freeze Protect
Solar Sensor Shorted	Solar S Shorted Freeze Protect
Both Sensors Shorted	Sensors Shorted Freeze Protect
Water Sensor Open	Water S Open Freeze Protect
Solar Sensor Open	Solar S Open Freeze Protect
Both Sensors Open	Sensors Open Freeze Protect

Note: (\*) The pump will continue to operate until the problem is resolved.

**The Displayed IntelliFlo pump error messages are as follows:**

Error Message Displayed)	Description
(**) Pump Alarm Solar Paused	IntelliFlo pump has been manually stopped.
(**) IntelliFlo Pump COM Lost	IntelliFlo pump communication cable is not properly connected to SolarTouch Controller or no AC power to IntelliFlo pump.

(\*\*) *Blinking control panel LED*

**IntelliFlo and IntelliPro Pump manuals**

For more information about IntelliFlo and IntelliPro pump operations, refer to: [www.pentairpool.com](http://www.pentairpool.com) and [www.staritepool.com](http://www.staritepool.com).

**Note:** For complete SolarTouch Controller installation instructions please see the SolarTouch Controller User's Guide (P/N 521591).

**Customer Support: (800) 831- 7133**

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