SolarTouch™ Pool & Spa Automation Control
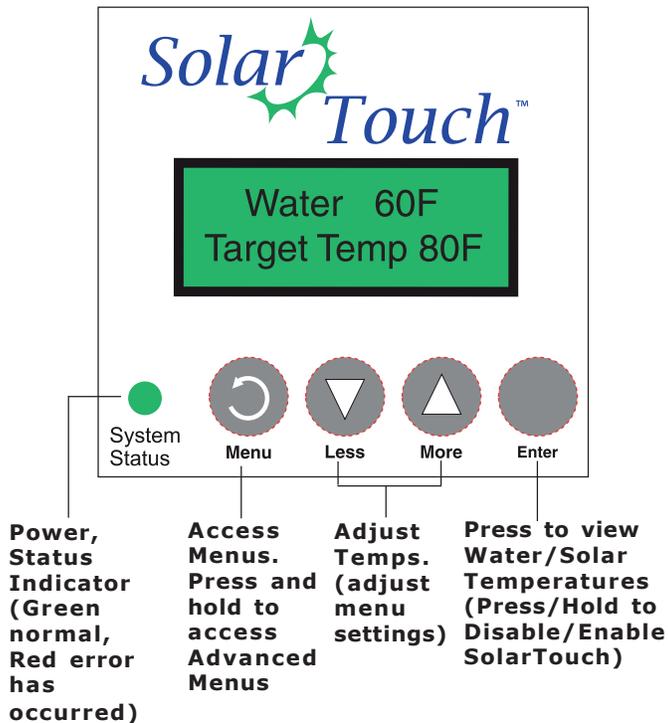
Quick Reference

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 2° (default), solar heat will switch off. This differential setting is adjustable in the "Diff to Stop" setting and is factory set at 2°. 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 circuit board which will be always set to on.

SolarTouch Control Buttons

Water 60F
Target Temp 80F

System Status — Power, Status Indicator (Green normal, Red error has occurred)

Menu — Access Menus. Press and hold to access Advanced Menus

Less — Adjust Temps. (adjust menu settings)

More

Enter — Press to view Water/Solar Temperatures (Press/Hold to Disable/Enable SolarTouch)
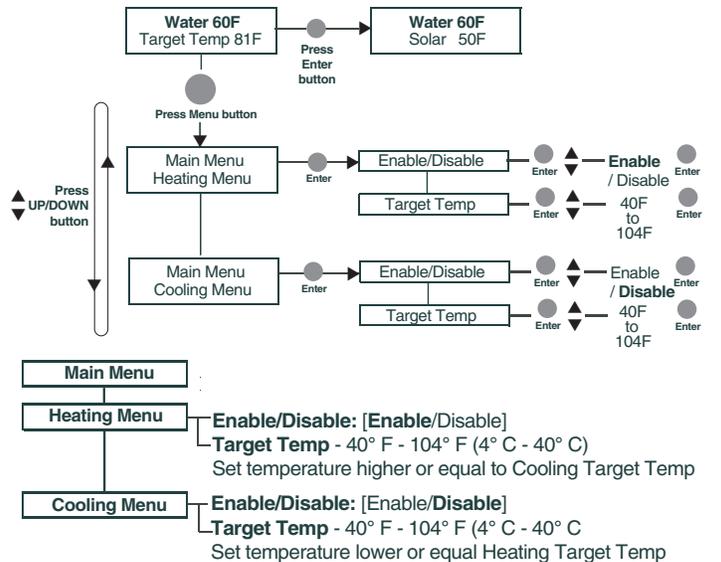
MAIN SCREEN DISPLAY

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 (see Advanced menu). Effective solar heat depends on the solar and water temperature and the start and stop differentials, then SolarTouch 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 2° of each other, solar heat will switch off. The solar temperature start and stop differential settings are factory set at 6° and 2°. These differential settings are adjustable in the Advanced Menu settings. Refer to your solar service professional for the optimum setting.

Nocturnal Cooling: The SolarTouch solar controller provides automatic nocturnal (nighttime) cooling during night time hours for pools that overheat in hot climates. When enabled, SolarTouch circulates relatively warmer pool water to the collector panels when the collector temperature and the pool temperature is hotter than the high limit setting. This process cools the pool water over time. Circulation will stop when the collector temperature is 2° (default) less than the pool temperature or the pool temperature is cooler than the high limit setting. For more information.

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:
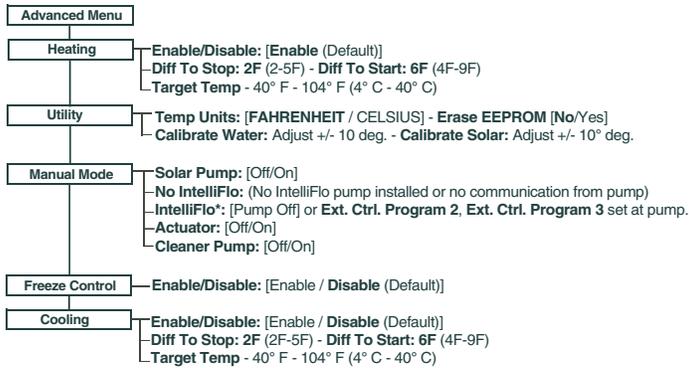

Main Menu
Heating Menu — **Enable/Disable:** [**Enable**/Disable]
Target Temp - 40° F - 104° F (4° C - 40° C)
Set temperature higher or equal to Cooling Target Temp
Cooling Menu — **Enable/Disable:** [Enable/**Disable**]
Target Temp - 40° F - 104° F (4° C - 40° C
Set temperature lower or equal Heating Target Temp

Using the Enter Button to Disable/Enable SolarTouch System
For service purposes, the SolarTouch solar system can disable Heating, Cooling and Freeze Protect. Press and hold the Enter button to disable the system. The display shows "SolarTouch Disabled". Press and hold the Enter button again to enable the SolarTouch system.

Advanced Menu

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

```
Advanced Menu
   │
 Heating ──────┬── Enable/Disable: [Enable (Default)]
               ├── Diff To Stop: 2F (2-5F) - Diff To Start: 6F (4F-9F)
               └── Target Temp - 40° F - 104° F (4° C - 40° C)
   │
 Utility ──────┬── Temp Units: [FAHRENHEIT / CELSIUS] - Erase EEPROM [No/Yes]
               └── Calibrate Water: Adjust +/- 10 deg. - Calibrate Solar: Adjust +/- 10° deg.
   │
 Manual Mode ──┬── Solar Pump: [Off/On]
               ├── No IntelliFlo: (No IntelliFlo pump installed or no communication from pump)
               ├── IntelliFlo*: [Pump Off] or Ext. Ctrl. Program 2, Ext. Ctrl. Program 3 set at pump.
               ├── Actuator: [Off/On]
               └── Cleaner Pump: [Off/On]
   │
 Freeze Control ── Enable/Disable: [Enable / Disable (Default)]
   │
 Cooling ──────┬── Enable/Disable: [Enable / Disable (Default)]
               ├── Diff To Stop: 2F (2F-5F) - Diff To Start: 6F (4F-9F)
               └── Target Temp - 40° F - 104° F (4° C - 40° C)
```

Note: (*) Only displays if IntelliFlo pump if connected and communicating with SolarTouch controller.
Note: (**) Program 2 is assigned for solar heating/cooling.
Program 3 is assigned for freeze protect.

HEATING

The SolarTouch system can heat the pool or spa by circulating water through the solar panels. 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 2°). The Heating Menu settings are as follows:

Menu Item	Action
Enable/Disable	Enables or disables Heating.
Target Temp	The desired pool/spa temperature.
Diff To Start *	(4°F - 9°F) The minimum temperature difference to start Heating.
Diff To Stop *	(2°F - 5°F) The temperature difference at which Heating will stop.

(*) available in Advanced Menu

Heating will start when both Start and Stop 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 pump; the pump will ramp up to the RPM's assigned to Ext Ctrl Program 2. 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.

• IntelliFlo/IntelliPro pump connected and communicating with SolarTouch: Ext Ctrl Program 2 default speed is assigned for solar heating or cooling. For more about setting Ext Ctrl Program 2.

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 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: The pump is not being controlled by SolarTouch at this time. • Pressure Cleaner pump will remain on only if the external time clock cycle is still on.

COOLING

The SolarTouch system can cool the pool/spa by circulating water through the solar panels when the solar controller is 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 2°) temperature differential settings.

Menu Item	Action
Enable/Disable	Enables or disables Cooling.
Target Temp	The desired pool/spa temperature.
Diff To Start *	(4°F - 9°F) The minimum temperature difference to start Cooling.
Diff To Stop *	(2°F - 5°F) The temperature difference at which Cooling will stop.

(*) available in Advanced Menu)

Cooling turns ON; when the water temperature is above the target temperature then cooling will start and the valve actuator will rotate. After five minutes the Cleaner Pump Relay will turn on.

• **IntelliFlo/IntelliPro pump connected and communicating with SolarTouch:** Ext Ctrl Program 2 default speed is assigned for solar cooling (solar booster pump). For more about setting Ext Ctrl Program 3.

Cooling will turn OFF under the following conditions:
• Pool or spa has met the target temperature.
• No more thermal cooling energy available.
• 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: The pump is not being controlled by SolarTouch at this time.
• Pressure Cleaner pump will remain on only if the external time clock cycle is still on.

FREEZE CONTROL

When the water or 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". Freeze Protect will continue until both temperatures reach at least 42°F (6°C). Note: Sensors have a +/- 1° variance. The Freeze Menu settings are as follows:

Menu Item	Action
Enabled/Disabled Protection.	Enables or disables Freeze
(Default is Disabled)	Enable/Disable Freeze Protect will start when either the water or solar temperature reaches 40°F (4°C) or below. Freeze Protect will continue until both temperatures reach at least 42°F (6°C).

When Freeze Protect is turned ON; the filter pump, solar booster pump or IntelliFlo/IntelliPro (Ext Ctrl Program 3) pump 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 and Valve Actuator are turned off. If an IntelliFlo pump is connected and communicating with SolarTouch, RPM will change and resume to the timed program set speed (RPM). This could take up to one minute. The pump is not being controlled by SolarTouch at this time.

MANUAL MODE

The "MANUAL MODE" menu setting is accessed from the Advanced menu. Manual mode is useful for setup or service purposes. Manual mode menu settings will override existing SolarTouch system 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 relays 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 save 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	On / Off
Actuator	On / Off

(*) IntelliFlo will only be displayed if an IntelliFlo or IntelliPro 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 Relays: When exiting Manual Mode, all relays are turned off, and then set to the previously save settings.

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

RESET SYSTEM TO DEFAULT SETTINGS

Factory Default Settings (ERASE EEPROM)

The SolarTouch 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.	2°F (-16.6° C)
Target Heating	80°F (26° C)
Target Cooling	90°F (32° C)

DISABLE/ENABLE SYSTEM

Using the Enter Button to Disable/Enable SolarTouch System

For service purposes, the SolarTouch system can disable Heating, Cooling and Freeze Protect. Press and hold the Enter button to disable the system. The display shows "SolarTouch Disabled". Press and hold the **Enter button** again to enable the SolarTouch system.

GENERAL INFORMATION

SolarTouch 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.

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.

High voltage relay output, as a solar booster pump control: The SolarTouch solar controller control panel can control a high voltage booster pump for solar in addition to the valve actuator. The high voltage relay (Single Pole Single Throw) contacts will turn on when solar, freeze or cooling is turned on.

High voltage relay output, as a time clock override: The SolarTouch solar controller can be used to override a single speed filter pump timer. This feature is important if re-circulate freeze protection or nocturnal cooling functions are being used. Also, this function can be used on systems that should operate whenever solar heat is available, regardless of the timer settings.

Low voltage output: Solar Valve Connector: The SolarTouch solar controller can control a single solar valve, which diverts the water, depending on the temperature differentials of the water and solar. There are two three pin valve actuator connectors provided on the SolarTouch circuit board. Select either connector to be used for the desired direction of the valve.

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 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 National Electrical Code or the Canadian Electric Code, as well as any local electrical codes in effect at the time of installation.

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 <u>not</u> recommended for use with SolarTouch Controller
- IntelliFlo/IntelliPro VF 3.2 Kilowatts, Sta-Rite VS+SVRS, IntelliFlo VS+SVRS

Using IntelliFlo & IntelliPro Pumps with SolarTouch Solar Controller

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, set the desired speed at the pump from the Ext. Control Program 1-4 menu options. Ext. Control Program 2 is assign for solar heating and cooling. Ext.Control Program 3 is assign for freeze control. IntelliFlo and IntelliPro pumps also support 8 internal programmed schedules (time clocks) for daily filtering schedules.

IntelliFlo/IntelliPro 4x160/VS-3050 (Speed 2 and Speed 3) Overview

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

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

Changing default speeds in Ext. Crtl. Program 2 (1500 RPM) and Program 3 (2350) default speed:
1. From the pump's control panel, press the MENU button.
2. Press Up or Down arrow button until "EXTERNAL CONTROL" is displayed.
3. Press Select button.
4. Press the Up/Down arrow button to select Program 2*. Enter the desired RPM for solar heat/cooling.
5. Press the Select button to change the current value.
6. To change the value, press the Left and Right arrows to select which digit to modify, then use the Up and Down arrows 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: If Nocturnal cooling is required select Program 2* and follow step 4 -7.

(*) Program 2 (Assigned for solar heating or cooling only).
(**) Program 3 (Assigned for freeze protect mode only).
Note: Set freeze protection RPM's the same as solar heating to ensure proper flow.

Using IntelliFlo or IntelliPro pumps for daily filtering

When using an IntelliFlo or IntelliPro Variable Speed or IntelliFlo VF pump connected to SolarTouch, an external 24 hour time clock for daily pool filtering is not required. These pumps have built-in programs to schedule daily pool filtering.

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 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 red, a sensor error has occurred. The control panel LCD will display the error message if either or both of the sensors are shorted or an open circuit occurred. For sensor resistance data. 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 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 sensor error messages are as follows:

IF FREEZE MODE IS DISABLED		IF FREEZE MODE IS ENABLED
Water Sensor Shorted	The water sensor reads over maximum temperature >390°F (199°C).	Water S Shorted Freeze Protect
Solar Sensor Shorted	The solar sensor reads over maximum temperature >390°F (199°C).	Solar S Shorted Freeze Protect
Both Sensors Shorted	Both temperature sensors read over maximum temperature >390°F (199°C).	Sensors Shorted Freeze Protect
Water Sensor Open	The water temperature sensor circuit is open or disconnected.	Water S Open Freeze Protect
Solar Sensor Open	The solar temperature sensor circuit is open or disconnected.	Solar S Open Freeze Protect
Both Sensors Open	Both temperature sensor circuits are open or disconnected.	Sensors Open Freeze Protect

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

IntelliFlo & IntelliPro Pump manuals

For more information about IntelliFlo and IntelliPro pump operations, refer to:

www.pentairpool.com and www.staritepool.com

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