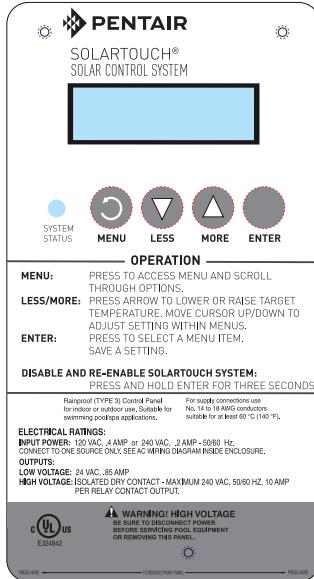# SOLARTOUCH® SOLAR CONTROLLER
FOR POOL AND SPA

INSTALLATION
AND
USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

Contents

IMPORTANT WARNING AND SAFETY INSTRUCTIONS

⚠ **WARNING** Most states and local codes regulate the construction, installation, and operation of public pools and spas, and the construction of residential pools and spas. It is important to comply with these codes, many of which directly regulate the installation and use of this product. Consult your local building and health codes for more information.

IMPORTANT NOTICE - Attention Installer: This Installation and User's Guide ("Guide") contains important information about the installation, operation and safe use of this product. This Guide should be given to the owner and/or operator of this equipment.

⚠ **WARNING** Before installing this product, read and follow all warning notices and instructions in this Guide. Failure to follow warnings and instructions can result in severe injury, death, or property damage.
Call (800) 831-7133 for additional free copies of these instructions. Please refer to www.pentairpool.com for more information related to this products.

⚠ **WARNING** Be sure that the pool or spa meets the requirements of the current National Electrical Code (NEC) Article 680-22 and all local codes and ordinances. A licensed or certified electrician must install the electrical system to meet or exceed those requirements before the controller is installed.

⚠ **WARNING** When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

IMPORTANT SAFETY INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS. READ AND FOLLOW ALL INSTRUCTIONS.
Before attempting installation or service, be sure the source AC power to the Controller is switched OFF at the circuit breaker located at the house.

- **DANGER! RISK OF ELECTRIC SHOCK, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH.** Before attempting installation or service, be sure the source AC power to the SolarTouch® Controller is switched OFF at the circuit breaker located at the house.
- Grounding (earth bonding) is required. The SolarTouch controller should be installed by a qualified professional.
- Read Safety Precautions and Important Instructions (page i-ii). Before attempting any electrical wiring, be sure to read and follow Safety Instructions. Wiring should only be performed by a qualified professional.

⚠ **WARNING** Risk of Electric Shock. Install at least 5 feet (1.5 m) from inside wall of pool using nonmetallic plumbing.

IMPORTANT WARNING AND SAFETY INSTRUCTIONS

⚠ WARNING   To reduce the risk of injury, do not permit children to use this product.

⚠ WARNING   A wire connector is provided on this unit to connect a minimum 8 AWG (8.4 mm) solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5 m) of the unit.

⚠ CAUTION   CONNECT ONLY TO A CIRCUIT PROTECTED BY A CLASS A GROUND FAULT CIRCUIT INTERRUPTER. USE COPPER CONDUCTORS ONLY.

For Canadian C-UL (CNL) Clause 5.3.4 of C22.2 No. 218.1-M89.

READ AND FOLLOW ALL INSTRUCTIONS.

A green-colored terminal or a terminal marked G, GR, Ground, Grounding, or the symbol is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.
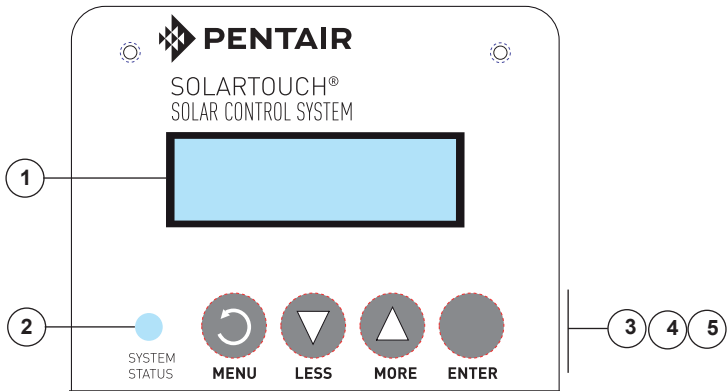
Introduction

The SolarTouch® Solar Controller system consists of a four button controller, a valve actuator, a positive sealed diverter valve and two temperature sensors (used for water and solar). SolarTouch solar controller maximizes available solar heat by monitoring the temperature of both the solar collectors and the pool water. When the pool calls for heat, and solar is available (collectors are in energy-receiving mode), the controller automatically diverts the water flowing between the pool's filter and gas heater or heat pump and circulates the water through the solar collectors. The SolarTouch solar controller supports IntelliFlo® and IntelliPro® Pumps. For more information, see page 11.

General Features

- **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.

- **Easy Temperature Adjustment Controls:** From the SolarTouch controller control panel you can easily set the desired target temperature setting from the Heating and Cooling menus. To set 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.

- **Nocturnal Cooling:** The SolarTouch controller provides automatic nocturnal (nighttime) cooling during night time hours for pools that overheat in hot climates. When enabled, SolarTouch controller 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 3° (default) less than the pool temperature or the pool temperature is cooler than the high limit setting. For more information, see page 7.

- **Freeze Control (Advanced Menu):** When the water temperature and 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. When the solar temperature sensor and or the water sensor reaches 42° F (6° C), or above, freeze protection will stop. In mild climates, freeze protection can help prevent solar collector damage. If an IntelliFlo or IntelliPro pump is being used, be sure that the pump provides sufficient RPM/GPM flow so the entire solar array is properly protected. In climates where prolonged freezing temperatures occur, freeze protection is not recommended. In the event of a power failure, solar collectors are not protected against freezing conditions. For more information, see page 8.

- **Using IntelliFlo or IntelliPro pumps for daily filtering**: When using an IntelliFlo or IntelliPro Variable Speed or IntelliFlo VF Pump connected to SolarTouch controller, an external 24 hour time clock for daily pool filtering is *not required*. These pumps have built-in programs to schedule daily pool filtering.
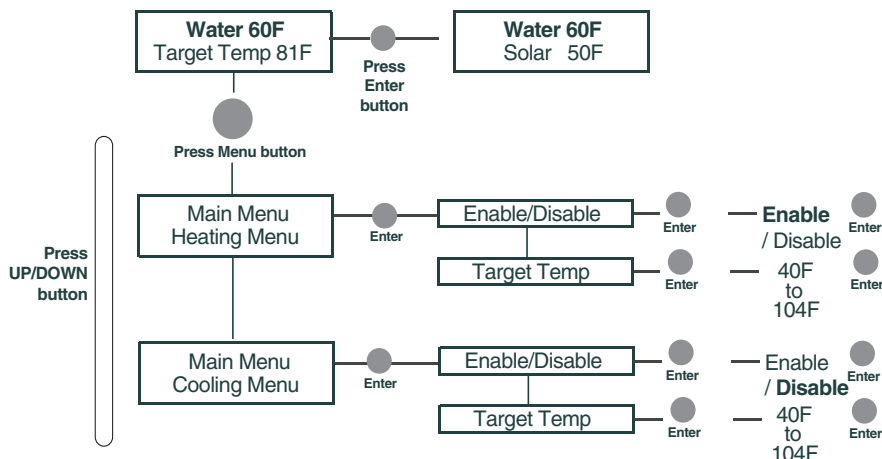
SolarTouch® Controller Control Panel

(1) **Liquid Crystal Display (LCD):** The system LCD displays backlighting for easy viewing of the menu items and status messages. Each button press will light the display. When an event message is displayed, the backlight will also be on.

(2) **System Status LED indicator:** When indicator is green, the system is running normally. If indicator is solid red or blinking red, an error occurred. See page 11 for error conditions.

(3) **Menu Button:** Access Main Menu, Advanced Menu and exit menus. Press and hold this button for three (3) seconds to access the Advanced Menu. If no menu activity is detected after two (2) minutes, the main screen is displayed.

(4) **Less/More Buttons:** Lower or Raise target water temperature. Scroll through menu options. Adjust menu settings. All menu settings are permanently saved and retained even after the unit is power off.

(5) **Enter button:** This button has the following functions:
- During normal operation, when SolarTouch® Controller is displaying 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 and return to the menu tree.
- Press and hold the Enter button for three (3) seconds to disable all SolarTouch controller functions (disables Heating, Cooling and Freeze Protect), "SolarTouch Disabled" is displayed. To re-enable the SolarTouch controller press and hold the Enter button for three (3) seconds.

Note: The display will automatically revert back to the monitoring water and solar temperatures after 30 seconds from the last selection.

Using the SolarTouch® Controller Control Buttons

Main Menu

Using the Enter Button to Disable/Enable SolarTouch Controller

For service purposes, the SolarTouch Controller can disable Heating or Cooling. **Press and hold the Enter button for 3 secs.** to disable the system. The display shows "SolarTouch Disabled". Press and hold the Enter button for 3 secs. again to enable the SolarTouch controller. In the event of a power outage, after power is restored to the SolarTouch controller the previous user settings are restored. Non-volatile memory stores all user system settings.

SolarTouch Controller Main Status Screens

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.

Example: The following screens show SolarTouch controller in normal operating mode. The water temperature is 60° F (15.6° C), solar heating is *on* and the target temperature is 80° F (26.7° C) (see Heating Menu page 5).

Water 60F Target Temp 80F	▶	Water 60F Solar Heat On

Example: The following screens show SolarTouch controller solar is off. The water temperature is 80° F, solar heating is *off* and the target temperature is 80° F (see Heating Menu
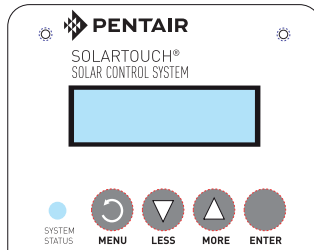
Water 80F Target Temp 80F	▶	Water 80F Solar Heat Off

Water 80F Solar 90F	Press the **Enter** button to view current solar temperatures.

Temperature Control

From the SolarTouch® Controller control panel you can set the desired target temperature setting using the **Less (Down arrow) button** or **More (Up arrow) button**. After the target temperature is reached, the solar system will automatically switch off or when solar energy is no longer available.

Setting the Water Target Temperature for Pool or Spa
(see Main Menu on page 3)

To set the water target temperature, press the **Less (Down arrow) button** or **More (Up arrow) button** to lower or raise the set target temperature to the desired level. The set 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 when enough solar energy is available.

Less (Down arrow) button - More (Up arrow) button

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, page 5).

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.
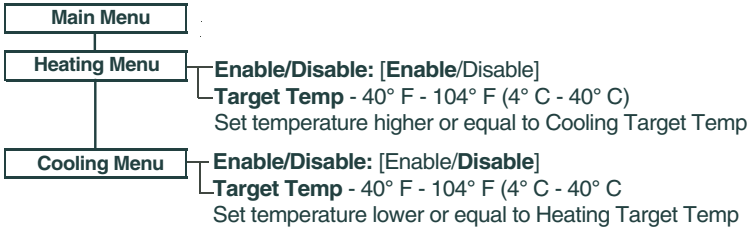
Note: For more Information about daily pool filtering schedules and time clock override see page 12.
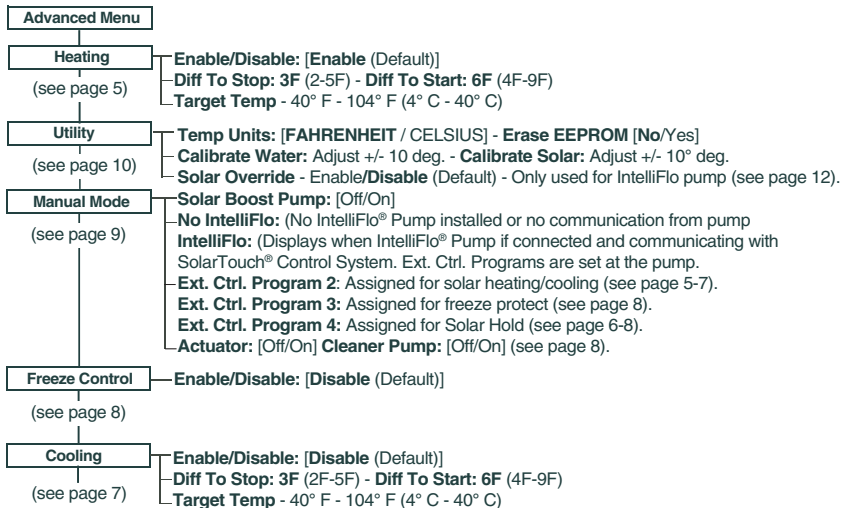
SolarTouch® Controller Menus

Main Menus

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 to Heating Target Temp

Advanced Menu

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

Advanced Menu	
Heating (see page 5)	**Enable/Disable:** [**Enable** (Default)] **Diff To Stop: 3F** (2-5F) - **Diff To Start: 6F** (4F-9F) **Target Temp** - 40° F - 104° F (4° C - 40° C)
Utility (see page 10)	**Temp Units:** [**FAHRENHEIT** / CELSIUS] - **Erase EEPROM** [**No**/Yes] **Calibrate Water:** Adjust +/- 10 deg. - **Calibrate Solar:** Adjust +/- 10° deg. **Solar Override** - Enable/**Disable** (Default) - Only used for IntelliFlo pump (see page 12).
Manual Mode (see page 9)	**Solar Boost Pump:** [Off/On] **No IntelliFlo:** (No IntelliFlo® Pump installed or no communication from pump **IntelliFlo:** (Displays when IntelliFlo® Pump if connected and communicating with SolarTouch® Control System. Ext. Ctrl. Programs are set at the pump. **Ext. Ctrl. Program 2**: Assigned for solar heating/cooling (see page 5-7). **Ext. Ctrl. Program 3:** Assigned for freeze protect (see page 8). **Ext. Ctrl. Program 4:** Assigned for Solar Hold (see page 6-8). **Actuator:** [Off/On] **Cleaner Pump:** [Off/On] (see page 8).
Freeze Control (see page 8)	**Enable/Disable:** [**Disable** (Default)]
Cooling (see page 7)	**Enable/Disable:** [**Disable** (Default)] **Diff To Stop: 3F** (2F-5F) - **Diff To Start: 6F** (4F-9F) **Target Temp** - 40° F - 104° F (4° C - 40° C)

Heating

The SolarTouch controller 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 3°). 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 (continued)

Heating will start when the Start differential condition is 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° (81° F), the solar valve rotates. If a solar booster pump is required, this pump will turn on.

When Heating turns ON; the solar booster pump will turn ON and the valve actuator will rotate. After five (5) minutes the Cleaner Pump Relay will turn on.

- **IntelliFlo® IntelliPro® Pump connected and communicating with SolarTouch controller: Program 2** (Speed 2) solar speed is assigned for solar heating and cooling. For more about setting Program 2, 3 & 4 see page 12.

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 and 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.

Solar Hold Feature for Heating and Cooling: Using a Variable Speed Pump

When SolarTouch controller calls for heating or cooling and solar heat is available, the IntelliFlo Variable Speed Pump will ramp up to the RPM's assigned to **Program 4 (Speed 4 - default speed is 3110 RPM)**. 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 **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 will turn off for five (5) minutes when the valve actuator turns on. This allows the air in the solar collectors to be evacuated from the system without damage to the pump.*

Cooling

The SolarTouch® Controller can cool the pool/spa by circulating water through the solar collectors when the solar temperature 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 3°) temperature differential settings.

The Cooling Settings are as follows:

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.

(*) See the Advanced Menu for these settings)

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

- **IntelliFlo® and IntelliPro® Pump connected and communicating with SolarTouch Controller: Program 2** (speed 2) is assigned for solar heating or cooling (solar booster pump). For more about setting Program 2, 3 & 4 see page 12.

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 and IntelliPro pump connected and communicating with SolarTouch controller: The pump is not being controlled by the SolarTouch controller at this time.
- Pressure Cleaner pump will remain on only if the external time clock cycle is still on.

Note: Also see "Solar Hold Feature for Heating and Cooling" on page 6.

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. The Freeze Menu settings are as follows:

Advanced Menu Item	Action
Enabled/Disabled (Disabled default)	**Enables or disables Freeze Protection.** 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® 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 Actuator 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 the SolarTouch controller at this time.

Cleaners

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.

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 **External Control 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 will turn off for five (5) minutes when the valve actuator turns on. This allows the air in the solar collectors to be evacuated***

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* - Ext. Ctrl. Program 2, Ext. Ctrl. Program 3, and Ctrl. Program 4 (set at pump).	
Pressure Cleaner Pump	On / Off
Actuator	On / Off

(*) "IntelliFlo" is displayed when an IntelliFlo or IntelliPro pump is connected and communicating with the SolarTouch controller.
Note: For IntelliFlo/IntelliPro pumps SolarTouch Controller connections, see page 19.

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 when done.

Reset to 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)**

The default settings are as follows:

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

Calibrating Sensors

Control Panel LED indicator

To adjust the calibration of the pool water and solar collector sensor go to:
Advanced Menu > Utility Menu >Calibrate Water or Calibrate Solar Sensor

Use the Up or Down arrow button to adjust the calibration of the sensor.

The sensor can be adjusted up to +/-10°. As you adjust the degree off-set value the corresponding temperature will also be adjusted.

Calibrate Water **70F Adj +0**	The Water sensor adjustment range is: **Adj +0 (70F) to +10 (+80F) or to -10 (60F)**
Calibrate Solar **80F Adj +0**	The Solar sensor adjustment range is: **Adj +0 (80F) to +10 (+90F) or to -10 (70F)**

Note: 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°, solar heat will switch off. This differential setting is adjustable in the Heating and Cooling menu "Diff To Start" and "Diff To Stop" setting in the Advanced Menu. Adjusting the differential will affect the performance of your solar system. See your solar professional for the optimum setting.

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 (see page 18).

Error Conditions

Error Conditions

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. For sensor resistance data, see page 22. 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.

Error Messages

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.

Using IntelliFlo and IntelliPro® Pumps

Note: Before working on any IntelliFlo or IntelliPro Pump (cleaning the basket etc.), first turn OFF the main circuit breaker and wait until the pump's red alarm LED light stops blinking.

IntelliFlo and IntelliPro Pumps recommended for use with SolarTouch Controller
- IntelliFlo/IntelliPro 4x160 (Mfg. 2005 -2011- P/N 011013).
- IntelliFlo/IntelliPro Variable Speed (8 programmable time clocks - P/N 011018 VS 3050.
- IntelliPro Variable Speed (8 programmable time clocks, P/N P6E6VS4H-209L).

IntelliFlo and IntelliPro Pumps not recommended for use with the SolarTouch Control System
- IntelliFlo/IntelliPro VF 3.2 Kilowatts (P/N 011012)
- IntelliPro VS+SVRS (P/N P6E6XS4H-209L)
- IntelliFlo VS+SVRS (P/N 011017)

For more information about IntelliFlo and IntelliPro pumps, visit www.pentairpool.com.

Using IntelliFlo® and IntelliPro® Variable Speed Pump

The SolarTouch**®** Controller communicates with the IntelliFlo or IntelliPro Variable Speed Pump via a two conductor RS-485 communication cable (P/N 350122) which is connected to the COM PORT on the SolarTouch controller circuit board (see wiring diagram on page 19). When using a Variable Speed pump with SolarTouch controller, set the desired speed at the pump from the ***Ext. Ctrl.* Program 2-4 (speed buttons 2-4)*** menu options. ***Ext. Ctrl. Program 2 (speed buttons 2)*** is assigned for solar heating and cooling. ***Ext. Ctrl. Program 3 (speed buttons 3)*** is assigned for freeze control. ***Ext. Ctrl. Program 4 (speed buttons 4) is assigned for Solar Hold***. IntelliFlo® and IntelliPro® pumps also support 8 internal programmed schedules (time clocks) for daily filtering schedules. ***(*) Note: Older IntelliFlo/IntelliPro 4x160/ VS-3050 pumps do not have a control panel display and do not display "Ext Ctrl."***

IntelliFlo and IntelliPro 4x160/VS-3050 Pump (Program 2, 3 & 4) Overview

Also see "Solar Hold Feature for Heating and Cooling" on page 6.

Early models of 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 *Program 2 (Speed 2 button)* for solar heat/cooling, *Program 3 (Speed 3 button)* for freeze protection, and *Program 4 (Speed 4 button)* for Solar Hold (see page 6). 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, *Program 1 (Speed 1 button)* is used for daily filtration. The LED indicator above the *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 *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.
  See page 13 for set up.
- *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*.

Solar Override - (Only Using IntelliFlo and IntelliPro 4x160/VS-3050 Pump) See page 19 for wiring diagram)

Solar Override is located under the Utilities menu, under the Advanced menu. The default setting for Solar Override is "disabled" from the factory. When Solar Override is disabled the system only runs during the variable speed pumps programmed run schedule. When Solar Override is enabled it 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 when the SolarTouch controller has releases control and is in pump standalone mode.

Setting Pump Speeds (IntelliFlo® and IntelliPro® VS Pumps)

Setting the IntelliFlo/IntelliPro 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 controller supports one IntelliFlo or IntelliPro pump assigned to pump ADDRESS 1. **(*) Note: Older IntelliFlo/IntelliPro 4x160/VS-3050 pumps do not have a control panel display and do not display "Ext Ctrl."***

Changing default pump speeds in Ext. Ctrl. Program 2 (1500 RPM) or Program 3 (2350) and Program (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***. Enter the desired RPM for solar heat/cooling. *Note: If Nocturnal cooling is required select Program 3**. Select Program 4*** 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.

(*)   **Program 2** (Assigned for solar heating or cooling only - See page 5-7).
(**) **Program 3** (Assigned for freeze protect mode only - See page 8).
(***) **Program 4** (Assigned for Solar Hold feature - Default pump speed is 3110 RPM) - See page 6 for more information).

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

Adjusting IntelliFlo or IntelliPro Pump Preset Speeds

Be sure the pump is powered on and the green power LED is on. SolarTouch controller supports one IntelliFlo or IntelliPro pump assigned to pump ADDRESS 1. The IntelliFlo pump must be in "Running Schedules" mode to communicate with the SolarTouch controller. **Note: IntelliFlo VS+SVRS and IntelliFlo VF (Variable Flow) programmable (up to 8 time clocks) is not recommended for use with solar systems.**

To adjust one of the four preset (default) pump speeds:
The following describes how to adjust IntelliFlo and IntelliPro pump speeds.
The pump models include: IntelliFlo & IntelliPro Variable Speed 8 Programmable time clocks. IntelliFlo & IntelIPro VS 3050 (also known as 4x160).

1. Press the desired **speed button** (1- 4) to select the preset pump speed. When the selected speed button is pressed, the LED is on. The pump preset buttons and speeds are: **Speed button #1, (750 RPM), #2, (1500 RPM), #3, (2350 RPM) and #4, (3110 RPM)**.
2. Press the **Start** button. The pump will ramp to the selected preset speed.
3. Adjusting the pump speed while the pump is running, Press the **Up/Down** button to increase or decrease the pump speed. To save the adjusted speed, **Press and hold down a Speed Button for three (3) seconds** to save speed to the button.
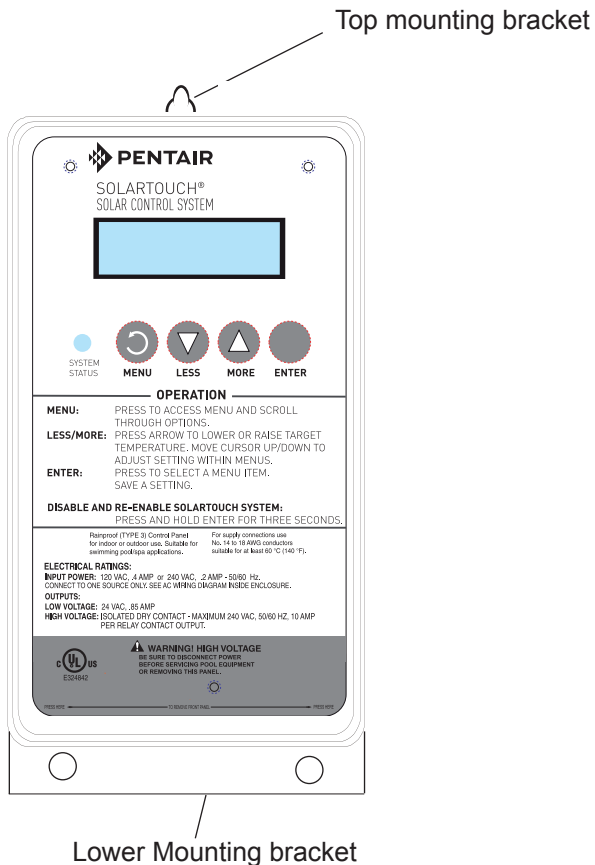
Installing Conduit and Wire to the Enclosure

- Use No. 14 minimum to No. 6 maximum AWG for power relay circuits depending on the power requirement. Be sure to follow all regulation safety codes for the number and size of conductors that can be installed in various sizes of conduit.
- Supply circuit must be protected by suitable circuit breaker.
- To avoid obstruction into the Controller, when using electrical conduit complete the installation of the conduit before concrete is poured. Also, underground conduit should be positioned in well compacted soil. Ensure that all conduit joints are well sealed and watertight.

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

IMPORTANT SAFETY INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS. READ AND FOLLOW ALL INSTRUCTIONS.

- **DANGER! RISK OF ELECTRIC SHOCK, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH.** Before attempting installation or service, be sure the source AC power to the SolarTouch® Controller is switched OFF at the circuit breaker located at the house.
- Grounding (earth bonding) is required. The SolarTouch controller should be installed by a qualified professional.
- Read Safety Precautions and Important Instructions (page i-ii). Before attempting any electrical wiring, be sure to read and follow Safety Instructions. Wiring should only be performed by a qualified professional.

   TO AVOID AN ELECTRICAL HAZARD - Do not connect the power source conductors to the SolarTouch controller until all electrical connections for all equipment (heaters, pumps, motorized valves, and lights etc.) are completed.
   - For the main AC power conduit, it is recommended to use the 3/4" conduit knockout located directly under the enclosure.
   - Use the 1" grommet low voltage opening located on the lower right side of the SolarTouch controller enclosure for the temperature sensor wires. For connection information (see page 18).

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.
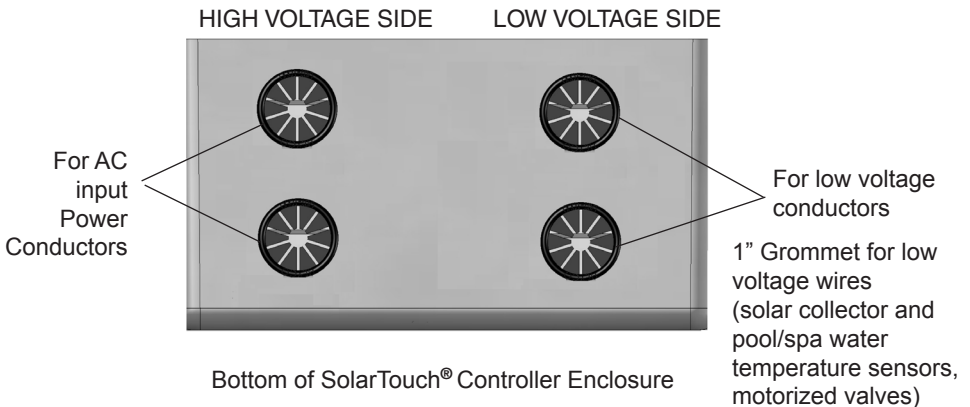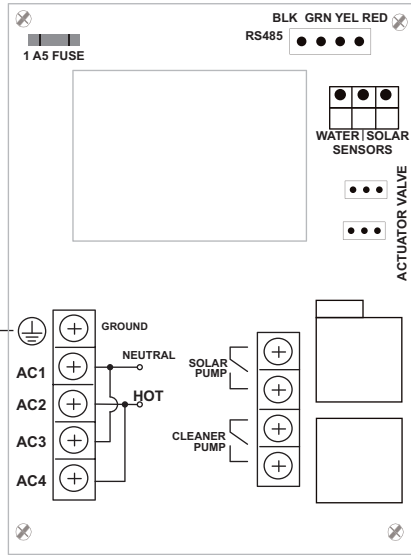
CAUTION All electrical materials used for the SolarTouch controller installation must be accomplished by, or be under the direct supervision of a qualified electrician.

Grounding and Bonding to the SolarTouch® Controller

Connect a ground wire from the primary electrical panel to the SolarTouch Controller ground bus bar. Also ground each piece of high voltage (120 VAC or 240 VAC) equipment that is connected to the Controller relays. The SolarTouch controller must also be connected to the pool bonding system using an 8 AWG (minimum) wire. An earth terminal for bonding is provided on the grounding bus bar inside the SolarTouch controller. For input AC wiring information, see page 17.

Grounding Terminal (for main AC ground wire)

BLK GRN YEL RED

RS485

1 A5 FUSE

WATER SOLAR
SENSORS

ACTUATOR VALVE

GROUND

NEUTRAL

HOT

AC1

AC2

AC3

AC4

SOLAR
PUMP

CLEANER
PUMP

HIGH VOLTAGE SIDE   LOW VOLTAGE SIDE

For AC input Power Conductors

For low voltage conductors

1" Grommet for low voltage wires (solar collector and pool/spa water temperature sensors, motorized valves)

Bottom of SolarTouch® Controller Enclosure

Transformer AC Power Connections
High Voltage Wiring

The high voltage wiring section is located inside the SolarTouch® Controller enclosure on the right side. The SolarTouch controller can be connected either to 120 VAC or 220 VAC. The SolarTouch controller should be wired to receive continuous power (connect directly to sub-panel).
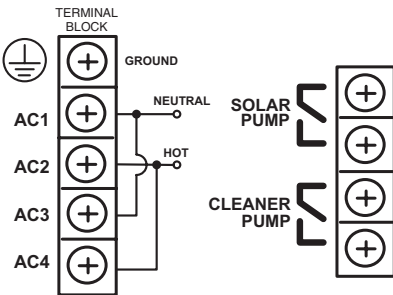
- Use three (3) conductors For the AC power wire into the SolarTouch controller enclosure from the main circuit breaker at the house, use a three conductor cable.

Connect input AC wires to the SolarTouch controller transformer wires as follows:
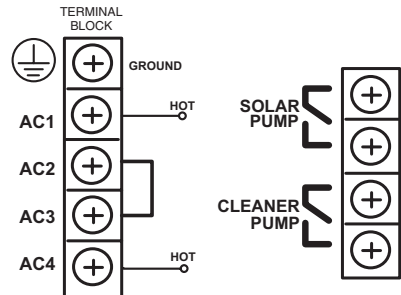
- **120 VAC .4 AMP:** Connect the neutral conductor to AC1. Connect the LINE conductor to AC2. Jumper AC1 and AC3 together and AC2 and AC4 together. One wire must be connected to the ground screw terminal.

- **240 VAC .2 AMP:** Connect the LINE conductors to AC1 and AC4. Jumper AC2 and AC3 together. One wire must be connected to the ground screw terminal.
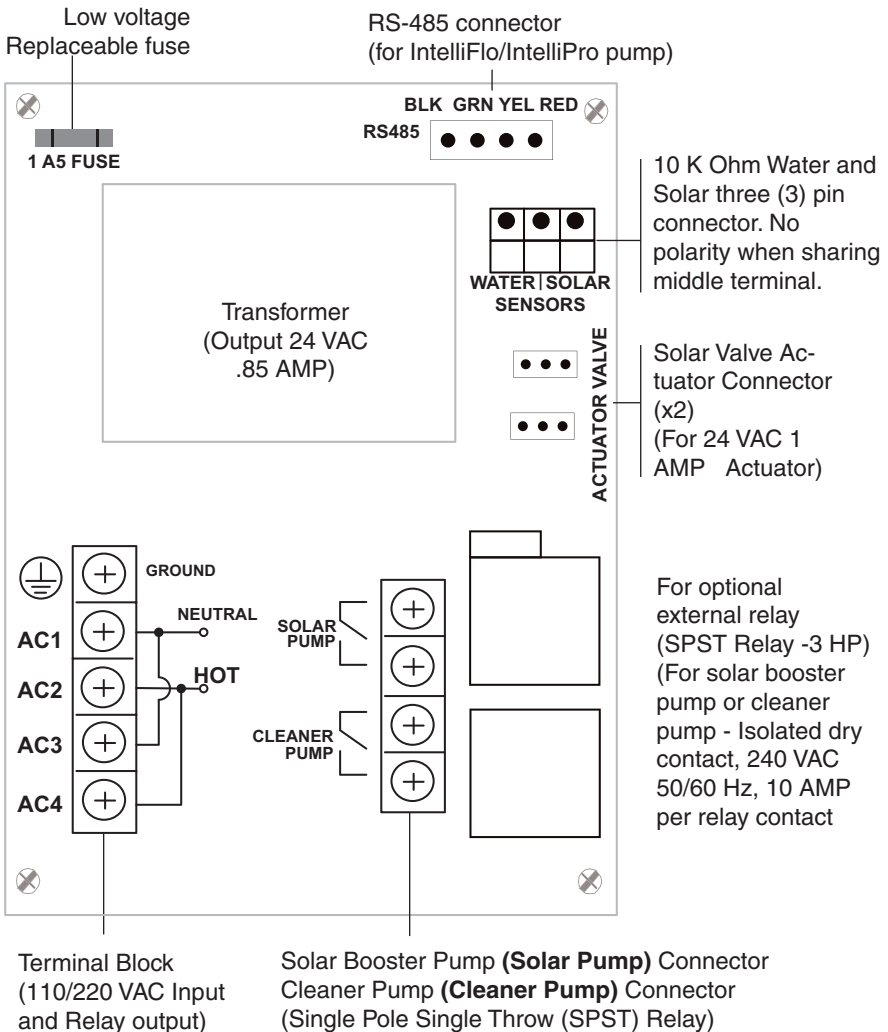

AC WIRING DIAGRAM

Controller Circuit Board Connections

The SolarTouch® Controller circuit board is mounted onto the back of the enclosure. The circuit provides the voltage connections to switch the solar booster pump, cleaner pump, solar valve actuators, connections for temperature sensors and connections for communication with an IntelliFlo® or IntelliPro® Pump via RS-485 communication cable.

Equipment Power

• It is recommended to connect the filter pump relay to an independent circuit breaker. Follow manufacturer's instructions when installing and testing of Ground Fault Circuit Breaker (GFCB) and interrupters (GFCI).

Low voltage
Replaceable fuse

RS-485 connector
(for IntelliFlo/IntelliPro pump)

BLK GRN YEL RED

RS485

1 A5 FUSE

10 K Ohm Water and Solar three (3) pin connector. No polarity when sharing middle terminal.

WATER SOLAR
SENSORS

Transformer
(Output 24 VAC
.85 AMP)

ACTUATOR VALVE

Solar Valve Actuator Connector (x2)
(For 24 VAC 1 AMP Actuator)

GROUND

NEUTRAL

AC1

SOLAR
PUMP

HOT

AC2

AC3

CLEANER
PUMP

AC4

For optional external relay (SPST Relay -3 HP) (For solar booster pump or cleaner pump - Isolated dry contact, 240 VAC 50/60 Hz, 10 AMP per relay contact

Terminal Block
(110/220 VAC Input and Relay output)

Solar Booster Pump **(Solar Pump)** Connector
Cleaner Pump **(Cleaner Pump)** Connector
(Single Pole Single Throw (SPST) Relay)

SolarTouch® Controller Auxiliary Outputs (Pool Filter Pump, Booster Pump, Cleaner and Time Clock)
See Cleaner and Solar Pump Wiring Diagrams on page 20

High voltage relay output, as a solar booster pump control
The SolarTouch 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 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.

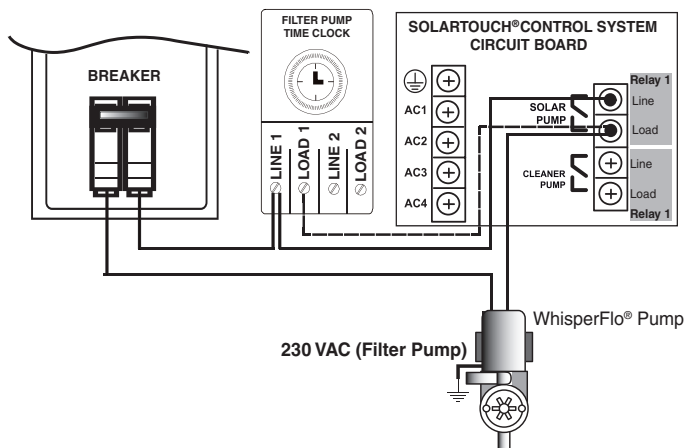### Low voltage output: Solar Actuator Valve Connector
The SolarTouch controller can control a single solar valve, which diverts the water, depending on the temperature differentials of the water and solar. There are two three pin valve actuator connectors provided on the SolarTouch controller circuit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

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 (see wiring diagram below).
- Pressure Cleaner Booster Pump: The cleaner is delayed for five minutes whenever solar heat, cooling or freeze turns on.

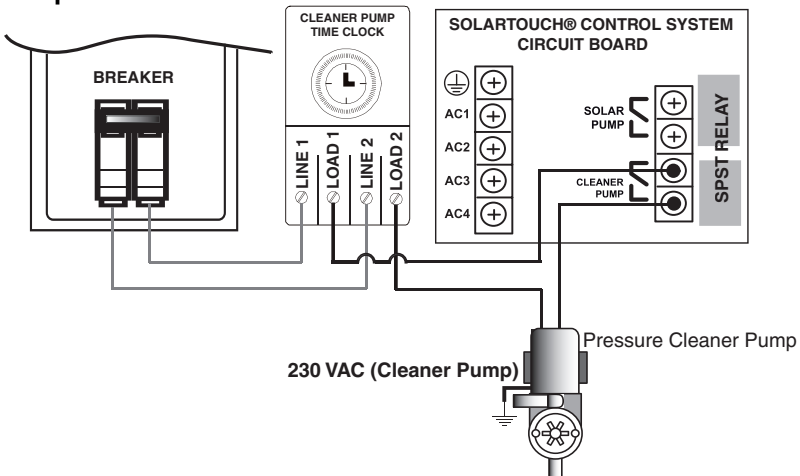## SolarTouch Controller/Timer/Booster Pump Wiring Diagram

FILTER PUMP (SINGLE SPEED) SOLAR OVERRIDE
CONNECTED TO SPST RELAY ON SOLARTOUCH® CONTROL SYSTEM CIRCUIT BOARD
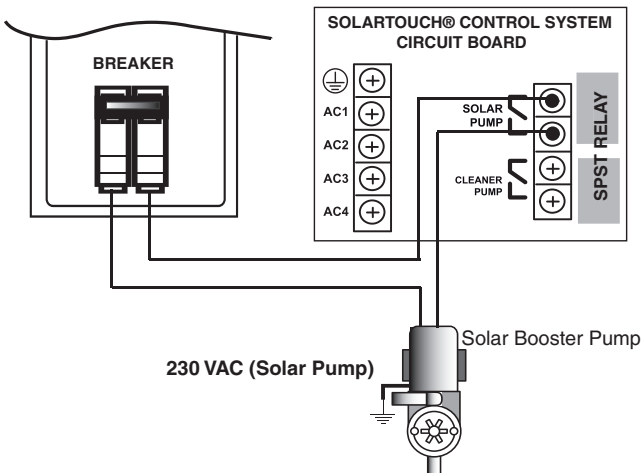
Time clock pool daily filtering override

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 National Electrical Code (NEC) or the Canadian Electric Code, as well as any local electrical codes in effect at the time of installation. See page 17 for wiring diagram.

SolarTouch Controller Wiring Diagrams for Cleaner Pump and Solar Pump

CLEANER PUMP CONNECTED TO SPST RELAY ON SOLARTOUCH® CONTROL SYSTEM CIRCUIT BOARD

SOLAR BOOSTER PUMP (SINGLE SPEED) CONNECTED TO SPST RELAY ON SOLARTOUCH® CONTROL SYSTEM CIRCUIT BOARD

Solar System Installation

- To ensure maximum flow of water through the solar panels, a solar booster pump may be required if panels are installed at a very high elevation. Please review your filter pump specifications.
- It is recommended that the solar panels are mounted in a way that gravity will allow draining whenever the filter pump or solar is not on. Positive sealed valve recommended.
- Check valves are not recommended to be used as an isolation valve to prevent back flow into the solar collector. Check valves fail and are not considered positive sealing.

SolarTouch® Controller System Start-Up

1. Switch power on to the SolarTouch Controller. Set the "Target Temperature" to the desired level. For more information see page 4.
2. Set the filter pump time clock accordingly. *Note: Remember to turn SolarTouch controller OFF before back washing your filter. Be sure that the sand or Diatomaceous Earth (DE) waste has been thoroughly flushed through the system before resuming solar operations. For more information, see "Manual Mode" on page 9.*
3. If pool cleaner protection has been added to the system, the pool cleaner pump motor should be activated whenever the pool cleaner timer is on. Momentarily turn pool cleaner on and off to check the motor is operating correctly.
4. Check that Solar Valve is in "solar bypass" position, diverting water away from solar panels when solar is off. If Solar Valve is staged incorrectly (diverting water to the solar panels), reverse switch on back of Valve Actuator (change from ON1 to ON2, or vice-versa). The Valve Actuator will automatically rotate to the correct position.
5. The system is now ready to be operated as desired.

Winterizing Solar Collectors

⚠ **CAUTION:** If you live in a location where freezing conditions occur and there is no solar air sensor connected to the SolarTouch controller, the SolarTouch system will be unprotected.

Please consult your manufacture's owner's manual for information about winterizing your solar collectors (panels). The SolarTouch controller freeze protection function is active when the water and solar sensor are installed. Freeze protection is enabled whenever the outside temperature is 40° F (4° C) lower (this method is not recommended where temperature levels may drop severely). Freeze Protect will continue until both temperatures (solar collectors and water) reach at least 42°F (6°C). See page 8 for more information about Freeze Protect. When freezing conditions are detected by the solar sensor, as described above, the filter pump will switch on and water will circulate continuously through the system. It's important that the solar sensor be permanently placed in the shade and away from windy locations. Note: In the event of a power failure, the system will be unprotected. Recirculating water to protect your system from freezing is not recommended in climates where freezing temperatures occur frequently and last for extended periods.

Installing and Connecting Temperature Sensors

Water Temperature Sensor (P/N 520272)

To install the water sensor:

1. Select a convenient location to mount the water sensor in the plumbing system between the filter pump and filter. Drill a 3/8" diameter hole in one side of the pipe. If solar override is necessary, install sensor underneath the pipe. This will help ensure a more accurate reading of the stagnate water in the pipe if sensor is in direct sunlight.

2. Insert tip of sensor into the hole. Use the band clamp to secure the sensor to the pipe. Tighten the clamp just enough so that the o-ring begins to flatten. Do not overtighten. Fasten the cable to the plumbing with cable ties.

3. Run 22-gauge two-conductor cable (included) between the sensor circuit board. Route the wire up through the grommet on the bottom of the enclosure to the SolarTouch® Controller circuit board (see page 18).

4. At the SolarTouch controller enclosure, cut off the excess wire and the strip conductors ¼ inch. Insert the sensor wires into the **WATER SENSOR** screw terminals (**JP1 Pool**) on right-side of the SolarTouch controller circuit board (see page 18). *Note: There are three screw terminals; use the middle screw terminal to share with one of the solar sensor wires. No polarity is required with the sensors.*

Solar Temperature Sensor (P/N 522101)

Run a two-conductor cable between the sensor and the controller. The maximum sensor cable length is 300 ft (90 m) from the controller enclosure.
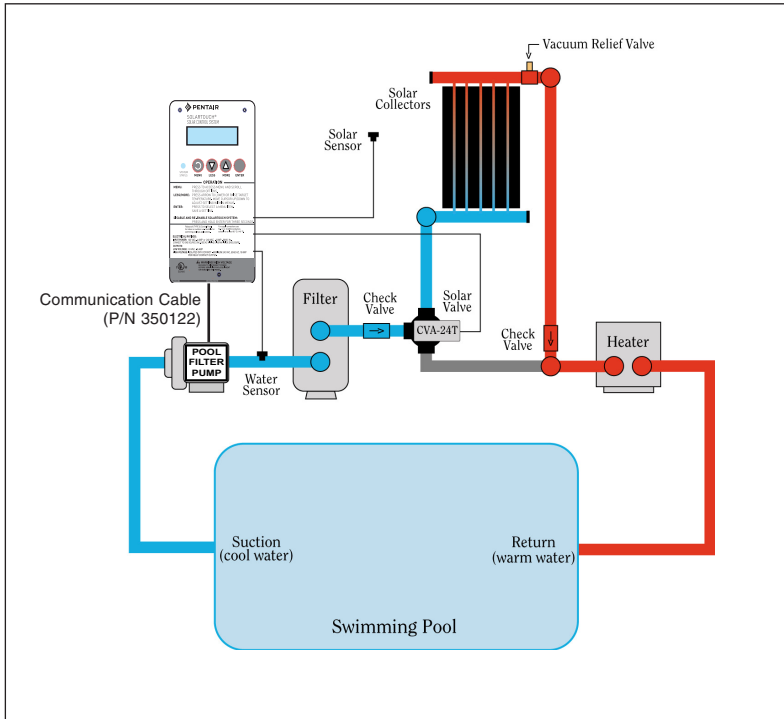
To install the solar sensor:

1. Mount the sensor on a flat surface, with the same exposure to sun as the solar collectors (next to the collectors is recommended). Do not let the sensor touch the panels. **WARNING: DO NOT DRILL HOLE AND CLAMP SENSOR INTO SOLAR PIPE**. For glazed panels, install the sensor between collector and glazing.

2   If necessary, splice a two-conductor extension wire to the sensor. Run two-conductor cable between the sensor and the controller enclosure. Use waterproof connectors to connect the sensor to the cable. Use twisted pair 20 AWG outdoor rated sensor wiring and be sure the wire connections are protected from the environment. Use shielded cable for long runs (300 ft. - 90 m) total wire length maximum) or runs near other electrical wiring.

3. Run 22-gauge two-conductor cable (included) between the sensor circuit board. Route the wire up through the grommet on the bottom of the enclosure to the SolarTouch controller circuit board (see page 18).

4. At the SolarTouch controller enclosure, cut off the excess wire and the strip conductors ¼ inch. Insert the sensor wires into the **SOLAR SENSOR** screw terminals (**JP1 Solar**) on right-side of the SolarTouch controller circuit board (see page 18). *Note: There are three screw terminals; use the middle screw terminal to share with one of the water sensor wires.*

Solar Hydraulics System

Plumb the solar system in accordance with recommended hydraulics shown below.

- 2" diameter plumbing is advised to ensure maximum flow of water through the solar panels. A solar booster pump should be added if panels are installed at a very high elevation.

- It is recommended that the solar panels are mounted in a way that gravity will allow draining whenever the filter pump is not on.

Temperature vs. Resistance Data

Solar systems use 10K Ohm thermistor sensors. When the solar sensor is disconnected from the SolarTouch® Controller system, the sensor will read 10K Ohm at 77° F (25° C). Refer to the following table for the resistance at other temperatures. An accurate reading should give a temperature setting that is accurate to ±0.2° C from 0 to 70° C.

Temp (°C)	Temp (°F)	Resistance (Ω)	Temp (°C)	Temp (°F)	Resistance (Ω)	Temp (°C)	Temp (°F)	Resistance (Ω)
-50	-58	669,500	25	77	10,000	95	203	787
-45	-49	471,500	27	80	9,298	96	205	761
-40	-40	336,200	29	85	8,250	99	210	701
-35	-31	242,500	30	86	8,056	100	212	679
-37	-35	280,100	32	90	7,331	102	215	646
-34	-30	234,100	35	95	6,530	104	220	596
-32	-25	196,300	38	100	5,826	105	221	587
-29	-20	165,100	40	104	5,326	107	225	552
-30	-22	176,800	41	105	5,209	110	230	510
-26	-15	139,300	43	110	4,663	113	235	472
-25	-13	130,300	45	113	4,367	115	239	444
-23	-10	118,000	46	115	4,182	116	240	438
-21	-5	100,200	49	120	3,757	120	248	389
-20	-4	97,000	50	122	3,602	125	257	341
-18	0	85,350	52	125	3,381	130	266	300
-15	5	72,910	54	130	3,047	135	275	264
-12	10	62,480	55	131	2,985	140	284	234
-9	15	53,640	57	135	2,750	145	293	208
-10	14	55,300	60	140	2,487	150	302	185
-7	20	46,230	63	145	2,251			
-5	23	42,300	65	149	2,083			
-4	25	39,910	66	150	2,041			
-1	30	34,560	68	155	1,854			
0	32	32,600	70	158	1,752			
2	35	30,000	71	160	1,686			
5	40	26,100	74	165	1,535			
5	41	25,400	75	167	1,480			
7	45	22,760	77	170	1,400			
10	50	19,900	79	175	1,278			
13	55	17,440	80	176	1,256			
15	59	15,700	82	180	1,168			
16	60	15,310	85	185	1,071			
18	65	13,480	88	190	980			
20	68	12,500	90	194	916			
21	70	11,880	91	195	900			
24	75	10,500	93	200	827			

SolarTouch® Controller Power Specifications

Power:
120 VAC, 0.4A 50/60 Hz
240 VAC, 0.2A 50/60 Hz

Output:
24 VAC (for solar actuator valve)
High Voltage isolated contacts
10 A at 120 VAC/ 240 VAC

SolarTouch Controller Package Contents (Three Versions)

SolarTouch Controller kit with 3-way positive seal solar valve with drain-down (P/N 521592)
- SolarTouch Controller - QTY 1
- CVA-24T Valve Actuator (P/N 263045) - QTY 1
- 3-way positive seal solar valve with drain-down (P/N 263047) - QTY 1
- 10k Ohm Temperature Sensor kit
  - 20 ft. water, solar 30 inches) - QTY 1 each

SolarTouch Controller kit with standard non-solar valve (P/N 521632)
- SolarTouch Controller - QTY 1
- CVA-24T Valve Actuator (P/N 263045) - QTY 1
- Standard non-solar valve (P/N 263026) - QTY 1
- 10k Ohm Temperature Sensor kit
  - 20 ft. water, solar 20 inches) - QTY 1

SolarTouch Controller kit for Booster Pump (P/N 521942)
- SolarTouch Controller - QTY 1
- 10k Ohm Temperature Sensor kit
  - 20 ft. water, solar 20 inches) - QTY 1

SolarTouch Controller Replacement Parts

- P/N 521516 – Enclosure Door Replacement Kit
- P/N 521604 – Control Panel Replacement Kit (Faceplate & Control Board)
- P/N 521605 – Power Replacement Kit (Power Board & Ribbon Cable)
- P/N 520272 – Temperature Sensor Replacement Kit (for water/air)
- P/N 522101 – Solar Temperature Sensor Replacement Kit (for solar)

Notes

Notes

PENTAIR