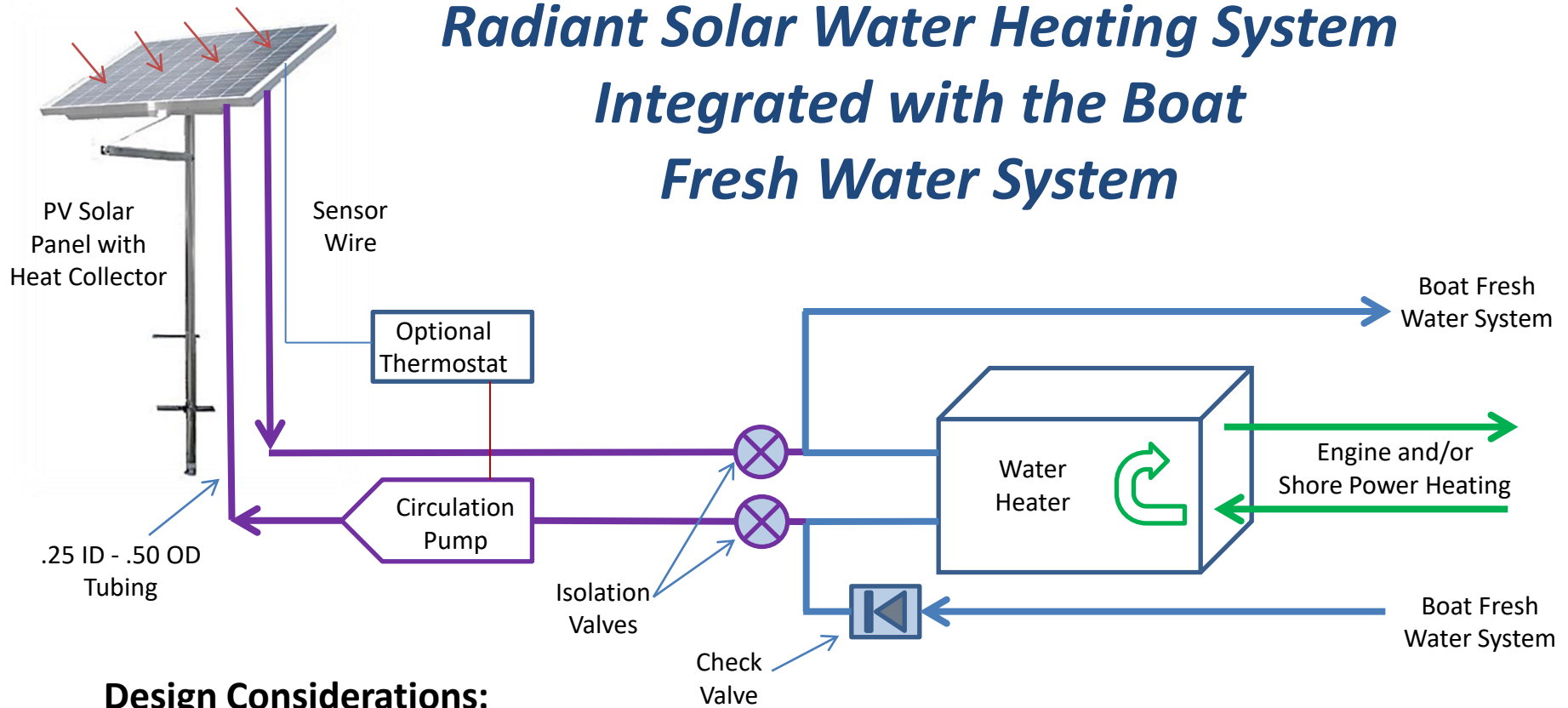


Radiant Solar Water Heating System Integrated with the Boat Fresh Water System



Design Considerations:

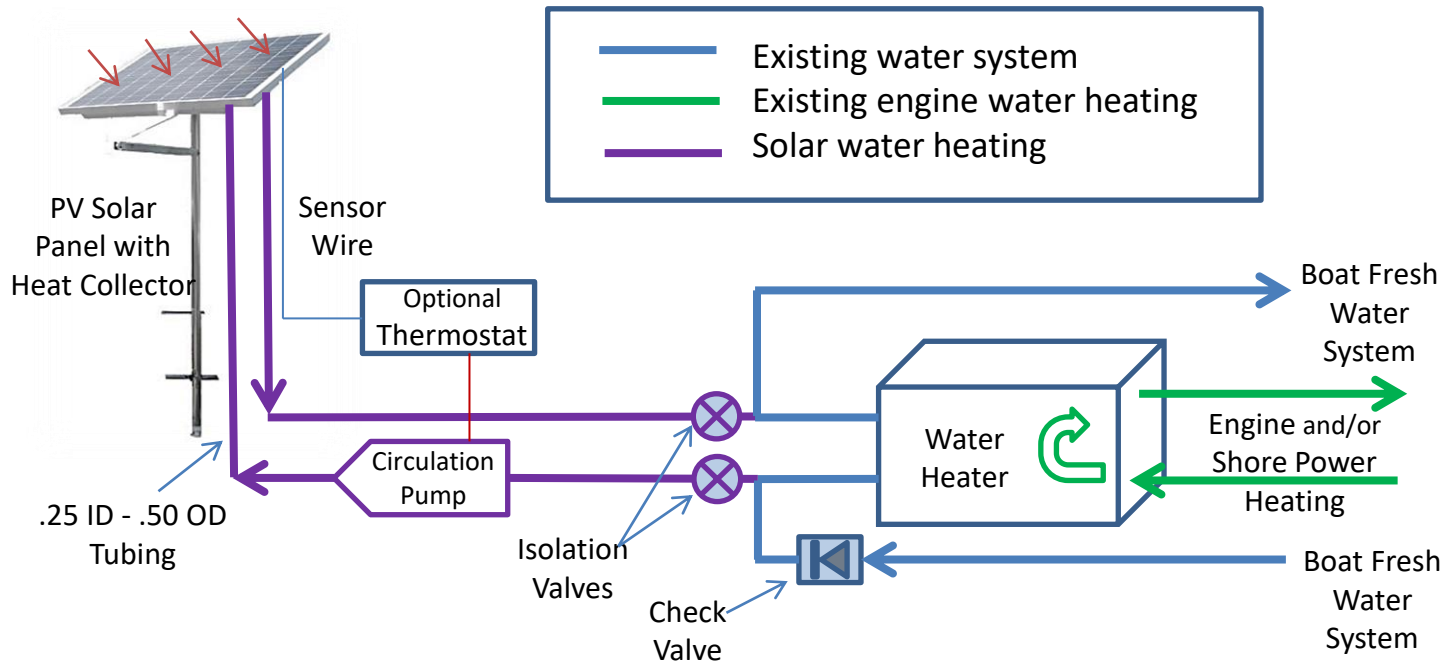
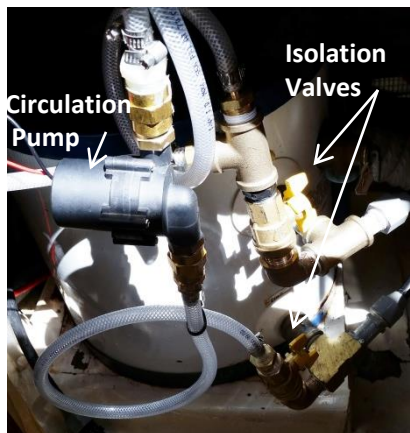
1. Heat exchanger is mounted behind the solar panel.
2. Boat water heater is used for storage of warmed water.
3. Circulation pump can be turned on and off manually or with a thermostat.
4. Solar panel is tilted and rotated for maximum heating efficiency.

- Existing water system
- Existing engine water heating
- Solar water heating

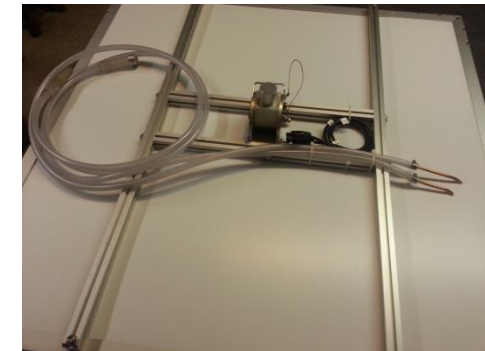
Radiant Solar Water Heating System Integrated with the Boat Fresh Water System Installation Instructions

Your radiant solar water heating system is installed in the following steps:

1. **Install the heat exchanger** – If your system did not come with the heat exchanger already installed on the back of your solar panel, refer to the following pages for installation instructions.
2. **Install plumbing and circulation pump** – The standard kit includes tubing to run from the solar panel heat exchanger to the circulation pump and water storage tank and the circulation pump. All other plumbing must be sourced by the owner. Refer to the included diagram for the proper plumbing.
3. **Install and program the optional thermostat** – Refer to instruction page for proper installation of the thermostat.
4. **Remove air from the system**



Adhering the Heat Exchanger to the Back of the Solar Panel



1. Silicone is a good conductor of heat. Fill in the area between the heat exchanger tubes on the panel side with 100% silicone. Apply with a caulking gun and smooth out so silicone is level with the top of the tubes. Allow time to cure. Two tubes of silicone should be adequate.
2. Place the solar panel face down. Add additional silicone in spots around the heat exchanger and press it against the back of the solar panel until cured. Weight down the heat exchanger as necessary so it is flat against the back of the panel. Allow a day to cure.
3. Place two layers of foil type insulation over the heat exchanger. This insulation can be purchased at hardware supply stores in a roll. It is about 5/16ths thick, has foil on each side and bubble wrap type material in the middle. The idea is to capture the radiant heat from the sun in the heat exchanger and the insulation reduces heat loss.
4. Install an additional backing on the assembly. Use the white corrugated plastic sheet used in making signs. It is about a quarter inch thick and can be purchased from sign makers or plastics companies. (Laird Plastic has excellent prices and will cut it to size. They have outlets throughout the US.) Cut the sheet so that it can be tucked under the solar panel frame to hold it in place. Tuck it under on two sides and use a putty knife to force it under on the other two sides. The sheet will bend so bow it up and fit it under the panel frame. You will need to cut holes for the two water tubes and for the solar panel wires. The plastic is easy to cut with a sharp knife. This can be a bit tricky but gives the installation a nice finished look and works well.

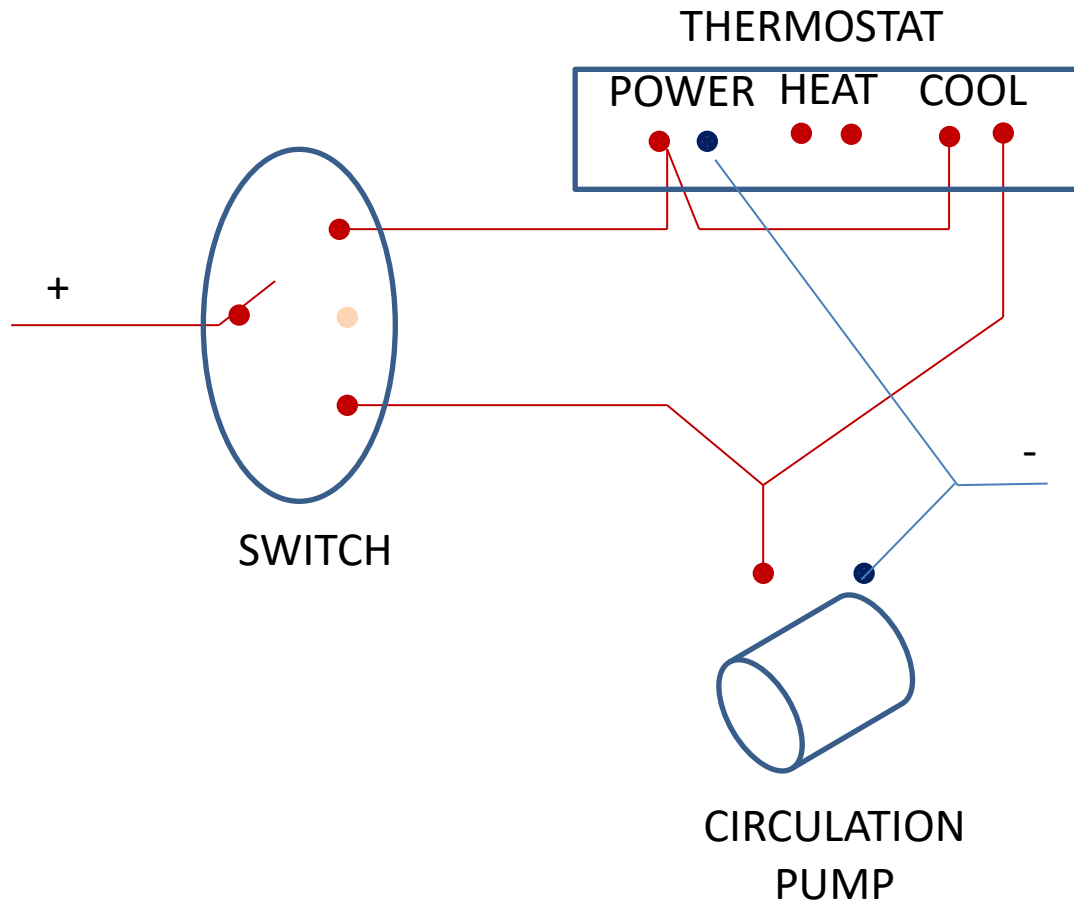
Note: Enclose the two tubes running from the solar panel to the water heater in the foam insulation used to insulate hot water pipes. Both tubes fit into insulation designed for 1 inch OD pipe. Use wire ties to hold the insulation closed and to hold the assembly against the pole. **This will significantly increase the efficiency of the system.**

Note: Once your installation is complete, it is important to bleed the air out of the system. Tilt the panel to horizontal. Disconnect the tube from the panel to the water tank at the tank. Turn on the circulation pump to pump water from the tank through the heat exchanger. Once water comes out of the tube, reconnect it to the tank.



Wiring Diagram for Solar Heating Thermostat Inkbird

This wiring approach uses a single pull double throw switch so the circulation pump can be operated manually or through the thermostat. The switch should have a center OFF position so the pump can be completely shut off.



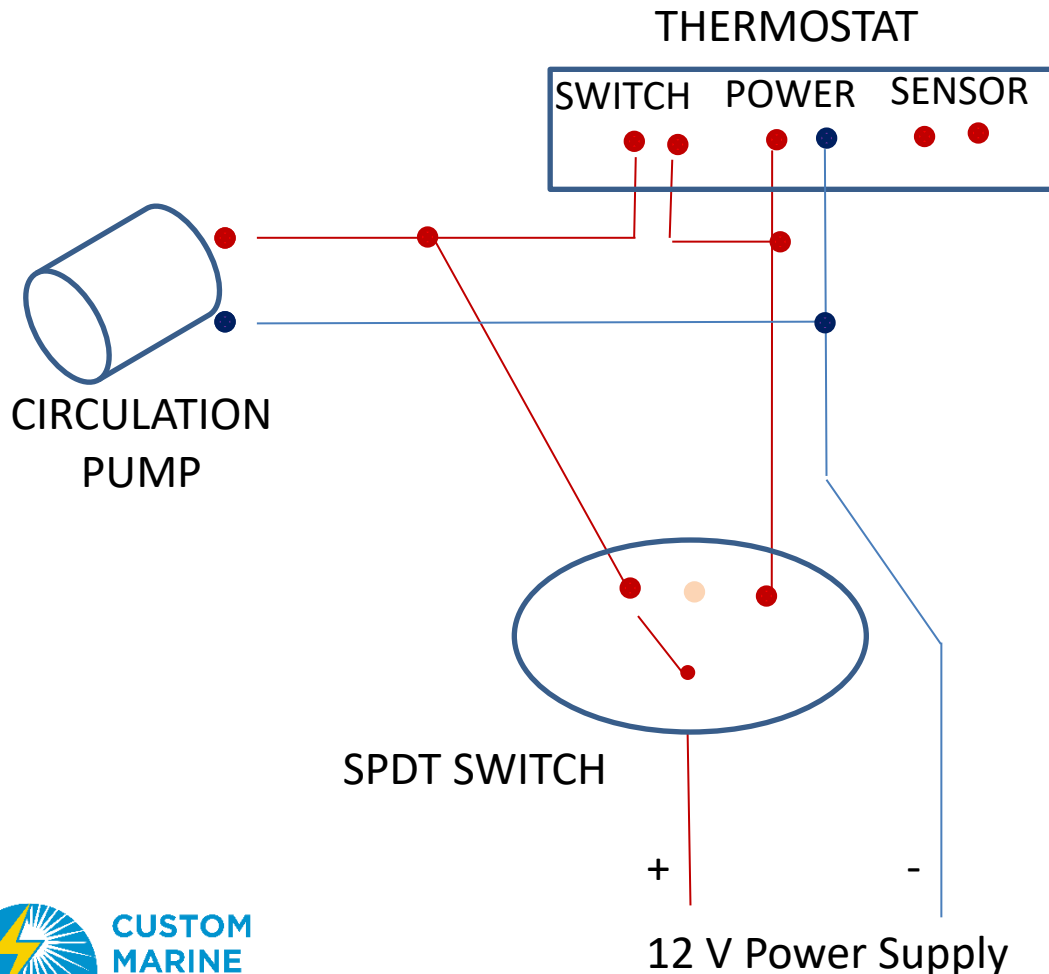
Use the **COOL** mode.

Suggestion: Set the temperature to 95 and the variance to 10 degrees F. The circulation pump will turn on when the panel heat exchanger reaches 105 degrees and will turn off at 85 degrees. Once the water temperature reaches 105 degrees, the pump will stay on. Turn the switch to off as evening approaches as the pump will run until the water temperature cools to 85 degrees thus cooling your warm water.

Note: The thermostat sensor wire can be extended up to 30 feet. Use a slightly heavier wire.

Wiring Diagram for Solar Heating Thermostat Model BAYITE-TCF-3A035

This wiring approach uses a single pull double throw switch so the circulation pump can be operated manually or through the thermostat. The switch should have a center OFF position so the pump can be completely shut off.



Programming the Thermostat

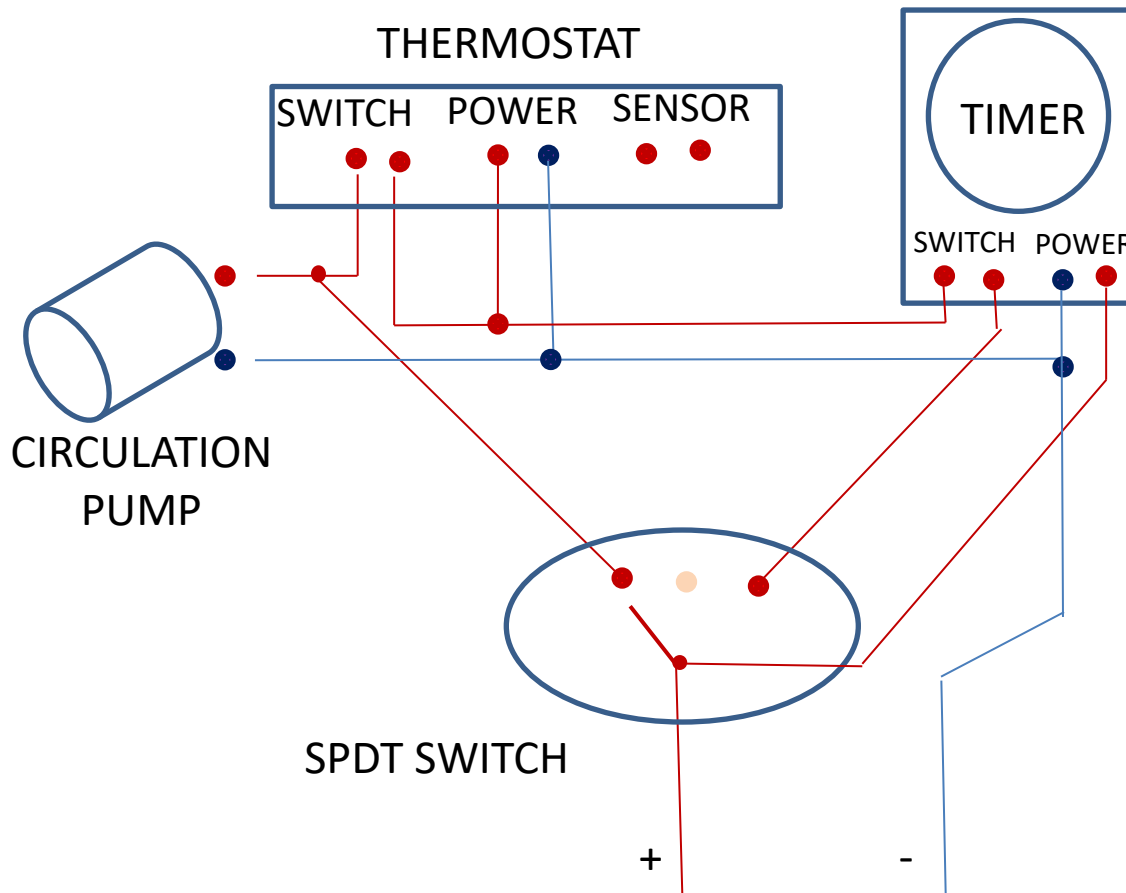
Use the **COOL** mode.

Suggestion: Set the temperature to 100 and the variance to 10 degrees F. The circulation pump will turn on when the panel heat exchanger reaches 110 degrees and will turn off at 90 degrees. Once the water temperature reaches 115 degrees, the pump will stay on. Turn the switch to off as evening approaches as the pump will run until the water temperature cools to 90 degrees thus cooling your warm water.

Note: The thermostat sensor wire can be extended up to 30 feet. Use a slightly heavier wire.

Wiring Diagram for Solar Heating Thermostat Model BAYITE-TCF-3A035 and a Programmable Timer

This wiring approach uses a single pull double throw switch so the circulation pump can be operated manually or through the thermostat and timer. The switch should have a center OFF position so the pump can be completely shut off. The timer will power the thermostat which will control the circulation pump.

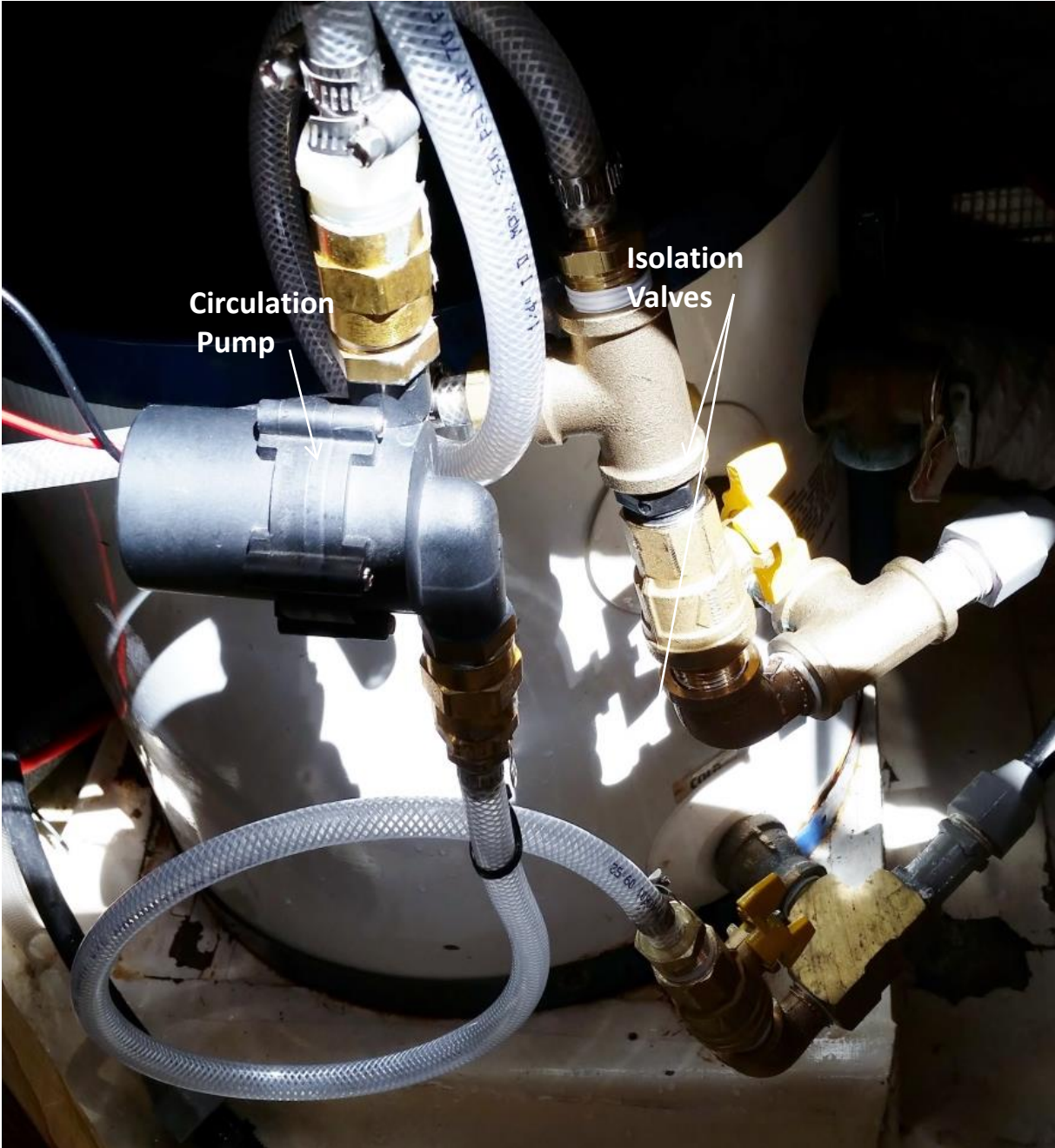


Programming the Thermostat

Use the **COOL** mode.

Suggestion: Set the temperature to 100 and the variance to 10 degrees F. The circulation pump will turn on when the panel heat exchanger reaches 110 degrees and will turn off at 90 degrees. Once the water temperature reaches 110 degrees, the pump will stay on until the timer turns it off.

Note: The thermostat sensor wire can be extended up to 30 feet. Use a slightly heavier wire.



Circulation
Pump

Isolation
Valves