

Smart Recirculation Control – Installation Guide

Congratulations on purchasing the most advanced micro processor controlled, hot water recirculation pump controller made. This system is designed to run the recirculation pump only when you need it thus saving both water and energy. It is designed and built with pride in the USA to provide years of service and savings.

Contents:

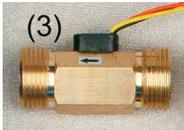
- 1 Smart Recirculation Control with RJ-45 connector



- 2 Temperature Sensors with RJ-11 connectors



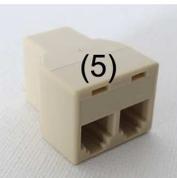
- 1 3/4" or 1" NPT Flow Sensor with JST connector



- 1 Wiring Harness with RJ-45, RJ-11 and JST connectors



- 1 RJ-11 Splitter



Needed:

The following items are needed for the installation, but are not included.

Electrical Tape

PTFE (Teflon) Tape

Wire fasteners for securing wiring to the wall

Please read over the following instructions. If you are not comfortable with any part of them please contact a licensed plumber to perform the installation.

Prior to installation please perform the following system test to ensure the unit is working prior to installing the flow meter.

1. Connect the wiring harness to the controller.
2. Connect the temperature sensors to the wiring harness ensuring they snap together securely.
3. Connect the flow meter to the wiring harness.
4. Plug the controller into a wall outlet and ensure that the LED on the side of the controller flashes green 3 times. If it doesn't but instead rapidly flashes red, see trouble shooting item 1 on page 7.
5. Gently blow through the flow meter in the direction of the arrow and ensure the controller makes a slight audible click and the red LED turns on for approximately 10 seconds. This test ensures that the controller, flow meter, temperature sensors and wiring harness are good and functional. If this test fails, please contact customer support at support@smartrecirculationcontrol.com.

LED Legend:

GREEN LED: will blink 3 times when first plugged in to indicate the unit is functioning correctly

GREEN LED: solid on when a timer is active and pump is not running

RED LED: fast blinking indicates that one or both of the temperature sensors are not connected properly

RED LED: solid on when the pump is running whether due to a timer or due to demand

BLUE LED: solid on when connected via the smart phone app

Installation:

1. Note setting of water heater thermostat and then set to lowest temperature setting (do not turn off the pilot light).
2. Shut off the cold water supply to the water heater.
3. Open the closest hot water faucet to the water heater to depressurize the hot water line. When water quits flowing, turn off the faucet.
4. Disconnect the cold water supply line from water heater. Be careful not to bend and crease the supply line when manipulating it. Be prepared with some towels as some water will flow out from the piping and the hookup line. You don't have to drain the tank and as long as all the faucets remain closed you should not get any back flow from the hot water line.
5. Connect the flow meter to the cold water input of water heater using PTFE tape being sure that the arrow on the flow meter is pointing toward the water heater.
6. Connect the cold water supply line to the input side of the flow meter. The supply line uses a rubber washer to seal instead of PTFE tape so you don't need use PTFE tape on this connection. The rubber washer will seal the line to the flow meter. Hand tighten and turn an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn. **DO NOT OVER TIGHTEN!**
7. Turn on cold water supply to water heater and inspect for any leaks.
8. Turn water heater thermostat back to its original temperature setting.





9. Locate the recirculation pump.
10. Place one temperature sensor against the recirculation loop return pipe immediately before or after the pump, whichever is more convenient, and tape it securely in place.

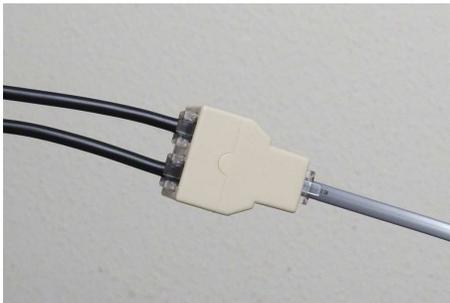
Note 1: If installing on PEX it is recommended to plumb in a short section of copper pipe to attach the temperature sensors to. PEX is a pretty good insulator and causes a lag in the controller sensing the temperature.

Note 2: Temperature sensor **MUST** be placed before the junction with the cold water supply line. The temperature sensor must be taped securely in place against the return pipe **UNDERNEATH** the insulation that is covering the pipe.

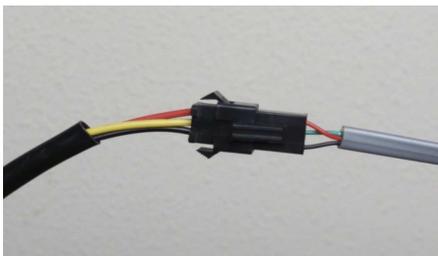


11. Place the other temperature sensor against the hot water outlet pipe of the water heater and tape it securely in place.

Note: The temperature sensor must be taped securely in place **UNDERNEATH** the insulation that is covering the pipe.



12. Connect the temperature sensors to the wiring harness using the RJ-11 splitter ensuring they snap together securely.



13. Connect the flow meter to the wiring harness via the JST connector.



14. Secure the wires to the wall away from the water heater.
15. Plug the wiring harness into the Smart Recirculation Control via the RJ-45 connector.



16. Plug the Smart Recirculation Control into an electrical outlet and plug the recirculation pump into the Smart Recirculation Control.
17. The green LED on the left side of the unit will blink 3 times if everything is OK. If the red LED flashes quickly instead please see Trouble Shooting item 1.
18. Go to a faucet and turn the hot water on and then off. This will trigger the recirculation pump to turn on and run until the recirculation loop is hot. The red LED turns on while the pump is running. If the recirculation pump doesn't turn on, turn on the hot water for a bit longer and then turn it off again. If it still doesn't turn on see Smart Recirculation Control Setup with Smart Phone – Basic Settings – Sensitivity on Page 5.
19. Once the difference in temperature between the water leaving the water heater and the water returning to the water heater are within the controller's set range, the controller will turn the pump off. For more information see Smart Recirculation Control Setup with Smart Phone – Basic Settings – Temperature Range on Page 5.

Smart Recirculation Control Setup with Smart Phone:

The Smart Recirculation Control can be used simply as an on-demand controller for your recirculation pump or, once configured using either an iPhone or Android smart device, it will also work as an advanced timer keeping the recirculation loop hot between specific times of day and on specific days of the week (up to 10 timers can be set). Even when a timer is active it only runs the pump until the recirculation loop has heated up and then it shuts the pump off while continuing to monitor the flow demand and the recirculation loop temperature. The app uses Bluetooth in order to communicate with the controller so you need to be sure that Bluetooth is enabled on your smart device. The app can be downloaded for free from either the Apple App Store or from Google Play by looking up “Smart Recirc”.

Running the app will connect to the Smart Recirculation Control and display the timers currently set. The blue LED on the controller will illuminate when the app is connected. If the blue LED doesn't illuminate, press the menu button in the top right of the app and select “Scan for Recirc Control”. **Note:** I have noticed that some smart devices have a harder time connecting than others so if it fails to connect after pressing the “Scan for Recirc Control” menu item, try restarting the app.

Once connected you can tap any of the existing timers to edit or delete them or press the Add Timer button to add a new one. You must disconnect the app in order for the controller to run. To disconnect the app simply go to your home screen causing the app to go to the background. It will disconnect when backgrounded and reconnect when brought to the foreground. The app is connected if the blue LED on the controller is lit.

The real time clock in the Smart Recirculation Control is set when you connect to the controller with your smart phone. When a timer is active the green LED will light. When the Smart Recirculation Control turns the pump on, the LED will change from green to red. When the loop is up to temperature the pump will shut off and the led will change back from red to green.

The Smart Recirculation Control has a built in power backup that will keep the clock's time for approximately 48 hours after which the clock will lose its time and the controller's timers won't function until the time is set by running the app and connecting to the Smart Recirculation Control.

The clock does not adjust for daylight savings time so when the time changes you will need to connect to the

Smart Recirculation Control with your smart device and the time will be set to the time of your smart device.

Smart Recirculation Control Settings:

The app also allows for controlling all the settings of the firmware of the Smart Recirculation Control. To access the settings press the menu button in the top right of the app and select “Settings”. There will be a list of basic settings and the ability to expand the settings to “Show Advanced Settings”.

Basic Settings:

Sensitivity – The sensitivity setting allows the user to set how many clicks of the flow meter are required to turn the controller on. The default value is 20 which is fine for most installations. If you find that the controller is not turning on when you turn a faucet on and off, you would decrease this value to make the controller more sensitive to flow (require fewer clicks to turn the controller on). Correspondingly, if you find that the controller is turning on when there is no timer active and no hot water being drawn, you would increase this number to make the unit less sensitive to fluctuations in flow (require more clicks to turn the controller on).

Temperature Range – The temperature range setting allows the user to set the temperature differences that cause the controller to turn the pump on and off. When the controller senses flow, it checks to see if the temperature difference between the two temperature sensors is greater than the large difference and if it is it turns the pump on. It runs the pump while reading the temperature sensors until the temperature difference is less than or equal to the small difference. The default large difference is 8 F deg and the default small difference is 5 F deg. These values work fine for most installations, however if you find that the controller is turning on and never turning off, you can increase the value of the small difference. If you find that the controller turns on but doesn't run the pump for more than the Initial Pump Run Time (see Advanced Setting), you can decrease the large difference.

Timers Enabled – This switch enables and disables the timers. This can be used to turn the timers off when you go away on vacation.

Advanced Settings:

Dormant Interval – The dormant interval is the number of minutes that the controller lies dormant after having run the pump and gotten the recirculation loop up to temperature. This setting prevents fast cycling of the pump when hot water is being turned on and off over a short period of time. This is also the number of minutes that the controller waits when a timer is active after turning the pump off before turning the pump on again to check the recirculation loop temperature. If you want the pump to turn on more often while a timer is active or more quickly between pump runs when you draw hot water you would reduce this value. This value is set to 10 minutes which is fine for most installations.

Flow Meter Delay – The flow meter delay is the amount of time in hundredths of a second during which time the controller counts the number of clicks that occur in the flow meter. If the number of clicks is above the sensitivity threshold then the controller deems that there is flow in the hot water line. This value is set to 75 hundredths of a second which is fine for most installations.

Initial Pump Run Time – The initial pump run time is the number of seconds that the pump runs when it first senses flow IF the pump hasn't run in the last dormant interval. This is to ensure that water from the heater makes it to the first temperature sensor in order to obtain an accurate temperature comparison between the two temperature sensors. When a timer is active the pump will turn on every dormant interval for the length of the initial pump run time in order to check the temperature of the recirculation loop. This value is set to 10 seconds which is fine for most installations.

Reset to Factory – This will reset the Smart Recirculation Control back to the factory defaults. If you experience strange behavior of the controller, resetting to the factory defaults would be a good thing to try to resolve the issue. This will also reset all the timers back to the 4 factory default timers so if you have changed the timers you will need to reset them after performing a factory reset. You must type “yes” when prompted in order for the factory reset to take place.

Trouble Shooting:

1. SYMPTOM: Red LED flashes quickly after it is plugged in and never stops.

ISSUE: The Smart Recirculation Control is not able to get temperature information from the temperature sensors.

RESOLUTION: Unplug the Smart Recirculation Control from the wall, disconnect the connection to the temperature sensors, disconnect the wiring harness from the Smart Recirculation Control. Reconnect the temperature sensors ensuring they are firmly connected and snapped together. Plug the wiring harness back into the Smart Recirculation Control. Plug the Smart Recirculation Control back into the wall outlet.

2. SYMPTOM: Pump won't turn on when hot water is drawn from a faucet.

ISSUE: Water in the loop is already hot.

RESOLUTION: Unplug the Smart Recirculation Control from the wall outlet, wait 10 seconds and plug it back in. Go to the faucet and turn on the hot water and see if the pump turns on for the Initial Pump Run Time and then off. If it does, then the unit is functioning correctly. If it doesn't, then the sensitivity of the Smart Recirculation Control needs to be adjusted. Please see Basic Settings – Sensitivity on Page 5.

3. SYMPTOM: Pump turns on when no hot water is being drawn.

ISSUE: Pressure spikes in the cold water supply line caused by abrupt turning off of the cold water (for instance when a toilet fills) or caused by fluctuations in the feed from the utility company can cause the Smart Recirculation Control to trigger the hot water recirculation pump to turn on.

RESOLUTION: The sensitivity of the Smart Recirculation Control should be adjusted. Please see Basic Settings – Sensitivity on Page 5.

If you need further support please contact:

Leridian Dynamics, Inc.
support@smartrecirculationcontrol.com
or 831-761-8659