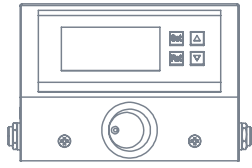




ENGINEERING BETTER BEER

FTSs² Product Guide

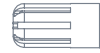
STANDARD KIT



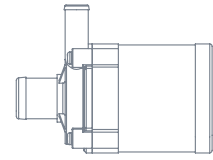
FTSs² Controller



Hose Clamps
*(x2 Half bbl Chronical)



Pump Inlet Cover



Pro Grade Submersible Pump



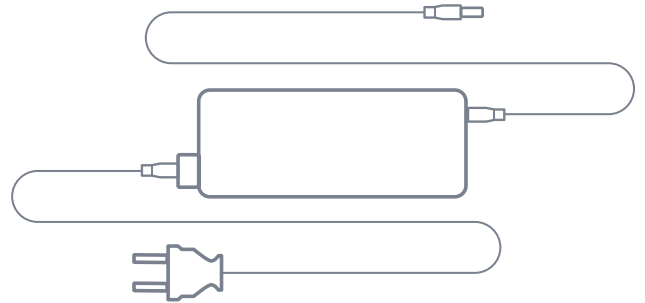
Silicone Stopper



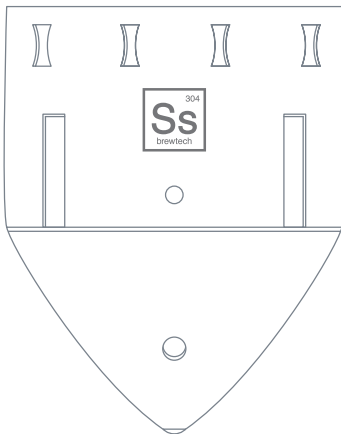
O-Rings



Lock Nuts

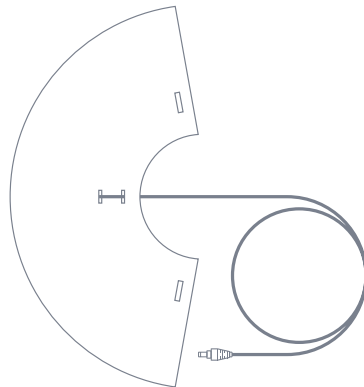


Power Supply

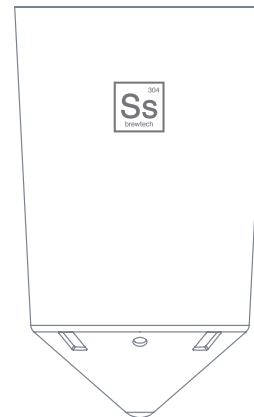


Chronical
Neoprene Insulation Jacket

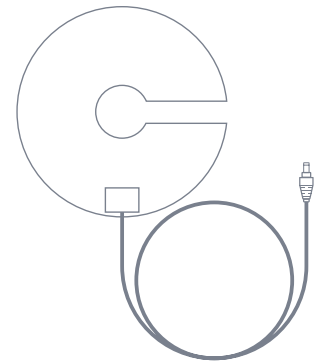
(Included with the Chronical Kit only)



Chronical
Cone Heating Pad

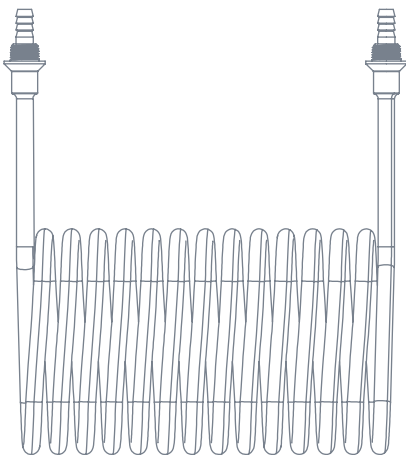


Brew Bucket
Neoprene Insulation Jacket

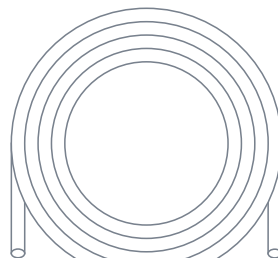


Brew Bucket
Cone Heating Pad

(Included with the Brew Bucket Kit only)



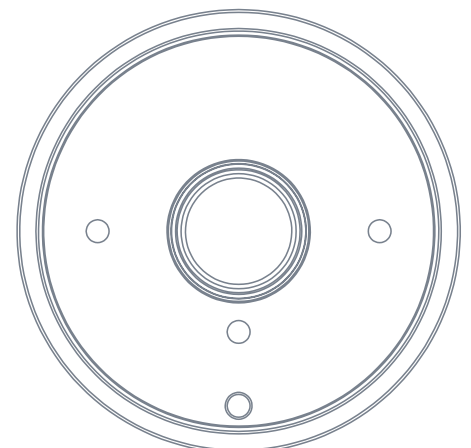
Immersion Coil
*(x2 Half bbl Chronical)



Vinyl Tubing

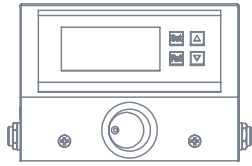


Thermowell



FTSs Lid

BME KIT



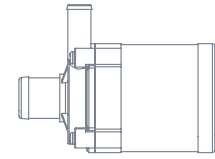
FTSs² Controller



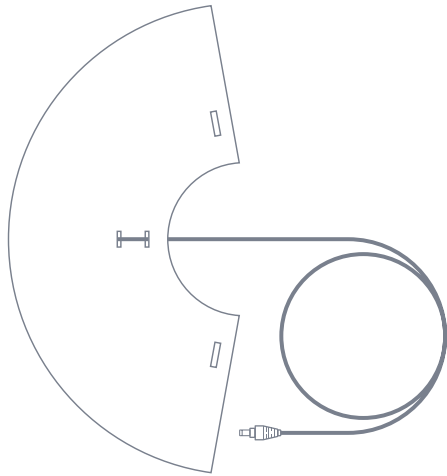
Hose Clamps



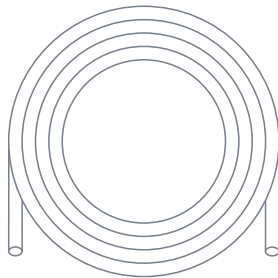
Pump Inlet Cover



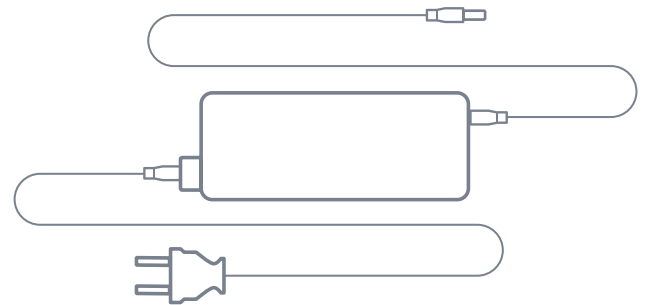
Pro Grade Submersible Pump



Cone Heating Pad

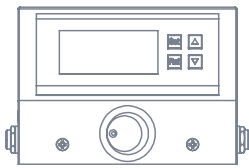


Vinyl Tubing

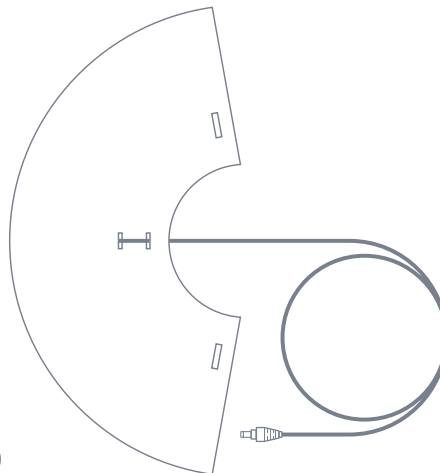


Power Supply

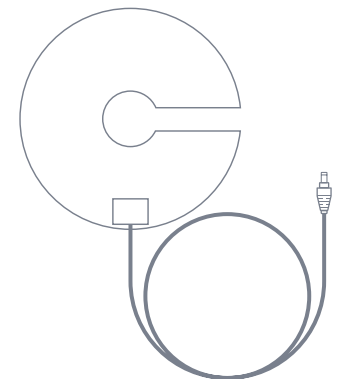
UPGRADE KIT



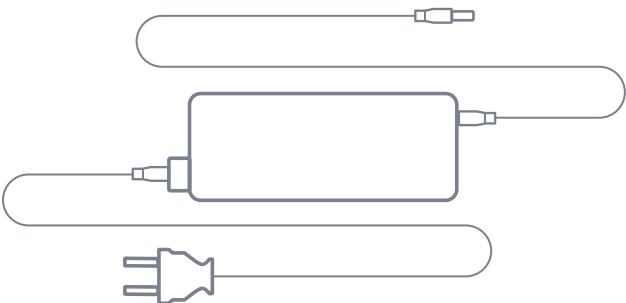
FTSs² Controller



Chronical
Cone Heating Pad
(Included with the
Chronical Kit only)



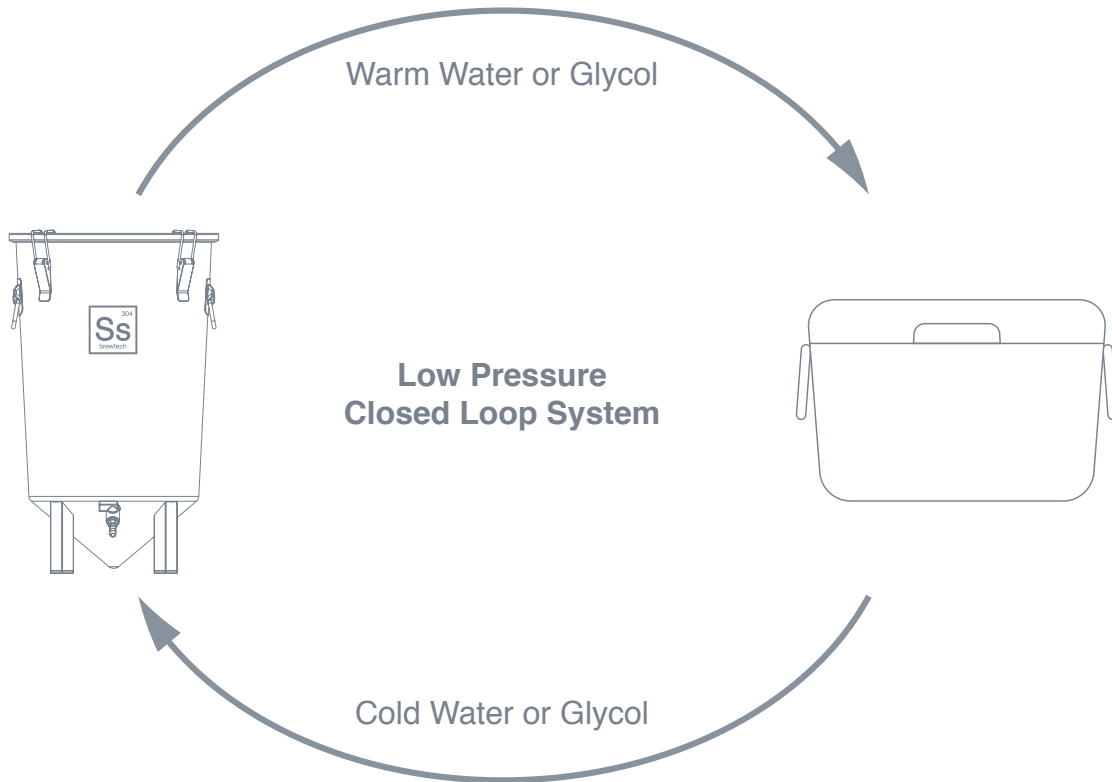
Brew Bucket
Cone Heating Pad
(Included with the
Brew Bucket Kit only)



Power Supply

SYSTEM OVERVIEW

The basic principle of the Fermentation Temperature Stabilization System (**FTSs²**) is to pump chilled water or glycol through the immersion coil when the temperature of your wort is greater than the controller set-point. The system is designed to use chilled ice water from a common cooler or glycol chiller. In this configuration, the submersible pump will be placed in the bottom of the cooler.



The FTSs² is intended to be a low pressure closed loop system. Water or glycol pumped from the cooler to the fermenter is then returned to the cooler to be used again.

If your setup requires more distance from the fermenter to the cooler, you can purchase common vinyl tubing at most hardware stores. The pump is capable lifting the water up to 10 feet. Pumping beyond 10 feet will negatively affect efficiency.

In a heating mode, the controller will activate the low wattage heater, which will in-turn begin to slowly raise the temperature of the liquid volume starting at the fermenter's cone. From there, convection will foster the newly introduced heat to radiate up to the remaining liquid volume not in direct contact with the cone. This key characteristic insures that hot-spots don't form within the fermenter.

NOTES ON EFFICIENCY

Efficiency of your system depends on many variables. Ideally, you would have the fermenter in an area where the temperatures are relatively moderate.

Since the system contains both heating and cooling, the controller will need to be properly setup to avoid over cycling. Cycling is where the system runs the cooling or heating cycle long enough to overshoot the set point and past the threshold where it causes the opposite function to activate too quickly.

To avoid over cycling, we recommend you set the “delay” on your controller to at least 5 minutes. This will allow sufficient time for the fermenter’s liquid temperature to stabilize and ultimately avoid over cycling.

This will extend the life of the ice in your cooler. We recommend using **ONLY** block ice, frozen plastic water jugs or similar. Cubed ice melts much faster than block ice thus requiring more frequent additions of ice to ensure you maintain cold water. You should avoid using your FTSS² to bring the wort from a high temperature to a pitching temperature. In addition to leaving all of the **cold break*** in your fermenter, it will consume much of your cooling capacity and require you to replenish the ice early in the process.

***Cold break-** A term that describes the precipitation or flocculation of proteins, tannins, and hop matter that occurs when wort is rapidly chilled.

PRE-ASSEMBLY INSTRUCTIONS

FIRST TIME CLEANING

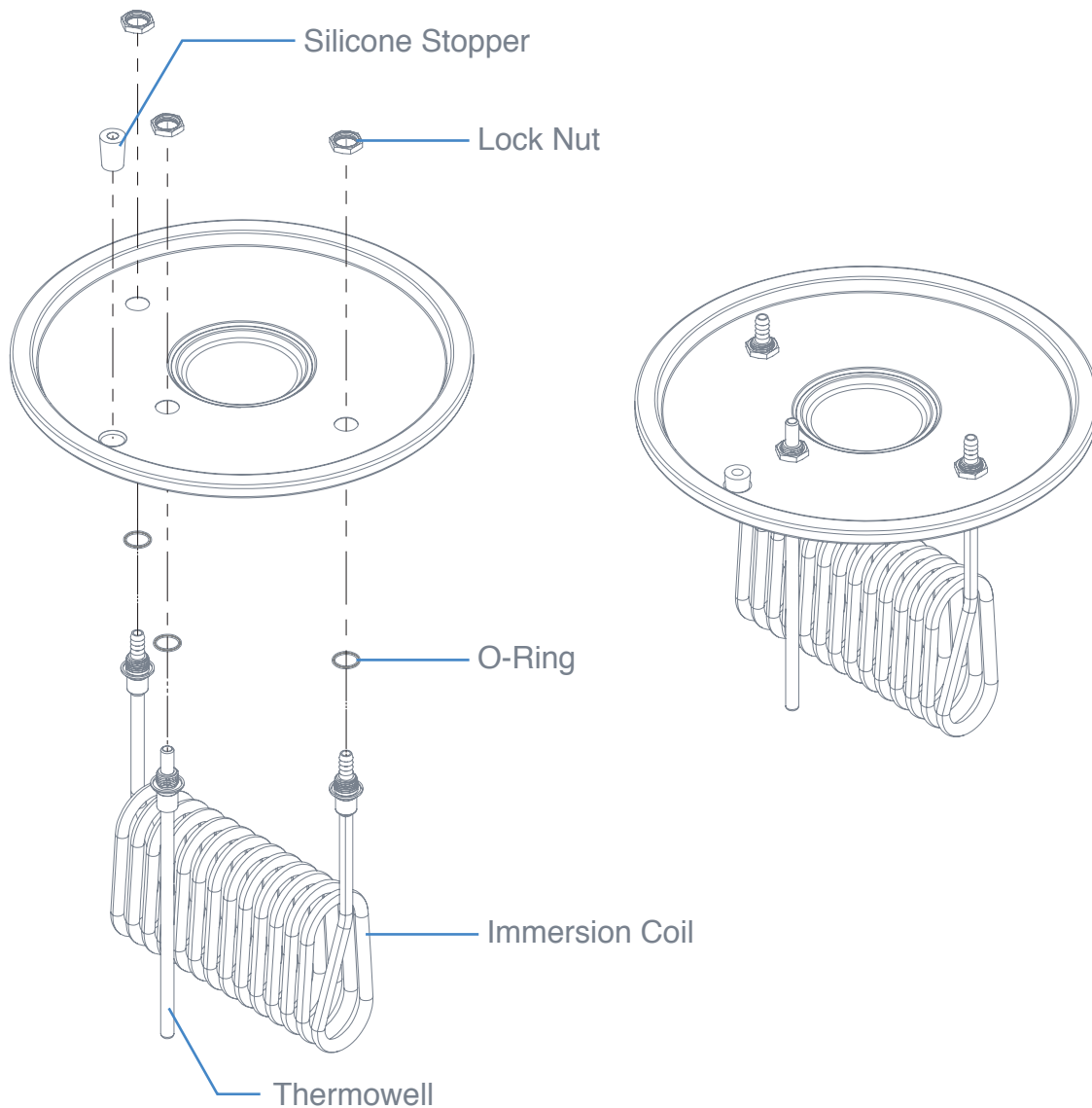
Before you use your system, you will need to clean all manufacturing residues with either TSP (highly recommended and can be found at any hardware store) or warm soapy water, followed by a good hot water rinse. Please see the FAQ section on our website (www.ssbrewtech.com) regarding proper care and cleaning of stainless steel.

SANITATION

Sanitize the immersion coil, thermowell, lid and gasket.

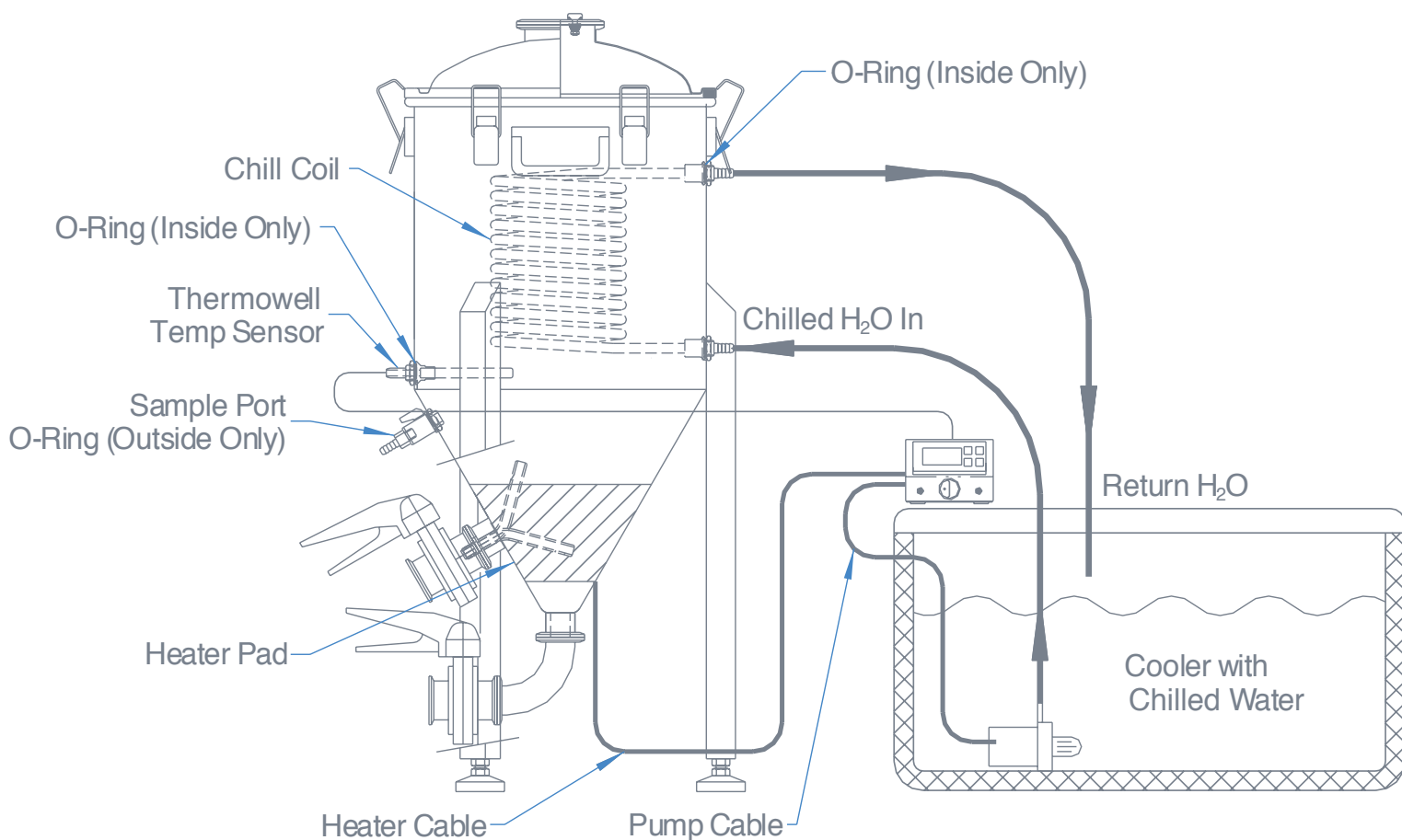
BEFORE YOU BREW - SYSTEM ASSEMBLY

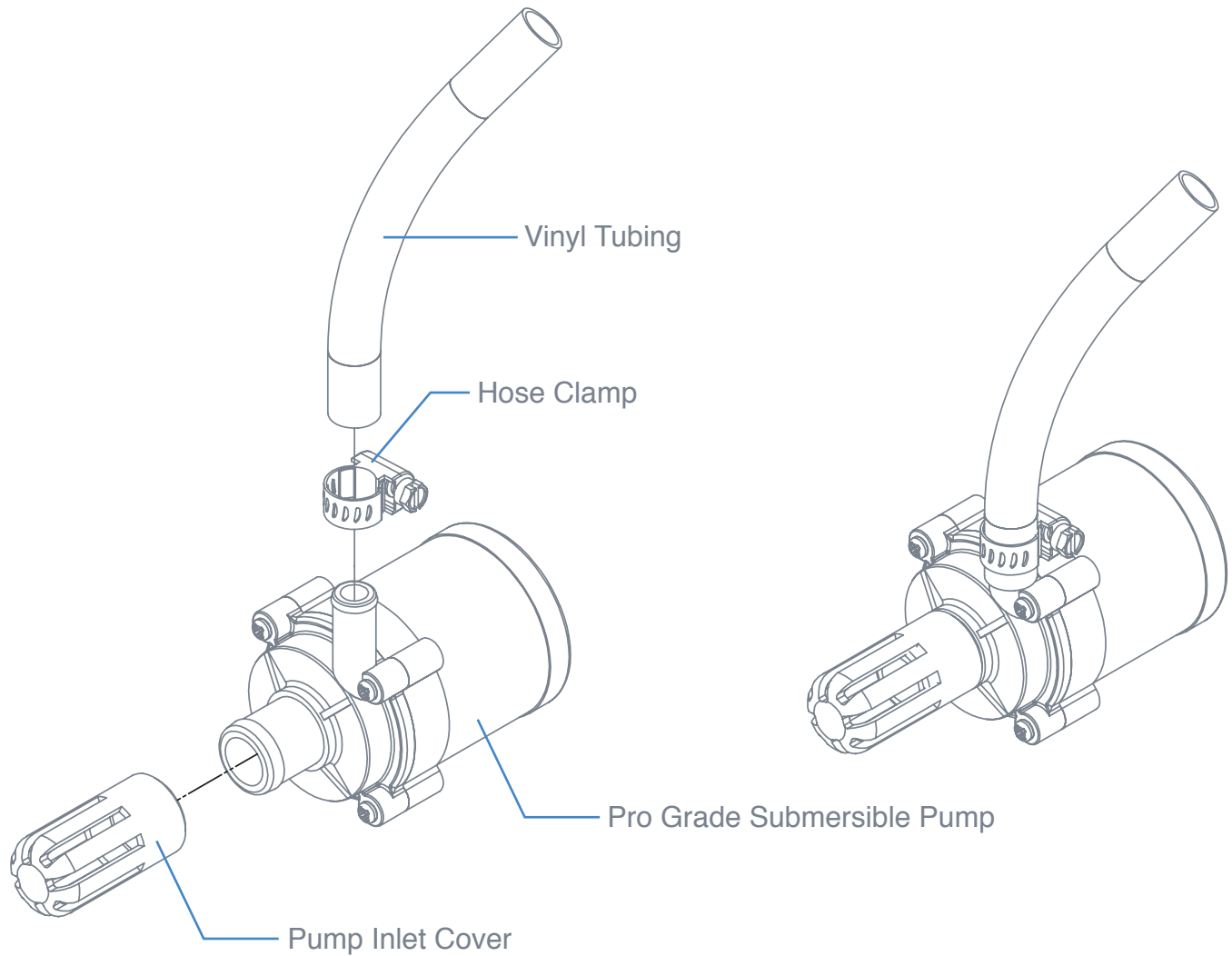
1. Think about where you want to locate your Brew Bucket or Chronical series fermenter, where you will place the controller, and where you will place your chilled water source (whether that is an ice chest, chilled corny keg in a cooler, glycol chiller, etc.).
2. Start by removing your fermenter's fittings, lid, and neoprene jacket if it is already installed, and then place the fermenter upside down on a surface that won't mar the upper rim of the body. This will make it easier to insure the heater is orientated correctly on the cone while you reinstall the neoprene jacket.
3. Place the low-wattage heater onto the cone so that it doesn't interfere with the welded fittings, and maximizes surface area contact with the fermenter body. Use a zip-tie to hold the heater's shape until the neoprene insulating jacket is reinstalled over the fermenter. The neoprene jacket will insure that the heater is held tightly to the cone to maximize efficiency.
3. Extend the wire from the low-wattage cone heater out of the bottom of the neoprene jacket.
4. Next, install the immersion coil and thermowell into the lid as shown (Note: there are extra o-rings supplied; you only need to use the o-rings on the wort side of the lid).



ASSEMBLY INSTRUCTIONS (CONTINUED)

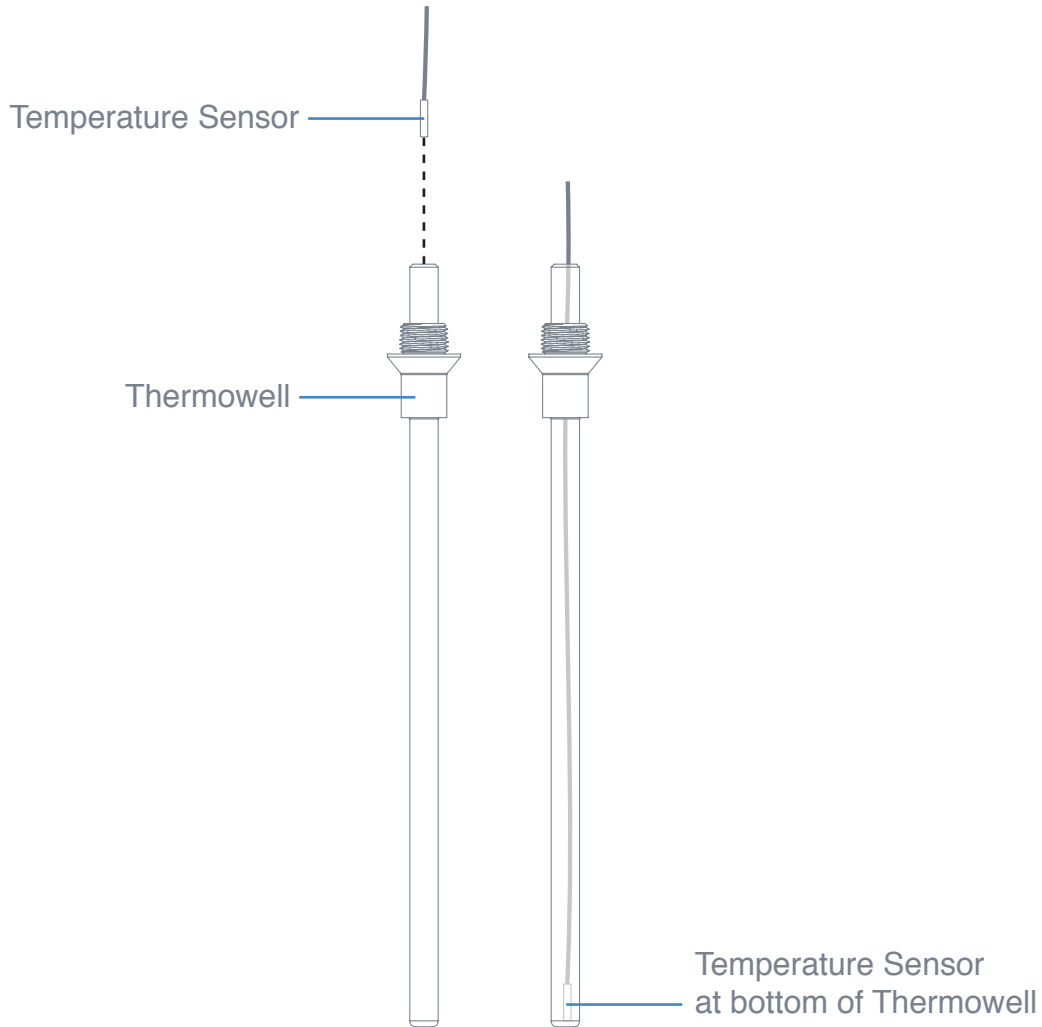
5. Divide the piece of vinyl tubing into two equal lengths. Connect one end of one tube to the immersion pump outlet and secure it with a hose clamp. The pump outlet is the small pipe connection on the top side of the pump. Connect the other end of the same piece of tubing to the immersion coil and secure it with a second hose clamp. Take the remaining piece of tubing and connect it to the other end of the immersion coil and secure it with a third hose clamp and then place the free end of the tubing back into the cooler.





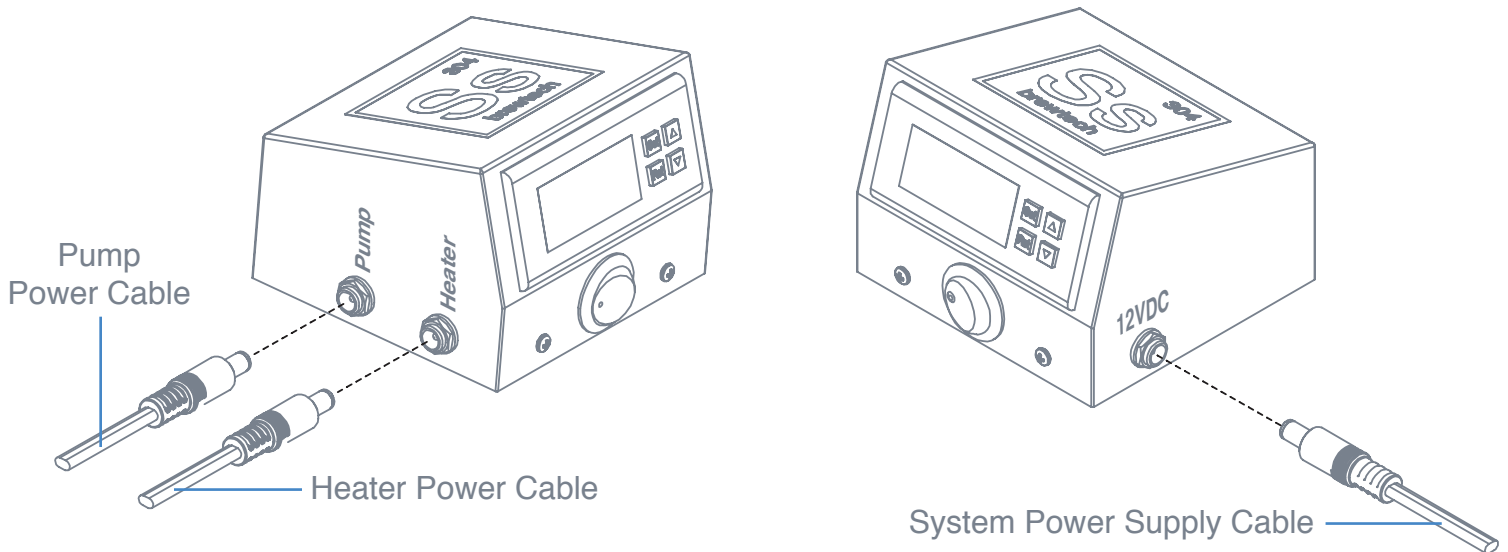
6. Place the silicone pump inlet cover over the intake port of the immersion pump.

7. If your cooler is dedicated to the FTSS² system, drill holes for the chilled water tubes and place the tubes through the holes with the pump located inside the cooler.



8. Place the digital controller's temperature sensor into the thermowell. Be sure the sensor goes all of the way into the bottom of the thermowell.

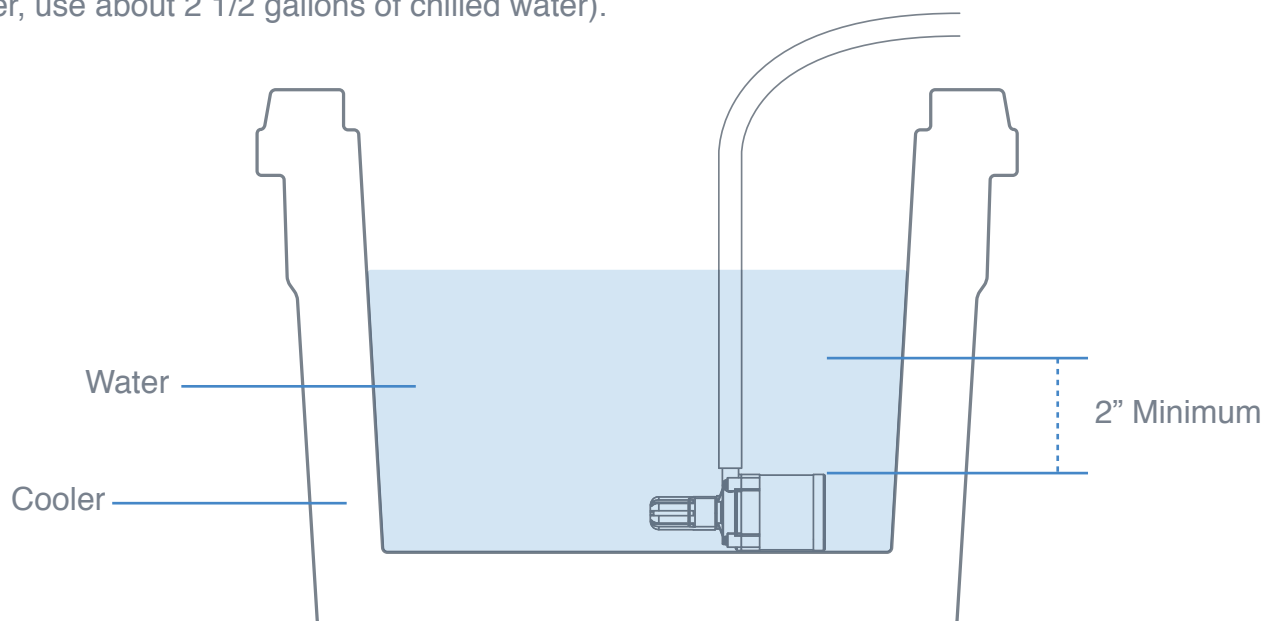
9. Plug in the pump power cable, the heating pad power cable and system power supply as marked on the digital controller.



OPERATING INSTRUCTIONS

INSTALLING THE FTSS² SYSTEM

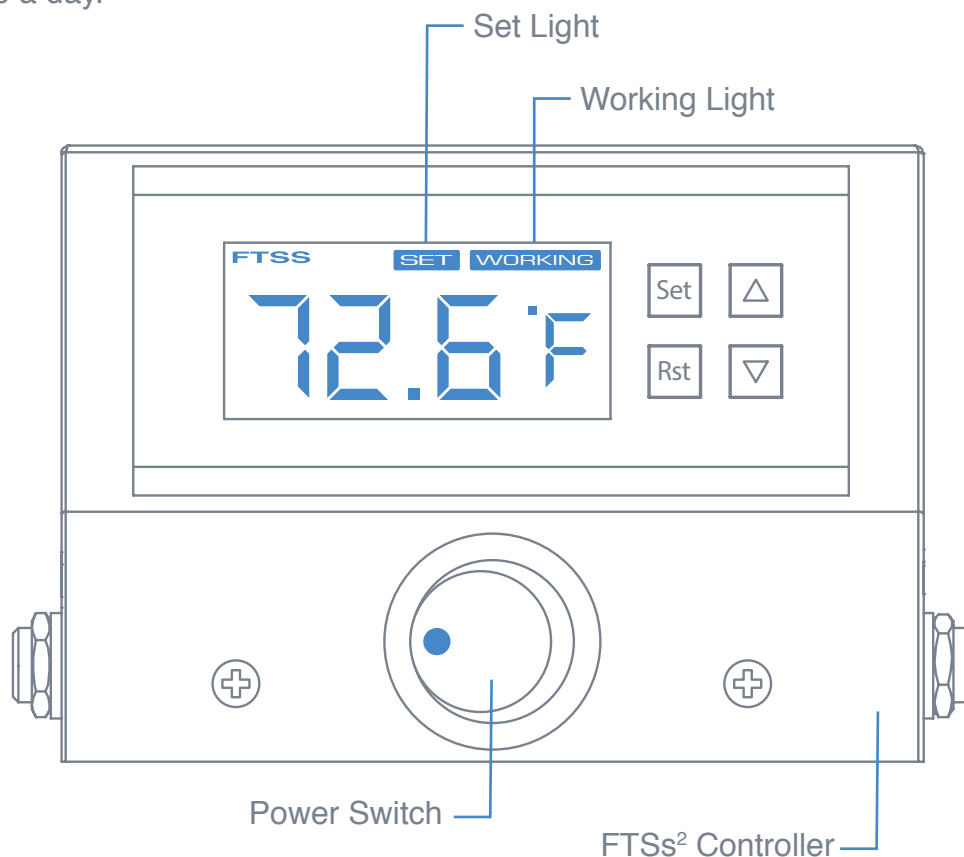
1. Sanitize your Brew Bucket or Chronical fermenter.
2. Fill your Brew Bucket or Chronical with cooled wort.
3. Place the sanitized FTSS² lid onto your Brew Bucket or Chronical fermenter.
4. Install a sanitized airlock (bubbler) or blow-off tube.
5. Connect the chilled water tubes to immersion coil and secure with zip ties or hose clamps.
6. Insert the temperature sensor into the thermowell.
7. Be sure the sensor is fully inserted to the bottom of the thermowell. (The excess wire on the temperature sensor can be “pushed” into the body of the controller if desired).
8. Plug the pump connector into the connector labeled “**Pump**”. Plug the heater connector into the connector labeled “**Heater**”.
9. Plug the power supply connector into the side labeled “**12VDC**”.
10. Place at least 10lbs of ice with about 2 gallons of cold water in your cooler.
11. We recommend using three of the 1/2 gallon size frozen jugs of water or block ice, as these will last much longer than cube ice.
12. The chilled water needs to fully cover the pump by at least 2” of depth - add more water as needed. Generally, you should have about 50% of your fermentation volume in chilled water (for a 5 gallon batch of beer, use about 2 1/2 gallons of chilled water).



13. Plug the power supply into a wall outlet (110V – 240V).

FERMENTING - SETTING THE FTSS² TO OPERATE

1. Toggle the main power switch “On”. The digits of the display will illuminate.
2. Momentarily press (less than a second) the “Set” button.
3. While the “Set Light” is illuminated, press the “▲” or “▼” buttons to select the desired temperature setting.
4. Once you have the desired temperature selected, momentarily press the “Set” button again. This will then set the controller to attain the desired temperature.
5. When the system calls for cooling, it will illuminate the “Working Light” and the pump will start to cycle chilled water through the immersion coil.
6. Sit back, have a beer and enjoy the magic of thermodynamics at work.
7. Depending on the ambient temperature, it’s a good idea to check on your chilled water source and ice once or twice a day.



You can also reset the controller to see if a setting is not allowing it to kick on.

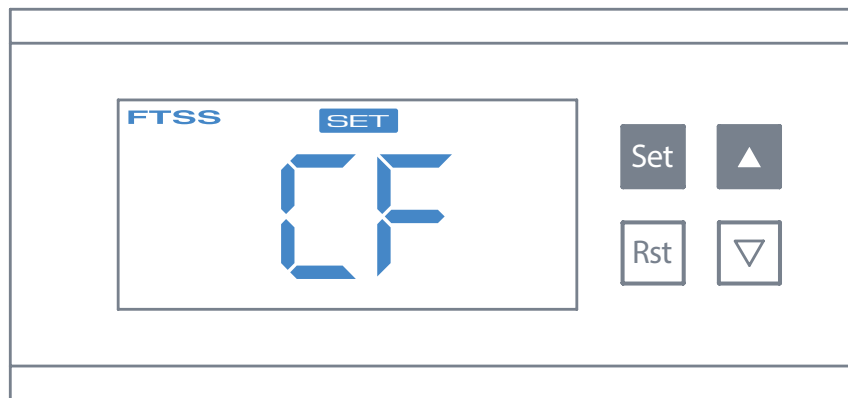
1. Press and hold the “Set” button and the “▲” button key simultaneously for 3 seconds. This will get you to the advanced settings menu.
2. Then press and hold the “Rst” key. The screen will restart and all settings will be reset back to the factory default settings.

ADVANCED CONTROLLER SETTINGS

There are a number of advanced settings that can be changed on the controller. In general, you will not need to make any changes. These settings are accessed by holding the “**Set**” button for more than 3 seconds.

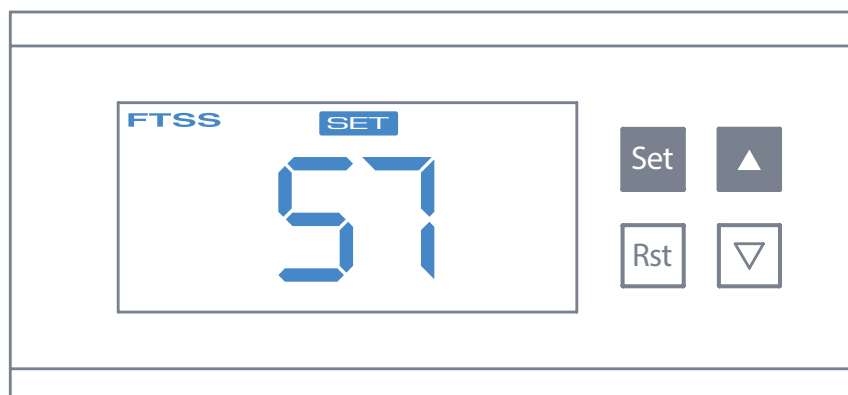
SELECTING BETWEEN CELSIUS OR FAHRENHEIT

Press “**Set**” and “**▲**” keys simultaneously and hold them for more than 3 seconds to enter the menu display, the screen appears “**CF**” code, press the “**Set**” key to display the working mode, press the “**▲**” or “**▼**” to adjust the display, “**C**” means Celsius mode; “**F**” means Fahrenheit mode. Press “**Rst**” to save the setting and exit. **Factory Default = “F”**.



CONDITIONING STEP FUNCTION

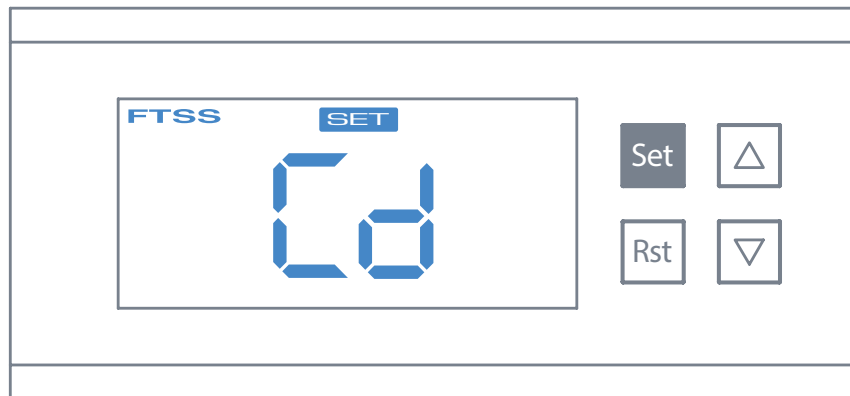
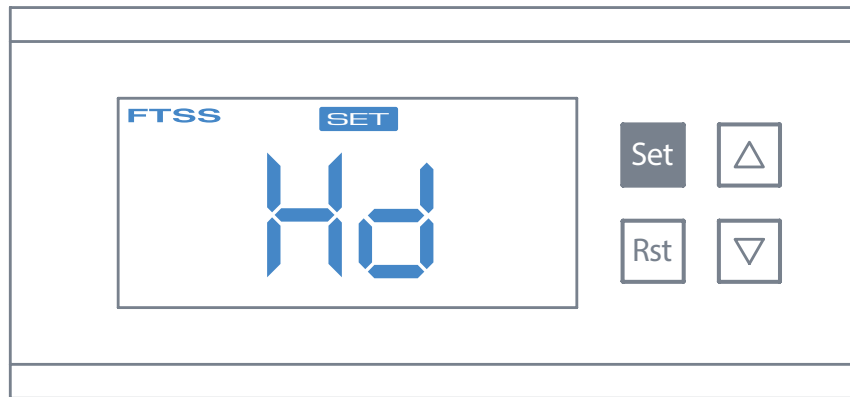
The controller can be set to first see a conditioning step, before the controller function starts. Press and hold the “**Set**” and “**▲**” keys at the same time for 3 seconds to enter this menu. When “**S7**” code is shown, press the “**Set**” key to display the upper or lower limit set value, then press “**▲**” or “**▼**” key to adjust the parameters. Parameter 01 = 0.1 Deg and 10 = 1.0 Deg
Factory Default = “01”.



HYSTERESIS SETTINGS

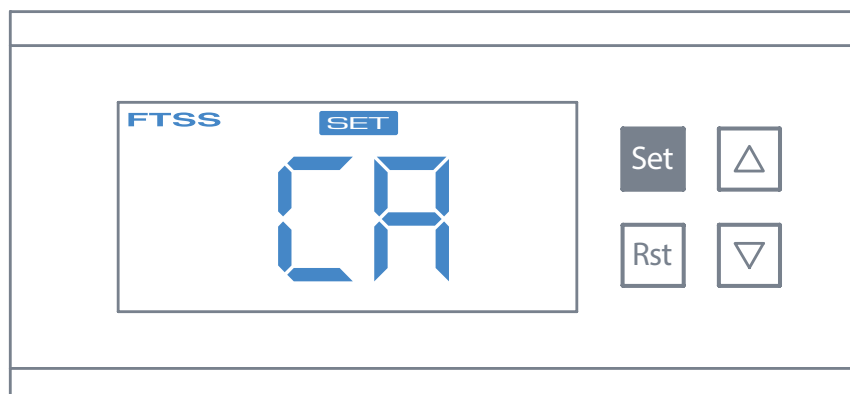
The “Hd” and “Cd” are menus which adjust by 0.1 degrees to offset heating and cooling from a set point. “Hd” being heating degrees from the set point to kick on and “Cd” being cooling from your current set temp to kick on.

Press “Set” key and hold more than 3 seconds to enter the menu display, with “▲” or “▼” key adjusted to the screen, appearing “Hd” or “Cd” code, press the “Set” key to display the hysteresis set value, press “▲” or “▼” key to adjust the parameters. **Factory Default = “1°”**.



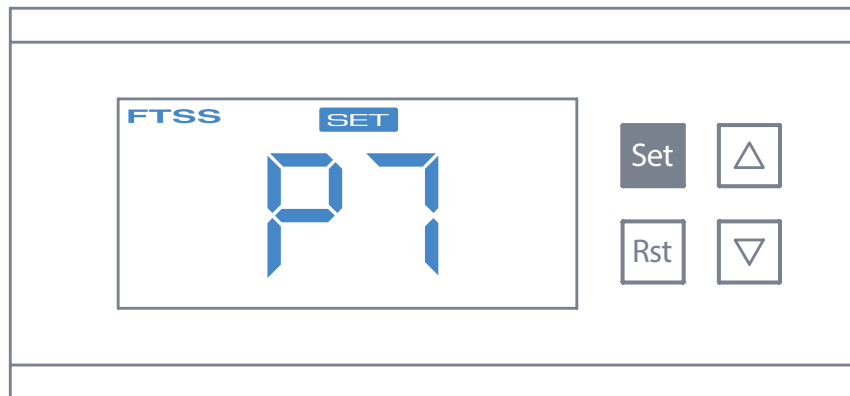
TEMPERATURE CALIBRATION SETTINGS

Press “Set” key and hold more than 3 seconds to enter the menu display, with “▲” or “▼” key adjusted to the screen, appearing “CA” code, press the “Set” key to display the temperature calibration settings, press “▲” or “▼” key to adjust the parameters. **Factory Default = “0”**.



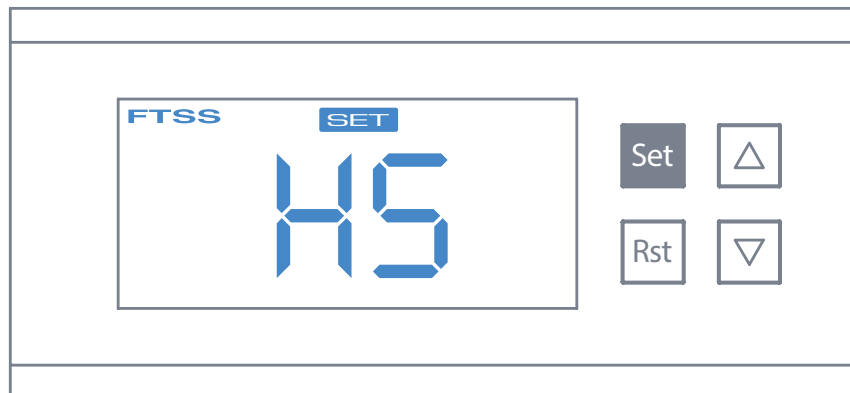
DELAY PROTECTION SETTING

Press “**Set**” key and hold more than 3 seconds to enter the menu display, with “**▲**” or “**▼**” key adjusted to the screen, appearing “**P7**” code, press the “**Set**” key to display the delay setting value, then press the “**▲**” or “**▼**” key to adjust the parameters. **Factory Default = “5” min.**



UPPER AND LOWER LIMIT SETTINGS

Press “**Set**” key and hold more than 3 seconds to enter the menu display, with “**▲**” or “**▼**” key adjusted to the screen, appearing “**HS**” or “**LS**” code, press the “**Set**” key to display the upper or lower limit set value, Then press “**▲**” or “**▼**” key to adjust the parameters. HS means upper limit. LS means lower limit. **Factory Default = “-44, +299”.**



HIGH/LOW TEMPERATURE ALARM

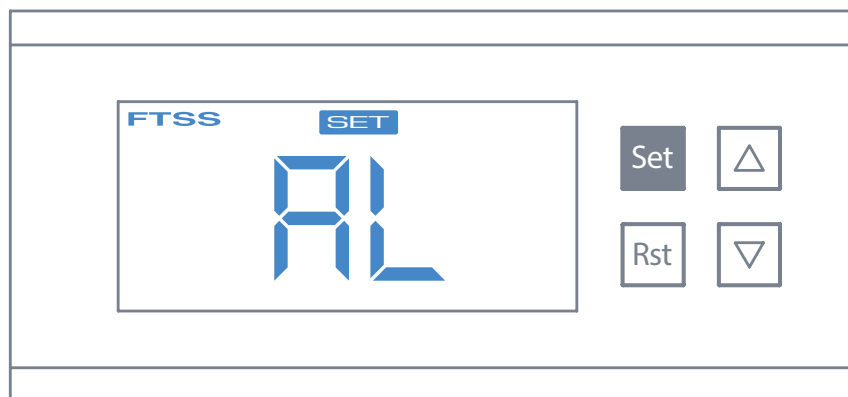
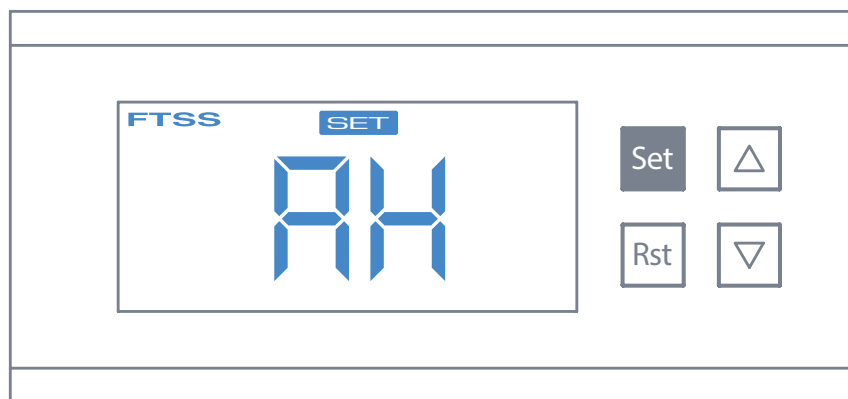
If the measured temperature is beyond the set point, an alarm will sound. To silence the alarm press any button.

HIGH/LOW TEMPERATURE ALARM SETTINGS

When the “AH” or “AL” code is shown, press the “Set” key to display the high-temperature alarm settings, press “▲” or “▼” key to adjust the parameters.

Factory Default = +999 Degrees for AH

Factory Default = -999 Degrees for AL



AFTER FERMENTATION HAS FINISHED, CLEAN AND DRAIN THE SYSTEM

1. Remove the FTSS² immersion coil from the drained fermenter.
2. Remove the tubes from the immersion coil and pump.
3. Remove the immersion coil and thermowell from the FTSS² lid.
4. Fully drain the remaining chilled water from the system.
5. Soak the stainless parts in PBW or similar caustic to remove any proteins that have adhered to the surfaces.
6. Follow the cleaning instructions - products like PBW depend on concentration, temperature and duration to do a proper job of cleaning.
7. Drain, rinse and allow every component of the system to air dry.

Q – Can I control more than one fermenter with a single FTSS² control unit?

A – You can, but it's better to use individual controllers, one for each fermenter because fermentation will progress at different rates.

Q – Can I use a single source of chilled water for multiple fermenters?

A – Yes, but keep in mind the thermal load will be doubled with 2 fermenters, so you will need twice the cooling capability for your chilled water.

Q – Can I increase the efficiency of the FTSS² system?

A – Yes, there are several things to consider: Most important, your initial wort temperature should be at or slightly below the set point temperature. Otherwise your chilled water will be consumed to cool the wort before fermentation starts. Use block ice or frozen water jugs as opposed to ice cubes. Ferment in an area with as moderate of an ambient temperature as possible. Use a cooler with thick walls and a good insulation value. Insulate the hoses going to the immersion chiller.

Q – Can I use the FTSS² to cool the wort to pitching temperatures?

A – Yes, but after you get to pitching temperatures, you should replenish your ice supply.

Q – Can I set multiple temperatures during fermentation, say 72°F for the lag phase and 68°F for primary?

A – Yes, however you will need to watch the progress of your fermentation closely so you don't stay too long at a higher temperature than you planned.

Q – How often do I need to replenish my ice?

A – That depends on many variables, so there's no exact answer. However, you should check your ice daily until you get a feel for the ice consumption on your particular fermentation setup.

Q – Can I run glycol in the FTSS²?

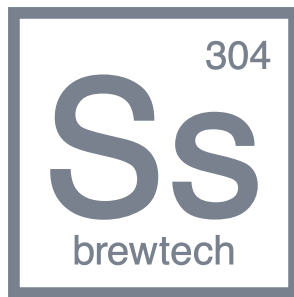
A – Yes, the submersion pump will operate fine in glycol, but this assumes you have a method to cool the glycol.

Q – My FTSS² seems to over-shoot the set point, is there a problem?

A – No, the FTSS² will stop running when the set point is reached, however the immersion coil is colder than the surrounding wort.

Q – Can I use my refrigerator for the chilled water?

A – Yes, as long as the chilled water temperature is at least 15°F below the set point, it will work fine, although it will cycle more often and for longer periods. Ideally, the chilled water volume should be equal to your fermenting volume.



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