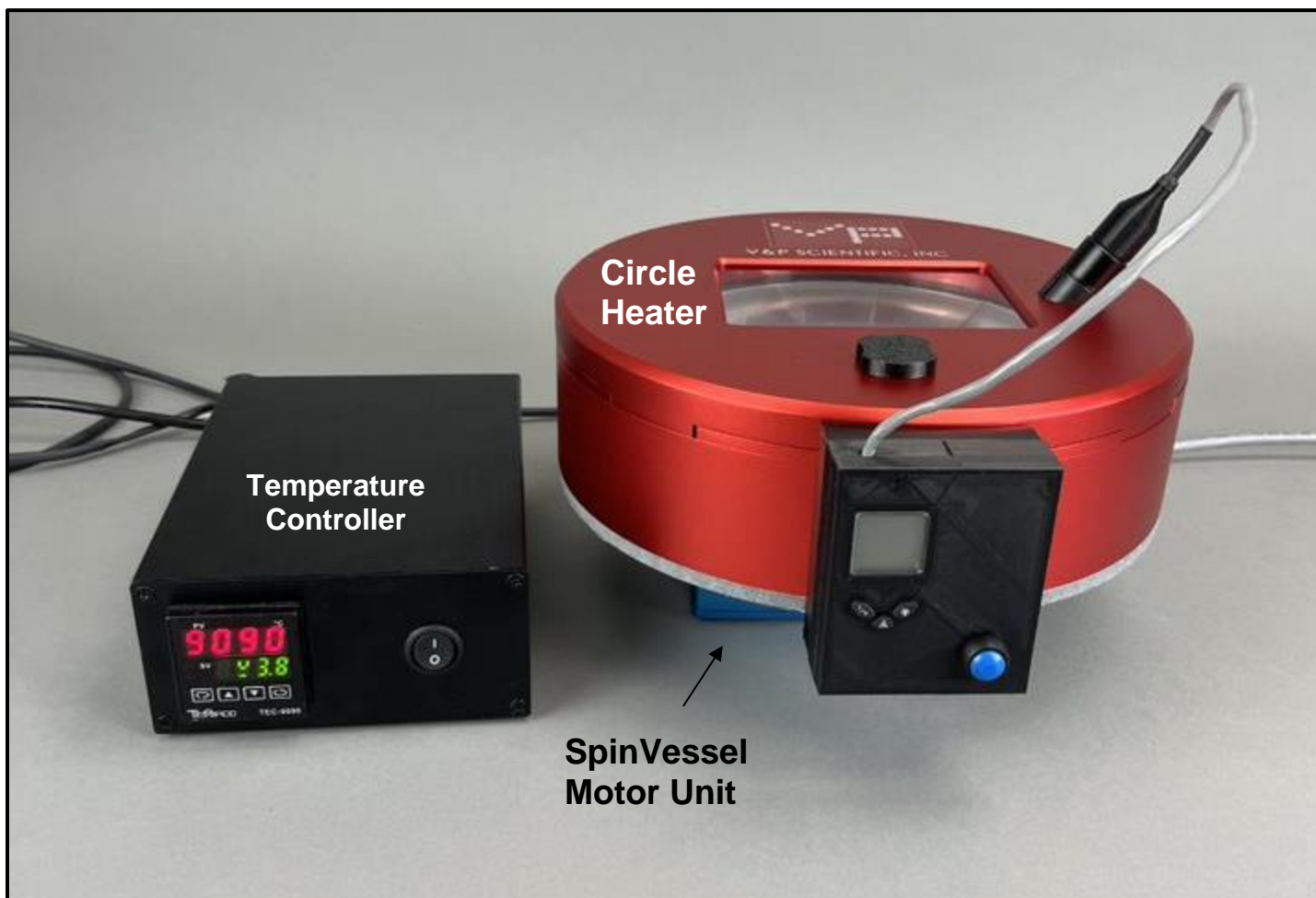


**OPERATION MANUAL FOR
CIRCLE HEATER SPINVESSEL®
VP 418SV2-H-1LFB-CC**

***US and Foreign Patents Pending**



**Figure 1. Basic Parts of Circle Heater SpinVessel® VP 418SV2-H-1LFB-CC
(SpinVessel® Controller not shown).**

WARNING!!!!

The VP 418SV2-H-1LFB-CC Circle Heater SpinVessel® will be very hot when operating, so exercise caution. Do not handle red aluminum heating portion of the unit while it is operating, it will be HOT!!



Figure 2. Parts of the Circle Heater SpinVessel® VP 418SV2-H-1LFB-CC.

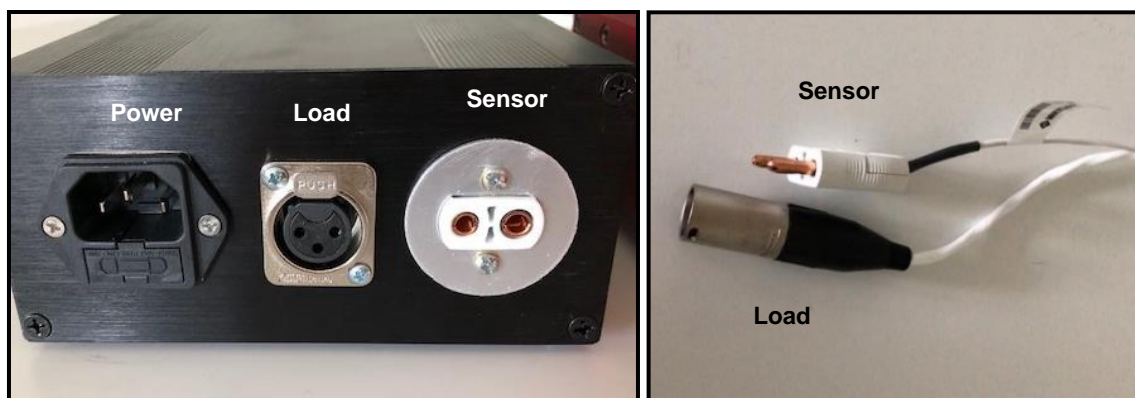


Figure 3. Back of Temperature Controller (left). Cable and plugs (right) for connecting Circle Heater to Temperature Controller.

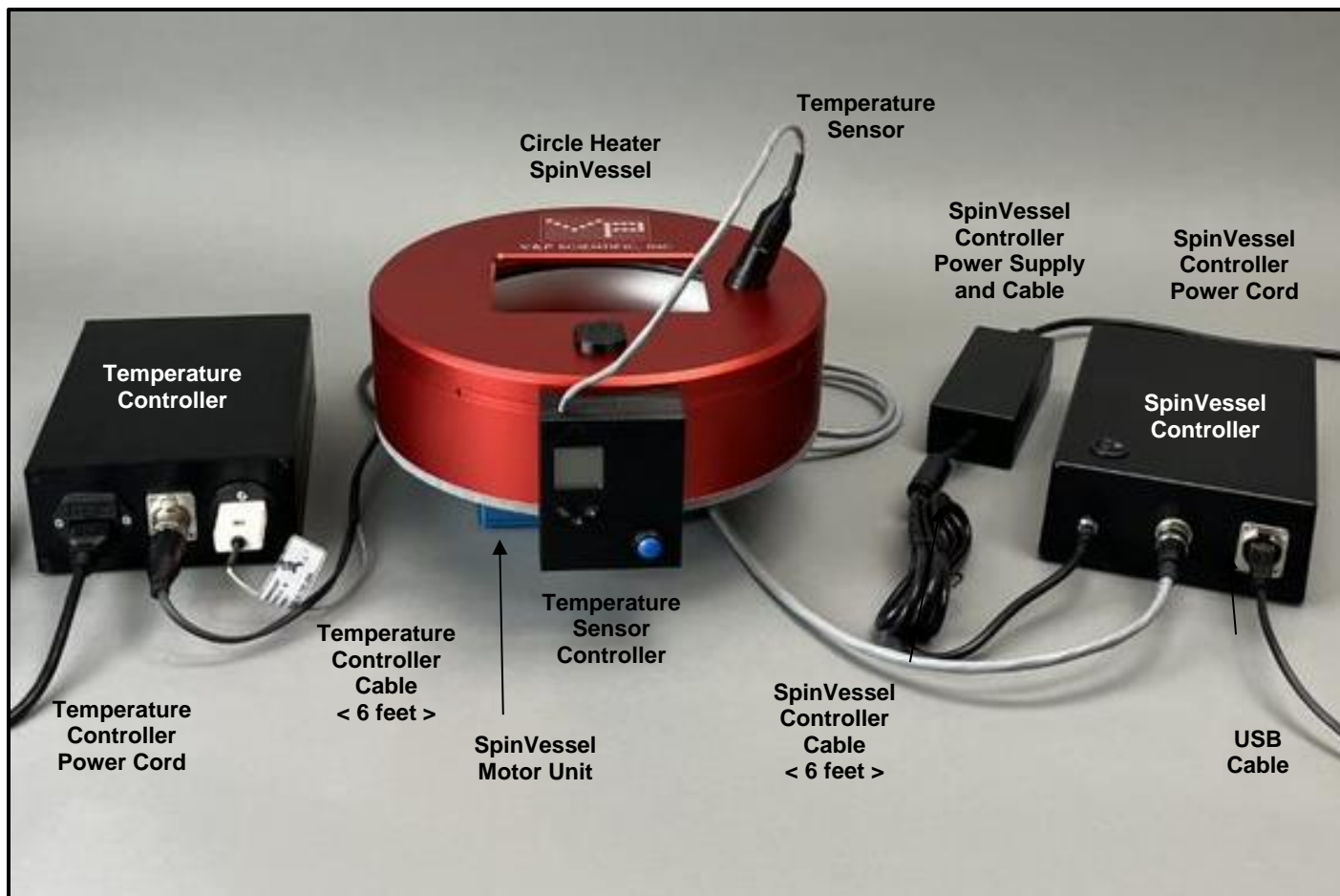


Figure 4. Connecting parts of the Circle Heater SpinVessel®.

SET-UP

CIRCLE HEATER SPINVESSEL INSTALLATION

1. Carefully remove Circle Heater Spin Vessel, Temperature Controller and SpinVessel Controller from the packaging inside the shipping box. Place the Circle Heater Spin Vessel on a solid work surface that is clear of heat-sensitive items, such as paper or equipment, or heat-conducting material. Both the Temperature and SpinVessel Controllers can be placed next to the Circle Heater Spin Vessel or up to 6 feet away with respective Controller Cables. Test on the benchtop before using with a liquid handler to become familiar with its operation.
2. The Temperature Controller Cable, which is attached to the back of the Circle Heater, has two plugs on the free end for connecting to the Temperature Controller (Figure 3, page 2). Connect the round 3-pin plug of the Connector Cable into the receptacle marked "Load" on the back of the Temperature Controller as shown in Figure 3. Also, on the back of the Temperature Controller, connect the 2-prong plug of the Controller Cable into the receptacle marked "Sensor".
3. See Technote 378B for instructions on setting up and running the SpinVessel part of the Circle Heater Spin Vessel. A laptop or PC is needed to control the SpinVessel.
4. Connect the power cord to the power receptacle on the back of the Temperature Controller. Connect the power cord to a 120 V outlet.

5. The Circle Heater has two temperature sensors, one internal and one external. The internal one controls the heating of the Circle Heater. The external one, composed of a control box and a non-contact infrared sensor, can monitor the temperature of the heated and mixed solution (see Figure 5). The Temperature Sensor Controller can be easily attached to the Circle Heater by engaging the magnets that are inside the Controller and with the ones in the side of the Heater. Just be careful to keep fingers away from the back of the Controller when doing this as the magnets are strong and fingers can be pinched!

6. There are 2 holes for Temperature Sensor placement, use the one that works best for the pipetting head to be used. The other one can be covered with the provided plug.

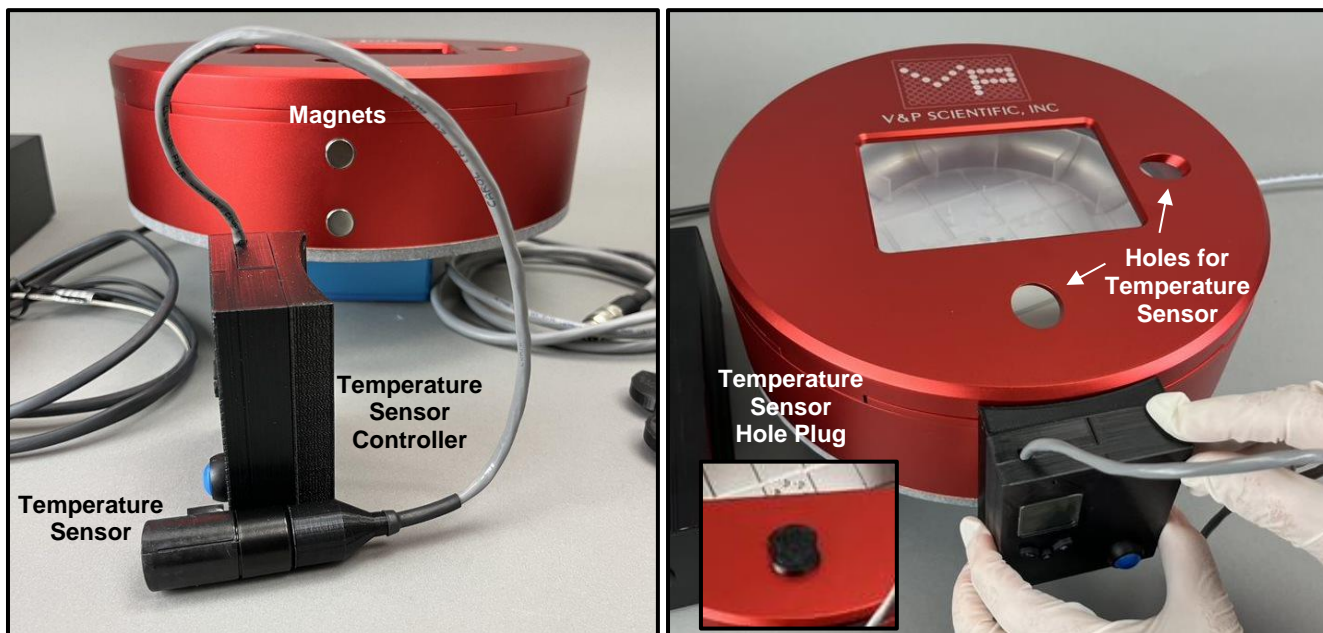


Figure 5. Attach the external Temperature Sensor Controller.

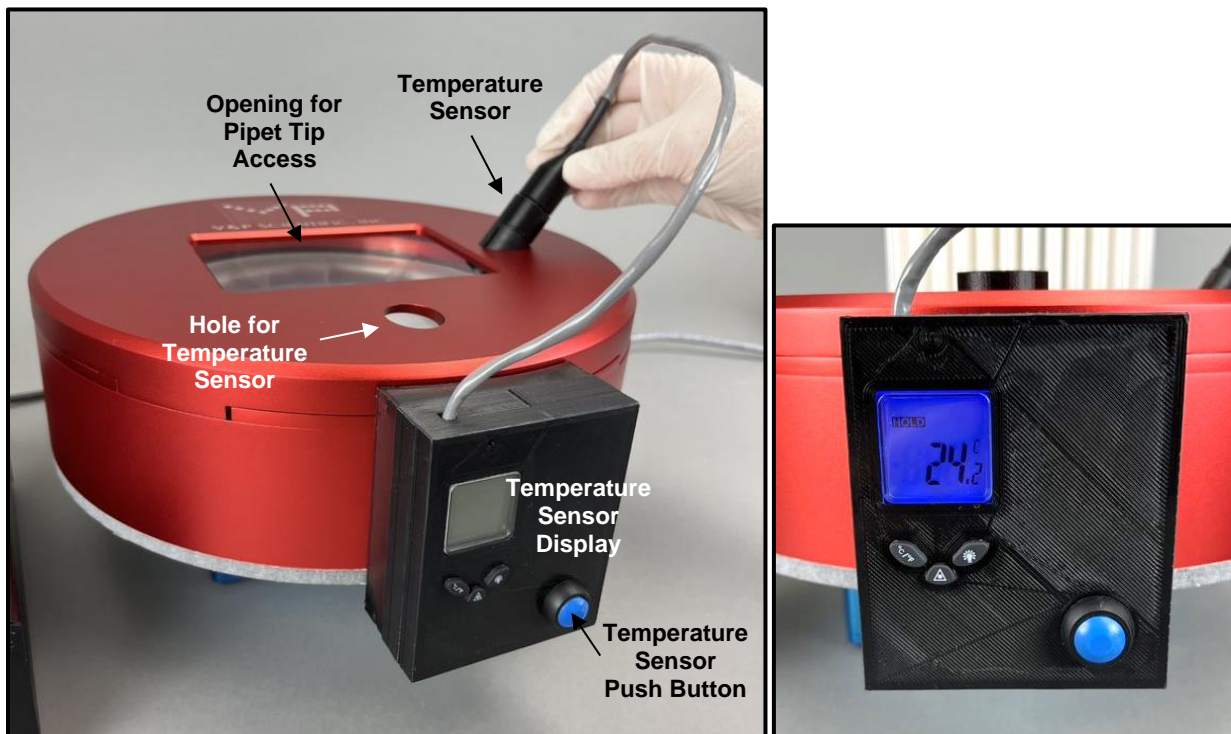


Figure 6. Position the external Temperature Sensor and take a reading by pushing the blue button.

OPERATION

HEATING BLOCK OPERATION USING THE TEMPERATURE CONTROLLER

1. Turn on the Temperature Controller using the on/off power switch (see figure 7). The Controller already has a temperature programmed so the Circle Heater will immediately begin to heat. The red number in the upper display is the current temperature of the heater. The green number in the lower display is the value set during operation. See the Tempo Controller Operating Instructions (Appendix) for more details on the features of the display.
2. To turn off the Circle Heater without turning the power switch off, press the down arrow key until the green lower display reads "OFF".



Figure 7. Front View of Temperature Controller for the Circle Heater.

3. The upper limit temperature on the Temperature Control Panel is set to 200°C at the factory. The temperature of the Spin Bases should not be higher than 120°C because of the Polypropylene SpinVessels. Polypropylene will melt at temperatures greater than 130°C.
4. Temperature set value will need to be empirically determined. Since there is no direct contact between the polypropylene SpinVessel and the heating element, heat transfer must occur through the air and to a limited extent through the Spin Base of the SpinVessel motor unit. Therefore, the temperature setting for the Controller will be much higher than the actual temperature in the solution in the SpinVessel.
5. It is best to pre-heat the Circle Heater and the solution to be mixed as it takes a long time for the solution to come to temperature otherwise. Heat the solution in a beaker so that it can be poured into the 1 liter SpinVessel already placed in the Circle Heater's Spin Base (see figure 8 next page).
6. If the lid was on during the pre-heating of the Circle Heater, be careful when handling it as it will be **very hot!** Place it back on top after pouring the heated solution into the 1 liter SpinVessel.
7. Note that the position of the Circle Heater in the photos has the SLAS dimensioned SpinVessel Motor Unit in a "landscape" position as it would be held in most microplate locators on a liquid handler deck. The magnets that hold the Temperature Sensor Controller will be in the front and if the lid is placed so that the "VP" label is toward the back, the opening in the lid will mirror the position of the Motor Unit underneath.

8. Since the hole for the pipet tips is so large, the solution will gradually lose heat over time. Testing has shown an approximately 4 degree reduction over 3 hours with 60°C water. When the Controller was set at 190°C the sides of Circle Heater got to 78°C, so be careful when handling the Circle Heater.



Figure 8. Pouring pre-heated solution in SpinVessel in the Circle Heater. Replacing the lid in the proper orientation for use with 96 channel pipet head. Independent check of solution temperature.

OPERATION of the SpinVessel

Please refer to the technical information provided in Technote 378B. Please contact V&P Scientific for more information.

TEMPERATURE CONTROLLER OPERATING INSTRUCTIONS

Supplied as an attached document.

Product Maintenance

GENERAL PRODUCT CARE

When not in use, turn the power switch off.

Do not place the Temperature Controller in chambers with temperatures above 40°C.

Do not submerge Circle Heater or Temperature Controller into liquid or allow liquid to come into contact with any openings.

Do not for any reason open the Temperature Controller enclosure or the heating element compartment of the Heating Block. This will void the warranty.

For any other questions regarding the Controller, please refer to the Temperature Controller Instructions (Appendix).

If technical assistance is required, contact:

V&P Scientific, Inc.

Ph: 858-455-0643

sales@vp-sci.com

WARRANTY

V&P Scientific, Inc. warrants this product to be free from defects in material and workmanship when used under normal laboratory conditions for one year. This warranty begins on the date of delivery from V&P Scientific.

In the event this product fails under normal laboratory conditions within the specified period of time because of a defect in material or workmanship, V&P Scientific will, at its option, repair or replace the product. Damage to the product caused by user negligence is not covered.

Please keep the special shipping carton in case the unit needs to be shipped back to V&P Scientific. Please contact V&P Scientific at the above address for return authorization and shipping instructions.

This warranty is made in lieu of other warranties expressed or implied including the warranties of merchantability and fitness for a particular purpose. V&P Scientific shall not be liable for loss or damages arising from the use of these products nor for consequential damages of any kind.