

Thermowells are not required for our heaters. The heaters are sometimes controlled with percentage timing devices that switch them on and off based on a time cycle and optical thermometers. The temperature sensitivity of the application dictates the need for a closed loop, making use of a temperature controller and a temperature sensing device, or an open loop, not making use of a temperature sensing device and commonly operating on a percentage on/off basis.

### **End Mount Thermowell/Thermocouple**

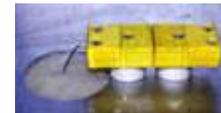
An end mount thermowell is the most common design. The thermowell is either a quartz tube (most common because of faster response) or ceramic tube located parallel to the heating element. The tube is typically 5" (127mm) long and has an inner diameter of 0.157" (4 mm). A thermocouple bracket is mounted outside the thermowell tube in order to assist in proper positioning and holding the thermocouple in place. The thermocouple is then located 4" into the thermowell and fastened using the bracket. It is important to assure that the thermocouple is not over extended into the thermowell, which may result in incorrect temperature readings or heater failure. A thermocouple with a male plug is displayed.



**End Mount Thermowell**

### **Back Mount Thermowell/Thermocouple**

The back mount design makes use of an L-shaped quartz tube that runs perpendicular to the coil toward the back of the heater. The thermowell then makes an arced 90° bend, continuing for a short distance parallel to the heating element. This design is used when the heaters are surrounded, not allowing side access, and requires the use of a .040" (1 mm)



**Back Mount Thermowell**

diameter thermocouple in order to make the 90° bend. A thermocouple with a male/female plug combination is displayed. This design is not available for the Q-Series.

### **Bayonet Style Thermowell**

The bayonet style thermowell is sometimes used with metal, ceramic, glass, and quartz face heaters to measure the actual face temperature (emitting surface) as opposed to the heating element temperature. The thermocouple goes through a bayonet fitting and is compressed using a stainless steel spring. This approach assures that the tip of the thermocouple makes correct contact with the heater face.



**Bayonet style thermowell**

### **Pyrometer Hole**

It is becoming more common for equipment manufacturers and end users to make use of optical pyrometers, or non-contact thermometers, to sense product temperature as opposed to heater temperature. In virtually all applications, product temperature is the temperature of choice. Heater temperature is only used as a reference in order to attain a particular product temperature. The reduced price for these devices and the quest for better process control has driven the use of optical pyrometers. For that reason, it is sometimes necessary to provide an opening (1.5" - 2" (38 - 51 mm) diameter hole) through the heater where the optical pyrometer can be placed to monitor the product temperature. The pyrometer hole size can vary based on the specific requirements. A smaller hole is always preferred in order to avoid nonuniform heating of the product.



**Pyrometer Hole**

### **Warranty**

Solar Products' panel heaters are covered by a one-year warranty against manufacturing defects.