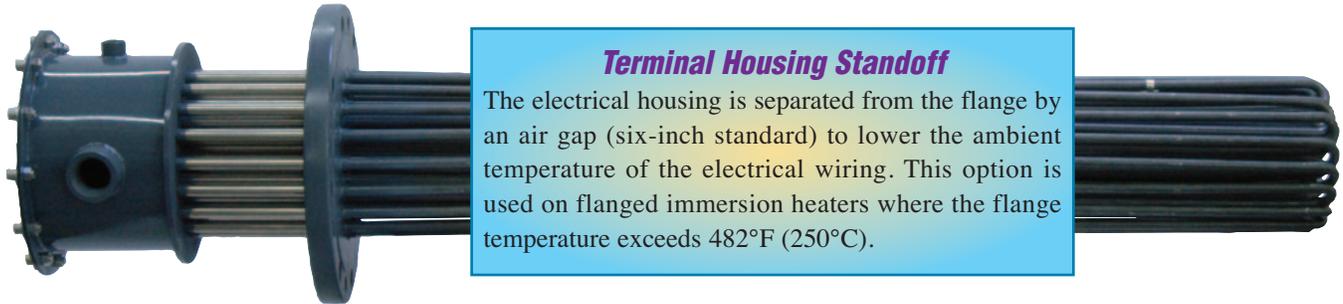


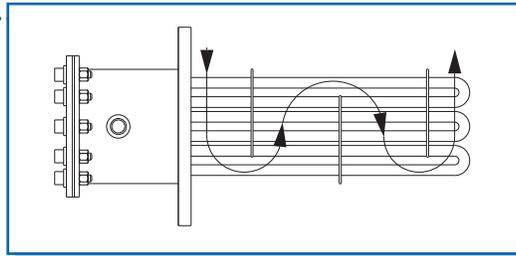
Optional Terminal Housing Standoff Construction



Optional Flanged Heater Features

Flow Control Baffles

For flange heaters used in circulation tanks, to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.



Temperature Control

Thermostats

Thermostats are an optional feature for flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed, and open on temperature rise.

Installation Warnings and Recommendations



1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

Thermocouples

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 1000°F (537.8°C). Type K should be used for higher temperatures.

For measuring process temperatures, the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection, the thermocouple is usually attached to one of the elements and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell, which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls and how to choose the best control for your application can be found in Section 14.

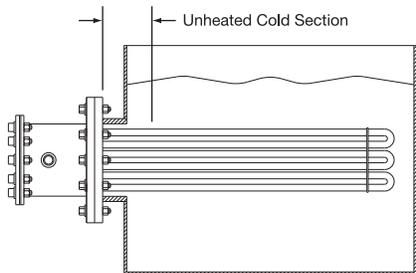
Flanged Heater Installation and Maintenance

1. Immersion heaters should be positioned to insure they are completely covered with the liquid they are heating. However, do not position the unit too low in structures where sludge buildup could cover it. Either of these conditions could cause overheating and subsequent premature failure of the elements.
2. Heated section should start sufficiently inside tank to assure good heat transfer. On large tanks, use several smaller KW rated heaters rather than one large heater for uniform heat and watt density distribution.
3. Install adequate controls and safety devices to prevent build-up of temperature and/or pressure.
4. Make sure gasket surface is clean and dry before seating the heater.
5. Do not operate heater at a voltage in excess of that stamped on the heater. A heater can be run at a reduced voltage, remembering that this will decrease the heater's output wattage.
6. A wiring diagram is supplied in the electrical enclosure and as required, circuits on the heater are labeled.
7. All heater terminal connections should be wrench or screwdriver tight with maximum torque consistent with terminal strength. To prevent twisting heater terminals when tightening connections, use backup wrench for countertorque. Periodically check that electrical connections are clean and tight.
8. The electrical insulating material used in electric heaters is hygroscopic and may absorb moisture when subjected to a humid environment during shipping, while in storage or during long equipment shutdowns. This moisture may lower the insulation resistance enough to cause heater failure.
A meg-ohmmeter should be used to check the insulation resistance before applying power to any questionable heater.
If a moisture condition exists it can be corrected by baking the heater in an oven at approximately 350°F (176.7°C) until the moisture is expelled and the meg-ohms have risen to an acceptable level.
9. For heaters supplied with an integral thermostat, this thermostat functions as a temperature control only and is not a fail-safe device.
10. For TFP flanged heaters used in UL recognized oil heating applications:
 - The heated oil temperature cannot exceed 257°F (125°C)
 - TFP designs with ASA pressure rated flanges are UL rated to a maximum operating pressure of 150 psig
 - Steel sheath elements are limited to 60 watts/in²
 - Maximum Wattage/Voltage: 45KW/480V, in 5" and smaller flange sizes with 9 elements maximum

Contact Tempco for other application specific UL file information.

Quality Assured Through 100% Final Inspection

1. Resistance test — to verify wattage
2. Insulation test — to measure leakage current resistance
3. High voltage test — to “proof-test” the insulation against grounds and short circuits
4. Hydrostatic or air pressure testing — to leakproof test all welding of the elements to the flange



The tubular heating elements used in type TFP Flanged Immersion Heaters are UL component recognized and CSA certified in most design variations for general immersion heater use. The UL File Number is E90771 (CCN UBJY2/8) and the equivalent CSA File Number is 043099. They are also UL recognized under UL standard UL574 File Number MP4154 (CCN MDS2/8) for oil heating.

If you require UL, CSA, or other NRTL agency approvals, please specify when ordering.

Ordering Information

Catalog Heaters

Catalog Part Numbers are stocked as sub-assemblies for 2-3 week delivery.

Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, **TEMPCO** will design and manufacture a Flanged Immersion Heater to meet your requirements. **Standard lead time is 4 weeks.**

Please Specify the following:

- | | |
|-----------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Wattage, Voltage and Phase | <input type="checkbox"/> Element Immersion Length |
| <input type="checkbox"/> Flange Size and Material | <input type="checkbox"/> Electrical Enclosure Type |
| <input type="checkbox"/> Element Sheath Material | <input type="checkbox"/> Thermostat— if required |
| <input type="checkbox"/> Element Watt Density | <input type="checkbox"/> Optional Features |

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.