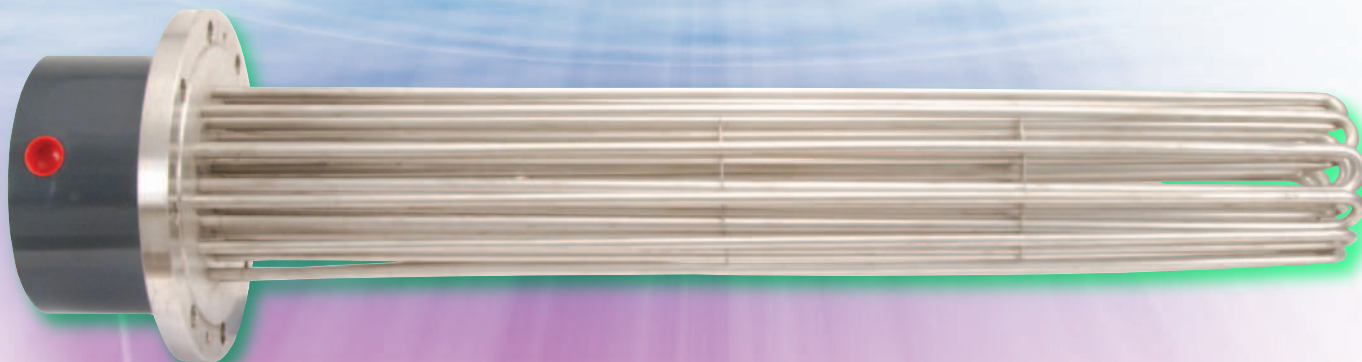


Flanged Immersion Heaters

Flanged Immersion Heaters are designed for use in tanks and pressurized vessels to heat both liquids and gases. They mate to a companion flange that is either welded to a tank

wall or, for circulating type heaters, to a pipe. See pages 11-46 through 11-69 for TEMPCO circulation heaters, which consist of a flange heater and a pipebody pressure vessel assembly.



Design Features

The catalog items listed on pages 11-32 through 11-44 have the following features, making them suitable for many applications:

- * 150-lb forged steel or 316 stainless steel flanges
- * Gasket Supplied
- * Incoloy® 800, 316 stainless steel, steel or copper tubular elements
- * Element hairpin bends are spanked in specially designed dies to re-compact the MgO insulating powder
- * Silicone resin seal of elements standard
- * 1/2" OD thermowell for a 3/8" diameter sensing bulb
- * NEMA 1 electrical enclosure
- * Standard heaters have elements wired into branch circuits having a maximum current of 48 Amps

The items listed in this catalog are only a small sample of the heaters that can be supplied by TEMPCO. The next few pages will describe both standard and optional materials and features available to meet the requirements of your application.

Checklist – Selecting the Proper Flanged Heater

Determine a Safe and Efficient Element Watt Density

Element Watt Density is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element dia.} \times \text{element heated length}}$$

For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. When heating hard water and cleaning solutions mineral deposits can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

Determine Pressure-Temperature Rating of Flange Required

NOTE: Catalog heaters listed on pages 11-32 through 11-44 have Class 150-lb flanges. For heaters with a higher Pressure-Temperature Rating consult Tempco.

Pressure-Temperature Ratings Class 150-LB (Pressure in PSIG)

Flange Material	Temperature °F (°C)													
	-20 to 100 (-28.9 to 37.8)	200 (93.3)	300 (148.9)	400 (204.4)	500 (260.0)	600 (315.6)	650 (343.3)	700 (371.1)	750 (398.9)	800 (426.7)	850 (454.4)	900 (482.2)	950 (510.0)	1000 (537.8)
A105 Steel	285	260	230	200	170	140	125	110	95	80	—	—	—	—
316 Stainless	275	240	215	195	170	140	125	110	95	80	65	50	35	20
304 Stainless	275	235	205	180	170	140	125	110	95	80	65	50	35	20