



## Immersion and Circulation Heaters



### Overview

Flanged Immersion Heaters consist of tubular elements or cartridge heaters welded into a flange and provided with wiring boxes for electrical connections. Flange heaters are installed by bolting to a matching flange welded to the tank wall or nozzle. A wide selection of flange sizes, kilowatt ratings, voltages, terminal enclosures and sheath materials make these heaters ideal for all types of heating applications.

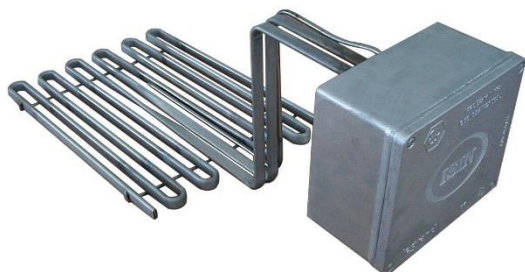
- Fuel and Oil Heaters
- Hot Water Storage Tanks
- Food Processing Equipment
- Heat Transfer Systems
- Process Air Equipment
- Boiler Equipment
- Freeze Protection for Fluids

### Applications

Flanged immersion heaters are one of the most widely used methods for heating gases and liquids (such as water, oil, heat transfer fluid and corrosive solutions). Designed for use in tanks and pressurized vessels, they are easy to install and maintain to provide heat for many processes. The direct immersion method is energy efficient and easily monitored and controlled.

### Specifications:

- Stainless Steel Heaters & Flange
- 1-Phase or 3-Phase options
- 1500V AC High Voltage Resistance(Hi-Pot)
- Optional Moisture resistant/Explosion-Proof
- Optional Third-party certifications; ATEX, UL
- Optional Withdrawable Heating Elements





## Application & Selection Guidelines

### *Selection Guidelines*

The selection of the proper Flanged Immersion Heater requires critical engineering judgement. After determining the heat requirement (see the applications section of this catalog), the proper selection of the flange material, heating element sheath material and correct watt density is critical for long life of a heater. Ultimate choice is determined by the knowledge of the process and engineering acumen of the plant engineer.

Heater application is influenced by the following parameters:

- The heated medium viscosity, specific heat density and corrosive properties
- Contaminants present in the medium
- The heater sheath material corrosion resistant properties.
- Watt density of the heating element
- Maximum sheath temperature — this is the recommended maximum sheath temperature of the element material. It is not the operating temperature of the heated medium

### *Features*

#### Heating Elements:

- **Materials:** 304, 316, 310 stainless-steel, Copper, steel.
- **Number of Elements in Flanges:** 3, 6, 12, 18, 27, 36 and 45.

- **Element Diameters:** 0,335" (8,5mm), 0,455" (11,5mm), 0,63" (16mm) *\*custom sizes available*

- **Watt Density:** 6.5, 15, 23, 45 and 75 W/In2.

#### Flange

- **Material:** Stainless steel, Carbon steel.

- **Rating:** 150 lb. pressure class per ANSI

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- **Sizes:** 3, 5, 6, 8, 10, 12 and 14", 150 lb.

### *Optional Features*

- Baffles to distribute flow on elements
- Stand-off Terminal Enclosures to isolate terminal housing from flange in high temperature applications.
- Withdrawable heating elements. This allows user to replace the heating elements one by one without removing the flange or emptying the tank.

### *Terminal Enclosure Options*

1. General-purpose, stainless-steel sheath metal
2. Moisture Resistant
3. Combination of Moisture Resistant and Explosion Resistant enclosures as per ATEX standards. It involves the use of cable glands for the use in hazardous location conditions.

Safe operation of heaters equipped with these enclosures depends on employment of electrical wiring meeting the National Electrical Code and/or



IEC for hazardous locations and limiting maximum operating temperatures (including temperatures on outside of vessel, piping, flanges, screw plugs, enclosures and other heat conducting parts) as dictated by flammable liquids, vapors or gases present. Approved pressure and/or temperature limiting controls must be used to assure safe operation in the event of a system malfunction.

### *Temperature control options*

1. An overheat protection thermostat is available on most models.
2. A built-in thermocouple can be used to measure the temperature inside of the heating elements, which extends the life of the heating elements by preventing the over-heating.
3. A thermocouple fixated on the outer sheath of the heating element. This helps to measure the sheath temperature of the heating element. At the same time, it is in contact with the medium that is being heated.
4. A process thermocouple. It is located in the center of the flange to measure the temperature of the medium to be heated. (Do not rely on this if the tank is not full or below the line of the heater.)

One or more thermocouples can be adapted to the heater according to the needs of the application.

All thermocouples should be wired to a compatible temperature controller. For more

information about temperature controllers, please contact us.

### *Corrosion Policy*

We cannot warrant any electric immersion heater against failure by sheath corrosion if such failure is the result of operating conditions beyond the control of the heater manufacturer. It is the responsibility of the purchaser to make the ultimate choice of sheath material based on their knowledge of the chemical composition of the corrosive solution, character of materials entering the solution, and controls which he maintains on the process.