

FLANGED IMMERSION HEATERS

Flanged industrial immersion heaters are amongst the most popular heaters owing to wide customization, easier installation and operations in stringent environment. Made by brazing or welding flange with several hairpin elements or bulge tubular elements, these are designed for heating chemical, petroleum and water based applications specially heat transfer fluids, medium and lightweight oils and water in tanks and pressure vessels. A thermocouple or RTD is often used within the bundle of elements to maintain the desired target temperature. Extra wiring boxes to make electrical connections are provided with it. Tubing known as a thermowell is used to protect thermocouples and heating elements. Temperature readings are then transmitted to a control unit that regulates power. Although, they occupy a small space, but have a large heating element which is perfect for applications which require high wattage heating. This is one of the most efficient forms of process heating with nearly 100 percent efficiency.

Different alloys and materials can be used to suit specific applications.

For instance, steel flanges are used for deionized water, lubricant oils, heavy and light oils, waxes as well as mildly corrosive liquids and low flow gas and water tank heating. Stainless steel flanged heating elements are used with mild and severe corrosive solutions and military applications. The sheath materials used can be steel, stainless steel, copper as well as exotic alloys such as incoloy.

OPTIONS

Sheath Material	Copper, Steel, 304 Stainless steel, INCOLOY, Titanium
Watt Density	Up to 120 W/in ²
Flange Material	MS, Stainless Steel
Flange size	Up to 480 V AC
Flange Rating	Up to 1200 °F or 650 °C
Diameter	0.375", 0.430", 0.475" or 9.5 mm, 11 mm, 12 mm
Terminal Enclosure	IP 54 Standard Terminal Box IP 66 Water Proof Terminal Box
Control	Thermocouple, RTD, Thermostat, Digitally controlled
Immersion Length	Customized
Voltage	Up to 600 V
Wattage	Customized

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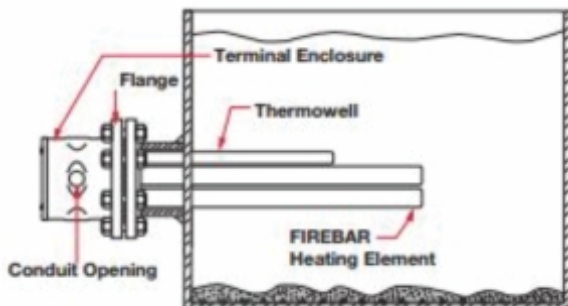
Different sheath materials used have different operating temperatures and watt densities. While selecting the material these values must match your criteria. Table shown below will help to make an ideal selection.

Sheath Material	Maximum Operating Temperatures		Maximum Watt Density	
	°F	°C	W/in ²	W/cm ²
INCOLOY	1600	870	60	9.3
316 stainless steel	1200	650	60	9.3
Steel	750	400	30	4.6

Some of the typical applications of flanged immersion heaters with their specific attributes are shown in the table below.

Application	Sheath Material	Flange Material
Clean water, hot water storage, portable water, freeze protection of liquid	Copper	Steel
Hot water, steam boilers, mildly corrosive solutions (in rinse tanks, spray washers), vapor degreasers	Incoloy	Steel
Oils (light or medium), Gases, hydraulic oil, stagnant or heavy oils, lubricating oil, crude asphalt	Steel	Steel
Process water, soap and detergent solutions, Boiler and water heaters, deionized water, chemical baths	Stainless Steel	Stainless Steel
Severe corrosive solutions, demineralized water	Incoloy	Stainless Steel

OPTIONS WITH FLANGED HEATERS



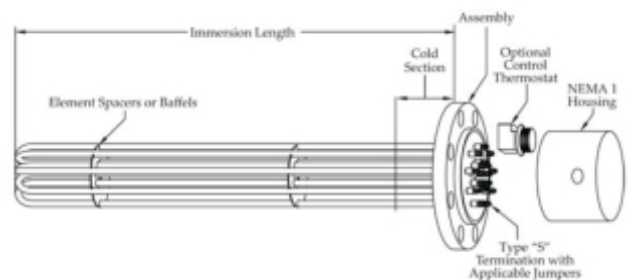
Terminal Enclosures

Apart from general purpose terminal enclosures without thermostats, other types are also readily available.

- Moisture resistant
- Corrosion resistant
- Explosion resistant
- Explosion/Moisture resistant combination
- Standoff terminal enclosures

Temperature Control

- **Thermostats** : It provides process temperature control and is generally mounted inside the terminal enclosure.
- **Thermocouple** : Type J or K thermocouple offers precise temperature control and sensing. It can be mounted inside the thermowell or attached to heater's sheath. It essentially consists of a temperature and power controllers such as digital controllers or SCR as desired.
- **RTD's** : If precision greater than thermowell is desired, an RTD is the right solution to the problem.
- **Gaskets** : Rubber, asbestos-free and spiral wound gaskets are available for all flange sizes.
- **Baffles** : Also called as Element spacers. Standard supports are provided for open tank or convection heating applications. In order to enhance or modify fluid or gas flow for better heat transfer, 316 stainless steel baffles can be provided.



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BENEFITS OF CHOOSING FLANGED HEATERS

- 100% efficient and versatile
- Easy installation, control and maintenance
- Designed and built for safety
- Perfect for higher kW output applications

Before buying flanged immersion heaters, some things are to be kept in mind.

- Supply voltage: Single phase or three phase
- Heat capacity
- Housing
- Sheath Materials
- Heating element materials
- Temperature controls

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