

# Flange Immersion Heaters

## Agency Certified Tubular Heaters Ideal for Heating Liquids, Gases, Tanks and Pressure Vessels Requiring Higher Kilowatts

Watlow<sup>®</sup> flange heaters, with IECEx and ATEX Ex'd' or Ex'e' certification, are easy to install and maintain. Designed for heating liquids and gases in tanks and pressure vessels, flange immersion heaters are ideal for applications requiring higher kilowatts.

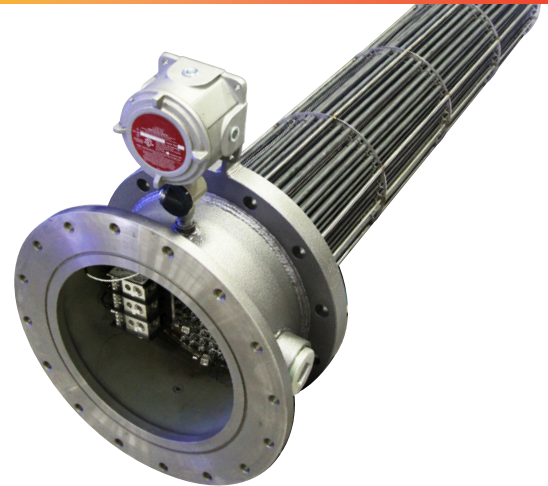
Watlow flange heaters are made with WATROD<sup>™</sup> or FIREBAR<sup>®</sup> tubular elements brazed or welded to a flange. Stock flange heaters are equipped with a general purpose terminal enclosure.

Watlow flange heaters possess IECEx and ATEX Ex'd' or Ex'e' ratings certifying that the flange heater enclosure is flameproof. Every enclosure is pressure tested to ensure heaters are safe and reliable and meet rigorous standards for electrical safety.

Flange heaters, with FIREBAR elements, also answer the need for liquid immersion applications requiring high kilowatts in small tanks. The FIREBAR element's unique flat surface geometry packs more power in a smaller bundle, with lower watt density, making it especially well-suited for petroleum-based liquid heating applications.

### Performance Capabilities

- Watt densities up to 100 W/in<sup>2</sup> (15.5 W/cm<sup>2</sup>)
- Wattages up to three megawatts
- UL<sup>®</sup> and CSA component recognition up to 600VAC and IEC and ATEX recognition up to 690VAC
- Alloy 800/840 sheath temperatures up to 1600°F (870°C)
- Passivated 316 stainless steel sheath temperatures up to 1200°F (650°C)
- 304 stainless steel sheath temperatures up to 1200°F (650°C)
- Steel sheath temperatures up to 750°F (400°C)
- FIREBAR flange heaters deliver more kilowatts in smaller bundles
- A conventional round tubular 10-inch ANSI flange can be replaced by a 6-inch ANSI FIREBAR flange with same immersed length
- Hazardous area ratings:
  - ATEX II 2 G Ex d IIB+H<sub>2</sub>, T1-6 Gb
  - IEC Ex d IIC: T1-6 Gb
  - ATEX II 2 G Ex e IIC T1-6 Gb
  - IEC Ex e IIC T1-6 Gb
  - Class 1, Divisions 1 & 2, Groups B, C & D
  - PESO, Zone 1 Group IIC
  - TR-CU EAC Certification



### Features and Benefits

#### ANSI and ANSI compatible 2, 2 1/2, 3 thru 48 inch flanges

- Provides appropriate heater size-to-application and fit

#### Element sheath and flange materials

- Meets your application needs

#### Integral thermowells

- Provides convenient temperature sensor insertion and replacement without draining the fluid being heated

#### Standard, general purpose terminal enclosure

- Offers easy access to wiring

#### Element support(s)

- Provides proper element spacing to maximizing heater performance and life

#### All units are inspected and/or tested

- Ensures element-to-flange pressure seals do not leak

#### Drilled and tapped eyebolt holes or lift lugs on larger flange heaters

- Facilitates lifting during installation

#### WATROD hairpins are repressed (recompacted)

- Provides improved heater life, insulation resistance and heat transfer

#### FIREBAR flange heaters pack more kilowatts into a smaller bundle

- Includes a conventional round tubular 10 in. (254 mm) ANSI flange which can be replaced by a 6 in. (152 mm) ANSI FIREBAR flange with the same immersed length

#### Branch circuits are designed for 48 amperes per circuit maximum

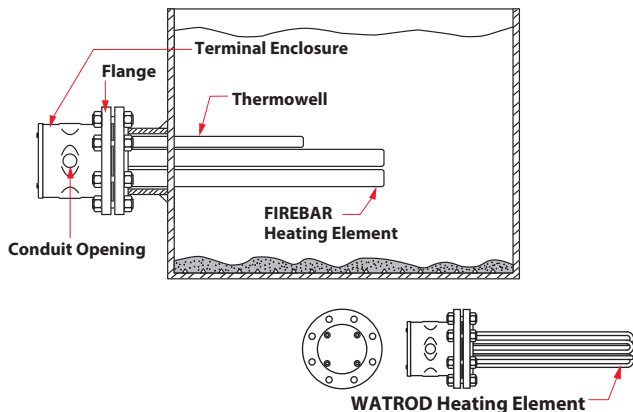
- Reduces risk of failure due to excessive temperatures generated by high amperage

#### UL<sup>®</sup> and CSA component recognition under file numbers E52951 and 31388 respectively

- Simplifies obtaining third-party recognition for assembly

## Typical Applications

- Water:
  - Deionized
  - Demineralized
  - Clean
  - Potable
  - Process
- Industrial water rinse tanks
- Vapor degreasers
- Hydraulic oil, crude, asphalt
- Lubricating oils at API specified watt densities
- Air and gas flow
- Caustic solutions
- Chemical baths
- Process air equipment
- Boiler equipment
- Freeze protection of any fluid
- Anti-freeze (glycol) solutions
- Paraffin



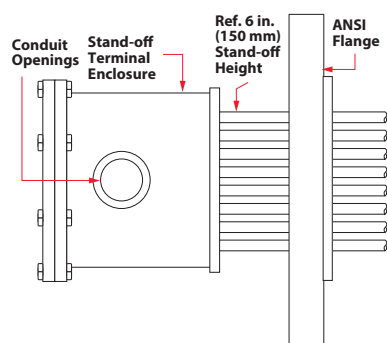
## Options

### Terminal Enclosures

General purpose terminal enclosures, without thermostats, are standard on all flange immersion heaters. Optional terminal enclosures include:

- General purpose with a single or double pole thermostat.
- Moisture resistant. Available with or without a single or double pole thermostat.
- Corrosion resistant. Available with or without a single or double pole thermostat.
- Explosion resistant Class 1, Div. 1 and 2, Groups B, C and D, T1-T6. Available with or without a single or double pole thermostat.
- Explosion/moisture resistant combinations. Available with or without a single or double pole thermostat.

### Stand-off Terminal Enclosures



Stand-off terminal enclosures provide an air-insulating barrier between the flange and terminal enclosure by mounting the terminations and wiring away from the flange. Stand-off terminal enclosures are recommended whenever a process operating temperature exceeds 210°F (100°C). This helps minimize terminal enclosure temperatures.

To order, specify **stand-off terminal enclosure**.

### Certified Enclosures

CSA, ATEX, IECEx or PESO certified enclosures protect wiring in hazardous gas environments. For additional information contact a Watlow representative.

To order, specify **CSA or ATEX, IECEx, PESO or TR-CU EAC certified enclosure, area classification, protection method, desired temperature code, process temperature (°F), maximum ambient temperature, maximum working pressure of application (psig), media being heated and heater mounting orientation (horizontal or vertical) and flange size**.

For products that will be installed in hazardous locations, please provide the following information:

- Operating conditions
- Minimum and maximum ambient temperatures for the installation location
- Mounting orientation

Watlow must understand this information so that an appropriate design can be provided.

### ASME Pressure Vessel Code Welding

Flange assemblies can be provided with an ASME Section VIII, Div. I pressure vessel stamp upon request.

### Thermostats

To provide process temperature control, Watlow offers optional single pole, single throw (SPST) and double pole, single throw (DPST) thermostats.

Unless otherwise specified, thermostats are mounted inside the terminal enclosure. Please verify that the thermostat's sensing bulb outside diameter is compatible with the flange heater's thermowell inside diameter.

### Thermocouples

ASTM Type J or K thermocouples offer more accurate sensing of process and/or sheath temperatures. A thermocouple may be inserted into the thermowell or attached to the heater's sheath.

Thermocouples are supplied with 120 in. (3050 mm) leads (longer lead lengths available). Unless otherwise specified, thermocouples are supplied with temperature ranges.

Using a thermocouple requires an appropriate temperature and power controller. These must be purchased separately. Watlow offers a wide variety of temperature and power controllers to meet virtually all applications. Temperature controllers can be configured to accept process variable inputs, too. Contact a Watlow representative for details.

To order, specify **Type J or K** thermocouple and lead length. Indicate if the thermocouple is for **process temperature sensing** or heater sheath **high-limit protection**. Please specify if the flange heater will be mounted **vertical** or **horizontal** in the tank. **If vertical, specify if the housing is on top or bottom**.

If the flange heater is part of an in-line circulation heating application, indicate flow direction relative to the heater's enclosure.

## Options (Continued)

### Wattages and Voltages

Watlow routinely supplies flange immersion heaters with 240 to 480VAC as well as wattages from 150 watts to one megawatt.

If required, Watlow will make heaters with voltage up to 600VAC and wattage beyond one megawatt. For more information on special voltage and wattage configurations, contact a Watlow representative.

### Sheath Materials

The following sheath materials are available on WATROD and FIREBAR flange heaters:

#### Standard Sheath Materials

WATROD	Alloy 800, 840 316 SS Steel
FIREBAR	Alloy 800

#### Extended Sheath Materials

WATROD	Titanium 304 and 321 SS Hastelloy® C276 Alloy 400 and 600
FIREBAR	304 SS

### Exotic Sheath Materials

Contact a Watlow representative for details and availability.

### External Finishing Passivation

During the manufacturing process, particles of iron or tool steel may become embedded in the stainless steel or alloy sheath. If not removed, these particles may corrode, produce rust spots and/or contaminate the process. For critical sheath applications, passivation will remove free iron from the sheath. To order, specify **passivation**.

### Other Finishes

Bright annealing available to meet cosmetic demands.

### Flanges

#### Flange Sizes and Styles

Standard: 2<sup>①</sup>, 2½<sup>①</sup>, 3 to 48 inch ANSI raised face/blind flanges.

**Made-to-Order:** 16, 18, 20 and 24 inch in any recognized configuration, as well as customer specified. Over 48 inch ANSI flange, contact a Watlow representative.

① ANSI bolt pattern only

### Flange Materials

Standard	Carbon steel 316 SS 304 SS
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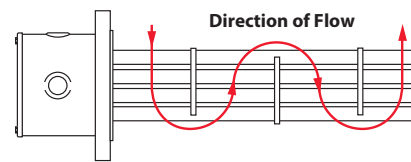
### Pressure Classes

Standard	150 lb 300 lb 600 lb
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### Gaskets

Rubber, asbestos-free and spiral wound gaskets are available for all flange sizes. Order by specifying gasket type, flange size/rating, process operating temperature and pressure.

### Baffles



For forced circulation applications, 316 stainless steel baffles can be arranged on the heating element bundle to enhance and/or modify fluid or gas flow for better heat transfer.

For open tank or convection heating applications, standard element supports will be supplied.

To order, specify **baffles** and provide vessel drawing with inlet and outlet size and dimensioned locations on vessel.

### Enclosure Enhancements

- Enclosure heater to solve condensation and freeze problems.
- Power distribution blocks to facilitate power feed line wiring.

### RTDs

If the process requires greater temperature sensing accuracy than is possible with thermocouples, Watlow can also supply RTDs in DIN or JIS calibrations. Contact your Watlow representative for details.



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