

# 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

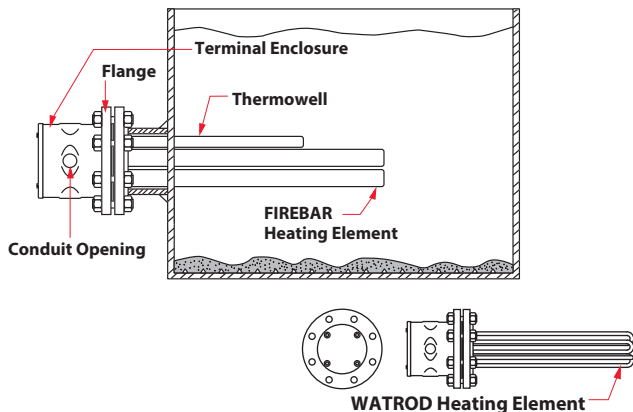
- Reduces risk of failure due to excessive temperatures generated by high amperage

#### 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



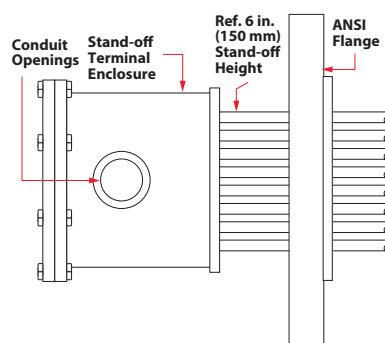
## Options

### 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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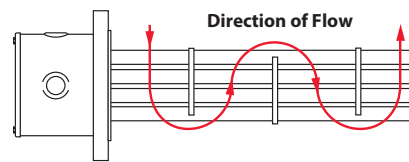
### Pressure Classes

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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WATROD™ is a trademark of Watlow Electric Manufacturing Company.

UL® is a registered trademark of Underwriter's Laboratories, Inc.

Hastelloy® is a registered trademark of Haynes International.

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To be automatically connected to the nearest North American Technical Sales Office:

1-800-WATLOW2 • [www.watlow.com](http://www.watlow.com)  
[inquiry@watlow.com](mailto:inquiry@watlow.com)

#### International Technical Sales Offices:

Austria	+43 6244 20129 0	Germany	+49 7253 9400 0	Mexico	+52 442 256 2200
Australia	+61 3 9335 6449	India	+91 40 6661 2700	Singapore	+65 6773 9488
China	+86 21 3532 8532	Italy	+39 02 4588841	Spain	+34 91 675 1292
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		Korea	+82 2 2169 2600	UK	+44 115 964 0777

# Immersion Heaters

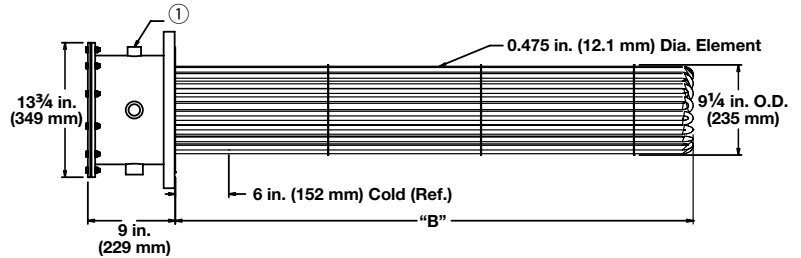


## WATROD ANSI Flange Immersion Heaters

### Application: Process Water

- 10 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



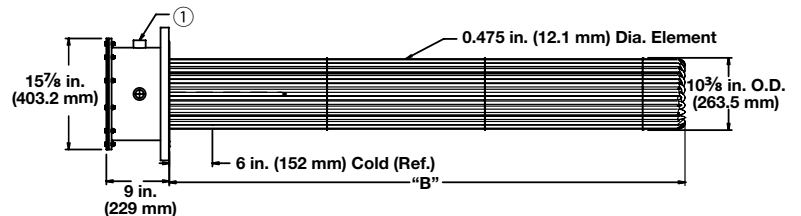
① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
48 W/in <sup>2</sup> Steel Flange 27-Alloy 800 Elements (7.5 W/cm <sup>2</sup> )	480	190.0	3	9	54 <sup>3</sup> / <sub>4</sub> (1391)	240 (109)	FSN754N5S	FSN754N5W	C/F	C/F
	480	262.0	3	9	73 <sup>1</sup> / <sub>4</sub> (1861)	260 (118)	FSN773E5S	FSN773E5W	C/F	C/F

### Application: Process Water

- 12 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
48 W/in <sup>2</sup> Steel Flange 36-Alloy 800 Elements (7.5 W/cm <sup>2</sup> )	480	250.0	3	6	54 <sup>5</sup> / <sub>8</sub> (1387.5)	280 (127)	FTN754L5S	FTN754L5W	C/F	C/F
	480	350.0	3	12	73 <sup>1</sup> / <sub>8</sub> (1857.4)	291 (132)	FTN773C5S	FTN773C5W	C/F	C/F

**Notes:**

- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
- For ANSI flange dimensions, reference chart on page 224

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# Immersion Heaters



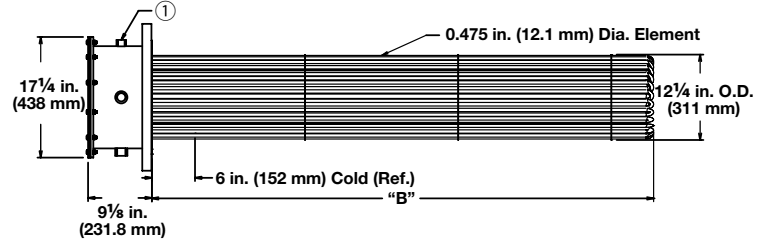
## WATROD ANSI Flange Immersion Heaters



### Application: Process Water

- 14 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
48 W/in <sup>2</sup> Steel Flange 45-Alloy 800 Elements (7.5 W/cm <sup>2</sup> )	480	315.0	3	15	54 1/2 (1384)	300 (136)	FWN754J5S	FWN754J5W	C/F	C/F
	480	375.0	3	15	63 1/2 (1613)	310 (141)	FWN763J5S	FWN763J5W	C/F	C/F

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

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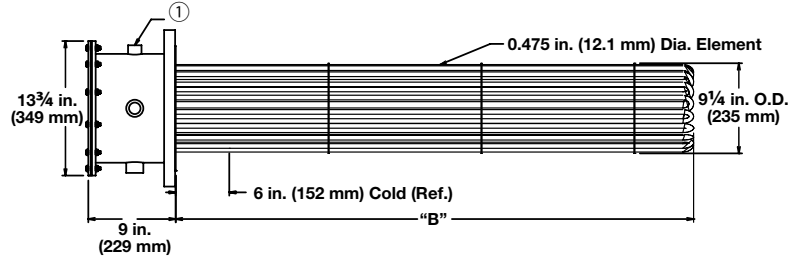
## WATROD ANSI Flange Immersion Heaters



### Application: Forced Air and Caustic Solutions

- 10 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
<b>23 W/in<sup>2</sup> Steel Flange 27-Alloy 800 Elements (3.6 W/cm<sup>2</sup>)</b>	240	45.0	3	3	33 <sup>1</sup> / <sub>4</sub> (845)	165 (75)	<b>FSNA33E3S</b>	<b>FSNA33E3W</b>	<b>C4-144</b>	<b>C4-145</b>
	480	45.0	3	3	33 <sup>1</sup> / <sub>4</sub> (845)	165 (75)	<b>FSNA33E5S</b>	<b>FSNA33E5W</b>	<b>C4-150</b>	<b>C4-151</b>
	240	60.0	3	3	43 <sup>3</sup> / <sub>4</sub> (1111)	195 (89)	<b>FSNA43N3S</b>	<b>FSNA43N3W</b>	<b>C4-144</b>	<b>C4-145</b>
	480	60.0	3	3	43 <sup>3</sup> / <sub>4</sub> (1111)	195 (89)	<b>FSNA43N5S</b>	<b>FSNA43N5W</b>	<b>C4-150</b>	<b>C4-151</b>
	240	75.0	3	9	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	<b>FSNA51N3S</b>	<b>FSNA51N3W</b>	<b>C/F</b>	<b>C/F</b>
	480	75.0	3	3	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	<b>FSNA51N5S</b>	<b>FSNA51N5W</b>	<b>C4-152</b>	<b>C4-153</b>

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

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# Immersion Heaters



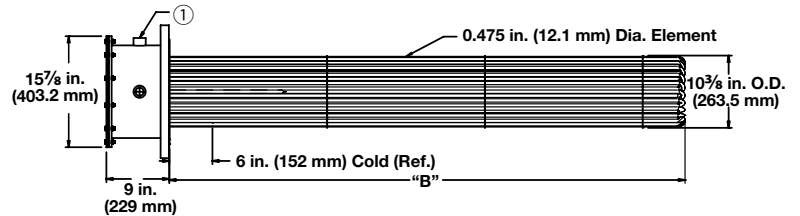
## WATROD ANSI Flange Immersion Heaters



### Application: Forced Air and Caustic Solutions

- 12 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
23 W/in <sup>2</sup> Steel Flange 36-Alloy 800 Elements (3.6 W/cm <sup>2</sup> )	480	60.0	3	3	33 <sup>1</sup> / <sub>8</sub> (841.4)	205 (93)	FTNA33C5S	FTNA33C5W	C4-150	C4-151
	480	80.0	3	3	43 <sup>5</sup> / <sub>8</sub> (1108.1)	240 (109)	FTNA43L5S	FTNA43L5W	C4-152	C4-153
	480	100.0	3	3	51 <sup>5</sup> / <sub>8</sub> (1311.3)	280 (127)	FTNA51L5S	FTNA51L5W	C4-152	C4-153

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

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# Immersion Heaters



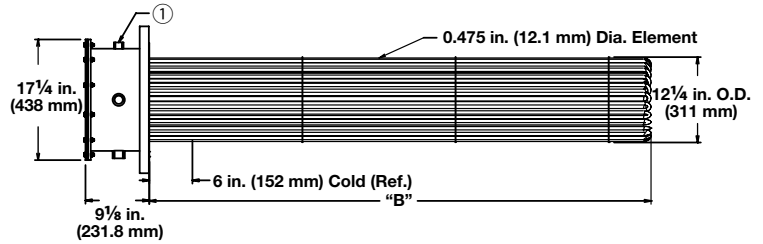
## WATROD ANSI Flange Immersion Heaters



### Application: Forced Air and Caustic Solutions

- 14 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
23 W/in <sup>2</sup> Steel Flange 45-Alloy 800 Elements (3.6 W/cm <sup>2</sup> )	480	75.0	3	3	33 (838)	225 (102)	FWNA33A5S	FWNA33A5W	C4-152	C4-153
	480	100.0	3	3	43 1/2 (1105)	255 (116)	FWNA43J5S	FWNA43J5W	C4-152	C4-153
	480	125.0	3	5	51 1/2 (1308)	300 (136)	FWNA51J5S	FWNA51J5W	C/F	C/F

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

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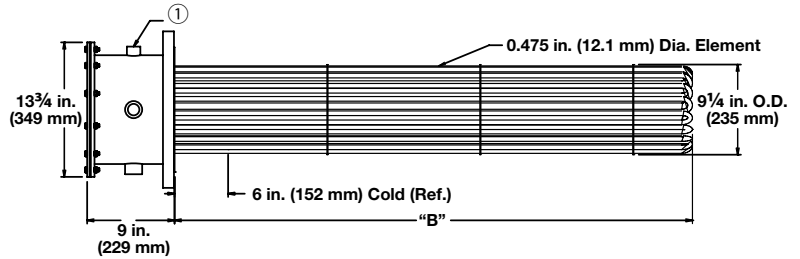
## WATROD ANSI Flange Immersion Heaters



### Application: Light Weight Oils and Heat Transfer Oils

- 10 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

#### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
23 W/in <sup>2</sup> Steel Flange 27-Steel Elements (3.6 W/cm <sup>2</sup> )	240	45.0	3	3	33 <sup>1</sup> / <sub>4</sub> (845)	165 (75)	FSS733E3S	FSS733E3W	C4-144	C4-145
	480	45.0	3	3	33 <sup>1</sup> / <sub>4</sub> (845)	165 (75)	FSS733E5S	FSS733E5W	C4-150	C4-151
	240	60.0	3	3	43 <sup>3</sup> / <sub>4</sub> (1111)	195 (89)	FSS743N3S	FSS743N3W	C4-144	C4-145
	480	60.0	3	3	43 <sup>3</sup> / <sub>4</sub> (1111)	195 (89)	FSS743N5S	FSS743N5W	C4-150	C4-151
	240	75.0	3	9	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	FSS751N3S	FSS751N3W	C/F	C/F
	480	75.0	3	3	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	FSS751N5S	FSS751N5W	C4-152	C4-153
	480	90.0	3	3	62 <sup>1</sup> / <sub>4</sub> (1581)	250 (114)	FSS762E5S	FSS762E5W	C4-152	C4-153
	480	105.0	3	3	70 <sup>3</sup> / <sub>4</sub> (1797)	258 (117)	FSS770N5S	FSS770N5W	C4-152	C4-153
	480	120.0	3	3	78 <sup>3</sup> / <sub>4</sub> (2000)	265 (121)	FSS778N5S	FSS778N5W	C4-152	C4-153

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

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# Immersion Heaters



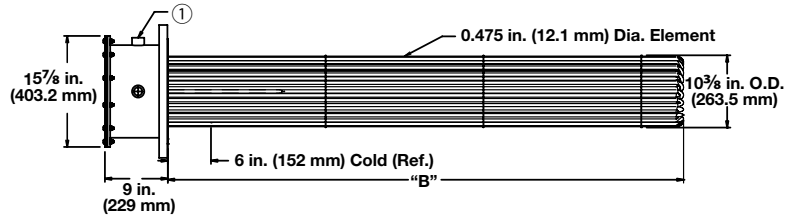
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### Application: Light Weight Oils and Heat Transfer Oils

- 12 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lb (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
23 W/in <sup>2</sup> Steel Flange 36-Steel Elements (3.6 W/cm <sup>2</sup> )	480	60.0	3	3	33 <sup>1</sup> / <sub>8</sub> (841.4)	205 (93)	FTS733C5S	FTS733C5W	C4-150	C4-151
	480	80.0	3	3	43 <sup>5</sup> / <sub>8</sub> (1108.1)	240 (109)	FTS743L5S	FTS743L5W	C4-152	C4-153
	480	100.0	3	3	51 <sup>5</sup> / <sub>8</sub> (1311.3)	280 (127)	FTS751L5S	FTS751L5W	C4-152	C4-153
	480	120.0	3	3	62 <sup>1</sup> / <sub>8</sub> (1578.0)	285 (130)	FTS762C5S	FTS762C5W	C4-152	C4-153
	480	140.0	3	4	70 <sup>5</sup> / <sub>8</sub> (1793.9)	290 (132)	FTS770L5S	FTS770L5W	C4-156	C4-157
	480	160.0	3	4	78 <sup>5</sup> / <sub>8</sub> (1997.1)	300 (136)	FTS778L5S	FTS778L5W	C4-156	C4-157

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

# Immersion Heaters



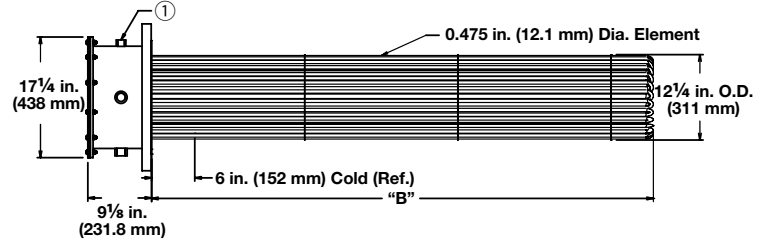
## WATROD ANSI Flange Immersion Heaters



### Application: Light Weight Oils and Heat Transfer Oils

- 14 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
23 W/in <sup>2</sup> Steel Flange 45-Steel Elements (3.6 W/cm <sup>2</sup> )	480	75.0	3	3	33 (838)	225 (102)	FWS733A5S	FWS733A5W	C4-152	C4-153
	480	100.0	3	3	43 1/2 (1105)	255 (116)	FWS743J5S	FWS743J5W	C4-152	C4-153
	480	125.0	3	5	51 1/2 (1308)	300 (136)	FWS751J5S	FWS751J5W	C/F	C/F
	480	150.0	3	5	62 (1575)	310 (141)	FWS762A5S	FWS762A5W	C/F	C/F
	480	175.0	3	5	70 1/2 (1791)	318 (145)	FWS770J5S	FWS770J5W	C/F	C/F
	480	200.0	3	5	78 1/2 (1994)	330 (150)	FWS778J5S	FWS778J5W	C/F	C/F

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

C/F - Contact factory, go to [www.watlow.com/en/contact-us](http://www.watlow.com/en/contact-us)

# Immersion Heaters



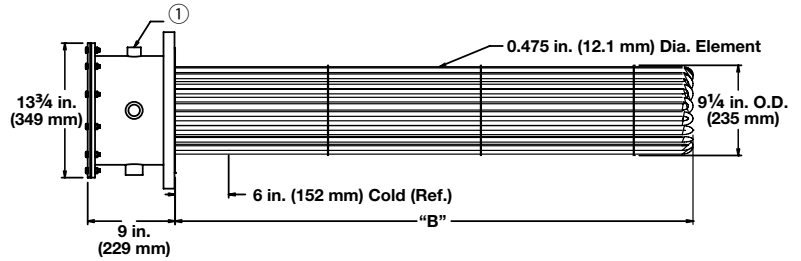
## WATROD ANSI Flange Immersion Heaters



### Application: Medium Weight Oils and Heat Transfer Oils

- 10 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
16 W/in <sup>2</sup> ③ Steel Flange 27-Alloy 800 Elements (2.5 W/cm <sup>2</sup> )	480	63.0	3	3	54 <sup>3</sup> / <sub>4</sub> (1391)	240 (109)	FSN754N13S	FSN754N13W	C4-152	C4-153
	480	75.0	3	3	63 <sup>3</sup> / <sub>4</sub> (1619)	250 (114)	FSN763N13S	FSN763N13W	C4-152	C4-153
	480	87.0	3	3	73 <sup>1</sup> / <sub>4</sub> (1861)	260 (118)	FSN773E13S	FSN773E13W	C4-152	C4-153

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

③ Wired for 3-phase operation only

# Immersion Heaters



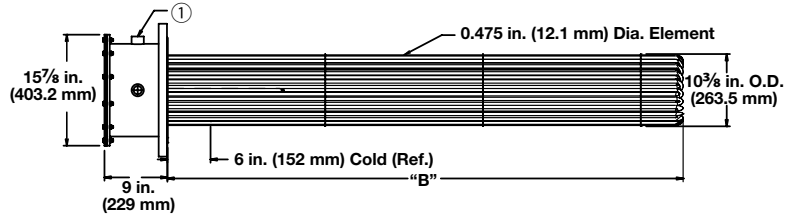
## WATROD ANSI Flange Immersion Heaters



### Application: Medium Weight Oils and Heat Transfer Oils

- 12 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

#### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
16 W/in <sup>2</sup> ③ Steel Flange 36-Alloy 800 Elements (2.5 W/cm <sup>2</sup> )	480	83.0	3	3	54 <sup>5</sup> / <sub>8</sub> (1387.5)	280 (127)	FTN754L13S	FTN754L13W	C4-152	C4-153
	480	117.0	3	3	73 <sup>1</sup> / <sub>8</sub> (1857.4)	291 (132)	FTN773C13S	FTN773C13W	C4-152	C4-153

**Notes:**

- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
- For ANSI flange dimensions, reference chart on page 224

③ Wired for 3-phase operation only

# Immersion Heaters



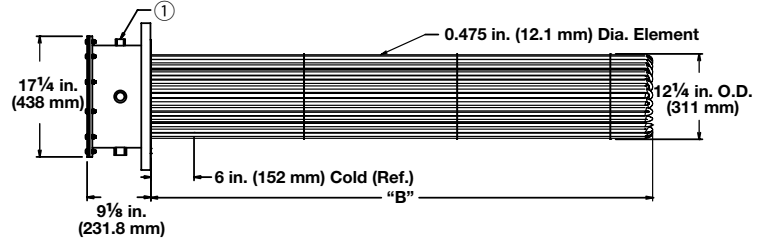
## WATROD ANSI Flange Immersion Heaters



### Application: Medium Weight Oils and Heat Transfer Oils

- 14 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
16 Win <sup>2</sup> ③ Steel Flange 45-Alloy 800 Elements (2.5 W/cm <sup>2</sup> )	480	105.0	3	3	54 1/2 (1384)	300 (136)	FWN754J13S	FWN754J13W	C4-152	C4-153
	480	125.0	3	5	63 1/2 (1613)	310 (141)	FWN763J13S	FWN763J13W	C/F	C/F

- Notes:**
- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
  - For ANSI flange dimensions, reference chart on page 224

C/F - Contact factory, go to [www.watlow.com/en/contact-us](http://www.watlow.com/en/contact-us)

③ Wired for 3-phase operation only

# Immersion Heaters



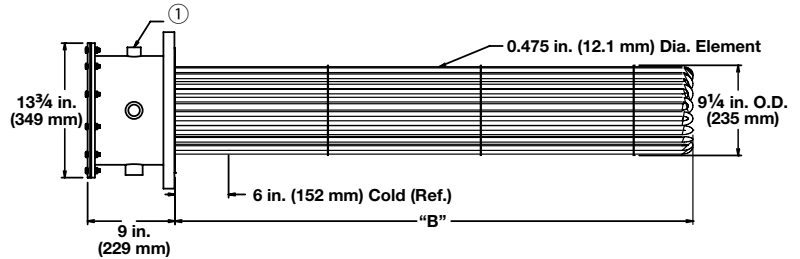
## WATROD ANSI Flange Immersion Heaters



### Application: Bunker C, Asphalt and #6 Fuel Oil

- 10 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
<b>8 W/in<sup>2</sup> ③ Steel Flange 27-Steel Elements (1.3 W/cm<sup>2</sup>)</b>	240	25.0	3	3	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	<b>FSS751N12S</b>	<b>FSS751N12W</b>	<b>C4-143</b>	<b>C4-142</b>
	480	25.0	3	1	51 <sup>3</sup> / <sub>4</sub> (1314)	230 (105)	<b>FSS751N13S</b>	<b>FSS751N13W</b>	<b>C2-225</b>	<b>C2-226</b>
	240	30.0	3	3	62 <sup>1</sup> / <sub>4</sub> (1581)	250 (114)	<b>FSS762E12S</b>	<b>FSS762E12W</b>	<b>C4-143</b>	<b>C4-142</b>
	480	30.0	3	1	62 <sup>1</sup> / <sub>4</sub> (1581)	250 (114)	<b>FSS762E13S</b>	<b>FSS762E13W</b>	<b>C2-225</b>	<b>C2-226</b>
	240	35.0	3	3	70 <sup>3</sup> / <sub>4</sub> (1797)	258 (117)	<b>FSS770N12S</b>	<b>FSS770N12W</b>	<b>C4-144</b>	<b>C4-145</b>
	480	35.0	3	1	70 <sup>3</sup> / <sub>4</sub> (1797)	258 (117)	<b>FSS770N13S</b>	<b>FSS770N13W</b>	<b>C2-225</b>	<b>C2-226</b>
	240	40.0	3	3	78 <sup>3</sup> / <sub>4</sub> (2000)	265 (121)	<b>FSS778N12S</b>	<b>FSS778N12W</b>	<b>C4-144</b>	<b>C4-145</b>
	480	40.0	3	1	78 <sup>3</sup> / <sub>4</sub> (2000)	265 (121)	<b>FSS778N13S</b>	<b>FSS778N13W</b>	<b>C2-225</b>	<b>C2-226</b>

**Notes:**

- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
- For ANSI flange dimensions, reference chart on page 224

③ Wired for 3-phase operation only



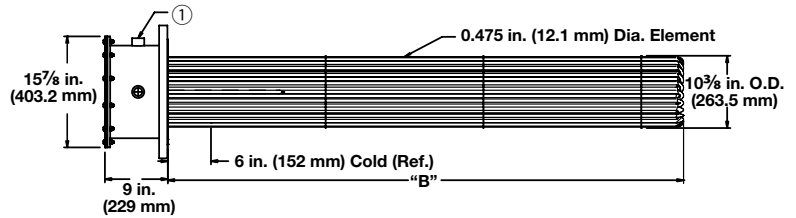


## WATROD ANSI Flange Immersion Heaters

### Application: Bunker C, Asphalt and #6 Fuel Oil

- 12 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number		WATCONNECT Part Number	
							General Purpose Enclosure	NEMA 4 Enclosure	Type J T/C	Type K T/C
8 W/in <sup>2</sup> ③ Steel Flange 27-Steel Elements (1.3 W/cm <sup>2</sup> )	240	34.0	3	2	51 <sup>5</sup> / <sub>8</sub> (1311.3)	280 (127)	FTS751L12S	FTS751L12W	C2-218	C2-224
	480	34.0	3	1	51 <sup>5</sup> / <sub>8</sub> (1311.3)	280 (127)	FTS751L13S	FTS751L13W	C2-225	C2-226
	240	40.0	3	2	62 <sup>1</sup> / <sub>8</sub> (1578.0)	285 (130)	FTS762C12S	FTS762C12W	C2-218	C2-224
	480	40.0	3	1	62 <sup>1</sup> / <sub>8</sub> (1578.0)	285 (130)	FTS762C13S	FTS762C13W	C2-225	C2-226
	240	47.0	3	3	70 <sup>5</sup> / <sub>8</sub> (1793.9)	290 (132)	FTS770L12S	FTS770L12W	C4-144	C4-145
	480	47.0	3	2	70 <sup>5</sup> / <sub>8</sub> (1793.9)	290 (132)	FTS770L13S	FTS770L13W	C2-229	C2-230
	240	54.0	3	3	78 <sup>5</sup> / <sub>8</sub> (1997.1)	300 (136)	FTS778L12S	FTS778L12W	C4-144	C4-145
	480	54.0	3	2	78 <sup>5</sup> / <sub>8</sub> (1997.1)	300 (136)	FTS778L13S	FTS778L13W	C2-229	C2-230

**Notes:**

- All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe
- For ANSI flange dimensions, reference chart on page 224

③ Wired for 3-phase operation only

# Immersion Heaters



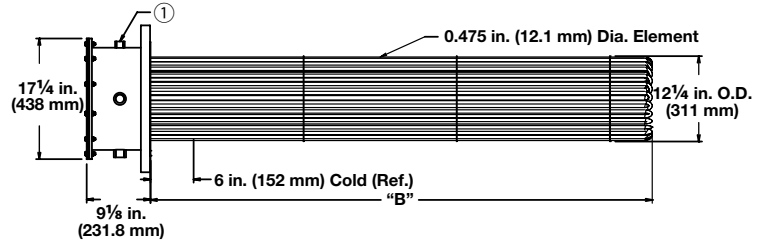
## WATROD ANSI Flange Immersion Heaters



### Application: Bunker C, Asphalt and #6 Fuel Oil

- 14 inch - 150 lb ANSI flange
- WATROD elements
- Without thermostat
- General purpose or NEMA 4 enclosure

### General Purpose or NEMA 4 Enclosure



① The number and size of the conduit opening will comply with the National Electrical Code® standards.

Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	Part Number	WATCONNECT Part Number	
							General Purpose Enclosure	Moisture-Resistant Enclosure	Type J T/C	Type K T/C
8 W/in <sup>2</sup> ③ Steel Flange 27-Steel Elements (1.3 W/cm <sup>2</sup> )	240	42.0	3	3	51 1/2 (1308)	300 (136)	FWS751J12S	FWS751J12W	C4-144	C4-145
	480	42.0	3	3	51 1/2 (1308)	300 (136)	FWS751J13S	FWS751J13W	C4-150	C4-151
	240	50.0	3	3	62 (1575)	310 (141)	FWS762A12S	FWS762A12W	C4-144	C4-145
	480	50.0	3	3	62 (1575)	310 (141)	FWS762A13S	FWS762A13W	C4-150	C4-151
	240	60.0	3	3	70 1/2 (1791)	318 (145)	FWS770J12S	FWS770J12W	C4-144	C4-145
	480	60.0	3	3	70 1/2 (1791)	318 (145)	FWS770J13S	FWS770J13W	C4-150	C4-151
	240	67.0	3	5	78 1/2 (1994)	330 (150)	FWS778J12S	FWS778J12W	C/F	C/F
	480	67.0	3	3	78 1/2 (1994)	330 (150)	FWS778J13S	FWS778J13W	C4-152	C4-153

**Notes:** • All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe  
 • For ANSI flange dimensions, reference chart on page 224

C/F - Contact factory, go to [www.watlow.com/en/contact-us](http://www.watlow.com/en/contact-us)

③ Wired for 3-phase operation only

# Immersion Heaters



## WATROD ANSI Flange Immersion Heaters

### Part Number

Stock ANSI Flange Part Number	Optional Terminal Enclosures	Optional Process Sensors	Sheath Limit Sensors

#### Stock ANSI Flange Part Number

**Note:** Catalog part numbers include optional enclosures and process sensors. To order optional enclosures or sensors, substitute the appropriate suffix.

#### Optional Terminal Enclosures

S =	General purpose enclosure
W =	NEMA 4 enclosure
C =	CSA Type 4/explosion proof enclosure

**Note:** Catalog listings include either a general purpose enclosure or NEMA 4 enclosure. Substitute enclosure options are noted.

#### Optional Bulb & Capillary Thermostats or Thermocouple Process Sensors

2 =	30 to 250°F, (-1 to 121°C) SPST
3 =	175 to 550°F, (79 to 288°C) SPST
4 =	30 to 110°F, (-1 to 43°C) DPST
5A=	60 to 250°F, (16 to 121°C) DPST
7A=	100 to 550°F, (38 to 288°C) DPST
PJ=	Type J process thermocouple in thermowell
PK=	Type K process thermocouple in thermowell

**Note:** Thermostat part numbers are shown in the *Thermostat Chart* on page 517.

#### Sheath Limit Sensors

HJ=	Type J high-limit thermocouple, horizontal mount
TJ=	Type J high-limit thermocouple, vertical/housing at top
BJ=	Type J high-limit thermocouple, vertical/housing at bottom
HK=	Type K high-limit thermocouple, horizontal mount
TK=	Type K high-limit thermocouple, vertical/housing at top
BK=	Type K high-limit thermocouple, vertical/housing at bottom

**Note:** Heater orientation is critical to accurate sensing of limit conditions. Use the appropriate code to indicate heater mounting orientation.

**Example Part Number:** FPS732R12 S 2 HJ