Tubular and Process Assemblies

Quick Ship

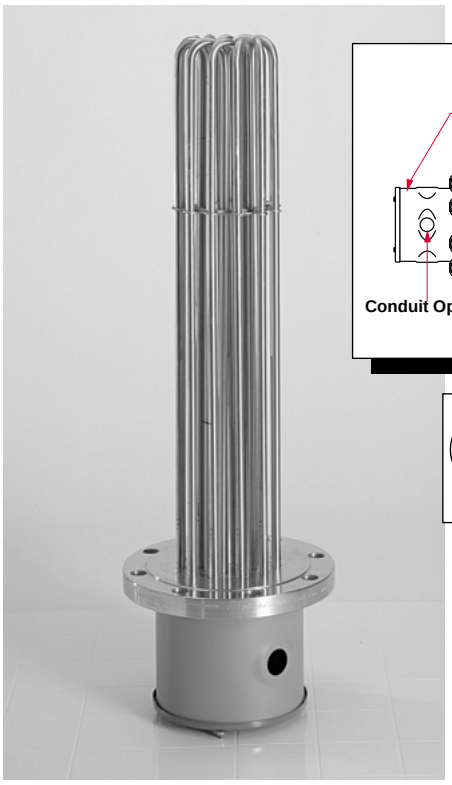
On stock chart units:
- *Three to five working days on most heaters*
- *10 working days on special voltages and/or wattages*
- *15 working days on special element lengths*

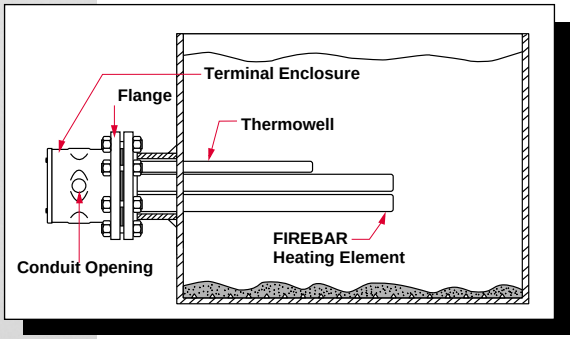
Flange Immersion Heaters

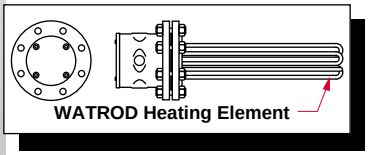
Watlow flange heaters are easy to install and maintain. Designed for heating liquids and gases in tanks and pressure vessels, flange immersion heaters are ideal for applications requiring higher kilowatts.

Watlow flange heaters are made with WATROD or FIREBAR® tubular elements brazed or welded to a flange. Stock flange heaters are equipped with a general purpose (NEMA 1) terminal enclosure.

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 to 100 W/in² (15.5 W/cm²)
- Wattages to one megawatt
- UL® and CSA component recognition to 480V~(ac) and 600V~(ac) respectively
- Incoloy® sheath temperatures to 1600°F (870°C)
- Passivated 316 stainless steel sheath temperatures to 1200°F (650°C)
- 304 stainless steel sheath temperatures to 1200°F (650°C)
- Steel sheath temperatures to 750°F (400°C)
- Copper sheath temperatures to 350°F (175°C)

Features and Benefits

- **ANSI and ANSI compatible 2, 2½, 3, 4, 5, 6, 8, 10, 12 and 14 inch flanges** provide appropriate heater size-to-application and fit.
- **Flange sizes up to 24 inches** available on made-to-order units.
- **Element sheath and flange materials** to meet application needs.
- **Integral thermowells** provide convenient temperature sensor insertion and replacement without draining the fluid being heated.
- **A standard, general purpose (NEMA 1) terminal enclosure** offers easy access to wiring.
- **Element support(s)** provide proper element spacing to maximizing heater performance and life.
- **To facilitate lifting**, drilled and tapped holes come supplied for eye bolts on 10 inch and larger flange heaters.
- **All units are inspected and/or tested** to ensure element-to-flange pressure seals do not leak.
- **Four or six inch FIREBAR flange heaters** pack more kilowatts in smaller bundles—in liquid immersion applications, a conventional 10 inch round tubular element flange can be replaced with a six inch FIREBAR flange.
- **WATROD hairpins are repressed (recompacted)** to maintain MgO density, dielectric strength, heat transfer and life.
- **Branch circuits meet NEC** with 48 amps per circuit maximum.
- **UL® and CSA component recognition** under file numbers E52951 and 31388 respectively. See **pages 268-271** for details.

Flange Immersion Heaters

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 (NEMA 1) with a single or double pole thermostat.
- Moisture resistant (NEMA 4–steel). Available with or without a single or double pole thermostat.
- Corrosion resistant (NEMA 4X). Available with or without a single or double pole thermostat.
- Explosion resistant (NEMA 7) class 1 groups C and D. Available with or without a single or double pole thermostat.
- Explosion/moisture resistant (NEMA 7/4) combinations. Available with or without a single or double pole thermostat.
- For class 1, group B enclosures, consult your Watlow representative.

Enclosure Enhancements

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

Prior to ordering, refer to the terminal enclosure dimensions on **page 341**. Order by adding the appropriate suffix letter(s) to the base flange heater code number, as shown on the Build-a-Code chart. Heater code numbers and suffix letters are depicted on the *Stock* and *Options* charts, **pages 345 to 362**. Specify class and group, if applicable.

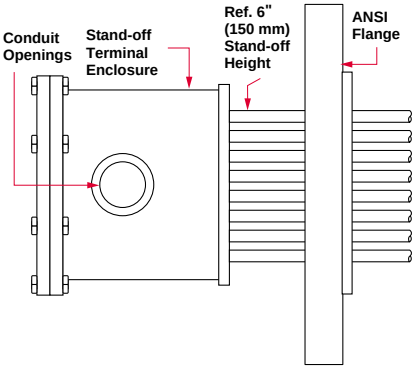
Caution

Explosion-resistant terminal enclosures are intended to provide explosion containment in the electrical termination/wiring enclosure only. No portion of the assembly outside of this enclosure is covered under this NEMA rating. NEMA rating effectiveness may be compromised by abuse or misapplication.

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 400°F (205°C). This helps minimize terminal enclosure temperatures.

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



CSA Certified Enclosures

CSA certified moisture and/or explosion resistant terminal enclosures protect wiring in hazardous gas environments. These terminal enclosures, covered under CSA file number 61707, are available on all WATROD and FIREBAR flange heaters. For additional information, consult your Watlow representative.

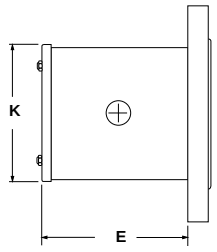
To order, specify **CSA certified enclosure**, **process temperature** (°F), maximum **working pressure** of application (psig), **media** being heated and heater **mounting orientation** (horizontal or vertical) and **flange size**.

Tubular and Process Assemblies

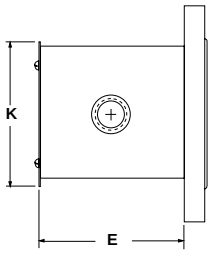
Flange Immersion Heaters

Options

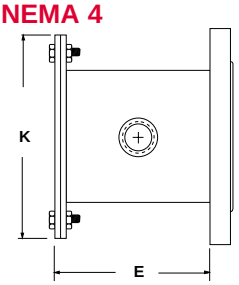
4-8 inches NEMA 1 and NEMA 4



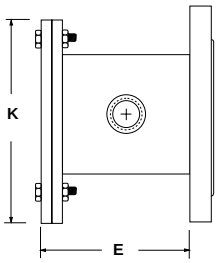
10-14 inches NEMA 1



10-14 inches NEMA 4



4-14 inches NEMA 7



Terminal Enclosure Dimensions

Enclosure Type	Flange Size inch	Without Thermostat				With Thermostat							
						Single Pole				Double Pole			
		E Dimension inch	(mm)	K Dimension inch	(mm)	E Dimension inch	(mm)	K Dimension inch	(mm)	E Dimension inch	(mm)	K Dimension inch	(mm)
General Purpose (NEMA 1)	2①	1 ½	(38)	3 ⅜	(86)	—	—	—	—	—	—	—	—
	2½①	2 ⅛	(54)	4	(102)	—	—	—	—	—	—	—	—
	3	3 13/16	(97)	4 ⅝	(117)	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)
	4	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)
	5	7 1/16	(179)	7	(178)	7 1/16	(179)	7	(178)	7 1/16	(179)	7	(178)
	6	7 1/16	(179)	8	(203)	7 1/16	(179)	8	(203)	7 1/16	(179)	8	(203)
	8	7 1/16	(179)	10 1/32	(255)	7 1/16	(179)	10 1/32	(255)	7 1/16	(179)	10 1/32	(255)
	10	7 1/16	(179)	11 ⅝	(295)	7 1/16	(179)	11 ⅝	(295)	7 1/16	(179)	11 ⅝	(295)
	12	7 1/16	(179)	13 ½	(343)	7 1/16	(179)	13 ½	(343)	7 1/16	(179)	13 ½	(343)
	14	7 1/16	(179)	15 ⅛	(384)	7 1/16	(179)	15 ⅛	(384)	7 1/16	(179)	15 ⅛	(384)
Moisture Resistant (NEMA 4)	2	2 ⅝	(67)	3 ½	(89)	—	—	—	—	—	—	—	—
	2 ½	2 ⅝	(67)	3 ½	(89)	—	—	—	—	—	—	—	—
	3	2 ⅛	(54)	4	(102)	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)
	4	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)	9 ⅜	(238)	7	(178)
	5	7 1/16	(179)	7	(178)	7 1/16	(179)	7	(178)	7 1/16	(179)	7	(178)
	6	7 1/16	(179)	8	(203)	7 1/16	(179)	8	(203)	7 1/16	(179)	8	(203)
	8	7 1/16	(179)	10 1/32	(255)	7 1/16	(179)	10 1/32	(255)	7 1/16	(179)	10 1/32	(255)
	10	7 ¾	(197)	13 ¾	(349)	7 ¾	(197)	13 ¾	(349)	7 ¾	(197)	13 ¾	(349)
	12	7 ¾	(197)	15 ⅞	(403)	7 ¾	(197)	15 ⅞	(403)	7 ¾	(197)	15 ⅞	(403)
	14	7 ¾	(197)	17 ¼	(438)	7 ¾	(197)	17 ¼	(438)	7 ¾	(197)	17 ¼	(438)
Explosion Resistant (NEMA 7) Class 1, Groups C and D Consult Factory for Group B)	2	3 1/16	(78)	3 ¾	(95)	—	—	—	—	—	—	—	—
	2 ½	3 1/16	(78)	3 ¾	(95)	—	—	—	—	—	—	—	—
	3	7 ⅛	(181)	5 ¾	(146)	7 ⅛	(181)	5 ¾	(146)	7 ⅛	(181)	5 ¾	(146)
	4	7 ⅛	(181)	5 ¾	(146)	7 ⅛	(181)	5 ¾	(146)	7 ⅛	(181)	5 ¾	(146)
	5	7 ⅞	(200)	8 ⅞	(225)	7 ⅞	(200)	8 ⅞	(225)	7 ⅞	(200)	8 ⅞	(225)
	6	7 ⅞	(200)	9 ⅞	(251)	7 ⅞	(200)	9 ⅞	(251)	7 ⅞	(200)	9 ⅞	(251)
	8	7 ⅞	(200)	12 ⅛	(308)	7 ⅞	(200)	12 ⅛	(308)	7 ⅞	(200)	12 ⅛	(308)
	10	7 ⅞	(200)	14 ⅝	(371)	7 ⅞	(200)	14 ⅝	(371)	7 ⅞	(200)	14 ⅝	(371)
	12	7 ⅞	(200)	15 ⅞	(403)	7 ⅞	(200)	15 ⅞	(403)	7 ⅞	(200)	15 ⅞	(403)
	14	7 ⅞	(200)	19 ⅜	(492)	7 ⅞	(200)	19 ⅜	(492)	7 ⅞	(200)	19 ⅜	(492)

① Terminal enclosure is octagonal, not round.

Flange Immersion Heaters
Options

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. For details and ordering information, refer to ***Thermostats*** on **pages 423 to 425**. Please verify that the thermostat's sensing bulb O.D. is compatible with the flange heater's thermowell I.D.

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 inch (3050 mm) leads (longer lead lengths available). Unless otherwise specified, thermocouples are supplied with temperature ranges detailed on the *Thermocouple Types* chart.

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

Consult your 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.

RTDs

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

Thermocouple Types

ASTM Type	Conductor Characteristics Positive	Conductor Characteristics Negative	Recommended① Temperature Range °F	Recommended① Temperature Range (°C)
J	Iron (Magnetic)	Constantan (Non-magnetic)	0 to 1000	(-20 to 540)
K	Chromel® (Non-magnetic)	Alumel® (Magnetic)	0 to 2000	(-20 to 1100)

① Type J and Type K thermocouples are rated 32 to 1382°F and 32 to 2282°F (0-750°C and 0-1250°C), respectively. Watlow does not recommend exceeding temperature ranges shown on this chart for the tubular product line.

Wattages and Voltages

Watlow routinely supplies flange immersion heaters with 240 to 480V~(ac) as well as wattages from 150 watts to one megawatt. If required, Watlow will make heaters with voltage up to 600V~(ac) and wattage beyond one megawatt. For more information on special voltage and wattage configurations, consult your Watlow representative.

Branch Circuits

Branch circuits are subdivided by National Electrical Code (NEC) requirements to a maximum of 48 amps per circuit. Consult factory for circuit requirements other than those listed in the stock charts.

Tubular and Process Assemblies

Flange Immersion Heaters

Options

Sheath Materials

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

Standard Sheath Materials

WATROD	Incoloy® 316 stainless steel Steel Copper
FIREBAR	Incoloy®

Made-to-Order Sheath Materials

WATROD	304 stainless steel Monel®
FIREBAR	304 stainless steel

Exotic Sheath Materials

Consult your 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

Simple belt polishing and glass beading are available to meet cosmetic demands. Consult factory for details.

Flanges

Flange Sizes and Styles

Standard: 2①, 2½①, 3, 4, 5, 6, 8, 10, 12 and 14 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 24 inch, consult Watlow Process Systems.

Flange Materials

Standard	Carbon steel 316 stainless steel 304 stainless steel
Made-to-Order	Exotic materials to meet specific application needs②

Pressure Classes

Standard	150 lb
Made-to-Order	300 lb 600 lb Over 600 lb②

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.

To make the correct selection, see the *Gasket Selection* chart.

It provides a recommended gasket type and effective temperature rating.

To use this chart, multiply operating temperature by the operating pressure to arrive at “Maximum PSIG X °F.” This is listed in the chart’s first column.

Gasket Selection

Maximum PSIG X °F	Gasket Temperature °F	Gasket Type
Up to 15,000	300	Rubber
Over 250,000	700	Asbestos-Free
Over 250,000	③	Spiral Wound

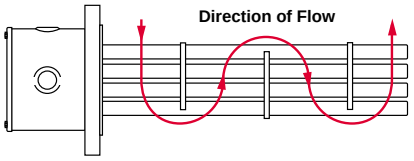
③ Depends on metal gasket material.

Baffles

For forced circulation applications, 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**.



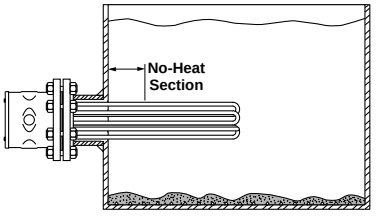
① ANSI compatible only.
② Consult Watlow Process Systems in Troy, Missouri.

Monel® is a registered trademark of Special Metals Corporation.

Flange Immersion Heaters

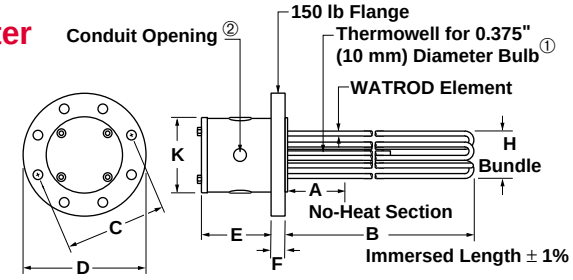
Application Hints

- Select the recommended heating element sheath material and watt density for the substance being heated. Use the ***Supplemental Applications Chart*** on **pages 263 to 266**. If unable to determine the correct heating element sheath material and type, consult your Watlow representative.
- Extend the element no-heat section completely into the fluid being heated to help prevent premature heater failure. See accompanying illustration for proper no-heat section placement.
- Locate flange heater low in the tank, but above the sludge level.



- Choose a FIREBAR element when your application requires a smaller system package or lower watt density.
- Ensure wiring integrity by keeping terminal enclosure temperature below 400°F (205°C).
- Keep electrical connections clean, dry and tight.
- Minimize problems associated with low liquid level conditions by using low liquid level sensor or sheath temperature high-limit control.
- Periodically remove the flange assembly to inspect and clean the heating element(s). This preventive maintenance will reduce premature failure and optimize heater performance.
- Refer to the *Installation and Maintenance Instructions* for correct orientation of FIREBAR elements. This is important in air applications with customer supplied circulation tanks. Correct element orientation to flow minimizes pressure drop, increases buoyancy force and heater performance.

Flange Immersion Heater



For terminal enclosure dimensions (K and E) see page 341.

Flange Immersion Heater Dimensions

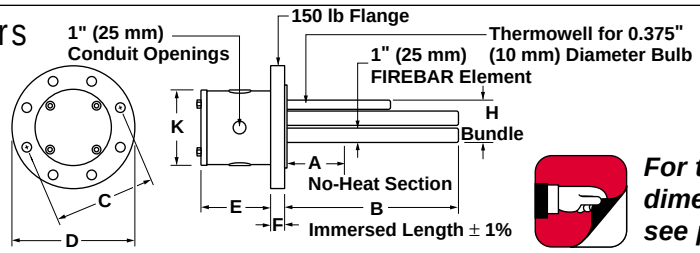
Element Type	Flange Size in	Flange Mounting Hole Size in (mm)	Flange Mounting Hole Number	Thermowell Length in (mm)	A Dimension in (mm)	C Dimension in (mm)	D Dimension in (mm)	F Dimension in (mm)	H Dimension in (mm)	Number of Elements Std	Number of Elements Max
WATROD	2①	¾ (19)	4	— —	2 (51)	4¾ (121)	6 (152)	9/16 (14)	2 (51)	3	3
WATROD	2½①	¾ (19)	4	— —	3 (76)	5½ (140)	7 (178)	⅜ (10)	2¼ (57)	3	3
WATROD	3	¾ (19)	4	12 (305)	4 (102)	6 (152)	7½ (191)	15/16 (24)	2¾ (70)	3	6
WATROD	4	¾ (19)	8	12 (305)	4 (102)	7½ (191)	9 (229)	15/16 (24)	3⅜ (98)	6	6
WATROD	5	⅞ (22)	8	12 (305)	4 (102)	8½ (216)	10 (254)	15/16 (24)	5 (127)	6	9
WATROD	6	⅞ (22)	8	12 (305)	4 (102)	9½ (241)	11 (279)	1 (25)	6 (152)	12	15
WATROD	8	⅞ (22)	8	18 (457)	6 (152)	11¾ (298)	13½ (343)	1⅛ (29)	7 13/16 (198)	18	24
WATROD	10	1 (25)	12	18 (457)	6 (152)	14¼ (362)	16 (406)	1 3/16 (30)	9¾ (248)	27	36
WATROD	12	1 (25)	12	18 (457)	6 (152)	17 (432)	19 (483)	1 ¼ (32)	11¾ (298)	36	54
WATROD	14	1⅛ (29)	12	18 (457)	6 (152)	18¾ (476)	21 (533)	1 ⅜ (35)	12¾ (324)	45	72

① Thermowells are not provided on two and 2½ inch units. 150 lb rating is not available on two and 2½ inch stock units.

Note: The number and size of conduit openings will comply with the National Electrical Code standards.

Tubular and Process Assemblies

Flange Immersion Heaters



For terminal enclosure dimensions (K and E) see page 341.

Flange Immersion Heater Dimensions

Element Type	Flange Size in	Flange Mounting Hole Size in (mm)	Flange Mounting Hole Number	Thermowell Length in (mm)	A Dimension in (mm)	C Dimension in (mm)	D Dimension in (mm)	F Dimension in (mm)	H Dimension in (mm)	Elements Standard
FIREBAR	4	¾ (19)	8	12 (305)	4 (102)	7½ (191)	9 (229)	15⁄16 (24)	3⅜ (98)	6
FIREBAR	6	⅞ (22)	8	12 (305)	4 (102)	9½ (241)	11 (279)	1 (25)	6 (152)	15

6" O.D. Plate Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	Code No. 240V~(ac) 3-Phase	Code No. 480V~(ac) 1-Phase	Code No. 480V~(ac) 3-Phase	Est. Ship. Weight lbs (kg)
Applications: Process Water, Ethylene Glycol (50%)							
45 W/in² Steel Flange 3-Copper (7 W/cm²)	4.5 9	16 (406) 29 (737)	**FKC16A10**② **FKC29A10**②	**FKC16A3**② **FKC29A3**	**FKC16A11**② **FKC29A11**②	**FKC16A5** **FKC29A5**	22 (10) 27 (13)
Application: Process Water							
45 W/in² Steel Flange 3-Incoloy® (7 W/cm²)	9	28 (711)	**FKN28A10**②	**FKN28A3**②	**FKN28A11**②	**FKN28A5**	27 (13)
Applications: Cooking Oils, Ethylene Glycol (100%)							
30 W/in² Steel Flange 3-Steel (4.7 W/cm²)	6	29 (737)	**FKS29A10**②	**FKS29A3**②	**FKS29A11**②	**FKS29A5**	27 (13)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin							
15 W/in² ③ **Steel Flange 3-Incoloy®** (2.3 W/cm²)	3	28 (711)		**FKN28A12**②		**FKN28A13**②	27 (13)
Applications: Medium Weight Oils, Heat Transfer Oils, Lube Oils, Liquid Paraffin							
10 W/in² ③ **Steel Flange 3-Steel** (1.6 W/cm²)	2	29 (737)		**FKS29A12**②		**FKS29A13**②	27 (13)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

③ Must be operated 3-phase wye

Flange Immersion Heaters

7" O.D. Plate Flange— WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Clean and Potable Water											
100 W/in²	12	18 (457)	**FLN18A10**②	2	**FLN18A3**②	1	**FLN18A11**②	1	**FLN18A5**	1	22 (10)
Steel Flange											
3-304 SS											
(15.5 W/cm²)											
Applications: Clean and Potable Water											
80 W/in²	9	17¾ (451)	**FLN17N10**②	1	**FLN17N3**	1	**FLN17N11**②	1	**FLN17N5**②	1	22 (10)
Steel Flange	18	30 (762)	**FLN30A10**②	2	**FLN30A3**	1	**FLN30A11**②	1	**FLN30A5**②	1	27 (13)
3-304 SS											
(12.4 W/cm²)											
Application: Process Water											
60 W/in²	4.5	12½ (318)	**FLN12J10**②	1	**FLN12J3**	1	**FLN12J11**②	1	**FLN12J5**②	1	21 (10)
Steel Flange											
3-Incoloy®											
(9.3 W/cm²)											
Applications: Cooking Oils, Ethylene Glycol (100%)											
30 W/in²③	3	17¾ (451)			**FLN17N12**②	1			**FLN17N13**②	1	22 (10)
Steel Flange	4	18 (457)			**FLN18A12**②	1			**FLN18A13**	1	22 (10)
3-Incoloy®	6	30 (762)			**FLN30A12**	1			**FLN30A13**	1	27 (13)
(4.7 W/cm²)											

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

③ Must be operated 3-phase wye

Tubular and Process Assemblies

Flange Immersion Heaters

3" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Clean Water											
60 W/in²	6	15½ (394)	**FMC715J10**	1	**FMC715J3**	1	**FMC715J11**	1	**FMC715J5**	1	22 (10)
Steel Flange	9	21½ (546)	**FMC721J10**	1	**FMC721J3**	1	**FMC721J11**	1	**FMC721J5**	1	25 (12)
3-Copper	12	27 (686)			**FMC727A3**	1	**FMC727A11**	1	**FMC727A5**	1	27 (13)
(9.3 W/cm²)	15	32½ (826)			**FMC732J3**	1	**FMC732J11**	1	**FMC732J5**	1	28 (13)
	18	38 (965)			**FMC738A3**	1	**FMC738A11**	1	**FMC738A5**	1	30 (14)
	25	51 (1295)					**FMC751A11**	1	**FMC751A5**	1	34 (16)
	30	60½ (1537)					**FMC760J11**②	1	**FMC760J5**②	1	36 (17)
Application: Process Water											
48 W/in² ⑤⑥	4.5	13½ (343)	**FMN713J10**	1	**FMN713J3**	1	**FMN713J11**	1	**FMN713J5**	1	22 (10)
Steel Flange	6	18 (457)	**FMN718A10**	1	**FMN718A3**	1	**FMN718A11**	1	**FMN718A5**	1	23 (11)
3-Incoloy®	7.5	20½ (521)	**FMN720J10**	1	**FMN720J3**	1	**FMN720J11**	1	**FMN720J5**	1	25 (12)
(7.5 W/cm²)	9	25½ (648)	**FMN725J10**	1	**FMN725J3**	1	**FMN725J11**	1	**FMN725J5**	1	27 (13)
	12	33 (838)			**FMN733A3**	1	**FMN733A11**	1	**FMN733A5**	1	28 (13)
	15	40½ (1029)			**FMN740J3**	1	**FMN740J11**	1	**FMN740J5**	1	30 (14)
	18	48 (1219)			**FMN748A3**	1	**FMN748A11**	1	**FMN748A5**	1	32 (15)
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in² ⑤⑥	3	18 (457)	**FMNA18A10**	1	**FMNA18A3**	1	**FMNA18A11**	1	**FMNA18A5**	1	23 (11)
Steel Flange	4.5	25½ (648)	**FMNA25J10**	1	**FMNA25J3**	1	**FMNA25J11**	1	**FMNA25J5**	1	27 (13)
3-Incoloy®	6	33 (838)	**FMNA33A10**	1	**FMNA33A3**	1	**FMNA33A11**	1	**FMNA33A5**	1	28 (13)
(3.6 W/cm²)	7.5	40½ (1029)	**FMNA40J10**	1	**FMNA40J3**	1	**FMNA40J11**	1	**FMNA40J5**	1	30 (14)
	9	48 (1219)	**FMNA48A10**	1	**FMNA48A3**	1	**FMNA48A11**	1	**FMNA48A5**	1	32 (15)
	12.5	64½ (1638)			**FMNA64J3**	1	**FMNA64J11**	1	**FMNA64J5**	1	37 (17)
	15	77 (1956)			**FMNA77A3**	1	**FMNA77A11**	1	**FMNA77A5**	1	42 (19)
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils											
23 W/in²	3	18 (457)	**FMS718A10**	1	**FMS718A3**	1	**FMS718A11**	1	**FMS718A5**	1	23 (11)
Steel Flange	4.5	25½ (648)	**FMS725J10**	1	**FMS725J3**	1	**FMS725J11**	1	**FMS725J5**	1	27 (13)
3-Steel	6	33 (838)	**FMS733A10**	1	**FMS733A3**	1	**FMS733A11**	1	**FMS733A5**	1	28 (13)
(3.6 W/cm²)	7.5	40½ (1029)	**FMS740J10**	1	**FMS740J3**	1	**FMS740J11**	1	**FMS740J5**	1	30 (14)
	9	48 (1219)	**FMS748A10**	1	**FMS748A3**	1	**FMS748A11**	1	**FMS748A5**	1	32 (15)
	12.5	64½ (1638)			**FMS764J3**	1	**FMS764J11**	1	**FMS764J5**	1	37 (17)
	15	77 (1956)			**FMS777A3**	1	**FMS777A11**	1	**FMS777A5**	1	42 (19)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Tubular and Process Assemblies

Flange Immersion Heaters

3" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin											
16 W/in²③	1.5	13½ (343)			**FMN713J12**	1			**FMN713J13**	1	22 (10)
Steel Flange	2	18 (457)			**FMN718A12**	1			**FMN718A13**	1	23 (11)
3-Incoloy®	2.5	20½ (521)			**FMN720J12**	1			**FMN720J13**	1	25 (12)
(2.5 W/cm²)	3	25½ (648)			**FMN725J12**	1			**FMN725J13**	1	27 (13)
	4	33 (838)			**FMN733A12**	1			**FMN733A13**	1	30 (14)
	5	40½ (1029)			**FMN740J12**	1			**FMN740J13**	1	30 (14)
	6	48 (1219)			**FMN748A12**	1			**FMN748A13**	1	33 (15)
Applications: Bunker C and #6 Fuel Oils											
8 W/in²③	2	33 (838)			**FMS733A12**	1			**FMS733A13**	1	28 (13)
Steel Flange	3	48 (1219)			**FMS748A12**	1			**FMS748A13**	1	32 (15)
3-Steel	4	64½ (1638)			**FMS764J12**	1			**FMS764J13**	1	37 (17)
(1.3 W/cm²)	5	77 (1956)			**FMS777A12**	1			**FMS777A13**	1	42 (19)

4" 150 Lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Clean Water											
60 W/in²	12	15½ (394)	**FOC715J10**	2	**FOC715J3**	1	**FOC715J11**	1	**FOC715J5**	1	31 (14)
Steel Flange	18	21½ (546)	**FOC721J10**	2	**FOC721J3**	1	**FOC721J11**	1	**FOC721J5**	1	34 (16)
6-Copper	24	27 (686)	**FOC727A10**	2	**FOC727A3**	2	**FOC727A11**	1	**FOC727A5**	1	36 (17)
(9.3 W/cm²)	30	32½ (826)			**FOC732J3**	2	**FOC732J11**	2	**FOC732J5**	1	39 (18)
	36	38 (965)			**FOC738A3**	2	**FOC738A11**	2	**FOC738A5**	1	43 (20)
	50	51 (1295)							**FOC751A5**	2	48 (22)
	60	60½ (1537)							**FOC760J5**②	2	52 (24)
Application: Deionized Water, Demineralized Water											
60 W/in²	12	16 (406)	**FOR716A10**	1	**FOR716A3**	1	**FOR716A11**	1	**FOR716A5**	1	31 (14)
316 SS Flange	18	22 (559)	**FOR722A10**	2	**FOR722A3**	1	**FOR722A11**	1	**FOR722A5**	1	34 (16)
6-316 SS	24	27½ (699)	**FOR727J10**	2	**FOR727J3**	2	**FOR727J11**	1	**FOR727J5**	1	36 (17)
(9.3 W/cm²)	30	33 (838)			**FOR733A3**	2	**FOR733A11**	2	**FOR733A5**	1	39 (18)
Passivated	36	38½ (978)			**FOR738J3**	2	**FOR738J11**	2	**FOR738J5**	1	43 (20)
	50	51½ (1308)							**FOR751J5**	2	53 (25)
	60	61 (1549)							**FOR761A5**	2	56 (26)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

③ Must be operated 3-phase wye

Tubular and Process Assemblies

Flange Immersion Heaters

4" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Process Water											
48 W/in²⑤	9	13½ (343)	**FON713J10**	1	**FON713J3**	1	**FON713J11**	1	**FON713J5**	1	29 (14)
Steel Flange	12	18 (457)	**FON718A10**	2	**FON718A3**	1	**FON718A11**	1	**FON718A5**	1	32 (15)
6-Incoloy®	15	20½ (521)	**FON720J10**	2	**FON720J3**	1	**FON720J11**	1	**FON720J5**	1	34 (16)
(7.5 W/cm²)	18	25½ (648)	**FON725J10**	2	**FON725J3**	1	**FON725J11**	1	**FON725J5**	1	36 (17)
	24	33 (838)	**FON733A10**	2	**FON733A3**	2	**FON733A11**	1	**FON733A5**	1	39 (18)
	30	40½ (1029)			**FON740J3**	2	**FON740J11**	2	**FON740J5**	1	43 (20)
	36	48 (1219)			**FON748A3**	2	**FON748A11**	2	**FON748A5**	1	48 (22)
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in²⑤⑥	6	18 (457)	**FONA18A10**	1	**FONA18A3**	1	**FONA18A11**	1	**FONA18A5**	1	32 (15)
Steel Flange	9	25½ (648)	**FONA25J10**	1	**FONA25J3**	1	**FONA25J11**	1	**FONA25J5**	1	36 (17)
6-Incoloy®	12	33 (838)	**FONA33A10**	2	**FONA33A3**	1	**FONA33A11**	1	**FONA33A5**	1	39 (18)
(3.6 W/cm²)	15	40½ (1029)	**FONA40J10**	2	**FONA40J3**	1	**FONA40J11**	1	**FONA40J5**	1	43 (20)
	18	48 (1219)	**FONA48A10**	2	**FONA48A3**	1	**FONA48A11**	1	**FONA48A5**	1	48 (22)
	25	64½ (1638)			**FONA64J3**	2	**FONA64J11**	2	**FONA64J5**	1	53 (24)
	30	77 (1956)			**FONA77A3**	2	**FONA77A11**	2	**FONA77A5**	1	61 (28)
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils											
23 W/in²	6	18 (457)	**FOS718A10**	1	**FOS718A3**	1	**FOS718A11**	1	**FOS718A5**	1	32 (15)
Steel Flange	9	25½ (648)	**FOS725J10**	1	**FOS725J3**	1	**FOS725J11**	1	**FOS725J5**	1	36 (17)
6-Steel	12	33 (838)	**FOS733A10**	2	**FOS733A3**	1	**FOS733A11**	1	**FOS733A5**	1	39 (18)
(3.6 W/cm²)	15	40½ (1029)	**FOS740J10**	2	**FOS740J3**	1	**FOS740J11**	1	**FOS740J5**	1	43 (20)
	18	48 (1219)	**FOS748A10**	2	**FOS748A3**	1	**FOS748A11**	1	**FOS748A5**	1	48 (22)
	25	64½ (1638)			**FOS764J3**	2	**FOS764J11**	2	**FOS764J5**	1	53 (24)
	30	77 (1956)			**FOS777A3**	2	**FOS777A11**	2	**FOS777A5**	1	61 (28)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin											
16 W/in²③	3	13½ (343)			**FON713J12**	1			**FON713J13**	1	29 (14)
Steel Flange	4	18 (457)			**FON718A12**	1			**FON718A13**	1	32 (15)
6-Incoloy®	5	20½ (521)			**FON720J12**	1			**FON720J13**	1	34 (16)
(2.5 W/cm²)	6	25½ (648)			**FON725J12**	1			**FON725J13**	1	36 (17)
	8	33 (838)			**FON733A12**	1			**FON733A13**	1	39 (18)
	10	40½ (1029)			**FON740J12**	1			**FON740J13**	1	43 (20)
	12	48 (1219)			**FON748A12**	1			**FON748A13**	1	48 (22)
Applications: Bunker C and #6 Fuel Oils											
8 W/in²③	5	40½ (1029)			**FOS740J12**	1			**FOS740J13**	1	43 (20)
Steel Flange	6	48 (1219)			**FOS748A12**	1			**FOS748A13**	1	48 (22)
6-Steel	8	64½ (1638)			**FOS764J12**	1			**FOS764J13**	1	53 (24)
(1.3 W/cm²)	10	77 (1956)			**FOS777A12**	1			**FOS777A13**	1	61 (28)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

③ Must be operated 3-phase wye

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Flange Immersion Heaters

4" 150 lb ANSI Flange—FIREBAR Element

FIREBAR Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Process Water, Ethylene Glycol (50%)							
45 W/in²	12	13⅜ (340)	**FONF13G27**	1			32 (20)
304 SS Flange	15	16 (406)	**FONF16A27**	1			35 (20)
6-Incoloy®	18	18⅜ (467)	**FONF18G27**	1			38 (21)
(7 W/cm²)	24	22⅞ (581)	**FONF22R27**	2	**FONF22R28**	1	41 (21)
	30	27⅞ (708)	**FONF27R27**	2	**FONF27R28**	1	44 (20)
	36	32⅞ (835)	**FONF32R27**	2	**FONF32R28**	1	46 (21)
	48	42⅜ (1076)			**FONF42G28**	2	50 (23)
	60	51⅞ (1318)			**FONF51R28**	2	54 (25)
Applications: Cooking Oils, Ethylene Glycol (100%)							
30 W/in²③	10	16½ (420)	**FONF16J12**	1	**FONF16J13**	1	35 (16)
304 SS Flange	13	19½ (495)	**FONF19J12**	1	**FONF19J13**	1	38 (17)
6-Incoloy®	17	24½ (622)	**FONF24J12**	1	**FONF24J13**	1	41 (19)
(4.7 W/cm²)	21	30 (762)	**FONF30A12**	2	**FONF30A13**	1	44 (20)
	25.5	35 (889)	**FONF35A12**	2	**FONF35A13**	1	46 (21)
	34	45½ (1156)	**FONF45J12**	2	**FONF45J13**	1	50 (23)
	43	56 (1422)			**FONF56A13**	2	54 (25)
Applications: Heat Transfer Oils, Mineral Oils, Degreasing Solutions							
23 W/in²⑧	7.5	16½ (419)	**FONF16J20**	1			35 (16)
304 SS Flange	10	19½ (495)	**FONF19J20**	1			38 (18)
6-Incoloy®	12.8	24½ (622)	**FONF24J20**	1	**FONF24J19**	1	41 (19)
(3.6 W/cm²)	15.8	30 (762)	**FONF30A20**	1	**FONF30A19**	1	44 (20)
	19	35 (889)	**FONF35A20**	1	**FONF35A19**	1	46 (21)
	25	45½ (1156)	**FONF45J20**	2	**FONF45J19**	1	50 (23)
	32.3	56 (1422)	**FONF56A20**	2	**FONF56A19**	1	54 (25)
Applications: Medium Weight Oils, Heat Transfer Oils, Lube Oils, Liquid Paraffin							
15 W/in²③	4	13⅜ (340)	**FONF13G29**	1			32 (15)
304 SS Flange	5	16 (406)	**FONF16A29**	1			35 (16)
6-Incoloy®	6	18⅜ (467)	**FONF18G29**	1			38 (18)
(2.3 W/cm²)	8	22⅞ (581)	**FONF22R29**	1	**FONF22R30**	1	41 (19)
	10	27⅞ (708)	**FONF27R29**	1	**FONF27R30**	1	44 (20)
	12	32⅞ (835)	**FONF32R29**	1	**FONF32R30**	1	46 (21)
	16	42⅜ (1076)	**FONF42G29**	1	**FONF42G30**	1	50 (23)
	20	51⅞ (1318)	**FONF51R29**	1	**FONF51R30**	1	54 (25)
Applications: Bunker C and #6 Fuel Oils, Asphalt							
8 W/in²③	2.5	16½ (419)	**FONF16J22**	1			35 (16)
304 SS Flange	3.25	19½ (495)	**FONF19J22**	1			38 (17)
6-Incoloy®	4.25	24½ (622)	**FONF24J22**	1	**FONF24J21**	1	41 (19)
(1.3 W/cm²)	5.25	30 (762)	**FONF30A22**	1	**FONF30A21**	1	44 (20)
	6.38	35 (889)	**FONF35A22**	1	**FONF35A21**	1	46 (21)
	8.5	45½ (1156)	**FONF45J22**	1	**FONF45J21**	1	50 (23)
	10.75	56 (1422)	**FONF56A22**	1	**FONF56A21**	1	54 (25)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

③ Must be operated 3-phase wye

⑧ Can be rewired for 1-phase

Tubular and Process Assemblies

Flange Immersion Heaters

5" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Clean Water											
60 W/in²	12	15½ (394)	**FNC715J10**	2	**FNC715J3**	1	**FNC715J11**	1	**FNC715J5**	1	35 (16)
Steel Flange	18	21½ (546)	**FNC721J10**	2	**FNC721J3**	1	**FNC721J11**	1	**FNC721J5**	1	38 (18)
6-Copper	24	27 (686)	**FNC727A10**	3	**FNC727A3**	2	**FNC727A11**	3	**FNC727A5**	1	40 (19)
(9.3 W/cm²)	30	32½ (826)			**FNC732J3**	2	**FNC732J11**	2	**FNC732J5**	1	43 (20)
	36	38 (965)			**FNC738A3**	2	**FNC738A11**	2	**FNC738A5**	1	47 (22)
	50	51 (1295)							**FNC751A5**	2	52 (24)
	60	60½ (1537)							**FNC760J5**②	2	56 (26)
60 W/in²	18	15½ (394)	**FNC715J10X**	3	**FNC715J3X**	1	**FNC715J11X**	1	**FNC715J5X**	1	38 (18)
Steel Flange	27	21½ (546)	**FNC721J10X**	3	**FNC721J3X**	3	**FNC721J11X**	3	**FNC721J5X**	1	42 (19)
9-Copper	36	27 (686)			**FNC727A3X**	3	**FNC727A11X**	3	**FNC727A5X**	1	45 (21)
(9.3 W/cm²)	45	32½ (826)			**FNC732J3X**	3	**FNC732J11X**	3	**FNC732J5X**	3	48 (22)
	54	38 (965)			**FNC738A3X**	3	**FNC738A11X**	3	**FNC738A5X**	3	53 (24)
	75	51 (1295)							**FNC751A5X**	3	60 (28)
	90	60½ (1537)							**FNC760J5X**②	3	66 (30)
Application: Process Water											
48 W/in²⑤	9	13½ (343)	**FNN713J10**	1	**FNN713J3**	1	**FNN713J11**	1	**FNN713J5**	1	33 (15)
Steel Flange	12	18 (457)	**FNN718A10**	2	**FNN718A3**	1	**FNN718A11**	1	**FNN718A5**	1	36 (17)
6-Incoloy®	15	20½ (521)	**FNN720J10**	2	**FNN720J3**	1	**FNN720J11**	1	**FNN720J5**	1	38 (18)
(7.5 W/cm²)	18	25½ (648)	**FNN725J10**	2	**FNN725J3**	1	**FNN725J11**	1	**FNN725J5**	1	40 (19)
	24	33 (838)	**FNN733A10**	3	**FNN733A3**	2	**FNN733A11**	3	**FNN733A5**	1	43 (20)
	30	40½ (1029)			**FNN740J3**	2	**FNN740J11**	2	**FNN740J5**	1	47 (22)
	36	48 (1219)			**FNN748A3**	2	**FNN748A11**	2	**FNN748A5**	1	52 (24)
48 W/in²	14	13½ (343)	**FNN713J10X**	3	**FNN713J3X**	1	**FNN713J11X**	1	**FNN713J5X**	1	35 (16)
Steel Flange	18	18 (457)	**FNN718A10X**	3	**FNN718A3X**	1	**FNN718A11X**	1	**FNN718A5X**	1	39 (18)
9-Incoloy®	23	20½ (521)	**FNN720J10X**	3	**FNN720J3X**	3	**FNN720J11X**	1	**FNN720J5X**	1	42 (19)
(7.5 W/cm²)	27	25½ (648)	**FNN725J10X**	3	**FNN725J3X**	3	**FNN725J11X**	3	**FNN725J5X**	1	45 (21)
	36	33 (838)			**FNN733A3X**	3	**FNN733A11X**	3	**FNN733A5X**	1	48 (22)
	45	40½ (1029)			**FNN740J3X**	3	**FNN740J11X**	3	**FNN740J5X**	3	53 (24)
	54	48 (1219)			**FNN748A3X**	3	**FNN748A11X**	3	**FNN748A5X**	3	60 (28)
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in²⑤⑥	6	18 (457)	**FNNA18A10**	1	**FNNA18A3**	1	**FNNA18A11**	1	**FNNA18A5**	1	36 (17)
Steel Flange	9	25½ (648)	**FNNA25J10**	1	**FNNA25J3**	1	**FNNA25J11**	1	**FNNA25J5**	1	40 (19)
6-Incoloy®	12	33 (838)	**FNNA33A10**	2	**FNNA33A3**	1	**FNNA33A11**	1	**FNNA33A5**	1	43 (20)
(3.6 W/cm²)	15	40½ (1029)	**FNNA40J10**	2	**FNNA40J3**	1	**FNNA40J11**	1	**FNNA40J5**	1	47 (22)
	18	48 (1219)	**FNNA48A10**	2	**FNNA48A3**	1	**FNNA48A11**	1	**FNNA48A5**	1	52 (24)
	25	64½ (1638)			**FNNA64J3**	2	**FNNA64J11**	2	**FNNA64J5**	1	57 (26)
	30	77 (1956)			**FNNA77A3**	2	**FNNA77A11**	2	**FNNA77A5**	1	65 (28)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Flange Immersion Heaters

5" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in²	9	18 (457)	**FNNA18A10X**	1	**FNNA18A3X**	1	**FNNA18A11X**	1	**FNNA18A5X**	1	39 (18)
Steel Flange	14	25½ (648)	**FNNA25J10X**	3	**FNNA25J3X**	1	**FNNA25J11X**	1	**FNNA25J5X**	1	45 (21)
9-Incoloy®	18	33 (838)	**FNNA33A10X**	3	**FNNA33A3X**	1	**FNNA33A11X**	1	**FNNA33A5X**	1	48 (22)
(3.6 W/cm²)	23	40½ (1029)	**FNNA40J10X**	3	**FNNA40J3X**	3	**FNNA40J11X**	1	**FNNA40J5X**	1	53 (24)
	27	48 (1219)	**FNNA48A10X**	3	**FNNA48A3X**	3	**FNNA48A11X**	3	**FNNA48A5X**	1	60 (28)
	38	64½ (1638)			**FNNA64J3X**	3	**FNNA64J11X**	3	**FNNA64J5X**	1	68 (31)
	45	77 (1956)			**FNNA77A3X**	3	**FNNA77A11X**	3	**FNNA77A5X**	3	78 (36)
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils											
23 W/in²	6	18 (457)	**FNS718A10**	1	**FNS718A3**	1	**FNS718A11**	1	**FNS718A5**	1	36 (17)
Steel Flange	9	25½ (648)	**FNS725J10**	1	**FNS725J3**	1	**FNS725J11**	1	**FNS725J5**	1	40 (18)
6-Steel	12	33 (838)	**FNS733A10**	2	**FNS733A3**	1	**FNS733A11**	1	**FNS733A5**	1	43 (20)
(3.6 W/cm²)	15	40½ (1029)	**FNS740J10**	2	**FNS740J3**	1	**FNS740J11**	1	**FNS740J5**	1	47 (22)
	18	48 (1219)	**FNS748A10**	2	**FNS748A3**	3	**FNS748A11**	1	**FNS748A5**①	1	52 (24)
	25	64½ (1638)			**FNS764J3**	2	**FNS764J11**	2	**FNS764J5**	1	57 (26)
	30	77 (1956)			**FNS777A3**	2	**FNS777A11**	2	**FNS777A5**	1	65 (30)
23 W/in²	9	18 (457)	**FNS718A10X**	1	**FNS718A3X**	1	**FNS718A11X**	1	**FNS718A5X**	1	39 (18)
Steel Flange	14	25½ (648)	**FNS725J10X**	3	**FNS725J3X**	1	**FNS725J11X**	1	**FNS725J5X**	1	45 (21)
9-Steel	18	33 (838)	**FNS733A10X**	3	**FNS733A3X**	1	**FNS733A11X**	1	**FNS733A5X**	1	48 (22)
(3.6 W/cm²)	23	40½ (1029)	**FNS740J10X**	3	**FNS740J3X**	3	**FNS740J11X**	1	**FNS740J5X**	1	53 (24)
	27	48 (1219)	**FNS748A10X**	3	**FNS748A3X**	1	**FNS748A11X**	3	**FNS748A5X**	1	60 (28)
	38	64½ (1638)			**FNS764J3X**	3	**FNS764J11X**	3	**FNS764J5X**	1	68 (31)
	45	77 (1956)			**FNS777A3X**	3	**FNS777A11X**	3	**FNS777A5X**	3	78 (36)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin											
16 W/in²③	3	13½ (343)			**FNN713J12**	1			**FNN713J13**	1	36 (17)
Steel Flange	4	18 (457)			**FNN718A12**	1			**FNN718A13**	1	40 (18)
6-Incoloy®	5	20½ (521)			**FNN720J12**	1			**FNN720J13**	1	43 (20)
(2.5 W/cm²)	6	25½ (648)			**FNN725J12**	1			**FNN725J13**	1	47 (22)
	8	33 (838)			**FNN733A12**	1			**FNN733A13**	1	52 (24)
	10	40½ (1029)			**FNN740J12**	1			**FNN740J13**	1	57 (26)
	12	48 (1219)			**FNN748A12**	1			**FNN748A13**	1	65 (30)
16 W/in²③	4.5	13½ (343)			**FNN713J12X**	1			**FNN713J13X**	1	39 (18)
Steel Flange	6	18 (457)			**FNN718A12X**	1			**FNN718A13X**	1	45 (21)
9-Incoloy®	7.5	20½ (521)			**FNN720J12X**	1			**FNN720J13X**	1	48 (22)
(2.5 W/cm²)	9	25½ (648)			**FNN725J12X**	1			**FNN725J13X**	1	53 (24)
	12	33 (838)			**FNN733A12X**	1			**FNN733A13X**	1	60 (28)
	15	40½ (1029)			**FNN740J12X**	1			**FNN740J13X**	1	68 (31)
	18	48 (1219)			**FNN748A12X**	1			**FNN748A13X**	1	78 (36)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

① Stock

③ Must be operated 3-phase wye

Tubular and Process Assemblies

Flange Immersion Heaters

5" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Bunker C and #6 Fuel Oils											
8 W/in²③	5	40½ (1029)			**FNS740J12**	1			**FNS740J13**	1	47 (22)
Steel Flange	6	48 (1219)			**FNS748A12**	1			**FNS748A13**	1	52 (24)
6-Steel	8	64½ (1638)			**FNS764J12**	1			**FNS764J13**	1	57 (26)
(1.3 W/cm²)	10	77 (1956)			**FNS777A12**	1			**FNS777A13**	1	65 (30)
8 W/in²③	7.5	40½ (1029)			**FNS740J12X**	1			**FNS740J13X**	1	53 (24)
Steel Flange	9	48 (1219)			**FNS748A12X**	1			**FNS748A13X**	1	60 (28)
9-Steel	12	64½ (1638)			**FNS764J12X**	1			**FNS764J13X**	1	68 (31)
(1.3 W/cm²)	15	77 (1956)			**FNS777A12X**	1			**FNS777A13X**	1	78 (36)

6" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Clean Water											
60 W/in²	24	15⅜ (391)	**FPC715G10**	3	**FPC715G3**	2	**FPC715G11**	2	**FPC715G5**	1	73 (33)
Steel Flange	36	21⅜ (543)	**FPC721G10**	4	**FPC721G3**	2	**FPC721G11**	2	**FPC721G5**	1	78 (36)
12-Copper	48	26⅜ (683)			**FPC726R3**	4	**FPC726R11**	3	**FPC726R5**	2	81 (37)
(9.3 W/cm²)	60	32⅜ (822)			**FPC732G3**	4	**FPC732G11**	3	**FPC732G5**	2	85 (39)
	72	37⅜ (962)			**FPC737R3**	4			**FPC737R5**	2	92 (42)
	100	50⅜ (1292)							**FPC750R5**	4	100 (45)
	120	60⅜ (1534)							**FPC760G5**②	4	110 (50)
60 W/in²	30	15⅜ (391)	**FPC715G10X**	3	**FPC715G3X**	5	**FPC715G11X**	3	**FPC715G5X**	1	76 (35)
Steel Flange	45	21⅜ (543)	**FPC721G10X**	5	**FPC721G3X**	5	**FPC721G11X**	3	**FPC721G5X**	5	82 (38)
15-Copper	60	26⅜ (683)			**FPC726R3X**	5	**FPC726R11X**	3	**FPC726R5X**	5	85 (39)
(9.3 W/cm²)	75	32⅜ (822)			**FPC732G3X**	5	**FPC732G11X**	5	**FPC732G5X**	5	90 (41)
	90	37⅜ (962)			**FPC737R3X**	5			**FPC737R5X**	5	98 (45)
	125	50⅜ (1292)							**FPC750R5X**	5	108 (49)
	150	60⅜ (1534)							**FPC760G5X**②	5	120 (55)
Application: Deionized Water, Demineralized Water											
60 W/in²	24	15¾ (400)	**FPR715N10**	3	**FPR715N3**	2	**FPR715N11**	2	**FPR715N5**	1	73 (33)
316 SS Flange	36	21¾ (552)	**FPR721N10**	4	**FPR721N3**	2	**FPR721N11**	3	**FPR721N5**	1	78 (36)
12-316 SS	48	27¼ (692)			**FPR727E3**	4	**FPR727E11**	3	**FPR727E5**	2	81 (37)
(9.3 W/cm²)	60	32¾ (832)			**FPR732N3**	4	**FPR732N11**	3	**FPR732N5**	2	85 (39)
Passivated	72	38¼ (972)			**FPR738E3**	4			**FPR738E5**	2	92 (42)
	100	51¼ (1302)							**FPR751E5**	4	100 (46)
	120	60¾ (1543)							**FPR760N5**	4	110 (50)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

② Standard

③ Must be operated 3-phase wye

Tubular and Process Assemblies

Flange Immersion Heaters

6" 150 Lbs ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Deionized Water, Demineralized Water											
60 W/in²	30	15¾ (400)	**FPR715N10X**	3	**FPR715N3X**	5	**FPR715N11X**	3	**FPR715N5X**	1	76 (35)
316 SS Flange	45	21¾ (552)	**FPR721N10X**	5	**FPR721N3X**	5	**FPR721N11X**	3	**FPR721N5X**	5	82 (38)
15-316 SS	60	27¼ (692)			**FPR727E3X**	5	**FPR727E11X**	3	**FPR727E5X**	5	85 (39)
(9.3 W/cm²)	75	32¾ (832)			**FPR732N3X**	5	**FPR732N11X**	5	**FPR732N5X**	5	90 (41)
Passivated	90	38¼ (972)			**FPR738E3X**	5			**FPR738E5X**	5	98 (45)
	125	51¼ (1302)							**FPR751E5X**	5	108 (49)
	150	60¾ (1543)							**FPR760N5X**	5	120 (55)
Application: Process Water											
48 W/in²⑤	18	13⅜ (340)	**FPN713G10**	2	**FPN713G3**	1	**FPN713G11**	1	**FPN713G5**	1	73 (33)
Steel Flange	24	17⅞ (454)	**FPN717R10**	3	**FPN717R3**	2	**FPN717R11**	2	**FPN717R5**	1	75 (34)
12-Incoloy®	30	20⅜ (518)	**FPN720G10**	3	**FPN720G3**	2	**FPN720G11**	2	**FPN720G5**	1	78 (36)
(7.5 W/cm²)	36	25⅜ (645)	**FPN725G10**	4	**FPN725G3**	2	**FPN725G11**	2	**FPN725G5**	1	81 (37)
	48	32⅞ (835)			**FPN732R3**	4	**FPN732R11**	3	**FPN732R5**	2	85 (39)
	60	40⅜ (1026)			**FPN740G3**	4	**FPN740G11**	3	**FPN740G5**	2	92 (42)
	72	47⅞ (1216)			**FPN747R3**	4			**FPN747R5**	2	100 (46)
48 W/in²	23	13⅜ (340)	**FPN713G10X**	3	**FPN713G3X**	5	**FPN713G11X**	1	**FPN713G5X**	1	76 (35)
Steel Flange	30	17⅞ (454)	**FPN717R10X**	3	**FPN717R3X**	5	**FPN717R11X**	3	**FPN717R5X**	1	78 (36)
15-Incoloy®	38	20⅜ (518)	**FPN720G10X**	5	**FPN720G3X**	5	**FPN720G11X**	3	**FPN720G5X**	1	82 (38)
(7.5 W/cm²)	45	25⅜ (645)	**FPN725G10X**	5	**FPN725G3X**	5	**FPN725G11X**	3	**FPN725G5X**	5	85 (39)
	60	32⅞ (835)			**FPN732R3X**	5	**FPN732R11X**	3	**FPN732R5X**	5	90 (41)
	75	40⅜ (1026)			**FPN740G3X**	5	**FPN740G11X**	5	**FPN740G5X**	5	98 (45)
	90	47⅞ (1216)			**FPN747R3X**	5			**FPN747R5X**	5	108 (49)
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in²⑤⑥	12	17⅞ (454)	**FPNA17R10**	2	**FPNA17R3**	1	**FPNA17R11**	1	**FPNA17R5**	1	75 (34)
Steel Flange	18	25⅜ (645)	**FPNA25G10**	2	**FPNA25G3**	1	**FPNA25G11**	1	**FPNA25G5**	1	81 (37)
12-Incoloy®	24	32⅞ (835)	**FPNA32R10**	3	**FPNA32R3**	2	**FPNA32R11**	2	**FPNA32R5**	1	85 (39)
(3.6 W/cm²)	30	40⅜ (1026)	**FPNA40G10**	3	**FPNA40G3**	2	**FPNA40G11**	1	**FPNA40G5**	1	92 (42)
	36	47⅞ (1216)	**FPNA47R10**	4	**FPNA47R3**	2	**FPNA47R11**	2	**FPNA47R5**	1	100 (46)
	50	64⅜ (1635)			**FPNA64G3**	4	**FPNA64G11**	3	**FPNA64G5**	2	110 (50)
	60	76⅞ (1953)			**FPNA76R3**	4	**FPNA76R11**	3	**FPNA76R5**	2	118 (54)
23 W/in²	15	17⅞ (454)	**FPNA17R10X**	3	**FPNA17R3X**	1	**FPNA17R11X**	1	**FPNA17R5X**	1	78 (36)
Steel Flange	23	25⅜ (645)	**FPNA25G10X**	3	**FPNA25G3X**	5	**FPNA25G11X**	1	**FPNA25G5X**	1	85 (39)
15-Incoloy®	30	32⅞ (835)	**FPNA32R10X**	3	**FPNA32R3X**	5	**FPNA32R11X**	3	**FPNA32R5X**	1	90 (41)
(3.6 W/cm²)	38	40⅜ (1026)	**FPNA40G10X**	5	**FPNA40G3X**	5	**FPNA40G11X**	3	**FPNA40G5X**	1	98 (45)
	45	47⅞ (1216)	**FPNA47R10X**	5	**FPNA47R3X**	5	**FPNA47R11X**	3	**FPNA47R5X**	5	108 (49)
	63	64⅜ (1635)			**FPNA64G3X**	5	**FPNA64G11X**	3	**FPNA64G5X**	5	120 (55)
	75	76⅞ (1953)			**FPNA76R3X**	5	**FPNA76R11X**	5	**FPNA76R5X**	5	131 (60)

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Tubular and Process Assemblies

Flange Immersion Heaters

6" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils											
23 W/in²	12	17⅞ (454)	**FPS717R10**	2	**FPS717R3**	1	**FPS717R11**	1	**FPS717R5**	1	75 (34)
Steel Flange	18	25⅜ (645)	**FPS725G10**	2	**FPS725G3**	1	**FPS725G11**	1	**FPS725G5**	1	81 (37)
12-Steel	24	32⅞ (835)	**FPS732R10**	3	**FPS732R3**	2	**FPS732R11**	2	**FPS732R5**	1	85 (39)
(3.6 W/cm²)	30	40⅜ (1026)	**FPS740G10**	3	**FPS740G3**	2	**FPS740G11**	2	**FPS740G5**	1	92 (42)
	36	47⅞ (1216)	**FPS747R10**	4	**FPS747R3**	2	**FPS747R11**	2	**FPS747R5**	1	100 (46)
	50	64⅜ (1635)			**FPS764G3**	4	**FPS764G11**	3	**FPS764G5**	2	110 (50)
	60	76⅞ (1953)			**FPS776R3**	4	**FPS776R11**	3	**FPS776R5**	2	118 (54)
23 W/in²	15	17⅞ (454)	**FPS717R10X**	3	**FPS717R3X**	1	**FPS717R11X**	1	**FPS717R5X**	1	78 (36)
Steel Flange	23	25⅜ (645)	**FPS725G10X**	3	**FPS725G3X**	5	**FPS725G11X**	1	**FPS725G5X**	1	85 (39)
15-Steel	30	32⅞ (835)	**FPS732R10X**	3	**FPS732R3X**	5	**FPS732R11X**	3	**FPS732R5X**	1	90 (41)
(3.6 W/cm²)	38	40⅜ (1026)	**FPS740G10X**	5	**FPS740G3X**	5	**FPS740G11X**	3	**FPS740G5X**	1	98 (45)
	45	47⅞ (1216)	**FPS747R10X**	5	**FPS747R3X**	5	**FPS747R11X**	3	**FPS747R5X**	5	108 (49)
	63	64⅜ (1635)			**FPS764G3X**	5	**FPS764G11X**	3	**FPS764G5X**	5	120 (55)
	75	76⅞ (1953)			**FPS776R3X**	5	**FPS776R11X**	5	**FPS776R5X**	5	131 (60)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin											
16 W/in²③	6	13⅜ (340)			**FPN713G12**	1			**FPN713G13**	1	73 (33)
Steel Flange	8	17⅞ (454)			**FPN717R12**	1			**FPN717R13**	1	75 (34)
12-Incoloy®	10	20⅜ (518)			**FPN720G12**	1			**FPN720G13**	1	78 (36)
(2.5 W/cm²)	12	25⅜ (645)			**FPN725G12**	1			**FPN725G13**	1	81 (37)
	16	32⅞ (835)			**FPN732R12**	1			**FPN732R13**	1	85 (39)
	20	40⅜ (1026)			**FPN740G12**	2			**FPN740G13**	1	92 (42)
	24	47⅞ (1216)			**FPN747R12**	2			**FPN747R13**	1	100 (46)
16 W/in²③	7.5	13⅜ (340)			**FPN713G12X**	1			**FPN713G13X**	1	76 (35)
Steel Flange	10	17⅞ (454)			**FPN717R12X**	1			**FPN717R13X**	1	78 (36)
15-Incoloy®	12.5	20⅜ (518)			**FPN720G12X**	1			**FPN720G13X**	1	82 (38)
(2.5 W/cm²)	15	25⅜ (645)			**FPN725G12X**	1			**FPN725G13X**	1	85 (39)
	20	32⅞ (835)			**FPN732R12X**	5			**FPN732R13X**	1	90 (41)
	25	40⅜ (1026)			**FPN740G12X**	5			**FPN740G13X**	1	98 (45)
	30	47⅞ (1216)			**FPN747R12X**	5			**FPN747R13X**	1	108 (49)
Applications: Bunker C and #6 Fuel Oils											
8 W/in²③	8	32⅞ (835)			**FPS732R12**	1			**FPS732R13**	1	85 (39)
Steel Flange	10	40⅜ (1026)			**FPS740G12**	1			**FPS740G13**	1	92 (42)
12-Steel	12	47⅞ (1216)			**FPS747R12**	1			**FPS747R13**	1	100 (46)
(1.3 W/cm²)	16.5	64⅜ (1635)			**FPS764G12**	1			**FPS764G13**	1	110 (50)
	20	76⅞ (1953)			**FPS776R12**	2			**FPS776R13**	1	118 (54)
8 W/in²③	10	32⅞ (835)			**FPS732R12X**	1			**FPS732R13X**	1	90 (41)
Steel Flange	12.5	40⅜ (1026)			**FPS740G12X**	1			**FPS740G13X**	1	98 (45)
15-Steel	15	47⅞ (1216)			**FPS747R12X**	1			**FPS747R13X**	1	108 (49)
(1.3 W/cm²)	21	64⅜ (1635)			**FPS764G12X**	5			**FPS764G13X**	1	120 (55)
	25	76⅞ (1953)			**FPS776R12X**	5			**FPS776R13X**	1	131 (60)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

③ Must be operated 3-phase wye

Flange Immersion Heaters

6" 150 lb ANSI Flange—FIREBAR Element

FIREBAR Description	kW	Immersed B Dimension inch	(mm)	Code No. 240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs	(kg)
Applications: Process Water, Ethylene Glycol (50%)									
45 W/in²	30	13⅜	(340)	**FPNF13G27**				78	(36)
304 SS Flange	37.5	16	(406)	**FPNF16A27**	5			81	(37)
15-Incoloy®	45	18⅜	(467)	**FPNF18G27**	5			84	(38)
(7 W/cm²)	60	22⅞	(581)	**FPNF22R27**	5	**FPNF22R28**	5	87	(40)
	75	27⅞	(708)	**FPNF27R27**	5	**FPNF27R28**	5	91	(42)
	90	32⅞	(835)	**FPNF32R27**	5	**FPNF32R28**	5	95	(43)
	120	42⅜	(1076)			**FPNF42G28**	5	106	(48)
	150	51⅞	(1318)			**FPNF51R28**	5	116	(53)
Applications: Cooking Oils, Ethylene Glycol (100%)									
30 W/in²③	25	16½	(419)	**FPNF16J12**	5	**FPNF16J13**	5	81	(37)
304 SS Flange	32	19½	(495)	**FPNF19J12**	5	**FPNF19J13**	5	84	(38)
15-Incoloy®	42	24½	(622)	**FPNF24J12**	5	**FPNF24J13**	5	87	(40)
(4.7 W/cm²)	52	30	(762)	**FPNF30A12**	5	**FPNF30A13**	5	91	(42)
	64	35	(889)	**FPNF35A12**	5	**FPNF35A13**	5	95	(43)
	85	45½	(1156)	**FPNF45J12**	5	**FPNF45J13**	5	106	(48)
	110	56	(1422)		5	**FPNF56A13**	5	116	(53)
Applications: Heat Transfer Oils, Mineral Oils, Degreasing Solutions									
23 W/in²④	19	16½	(419)	**FPNF16J20**	5			81	(37)
304 SS Flange	24	19½	(495)	**FPNF19J20**	5			84	(38)
15-Incoloy®	32	24½	(622)	**FPNF24J20**	5	**FPNF24J19**	5	87	(40)
(3.6 W/cm²)	40	30	(762)	**FPNF30A20**	5	**FPNF30A19**	5	91	(42)
	48	35	(889)	**FPNF35A20**	5	**FPNF35A19**	5	95	(43)
	64	45½	(1156)	**FPNF45J20**	5	**FPNF45J19**	5	106	(48)
	80	56	(1422)	**FPNF56A20**	5	**FPNF56A19**	5	116	(53)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin									
15 W/in²③	10	13⅜	(340)	**FPNF13G29**	5			78	(36)
304 SS Flange	12.5	16	(406)	**FPNF16A29**	5			81	(37)
15-Incoloy®	15	18⅜	(467)	**FPNF18G29**	5			84	(38)
(2.3 W/cm²)	20	22⅞	(581)	**FPNF22R29**	5	**FPNF22R30**	5	87	(40)
	25	27⅞	(708)	**FPNF27R29**	5	**FPNF27R30**	5	91	(42)
	30	32⅞	(835)	**FPNF32R29**	5	**FPNF32R30**	5	95	(43)
	40	42⅜	(1076)	**FPNF42G29**	5	**FPNF42G30**	5	106	(48)
	50	51⅞	(1318)	**FPNF51R29**	5	**FPNF51R30**	5	116	(53)
Applications: Bunker C and #6 Fuel Oils, Asphalt									
8 W/in²③	6.3	16½	(419)	**FPNF16J22**	5			81	(37)
304 SS Flange	8.1	19½	(495)	**FPNF19J22**	5			84	(38)
15-Incoloy®	10.6	24½	(622)	**FPNF24J22**	5	**FPNF24J21**	5	87	(40)
(1.3 W/cm²)	13.1	30	(762)	**FPNF30A22**	5	**FPNF30A21**	5	91	(42)
	16	35	(889)	**FPNF35A22**	5	**FPNF35A21**	5	95	(43)
	21.3	45½	(1156)	**FPNF45J22**	5	**FPNF45J21**	5	106	(48)
	26	56	(1422)	**FPNF56A22**	5	**FPNF56A21**	5	116	(53)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

③ Must be operated 3-phase wye.
④ Can be rewired for 1-phase.

Tubular and Process Assemblies

Flange Immersion Heaters

8" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Clean Water											
60 W/in²	50	21¾ (553)			**FRC721N3②**	3	**FRC721N11**	3	**FRC721N5**	2	118 (54)
Steel Flange	75	29¾ (756)			**FRC729N3②**	6			**FRC729N5②**	2	126 (58)
18-Copper	100	37¼ (946)			**FRC737E3②**	6			**FRC737E5**	3	130 (59)
(9.3 W/cm²)	125	45¼ (1149)			**FRC745E3②**	6			**FRC745E5②**	6	132 (60)
	150	52¾ (1340)							**FRC752N5②**	6	137 (63)
	175	60¾ (1543)							**FRC760N5②**	6	144 (66)
	200	68¼ (1734)							**FRC768E5②**	6	149 (68)
Application: Process Water											
48 W/in²⑤	50	25¾ (654)			**FRN725N3②**	3	**FRN725N11②**	3	**FRN725N5②**	2	121 (55)
Steel Flange	75	35¾ (908)			**FRN735N3②**	6			**FRN735N5②**	2	130 (59)
18-Incoloy®	100	44¼ (1124)			**FRN744E3**	6			**FRN744E5**	3	132 (60)
(7.5 W/cm²)	125	54 11/16 (1389)			**FRN754M3②**	6			**FRN754M5②**	6	140 (64)
	150	63 11/16 (1617)							**FRN763M5②**	6	145 (66)
	175	73 11/16 (1859)							**FRN773D5**	6	151 (69)
	200	82 11/16 (2100)							**FRN782M5②**	6	157 (72)
48 W/in²	67	26 3/16 (665)			**FRN726D3X②**	4	**FRN726D11X②**	3	**FRN726D5X②**	2	129 (59)
Steel Flange	100	36 3/16 (919)			**FRN736D3X②**	8			**FRN736D5X②**	4	142 (65)
24-Incoloy®	133	44 11/16 (1135)			**FRN744M3X②**	8			**FRN744M5X②**	4	147 (67)
(7.5 W/cm²)	167	54 11/16 (1389)			**FRN754M3X②**	8			**FRN754M5X②**	8	158 (72)
	200	63 11/16 (1618)							**FRN763M5X②**	8	166 (76)
	233	73 3/16 (1859)							**FRN773D5X**	8	175 (80)
	267	82 11/16 (2100)							**FRN782M5X②**	8	184 (84)
Application: Forced Air and Gases, Caustic Solutions, Degreasing Solutions											
23 W/in²⑤⑥	30	32¾ (832)	**FRNA32N10②**	3	**FRNA32N3②**	2	**FRNA32N11②**	2	**FRNA32N5②**	1	130 (59)
Steel Flange	40	43¼ (1099)			**FRNA43E3②**	3	**FRNA43E11②**	2	**FRNA43E5②**	2	132 (60)
18-Incoloy®	50	51 11/16 (1313)			**FRNA51M3**	3	**FRNA51M11**	3	**FRNA51M5**	2	137 (63)
(3.6 W/cm²)											
23 W/in²	40	33 3/16 (843)	**FRNA33D10X②**	4	**FRNA33D3X②**	4	**FRNA33D11X②**	2	**FRNA33D5X②**	2	142 (65)
Steel Flange	53	43 11/16 (1110)			**FRNA43M3X②**	4	**FRNA43M11X②**	3	**FRNA43M5X②**	2	147 (67)
24-Incoloy®	67	51 11/16 (1313)			**FRNA51M3X②**	4	**FRNA51M11X②**	3	**FRNA51M5X②**	2	154 (70)
(3.6 W/cm²)											

CONTINUED

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

Truck Shipment only

② Standard

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Flange Immersion Heaters

8" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 1-Phase	No. of Circuits	240V~(ac) 3-Phase	No. of Circuits	480V~(ac) 1-Phase	No. of Circuits	480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils											
23 W/in²	30	32¾ (832)	**FRS732N10②**	3	**FRS732N3②**	2	**FRS732N11②**	2	**FRS732N5②**	1	130 (59)
Steel Flange	40	43¾ (1099)			**FRS743E3②**	3	**FRS743E11②**	2	**FRS743E5**	2	132 (60)
18-Steel	50	51 1/16 (1313)			**FRS751M3**	3	**FRS751M11**	3	**FRS751M5**	2	137 (63)
(3.6 W/cm²)	60	62 3/16 (1580)			**FRS762D3②**	6	**FRS762D11②**	3	**FRS762D5②**	2	154 (70)
	70	70 1/16 (1795)			**FRS770M3②**	6	**FRS770M11**	6	**FRS770M5**	2	160 (73)
	80	79 1/16 (2024)			**FRS779M3②**	6			**FRS779M5②**	3	172 (78)
23 W/in²	40	33 3/16 (843)	**FRS733D10X②**	4	**FRS733D3X②**	4	**FRS733D11X②**	2	**FRS733D5X②**	2	142 (65)
Steel Flange	53	43 1/16 (1110)			**FRS743M3X②**	4	**FRS743M11X②**	3	**FRS743M5X②**	2	147 (67)
24-Steel	67	51 1/16 (1313)			**FRS751M3X②**	4	**FRS751M11X②**	3	**FRS751M5X②**	2	154 (70)
(3.6 W/cm²)	80	62 3/16 (1580)			**FRS762D3X②**	8	**FRS762D11X②**	4	**FRS762D5X②**	4	166 (76)
	93	70 1/16 (1796)			**FRS770M3X②**	8	**FRS770M11X②**	6	**FRS770M5X②**	4	175 (80)
	107	79 1/16 (2024)			**FRS779M3X②**	8			**FRS779M5X②**	4	181 (82)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin											
16 W/in²③	17	25¾ (654)			**FRN725N12②**	1			**FRN725N13②**	1	121 (55)
Steel Flange	25	35¾ (908)			**FRN735N12②**	2			**FRN735N13②**	1	130 (59)
18-Incoloy®	33	44¼ (1124)			**FRN744E12②**	2			**FRN744E13**	1	132 (60)
(2.5 W/cm²)	42	54 1/16 (1389)			**FRN754M12②**	3			**FRN754M13②**	2	140 (64)
	50	63 1/16 (1618)							**FRN763M13②**	2	145 (66)
	58	73 3/16 (1859)							**FRN773D13**	2	151 (69)
	67	82 1/16 (2100)							**FRN782M13②**	2	157 (72)
16 W/in²③	23	26 3/16 (665)			**FRN726D12X②**	2			**FRN726D13X②**	1	129 (59)
Steel Flange	33	36 3/16 (919)			**FRN736D12X②**	2			**FRN736D13X②**	1	142 (65)
24-Incoloy®	44	44 1/16 (1135)			**FRN744M12X②**	4			**FRN744M13X②**	2	147 (67)
(2.5 W/cm²)	56	54 1/16 (1389)			**FRN754M12X②**	4			**FRN754M13X②**	2	158 (72)
	67	63 1/16 (1618)							**FRN763M13X②**	2	166 (76)
	77	73 3/16 (1859)							**FRN773D13X②**	2	175 (80)
	89	82 1/16 (2100)							**FRN782M13X②**	4	184 (84)
Applications: Bunker C and #6 Fuel Oils											
8 W/in²③	12.5	43¾ (1099)			**FRS743E12②**	1			**FRS743E13②**	1	132 (60)
Steel Flange	16.5	51 1/16 (1313)			**FRS751M12**	1			**FRS751M13**	1	137 (62)
18-Steel	20	62 3/16 (1580)			**FRS762D12②**	2			**FRS762D13②**	1	145 (66)
(1.3 W/cm²)	24	70 1/16 (1795)			**FRS770M12**	2			**FRS770M13**	1	151 (69)
	27	79 1/16 (2024)			**FRS779M12②**	2			**FRS779M13②**	1	155 (71)
8 W/in²③	17	43 1/16 (1110)			**FRS743M12X②**	1			**FRS743M13X②**	1	147 (67)
Steel Flange	22	51 1/16 (1313)			**FRS751M12X②**	2			**FRS751M13X②**	1	154 (70)
24-Steel	27	62 3/16 (1580)			**FRS762D12X②**	2			**FRS762D13X②**	1	166 (76)
(1.3 W/cm²)	32	70 1/16 (1796)			**FRS770M12X②**	2			**FRS770M13X②**	1	175 (80)
	36	79 1/16 (2024)			**FRS779M12X②**	2			**FRS779M13X②**	1	181 (82)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

Truck Shipment only

② Standard

③ Must be operated 3-phase wye

Tubular and Process Assemblies

Flange Immersion Heaters

10" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 3-Phase	No. of Circuits	Code No. 480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Process Water							
48 W/in²⑤	190	54¾ (1391)			**FSN754N5**②	9	240 (109)
Steel Flange	262	73¼ (1861)			**FSN773E5**	9	260 (118)
27-Incoloy®							
(7.5 W/cm²)							
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions							
23 W/in²⑤⑥	45	33¼ (845)	**FSNA33E3**②	3	**FSNA33E5**②	3	165 (75)
Steel Flange	60	43¾ (1111)	**FSNA43N3**②	3	**FSNA43N5**②	3	195 (89)
27-Incoloy®	75	51¾ (1314)	**FSNA51N3**	9	**FSNA51N5**	3	230 (105)
(3.6 W/cm²)							
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils							
23 W/in²	45	33¼ (845)	**FSS733E3**②	3	**FSS733E5**②	3	165 (75)
Steel Flange	60	43¾ (1111)	**FSS743N3**②	3	**FSS743N5**②	3	195 (89)
27-Steel	75	51¾ (1314)	**FSS751N3**	9	**FSS751N5**	3	230 (105)
(3.6 W/cm²)	90	62¼ (1581)			**FSS762E5**②	3	250 (114)
	105	70¾ (1797)			**FSS770N5**	3	258 (117)
	120	78¾ (2000)			**FSS778N5**②	3	265 (121)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin							
16 W/in²③	63	54¾ (1391)			**FSN754N13**②	3	240 (109)
Steel Flange	75	63¾ (1619)			**FSN763N13**②	3	250 (114)
27-Incoloy®	87	73¼ (1861)			**FSN773E13**	3	258 (117)
(2.5 W/cm²)							
Applications: Bunker C and #6 Fuel Oils							
8 W/in²③	25	51¼ (1314)	**FSS751N12**	3	**FSS751N13**	1	230 (105)
Steel Flange	30	62¼ (1581)	**FSS762E12**②	3	**FSS762E13**②	1	250 (114)
27-Steel	35	70¾ (1797)	**FSS770N12**	3	**FSS770N13**	1	258 (117)
(1.3 W/cm²)	40	78¾ (2000)	**FSS778N12**②	3	**FSS778N13**②	1	265 (121)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

Truck Shipment only

② Standard

③ Must be operated 3-phase wye.

⑤ 240V~(ac) 3-phase can be rewired wye to produce ⅓ more kW and watt density when operated at 480V~(ac) 3-phase.

⑥ Can be rewired wye to produce ⅓ of the original kW and watt density (3-phase only).

Tubular and Process Assemblies

Flange Immersion Heaters

12" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 3-Phase	No. of Circuits	Code No. 480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Process Water							
48 W/in²	250	54⅝ (1387)			**FTN754L5②**	6	280 (127)
Steel Flange	350	73⅛ (1857)			**FTN773C5**	12	291 (132)
36-Incoloy®							
(7.5 W/cm²)							
Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions							
23 W/in²	60	33⅛ (841)			**FTNA33C5②**	3	205 (93)
Steel Flange	80	43⅝ (1108)			**FTNA43L5②**	3	240 (109)
36-Incoloy®	100	51⅝ (1311)			**FTNA51L5**	3	280 (127)
(3.6 W/cm²)							
Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils							
23 W/in²	60	33⅛ (841)			**FTS733C5②**	3	205 (93)
Steel Flange	80	43⅝ (1108)			**FTS743L5②**	3	240 (109)
36-Steel	100	51⅝ (1311)			**FTS751L5**	3	280 (127)
(3.6 W/cm²)	120	62⅛ (1578)			**FTS762C5②**	3	285 (130)
	140	70⅝ (1794)			**FTS770L5**	4	290 (132)
	160	78⅝ (1997)			**FTS778L5②**	4	300 (136)
Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin							
16 W/in²③	83	54⅝ (1387)			**FTN754L13②**	3	280 (127)
Steel Flange	117	73⅛ (1857)			**FTN773C13②**	3	291 (132)
36-Incoloy®							
(2.5 W/cm²)							
Applications: Bunker C and #6 Fuel Oils							
8 W/in²③	34	51⅛ (1311)	**FTS751L12②**	2	**FTS751L13**	1	280 (127)
Steel Flange	40	62⅛ (1578)	**FTS762C12②**	2	**FTS762C13②**	1	285 (130)
36-Steel	47	70⅝ (1794)	**FTS770L12②**	3	**FTS770L13**	2	290 (132)
(1.3 W/cm²)	54	78⅝ (1997)	**FTS778L12②**	3	**FTS778L13②**	2	300 (136)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

Truck Shipment only

② Standard

③ Must be operated 3-phase wye.

Tubular and Process Assemblies

Flange Immersion Heaters

14" 150 lb ANSI Flange—WATROD Element

WATROD Description	kW	Immersed B Dimension inch (mm)	Code No. 240V~(ac) 3-Phase	No. of Circuits	Code No. 480V~(ac) 3-Phase	No. of Circuits	Est. Ship. Weight lbs (kg)
Application: Process Water							
48 W/in²	315	54½ (1384)			**FWN754J5**②	15	300 (136)
Steel Flange	375	63½ (1613)			**FWN763J5**②	15	310 (141)
45-Incoloy®							
(7.5 W/cm²)							
Application: Forced Air and Gases, Caustic Solutions, Degreasing Solutions							
23 W/in²	75	33 (838)			**FWNA33A5**②	3	225 (102)
Steel Flange	100	43½ (1105)			**FWNA43J5**②	3	255 (116)
45-Incoloy®	125	51½ (1308)			**FWNA51J5**	5	300 (136)
(3.6 W/cm²)							
Application: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils							
23 W/in²	75	33 (838)			**FWS733A5**②	3	225 (102)
Steel Flange	100	43½ (1105)			**FWS743J5**②	3	255 (116)
45-Steel	125	51½ (1308)			**FWS751J5**	5	300 (136)
(3.6 W/cm²)	150	62 (1575)			**FWS762A5**②	5	310 (141)
	175	70½ (1791)			**FWS770J5**	5	318 (145)
	200	78½ (1994)			**FWS778J5**②	5	330 (150)
Application: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin							
16 W/in²③	105	54½ (1384)			**FWN754J13**②	3	300 (136)
Steel Flange	125	63½ (1613)			**FWN763J13**②	5	310 (141)
45-Incoloy®							
(2.5 W/cm²)							
Application: Bunker C and #6 Fuel Oils							
8 W/in²③	42	51½ (1308)	**FWS751J12**	3	**FWS751J13**	3	300 (136)
Steel Flange	50	62 (1575)	**FWS762A12**②	3	**FWS762A13**②	3	310 (141)
45-Steel	60	70½ (1791)	**FWS770J12**	3	**FWS770J13**	3	318 (144)
(1.3 W/cm²)	67	78½ (1994)	**FWS778J12**②	5	**FWS778J13**②	3	330 (150)

All flange immersion heaters are Assembly Stock unless otherwise noted.

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Standard: 10 working days, depending on size

Truck Shipment only

② Standard

③ Must be operated 3-phase wye.

F.O.B.: Hannibal, Missouri

Flange Immersion Heaters

Build-a-Code

- - -

Flange Immersion Heater Base Code Number①

(Includes general purpose enclosure without thermostat)

Terminal Enclosure Type

S = General purpose (NEMA 1)
W = Moisture resistant (NEMA 4)
E = Explosion resistant (NEMA 7)
E/W = Explosion/moisture resistant (NEMA 7/4)

Thermostat②

Thermocouple③

J = Type J

K = Type K

① Flange immersion heaters are supplied with a standard, general purpose (NEMA 1) terminal enclosure. A thermostat will not fit the standard general purpose terminal enclosure on 2, 2½ and 3 inch flange sizes.
② Code numbers are shown on the Thermostat stock chart on page 425. Check the temperature sensing bulb O.D. to be certain it will fit into the thermowell's I.D.
③ Specify Type J or K thermocouple. If overtemp thermocouple specify orientation horizontal, vertical up or vertical down.

How to Order

To order a stock flange heater, please specify:

- Watlow code number
- Flange size and material
- Volts/watts
- Phase
- Options
- Quantity

If the flange immersion heater is to be configured with options, add the suffix letter(s) to the base flange heater code number, as indicated on the Build-a-Code chart.

If our stock units do not meet your application needs, Watlow will make-to-order.

For **made-to-order** units please specify:

- Application, including media heated, flow rate, pressure, and process operating temperatures
- Volts/watts
- Watt density
- Phase
- Number of circuits
- Number of heating elements
- Element diameter (WATROD only)
- Immersed ('B' dimension) length
- Flange size, rating and material
- No-heat section below the flange
- Terminal enclosure type
- Options
- Quantity

Availability

Stock: Same day shipment

Assembly Stock: Five to seven working days

Modified Stock③: Five to seven working days

Standard: 10 working days

Made-to-Order: Five to seven weeks

Options, complexity and quantity may affect availability and lead times. Consult factory.

③ Stock or Assembly Stock units with catalog options.

Tubular and Process Assemblies

Quick Ship

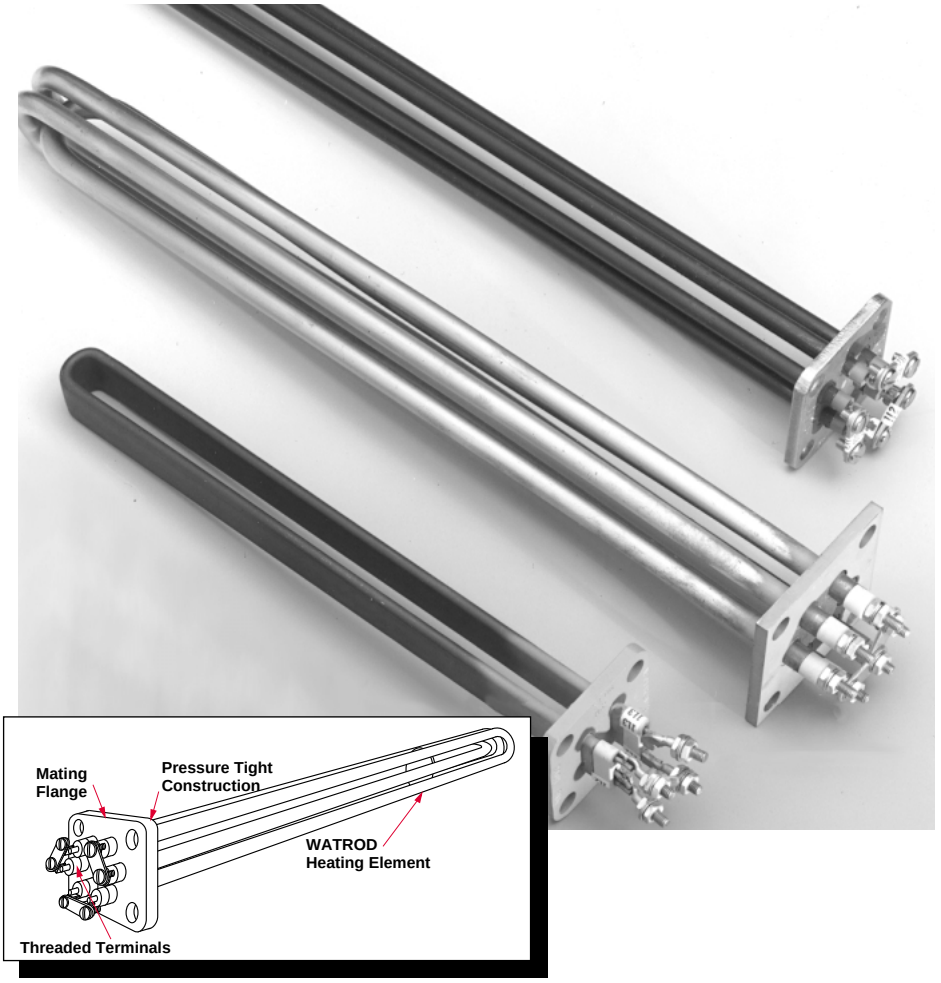
On stock chart units:
- *Same day on most heaters*
- *10 working days on special voltages and/or wattages*
- *15 working days on special element lengths*

Square Flange Immersion Heaters

Designed for use in boilers and industrial storage tanks, square flange immersion heaters offer an energy efficient solution to heating water, oils and degreasing solutions.

Consisting of WATROD or FIREBAR® elements brazed, staked, or welded to a four- or six-bolt flange, these heaters mount directly to a mating flange that is welded to a tank wall or nozzle.

Installation and maintenance is easy. Heater change-out is also simple … unbolt the flange and replace it with another ... without extensive equipment downtime.



Performance Capabilities

- Watt densities to 100 W/in² (15.5 W/cm²)
- Wattages to 24kW
- Voltages to 480V~(ac)
- Incoloy® sheath temperatures to 1600°F (870°C)

Features and Benefits

- **2½, 3⅛ and 4½ inch square flanges** easily adapt to application needs.

Flange materials:

WATROD	Steel 304 stainless steel
FIREBAR	Steel Brass

- **Asbestos-free gaskets** come wire-tied to each flange. Spare gaskets also available.
- **Epoxy or silicone resin seals**, rated to 250°F (120°C) or 390°F (200°C) respectively, protect elements against moisture and other contaminants.
- **WATROD hairpins are repressed (recompacted)** to maintain MgO density, dielectric strength, heat transfer and life.
- **UL® and CSA component recognition** under file numbers E52951 and 31388 respectively. See **pages 268 to 271** for details.

Applications

- Water
- Boiler equipment
- Vapor degreasers
- Fuel oils
- Heat transfer fluids
- Caustic solutions

Available on request:

- **Sheath materials** in copper, steel, 304 and 316 stainless steel and titanium
- **Flange materials** in titanium and 316 stainless steel
- **Flange sizes** to meet specific application needs
- **External finishes** such as passivation, belt polishing and glass beading
- **Other voltage and wattage ratings**

  Consult your Watlow representative for details.