

Immersion Heaters



WATROD™ Plate Flange Immersion Heaters

Watlow plate flange heaters are easy to install and maintain. These products are designed for heating heat transfer fluids, medium and lightweight oils and water in tanks and pressure vessels. Plate flange heaters are ideal for applications requiring low to medium wattage requirements.

Watlow plate flange heaters are made with WATROD tubular elements that are brazed or welded to the flange. Stock plate flange heaters are supplied with general purpose or moisture-resistant terminal enclosures.

Performance Capabilities

- Watt densities up to 100 W/in² (15.5 W/cm²)
- Wattages up to 18 kilowatts
- Alloy 800/840 sheath temperatures up to 1600°F (870°C)
- 304 stainless steel sheath temperatures up to 1200°F (650°C)
- Steel sheath temperatures up to 750°F (400°C)

Features and Benefits

Direct replacement for many OEM mold temperature control units

- Provides a single source supplier for many OEM applications

ANSI compatible 2 and 2½ inch flanges

- Provides appropriate heater size-to-application fit

Standard general purpose or moisture resistant terminal enclosures

- Offers easy access to wiring
- Limits accidental contact with termination
- Denies access to wiring connection in local environment



Immersion Heaters

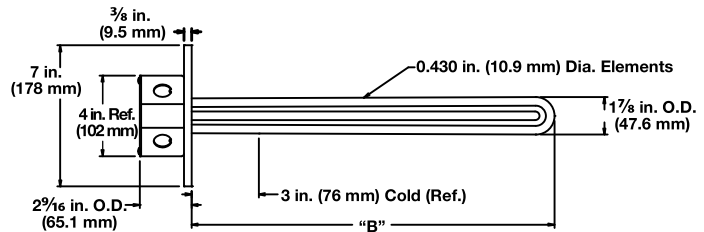


WATROD Plate Flange Immersion Heaters

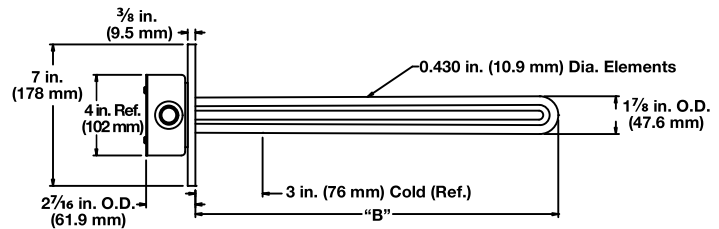
Application: Clean Water

- 2 1/2 inch plate flange (bolt pattern matches 2 1/2 inch - 150 lb ANSI flange)
- WATROD elements
- Not available with thermowell or thermostat
- General purpose or moisture-resistant enclosures

General Purpose



Moisture Resistant



Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)		Ship Wt. lbs (kg)		Part Number	Part Number
									General Purpose Enclosure	Moisture-Resistant Enclosure
100 W/in ² Steel Flange 3-304 SS Elements (15.5 W/cm ²)	240	12.0	1	3	18	(457)	22	(10)	FLN18A10S	FLN18A10W
	240	12.0	3	1	18	(457)	22	(10)	FLN18A3S	FLN18A3W
	480	12.0	1	1	18	(457)	22	(10)	FLN18A11S	FLN18A11W
	480	12.0	3	1	18	(457)	22	(10)	FLN18A5S	FLN18A5W
80 W/in ² Steel Flange 3-304 SS Elements (12.4 W/cm ²)	240	9.0	1	1	17 ³ / ₄	(451)	22	(10)	FLN17N10S	FLN17N10W
	240	9.0	3	1	17 ³ / ₄	(451)	22	(10)	FLN17N3S	FLN17N3W
	480	9.0	1	1	17 ³ / ₄	(451)	22	(10)	FLN17N11S	FLN17N11W
	480	9.0	3	1	17 ³ / ₄	(451)	22	(10)	FLN17N5S	FLN17N5W
	240	18.0	1	3	30	(762)	27	(13)	FLN30A10S	FLN30A10W
	240	18.0	3	1	30	(762)	27	(13)	FLN30A3S	FLN30A3W
	480	18.0	1	1	30	(762)	27	(13)	FLN30A11S	FLN30A11W
	480	18.0	3	1	30	(762)	27	(13)	FLN30A5S	FLN30A5W
60 W/in ² Steel Flange 3-Alloy 800 Elements (9.3 W/cm ²)	240	4.5	1	1	12 ¹ / ₂	(318)	21	(10)	FLN12J10S	FLN12J10W
	240	4.5	3	1	12 ¹ / ₂	(318)	21	(10)	FLN12J3S	FLN12J3W
	480	4.5	1	1	12 ¹ / ₂	(318)	21	(10)	FLN12J11S	FLN12J11W
	480	4.5	3	1	12 ¹ / ₂	(318)	21	(10)	FLN12J5S	FLN12J5W

Note: All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe

Immersion Heaters

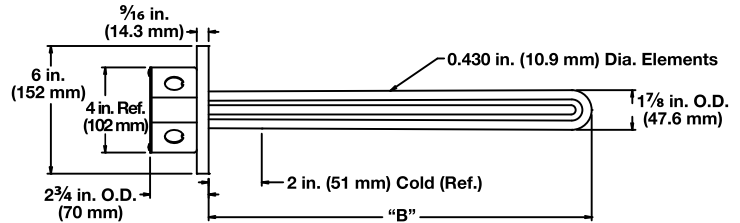


WATROD Plate Flange Immersion Heaters

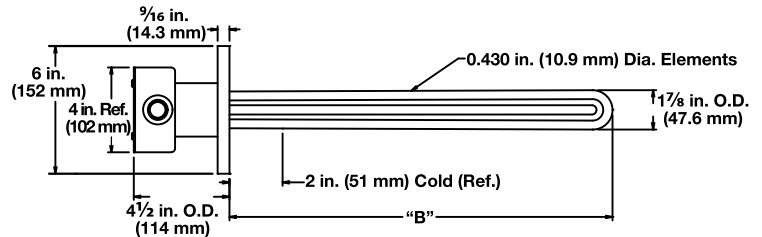
Application: Process Water

- 2 inch flange (bolt pattern matches 2 inch - 150 lb ANSI flange)
- WATROD elements
- Not available with thermowell or thermostat
- General purpose or moisture-resistant enclosures

General Purpose



Moisture Resistant



Description	Volts	kW	PH	# Circ.	"B" Dim. in.	(mm)	Ship Wt. lbs (kg)	Part Number	Part Number
								General Purpose Enclosure	Moisture-Resistant Enclosure
45 W/in ² Steel Flange 3-Alloy 800 Elements (7 W/cm ²)	240	4.5	1	1	16	(406)	22 (10)	FKN16A10S	FKN16A10W
	240	4.5	3	1	16	(406)	22 (10)	FKN16A3S	FKN16A3W
	480	4.5	1	1	16	(406)	22 (10)	FKN16A11S	FKN16A11W
	480	4.5	3	1	16	(406)	22 (10)	FKN16A5S	FKN16A5W
	240	9.0	1	1	29	(737)	27 (13)	FKN29A10S	FKN29A10W
	240	9.0	3	1	29	(737)	27 (13)	FKN29A3S	FKN29A3W
	480	9.0	1	1	29	(737)	27 (13)	FKN29A11S	FKN29A11W
	480	9.0	3	1	29	(737)	27 (13)	FKN29A5S	FKN29A5W
45 W/in ² Steel Flange 3-Alloy 800 Elements (7 W/cm ²)	240	9.0	1	1	28	(711)	27 (13)	FKN28A10S	FKN28A10W
	240	9.0	3	1	28	(711)	27 (13)	FKN28A3S	FKN28A3W
	480	9.0	1	1	28	(711)	27 (13)	FKN28A11S	FKN28A11W
	480	9.0	3	1	28	(711)	27 (13)	FKN28A5S	FKN28A5W

Note: All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe

Immersion Heaters

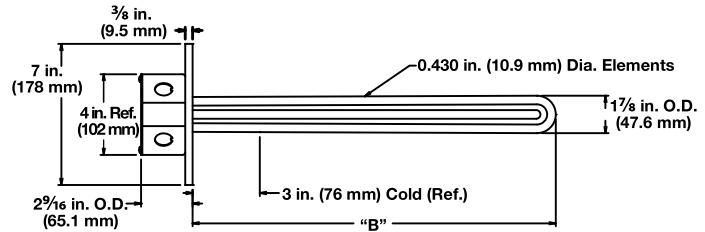


WATROD Plate Flange Immersion Heaters

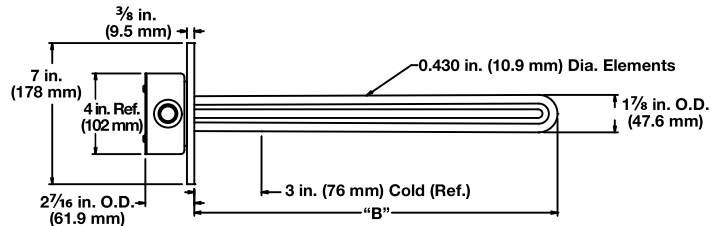
Application: Forced Air and Caustic Solutions

- 2 1/2 inch flange (bolt pattern matches 2 1/2 inch - 150 lb ANSI flange)
- WATROD elements
- Not available with thermowell or thermostat
- General purpose or moisture-resistant enclosures

General Purpose



Moisture Resistant



Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)	Ship Wt. lbs (kg)	Part Number	
							General Purpose Enclosure	Moisture-Resistant Enclosure
30 W/in ² Steel Flange 3-Alloy 800 Elements (4.7 W/cm ²)	240	3.0	3	1	17 ³ / ₄ (451)	22 (10)	FLN17N12S	FLN17N12W
	480	3.0	3	1	17 ³ / ₄ (451)	22 (10)	FLN17N13S	FLN17N13W
	240	4.0	3	1	18 (457)	22 (10)	FLN18A12S	FLN18A12W
	480	4.0	3	1	18 (457)	22 (10)	FLN18A13S	FLN18A13W
	240	6.0	3	1	30 (762)	27 (13)	FLN30A12S	FLN30A12W
	480	6.0	3	1	30 (762)	27 (13)	FLN30A13S	FLN30A13W

Note: All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe



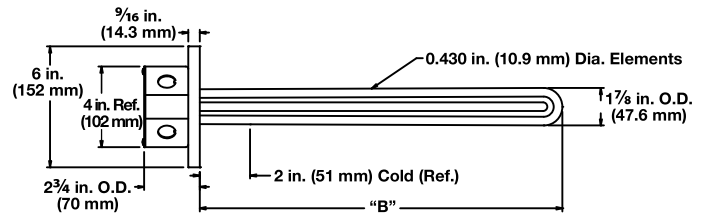
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WATROD Plate Flange Immersion Heaters

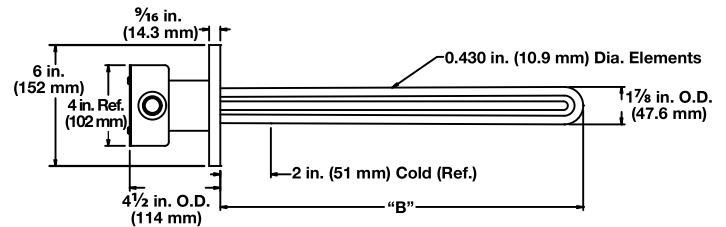
Application: Lightweight Oils and Ethylene Glycol (100%)

- 2 inch flange (bolt pattern matches 2 inch - 150 lb ANSI flange)
- WATROD elements
- Not available with thermowell or thermostat
- General purpose or moisture-resistant enclosures

General Purpose



Moisture Resistant



Description	Volts	kW	Ph	# Circ.	"B" Dim.		Ship Wt.		Part Number	Part Number
					in.	(mm)	lbs	(kg)	General Purpose Enclosure	Moisture-Resistant Enclosure
30 W/in ² Steel Flange 3-Steel Elements (4.7 W/cm ²)	240	6.0	1	1	29	(737)	27	(13)	FKS29A10S	FKS29A10W
	240	6.0	3	1	29	(737)	27	(13)	FKS29A3S	FKS29A3W
	480	6.0	1	1	29	(737)	27	(13)	FKS29A11S	FKS29A11W
	480	6.0	3	1	29	(737)	27	(13)	FKS29A5S	FKS29A5W

Note: All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe

Immersion Heaters

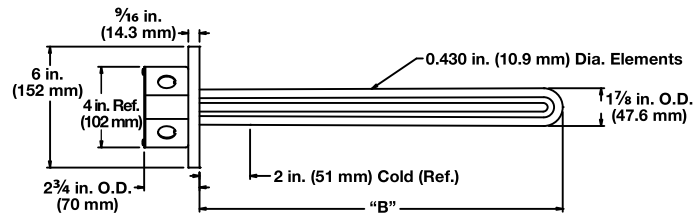


WATROD Plate Flange Immersion Heaters

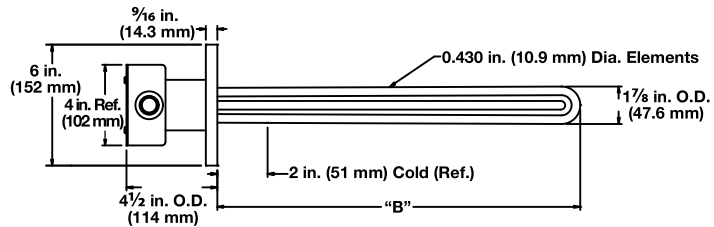
Application: Medium Weight Oils and Heat Transfer Oils

- 2 inch flange (bolt pattern matches 2 inch - 150 lb ANSI flange)
- WATROD elements
- Not available with thermowell or thermostat
- General purpose or moisture-resistant enclosures

General Purpose



Moisture Resistant



Description	Volts	kW	Ph	# Circ.	"B" Dim. in. (mm)		Ship Wt. lbs (kg)		Part Number	Part Number
									General Purpose Enclosure	Moisture-Resistant Enclosure
15 W/in² Steel Flange 3-Alloy 800 Elements (2.3 W/cm²)	240	3.0	3	1	28	(711)	27	(13)	FKN28A12S	FKN28A12W
	480	3.0	3	1	28	(711)	27	(13)	FKN28A13S	FKN28A13W
10 W/in² Steel Flange 3-Steel Elements (1.6 W/cm²)	240	2.0	3	1	29	(737)	27	(13)	FKS29A12S	FKS29A12W
	480	2.0	3	1	29	(737)	27	(13)	FKS29A13S	FKS29A13W

Note: All flange bundles are designed to fit the inside diameter of the equivalent standard schedule pipe



Immersion Heaters

WATROD™ and FIREBAR® Square Flange Immersion Heaters

Designed for use in boilers and industrial storage tanks, the square flange immersion heater from Watlow® offers 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 up to 100 W/in² (15.5 W/cm²)
- Wattages up to 24 kilowatts
- Voltages up to 480VAC
- Alloy 800/840 sheath temperatures up to 1600°F (870°C)

Features and Benefits

2 1/2, 3 1/8 and 4 1/2 inch square flanges

- Adapts easily to application needs

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)

- Protects elements against moisture and other contaminants

WATROD hairpins are repressed (recompacted)

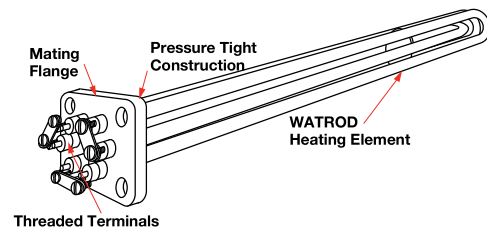
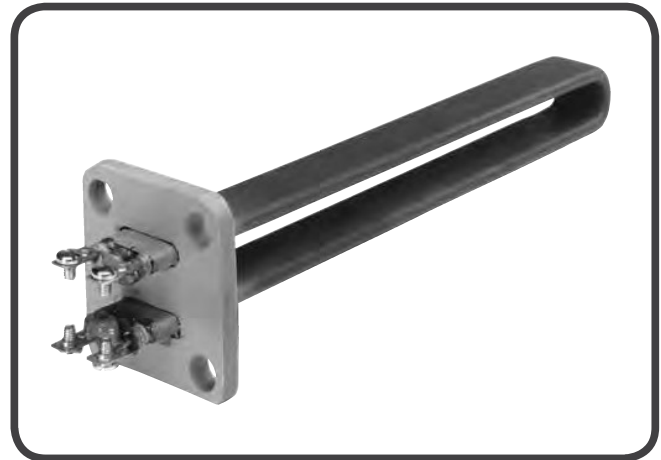
- Helps maintain MgO density, dielectric strength, heat transfer and life

UL® and CSA component recognition under file numbers E52951 and 31388

- Meets industry safety standards

Typical Applications

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



Flange Materials

WATROD	Steel 304 SS
FIREBAR	Steel

Available on Request

- **Sheath materials** in 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**
Contact your Watlow representative for details

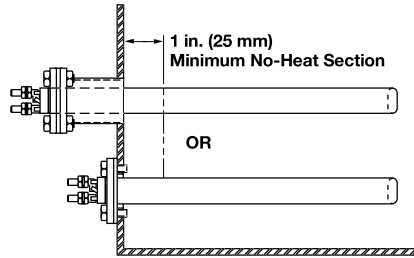
Immersion Heaters



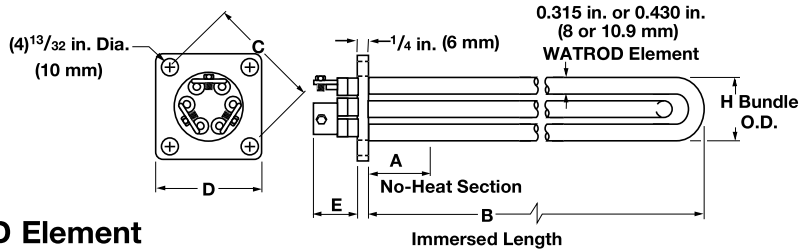
WATROD and FIREBAR Square Flange Immersion Heaters

Application Hints

- Determine recommended sheath materials and watt densities by using the *Element and Assembly Selection Guide* on pages 549 to 550. If wattage is not known, contact your Watlow representative.
- Extend the element's no-heat section completely in the fluid at all times to prevent premature heater failure. See the accompanying illustration for proper placement of the no-heat section.
- Mount WATROD and FIREBAR square flange heaters horizontally and low in the tank, but above sludge level.
- Periodically remove heaters to inspect and clean the elements.
- Keep terminations clean, dry and tight.
- Minimize problems associated with low liquid level conditions by using a low liquid level sensor.



Heater Dimension	in.	(mm)
A	1 1/2	(38)
C	2 1/2	(64)
D	2 1/2	(64)
E	1	(25)
H	1 1/2	(38)



2 1/2 inch Square Flange – WATROD Element

WATROD Description	kW	Immersed B Dimension in. (mm)	Part Number				Est. Ship. Wt. lbs (kg)
			240VAC 1-Phase	240VAC 3-Phase	480VAC 1-Phase	480VAC 3-Phase	

Applications: Clean and Potable Water

100 W/in ² Steel Flange 3-Alloy 800 (15.5 W/cm ²)	8.0	11 3/4 (298.0)	FHN11N10	FHN11N3	FHN11N11	FHN11N5	18 (9)
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Applications: Forced Air and Gases, Caustic Solutions, Degreasing Solutions

30 W/in ² 304 SS Flange 3-Alloy 800 (4.7 W/cm ²)	3.0 3.75	18 1/2 (470.0) 23 1/16 (585.8)	FHN18J10 FHN23B10	FHN18J3 FHN23B3	FHN18J11 FHN23B11	FHN18J5 FHN23B5	19 (9) 20 (9)
25 W/in ² 304 SS Flange 3-Alloy 800 (3.9 W/cm ²)	1.5	12 (305.0)	FHN12A10	FHN12A3	FHN12A11	FHN12A5	18 (8)

Applications: Bunker C and #6 Fuel Oils

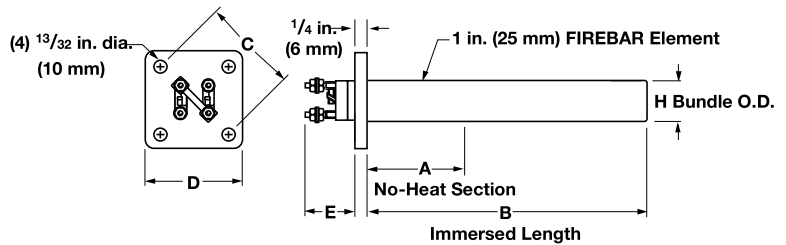
10 W/in ² 304 SS Flange 3-Alloy 800 (1.6 W/cm ²)	1.0 1.25	18 1/2 (470.0) 23 1/16 (585.8)		FHN18J12 FHN23B12		FHN18J13 FHN23B13	19 (9) 20 (9)
8 W/in ² 304 SS Flange 3-Alloy 800 (1.3 W/cm ²)	0.5	12 (305.0)		FHN12A12		FHN12A13	18 (8)

Immersion Heaters



WATROD and FIREBAR Square Flange Immersion Heaters

Heater Dimension	in.	(mm)
A	1 1/2	(38)
C	2 1/2	(64)
D	2 1/2	(64)
E	1 3/4	(44)
H	1 5/16	(33)



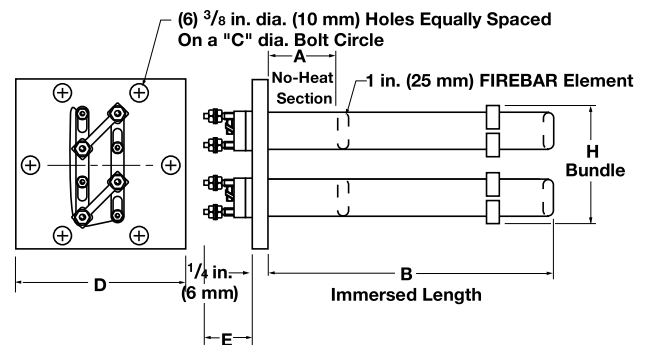
1 1/2 inch Square Flange—FIREBAR Element

FIREBAR Description	kW	Immersed B Dimension in. (mm)	Part Number					Est. Ship.	
			208VAC 3-Phase	240VAC 1-Phase	240VAC 3-Phase	480VAC 1-Phase	480VAC 3-Phase	lbs	Wt. (kg)

Applications: Clean and Potable Water

100 W/in ² Steel Flange 1-Alloy 800 (15.5 W/cm ²)	5	11 1/2 (292)	FHNFA11J26N	FHNFA11J10N	FHNFA11J3N	FHNFA11J11N	FHNFA11J5N	5	(3)
	8	20 3/4 (527)	FHNFA20N26N	FHNFA20N10N	FHNFA20N3N	FHNFA20N11N	FHNFA20N5N	7	(4)
	10	24 3/8 (619)	FHNFA24G26N	FHNFA24G10N	FHNFA24G3N	FHNFA24G11N	FHNFA24G5N	8	(4)
	15	33 15/16 (862)	FHNFA33S26N		FHNFA33S3N	FHNFA33S11N	FHNFA33S5N	9	(5)
80 W/in ² Steel Flange 1-Alloy 800 (12.4 W/cm ²)	16	22 5/8 (575)	FHNFB22L26J	FHNFB22L10J	FHNFB22L3J	FHNFB22L11J	FHNFB22L5J	10	(5)

Heater Dimension	in.	(mm)
A	1	(25.0)
C	3 13/16	(96.8)
D	4 1/2	(114.0)
E	2 1/4	(57.0)
H	3 7/32	(81.8)



4 1/2 inch Square Flange—FIREBAR Element

FIREBAR Description	kW	Immersed B Dimension in. (mm)	Part Number			Est. Ship.	
			208VAC 3-Phase	240VAC 3-Phase	480VAC 3-Phase	lbs	Wt. (kg)

Applications: Clean and Potable Water

100 W/in ² Steel Flange 2-Alloy 800 (15.5 W/cm ²)	18	10 1/2 (267)	FGNFB10J26N	FGNFB10J3N	FGNFB10J5N	16	(8)
70 W/in ² Steel Flange 2-Alloy 800 (10.9 W/cm ²)	12	10 1/2 (267)	FGNFB10J26P	FGNFB10J3P	FGNFB10J5P	16	(8)