

Circulation Heaters



WATROD™ and FIREBAR® Circulation Heaters

Circulation heaters provide a ready-made means to install electric heating with a minimal amount of time and labor. This is accomplished by combining heating elements, vessel, insulation, terminal enclosure, mounting brackets and inlet and outlet connections into a complete assembly.

Made from NPT screw plug or ANSI flange heater assemblies mated with a pressure vessel (tank), circulation heaters are designed to heat forced-circulation air, gases or liquids. Ideal for either in-line or side-arm operations, these assemblies direct fluids past FIREBAR® or WATROD™ heating elements, to deliver fast response and even heat distribution.

Watlow® meets virtually all your circulation heater assembly needs with made-to-order units. These units can be made from a wide range of heating element sheath materials, wattages, vessel sizes and materials, pressure ratings, terminal enclosures and controls.

Performance Capabilities

- Watt densities up to 120 W/in² (18.6 W/cm²)
- Wattages up to three megawatts
- UL® and CSA component recognition up to 690VAC
- Ratings up to ANSI Class 300 pressure class
- Alloy 800/840 sheath temperatures up to 1600°F (870°C)
- Passivated 316 stainless steel sheath temperatures up to 1200°F (650°C)
- Steel sheath temperatures up to 750°F (400°C)

Features and Benefits

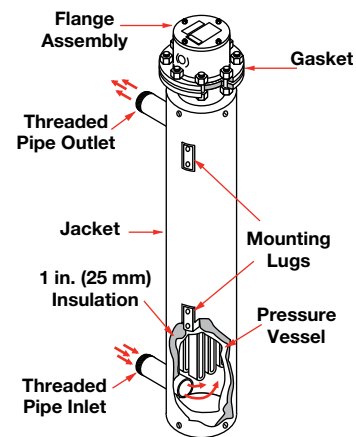
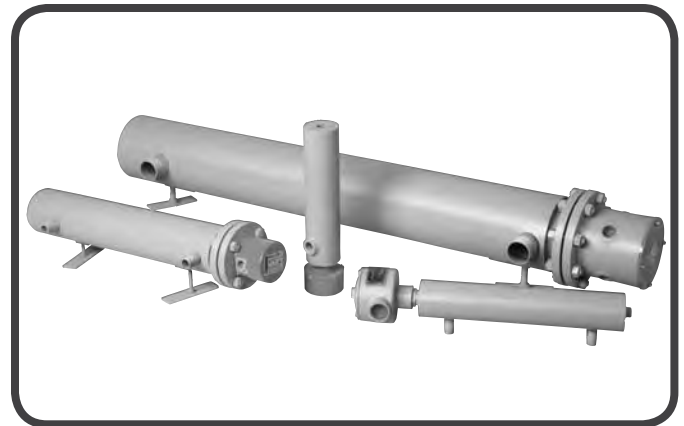
Catalog screw plug and flange part numbers

- Provides a wide selection of WATROD and FIREBAR elements to meet specific application requirements

Type	Sizes (in.)
NPT Screw Plugs	1 1/4, 2 1/2
ANSI flanges	3, 4, 5, 6, 8, 10, 12, 14

ANSI B16.5, Class 150 on 3 to 14 inch WATROD element flanges

- Meets recognized agency standards



Compacted MgO insulation filled elements

- Maximizes dielectric strength, heat transfer and life

1 inch (25 mm) thermal insulation rated to 750°F (400°C)

- Reduces heat loss from the vessel

Heavy-gauge steel jacket (shroud)

- Protects thermal insulation and heating vessel and comes with protective primer coating

Maximum recommended Input pressure 50 psi/3.45 Bar



WATROD and FIREBAR Circulation Heaters

Features and Benefits *(Continued)*

All catalog units rated to ANSI pressure Class 150

- Provides pressure vessels (tanks) that are either carbon or 316 stainless steel

Standard offering includes units rated for up to and including ANSI pressure class (application review required)

- Provides pressure vessels (tanks) available in carbon steel, 304 or 316 stainless steel materials
- Includes schedule 40, standard and 80 pipe used in the pressure vessel construction

Catalog units provided with NPT or ANSI Class 150 nozzle connection

- Makes installation easy. Inlet and outlet nozzle connections are threaded MNPT on 8 in. (203 mm) and smaller tanks. Class 150 flanged connections on 10 in. (254 mm) and larger tanks

Mounting lugs are welded onto the tank wall of all 2¹/₂ in. (64 mm) NPT and larger units

- Provides mounting support

General purpose or NEMA 4 enclosures available

- Offers easy access to terminal wiring

Flange mounting holes

- Straddles centerline to comply with industry standards

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

- Meets industry safety standards

Typical Applications

Water:

- Deionized
- Demineralized
- Clean
- Potable
- Process
- Industrial water rinse tanks
- Hydraulic oil, crude, asphalt
- Lubricating oils at API specified watt densities
- Heat transfer oil
- Paraffin
- Caustic cleaners
- Nitrogen, hydrogen and other air/gas systems
- Superheating steam

Options

WATCONNECT® Standard Control Panels



WATCONNECT® standard control panels are configured to work with Watlow's circulation heaters. They are quickly configured for process heating applications and delivered within two weeks. WATCONNECT panels integrate Watlow's high-quality heater, sensor, temperature

controller and power controller products for a complete thermal solution. Normally, competitive custom panels require significantly longer lead times. The broad range of standard features allow customers to quickly configure panels for each process heater included in this catalog.

Features and Benefits

Lead times of two weeks or less

- Provides faster delivery than competition

Full documentation provided for WATCONNECT control panels at the time of quotation

- Eliminates lengthy approval process and phone calls

Incorporates Watlow's temperature and power controllers

- Provides a turnkey solution for process heating applications

Range of standard input/output (I/O) options

- Provides the user with a higher level of monitoring and control assuring an efficient and safe operation

WATCONNECT enclosure easily mounts to wall or frame

- Decreases installation time

Note: The WATCONNECT part number associated with a heater is only a suggestion. The following installation details need to be compared to panel capabilities to assure a compatible match:

- Minimum and maximum ambient temperature where panel will be installed
- Statutory and regulatory requirements at installation site
- Sun loading, if any, at installation site
- Presence of any hazardous gases, dusts or fibers, if any
- Verification of process sensor type
- Verification of limit sensor type
- Input/Output (I/O) requirements

For additional product information see the

WATCONNECT landing page at www.watlow.com/watconnect.

On the WATCONNECT landing page you will find a complete specification sheet along with other tools to help you properly select your control panel. If you would like to know the specific configuration of a WATCONNECT part number, please use the Product Configuration Lookup Tool on Watlow.com.

Circulation Heaters



WATROD and FIREBAR Circulation Heaters

Options (Continued)

Terminal Enclosures

General purpose terminal enclosures, without thermostats, are supplied on all Watlow circulation heaters. Moisture and explosion resistant ratings are available to meet specific application needs. For screw plug terminal enclosures, refer to page 151. For flange terminal enclosures, refer to page 226.

Stand-off Terminal Enclosures

Stand-off terminal enclosures help protect terminal enclosures against excessive temperatures. For details, refer to page 221.

ASME Pressure Vessel Code Welding

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

Branch Circuits

Branch circuits are designed for 48 amperes per circuit maximum. Contact your Watlow representative for circuit requirements other than those listed in the part number tables.

Certified Enclosures

CSA, ATEX or IECEx certified enclosures protect wiring in hazardous gas environments. These terminal enclosures, covered under CSA file number 61707, ATEX certificate # SIRA 10ATEX 1155X or IECEx certificate # IECEx CSA 09.0010 are available on WATROD flange heaters. For additional information, see page 561 and 562 or contact your Watlow representative.

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
- Process temperature (°F)
- Maximum working pressure (MWP) of application (psig)
- Media being heated

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

Thermocouples

To sense process or element sheath temperature, ASTM Type J or K thermocouples are available.

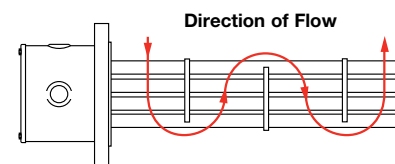
See *Screw Plug Immersion Heaters*, page 148 and *Flange Immersion Heaters*, on page 223 for details.

Thermostats

To provide process temperature control, Watlow offers optional single- and double-pole thermostats. Thermostats are typically mounted in the terminal enclosure.

See *Screw Plug Immersion Heaters*, page 147 and *Flange Immersion Heaters*, on page 222 for details.

Baffles



Baffles mounted on the heating element bundle enhance and/or modify liquid or gas flow for better heat transfer.

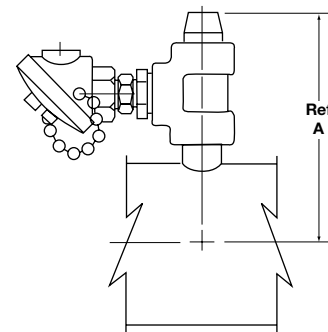
For critical sheath temperature and low flow conditions, baffles may be required.

Contact your Watlow representative for details.

Process Thermocouple in Nozzle

Note: Must specify which nozzle:

- Nozzle nearest flange or plug
- Nozzle away from flange or plug



Ref. Tank Size	Ref. Nozzle Size	Dimension "A"
1 ¹ / ₄	3/4 NPT	8 ³ / ₁₆
2 ¹ / ₂	1 NPT	8 ³ / ₁₆
3	1 NPT	8 ³ / ₁₆
4	1 ¹ / ₂ NPT	10 ³ / ₈
5	2 NPT	11 ¹ / ₁₆
6	2 ¹ / ₂ NPT	13 ³ / ₈
8	2 ¹ / ₂ NPT	14 ³ / ₈

For 10 in. (254 mm) and larger tanks contact your Watlow representative for dimension.



WATROD and FIREBAR Circulation Heaters

Options (Continued)

Sheath Materials

The following sheath materials are available on WATROD and FIREBAR heating elements:

Standard Sheath Materials

WATROD	Alloy 800/840 316 SS Copper clad steel
FIREBAR	Steel Alloy 800, 304 SS

Made-to-Order Sheath Materials

WATROD	304 SS Alloy 600 Titanium Hastelloy C276 Inconel®/Steel Monel®
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Wattages and Voltages

Watlow routinely supplies circulation heaters with 120 to 690VAC as well as wattages from 500 watts to one megawatt. If required, Watlow will configure circulation heaters with voltages and wattages outside these parameters.

For more information on special voltage and wattage configurations, contact your Watlow representative.

Pressure Vessels

All catalog pressure vessel (tank) materials consist of standard schedule and 150# class forged fittings and are made from one of the following materials:

- Carbon steel
- 316 stainless steel

All catalog pressure vessels (tanks) are steel unless otherwise noted.

316 stainless steel pressure vessels (tanks) are passivated on all wetted surfaces. Available on 2¹/₂ inch NPT and 4 or 6 inch ANSI flange circulation heaters.

Passivated Finish

For critical applications, passivation will remove free iron from all wetted surfaces.

Contact your Watlow representative for details.

Gaskets

Rubber, asbestos-free and spiral wound gaskets are available for all heater flanges, and inlet and outlet flange sizes.

Watlow recommends ordering spares in case replacement becomes necessary.

To order, specify **gasket type, flange size/rating** and **process operating temperature**.

For details on gasket materials and temperature ratings, see page 223.

Inlet and Outlet Nozzle Connections

All inlet and outlet materials are compatible with the pressure vessel material and pressure class rating.

Vessel sizes from 1¹/₄ to 8 inches are typically configured with MNPT (Male National Taper Pipe Thread) nozzles. Optional NPT and flange sizes can be supplied to mate with existing piping.

10 inch and larger vessels are supplied with Class 150 inlet and outlet flanges. Optional Class 300 or Class 600 can be provided to mate with existing piping.

To order, specify **type, size** and **pressure class** rating for both inlet and outlet nozzle/flange connections.

Protective Jacket (Shroud)

To protect circulation heaters from weather or wash-down conditions, welded (standard) outer protective jackets are available. Standard steel, or made-to-order 304 or 316 stainless steel or aluminum can be supplied. Jacket diameter is dependent upon thermal insulation thickness.

To order, specify **protective jacket, material type** and **weatherproof**, if desired.

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WATROD and FIREBAR Circulation Heaters

Technical Data

Maximum Velocities

The rate at which a gas or liquid flows through inlet and outlet pipes is critical to maintaining the desired output temperature. Pressure drop through the circulation heater must be considered to properly size blowers or pumps. The *Maximum Velocity to Avoid Excessive Pressure Drop* chart gives recommended maximum velocities, in feet per second and meters per second of gas or liquid being heated and nominal pipe size.

Maximum Velocity to Avoid Excessive Pressure Drop

Fluid	Nominal Pipe Size in.	Maximum Velocity	
		ft/sec	(m/sec)
Gases	All	200	(61.0)
Liquid	4 and smaller	10	(3.0)
Liquid	6-8	15	(5.0)
Liquid	10-12	19	(6.0)
Liquid	14-16	21	(6.4)
Liquid	18-20	23	(7.0)
Liquid	24	24	(7.3)

Vessel Orientation Guidelines

Correctly orienting the heating vessel assures lower terminal enclosure temperatures and element immersion. Detailed instructions on vessel orientation are contained in the *Installation and Maintenance Instructions* that accompanies all circulation heaters.

The following are guidelines for vessel orientation in liquid and gas heating applications.

Liquids

Orient circulation heater:

- Horizontally with inlet and outlet pipes pointing up
- Vertically with the terminal enclosure up and the inlet pipe on the bottom

These orientations ensure the heating elements will be immersed at all times and help prevent premature failure.

Air or Gases

Orient circulation heater:

- Horizontally with the inlet nozzle closest to the terminal enclosure
- Vertically with terminal enclosure at the bottom of the tank. Use the nozzle nearest the bottom as the inlet connection

If installation constraints do not allow mounting in accordance with these guidelines, contact your Watlow representative.

Application Hints

- Select the recommended heating element sheath material and watt density for the substance being heated. Use the *Supplemental Applications Chart* on pages 550 to 553. If unable to determine the correct heating element type and material, contact your Watlow representative.
- Assure selecting proper vessel by considering the pressure or flow rate, process temperature and corrosiveness of the media being heated. If assistance with vessel selection is required, contact your Watlow representative.
- For maintenance/replacement procedures, retain an area twice the circulation heater's overall length to permit easy removal and inspection of screw plug or flange heater assemblies.
- Choose a FIREBAR assembly when you require:
 - A smaller package
 - More kilowatts or lower watt density in an equally sized WATROD circulation tank
- Minimize problems associated with low flow or low liquid level conditions with a low liquid level sensor and/or sheath high-limit control.
- Ensure wiring integrity by making sure terminal enclosure temperature does not exceed 400°F (205°C).
- Size power feeder wires in accordance with National Electrical Code (NEC) guidelines and other applicable codes.
- Protect against electrical shock by properly grounding the unit per NEC requirements.
- One or more circulation heaters may be connected in series to achieve the desired total kilowatt or temperature output.

Circulation Heaters

**EXTENDED
CAPABILITY**



Extended Capabilities for WATROD and FIREBAR Circulation Heaters

Performance Capabilities

- Up to 3000psi design pressure

Features and Benefits

Offering includes units rated above ANSI pressure class 300

- Pressure vessel tanks are available in 304 and 316 “H” series stainless steel, Alloy 600, Alloy 800, Chrome Moly, Monel®, Duplex and 321 stainless steel.

Options

Exotic Sheath Materials

Contact your Watlow representative for details and availability.

Pressure Vessels

Made-to-order units can be made in a variety of materials, flange sizes and pressure classes.

To order, specify **pressure vessel (tank) size, material and pressure class**.

Ratings to ANSI class 2500 pressure class are available for high-pressure applications.

High-Temperature Thermal Insulation

To further minimize heat loss, the pressure vessel’s standard one inch thermal insulation wrap may be replaced with thicker or higher temperature insulation. For more information, contact your Watlow representative.

To order, specify **insulation thickness, standard or high temperature insulation and temperature rating**.

Vessels may be supplied with a primer coating without insulation.

To order, specify **no insulation**.

Support Saddles

To mate with an existing installation, customized support saddle(s) and/or mounting lugs are available.

To order, specify **mounting lugs or support saddles** and supply a dimensional drawing.

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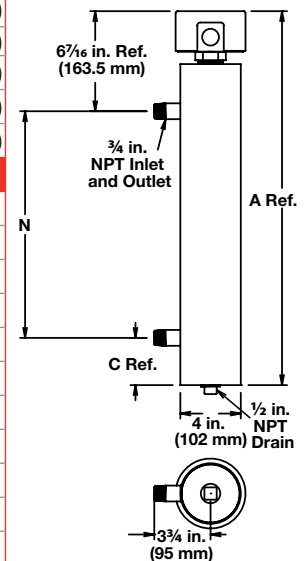


Application: Clean Water®

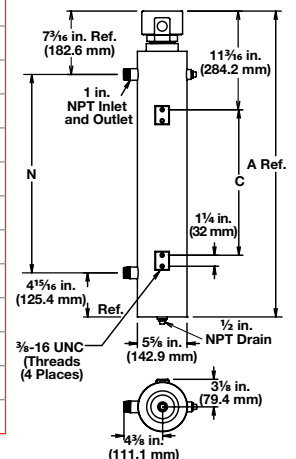
- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
1 1/4 inch NPT Screw Plug (WATROD)											
60 W/in² Steel Tank 2-Alloy 800 Elements (9.3 W/cm²)	120	3.0	1	1	CBEN15A6S	C1-15	C1-12	23 (11)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	3.0	1	1	CBEN15A6S	C1-17	C1-13	23 (11)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	4.0	1	1	CBEN19A10S	C1-17	C1-13	29 (14)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	5.0	1	1	CBEN23J10S	C/F	C/F	29 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	6.0	1	1	CBEN27J10S	C/F	C/F	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
1 1/4 inch NPT Screw Plug (FIREBAR)											
90 W/in² Steel Tank 1-Alloy 800 Element (14 W/cm²)	240	1.5	1	1	CBDNF7R10S	C1-17	C1-13	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	480	1.5	1	1	CBDNF7R11S	C/F	C/F	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	3.0	1	1	CBDNF11G10S	C1-17	C1-13	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	480	3.0	1	1	CBDNF11G11S	C/F	C/F	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	5.0	3	1	CBDNF16G3S	C2-50	C2-92	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	480	5.0	3	1	CBDNF16G5S	C2-43	C2-35	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	6.5	3	1	CBDNF19G3S	C2-50	C2-92	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	6.5	3	1	CBDNF19G5S	C2-43	C2-35	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	8.5	3	1	CBDNF24L3S	C2-50	C2-92	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	8.5	3	1	CBDNF24L5S	C2-43	C2-35	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	10.5	3	1	CBDNF29R3S	C2-236	C2-214	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	10.5	3	1	CBDNF29R5S	C2-43	C2-35	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	12.7	3	1	CBDNF34R3S	C2-236	C2-214	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	12.7	3	1	CBDNF34R5S	C2-43	C2-35	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	17.0	3	1	CBDNF45G3S	C2-236	C2-214	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
480	17.0	3	1	CBDNF45G5S	C2-43	C2-35	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
480	21.5	3	1	CBDNF55R5S	C2-225	C2-226	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
2 1/2 inch NPT Screw Plug (WATROD)											
60 W/in² Steel Tank 3-Alloy 800 Elements (9.3 W/cm²)	240	6.0	3	1	CBLN714L3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	6.0	3	1	CBLN714L5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	7.5	3	1	CBLN717L3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	7.5	3	1	CBLN717L5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	9.0	3	1	CBLN720L3S	C2-50	C2-92	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	9.0	3	1	CBLN720L5S	C2-43	C2-35	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	12.0	3	1	CBLN726C3S	C2-236	C2-214	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	12.0	3	1	CBLN726C5S	C2-43	C2-35	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	15.0	3	1	CBLN731L3S	C2-236	C2-214	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	15.0	3	1	CBLN731L5S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	18.0	3	1	CBLN737C3S	C2-236	C2-214	30 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	18.0	3	1	CBLN737C5S	C2-43	C2-35	30 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)

1 1/4 inch NPT Screw Plug



2 1/2 inch NPT Screw Plug



④ Wired for higher voltage

⑤ When steel vessel materials are used in this application, some rust may be present in the process media

C/F - Contact factory, go to www.watlow.com/en/contact-us



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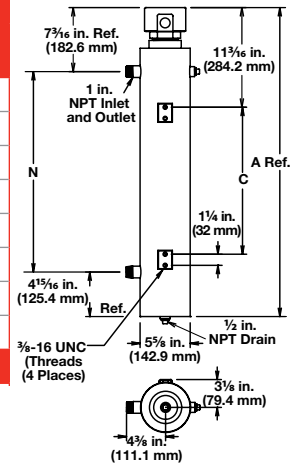


Application: Clean Water®

- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	Circ.	#	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
							Type J T/C	Type K T/C				
2 1/2 inch NPT Screw Plug (FIREBAR)												
90 W/in²® Steel Tank 3-Alloy 800 Elements (14 W/cm²)	240	15.0	3	1		CBLNF15C3S	C2-236	C2-214	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	15.0	3	1		CBLNF15C5S	C2-43	C2-35	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	20.0	3	1		CBLNF18C3S	C2-236	C2-214	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	20.0	3	1		CBLNF18C5S ®	C2-43	C2-35	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	25.0	3	1		CBLNF23C5S	C2-225	C2-226	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	32.0	3	1		CBLNF28L5S	C2-225	C2-226	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
480	38.0	3	1		CBLNF33L5S	C2-225	C2-226	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)	

2 1/2 inch NPT Screw Plug



- ③ Wired for 3-phase operation only
 - ⑤ When steel vessel materials are used in this application, some rust may be present in the process media
 - ⑧ Can be wired for 1-phase operation
- C/F - Contact factory, go to www.watlow.com/en/contact-us

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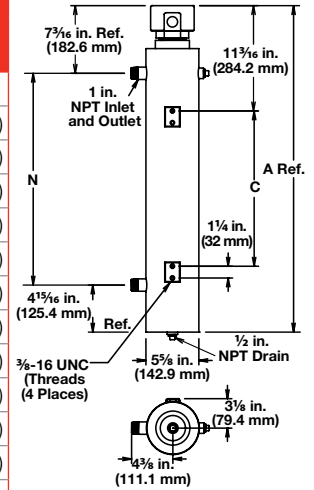


Application: Deionized or Demineralized Water

- WATROD elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
2 1/2 inch NPT Screw Plug (WATROD)											
60 W/in² 316 SS Tank 3-316 SS Elements (9.3 W/cm²) Passivated	240	6.0	3	1	CBLR714L3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	6.0	3	1	CBLR714L5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	7.5	3	1	CBLR717L3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	7.5	3	1	CBLR717L5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	9.0	3	1	CBLR720L3S	C2-50	C2-92	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	9.0	3	1	CBLR720L5S	C2-43	C2-35	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	12.0	3	1	CBLR726C3S	C2-236	C2-214	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	12.0	3	1	CBLR726C5S	C2-43	C2-35	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	15.0	3	1	CBLR731L3S	C2-236	C2-214	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	15.0	3	1	CBLR731L5S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	18.0	3	1	CBLR737C3S	C2-236	C2-214	30 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	18.0	3	1	CBLR737C5S	C2-43	C2-35	30 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)

2 1/2 inch NPT Screw Plug



Circulation Heaters



WATROD and FIREBAR Circulation Heaters

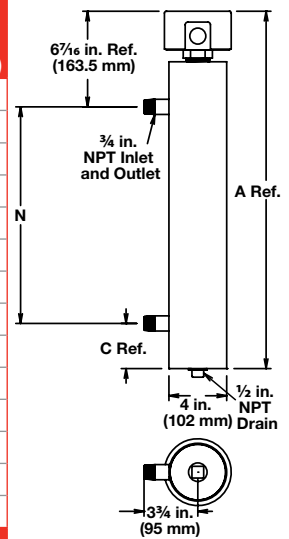


Application: Process Water[®]

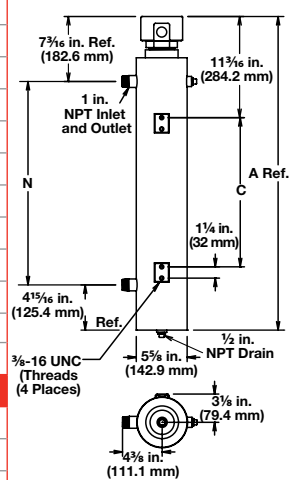
- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	Circ.	#	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
							Type J T/C	Type K T/C				
1 1/4 inch NPT Screw Plug (FIREBAR)												
45 W/in ² [®] Steel Tank 1-Alloy 800 Element (7 W/cm ²)	240	2.0	3	1	1	CBDNF13A27S	C2-50	C2-92	25 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	2.5	3	1	1	CBDNF15J27S	C2-50	C2-92	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	3.0	3	1	1	CBDNF18A27S	C2-50	C2-92	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	4.0	3	1	1	CBDNF22J27S	C2-50	C2-92	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	4.0	3	1	1	CBDNF22J28S	C2-43	C2-35	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	5.0	3	1	1	CBDNF27J27S	C2-50	C2-92	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	5.0	3	1	1	CBDNF27J28S	C2-43	C2-35	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	6.0	3	1	1	CBDNF32J27S	C2-50	C2-92	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	6.0	3	1	1	CBDNF32J28S	C2-43	C2-35	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	8.0	3	1	1	CBDNF42A27S	C2-50	C2-92	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
480	8.0	3	1	1	CBDNF42A28S	C2-43	C2-35	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
240	10.0	3	1	1	CBDNF51J27S	C2-50	C2-92	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
480	10.0	3	1	1	CBDNF51J28S	C2-43	C2-35	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
2 1/2 inch NPT Screw Plug (WATROD)												
48 W/in ² [®] Steel Tank 3-Alloy 800 Elements (7.5 W/cm ²)	240	6.0	3	1	1	CBLN717G3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	6.0	3	1	1	CBLN717G5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	7.5	3	1	1	CBLN719R3S	C2-50	C2-92	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	7.5	3	1	1	CBLN719R5S	C2-43	C2-35	26 (12)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	9.0	3	1	1	CBLN724R3S	C2-50	C2-92	27 (13)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	9.0	3	1	1	CBLN724R5S	C2-43	C2-35	27 (13)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	12.0	3	1	1	CBLN732G3S	C2-236	C2-214	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	12.0	3	1	1	CBLN732G5S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	15.0	3	1	1	CBLN739R3S	C2-236	C2-214	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	15.0	3	1	1	CBLN739R5S	C2-43	C2-35	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
240	18.0	3	1	1	CBLN747G3S	C2-236	C2-214	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)	
480	18.0	3	1	1	CBLN747G5S	C2-43	C2-35	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)	
2 1/2 inch NPT Screw Plug (FIREBAR)												
45 W/in ² [®] Steel Tank 3-Alloy 800 Elements (7 W/cm ²)	240	6.0	3	1	1	CBLNF12A27S	C2-50	C2-92	21 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	7.5	3	1	1	CBLNF14J27S	C2-50	C2-92	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	9.0	3	1	1	CBLNF17A27S	C2-50	C2-92	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	12.0	3	1	1	CBLNF21J27S	C2-236	C2-214	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	12.0	3	1	1	CBLNF21J28S	C2-43	C2-35	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	15.0	3	1	1	CBLNF26J27S	C2-236	C2-214	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	15.0	3	1	1	CBLNF26J28S	C2-43	C2-35	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	18.0	3	1	1	CBLNF31J27S	C2-236	C2-214	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	18.0	3	1	1	CBLNF31J28S	C2-43	C2-35	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	24.0	3	1	1	CBLNF41A28S	C2-225	C2-226	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
480	30.0	3	1	1	CBLNF50J28S	C2-225	C2-226	52 (24)	63 ³ / ₄ (1618)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)	

1 1/4 inch NPT Screw Plug



2 1/2 inch NPT Screw Plug



[®] When steel vessel materials are used in this application, some rust may be present in the process media
[®] Can be wired for 1-phase operation

Circulation Heaters



WATROD and FIREBAR Circulation Heaters



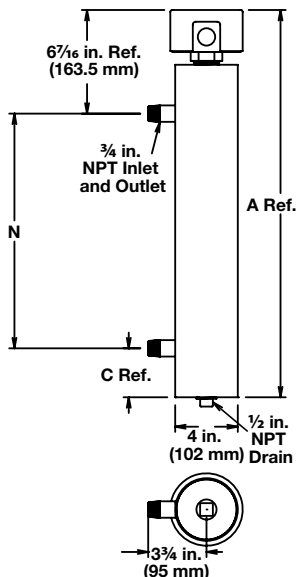
Application: Forced Air and Caustic Solutions

- WATROD elements
- Without thermostat
- General purpose enclosure

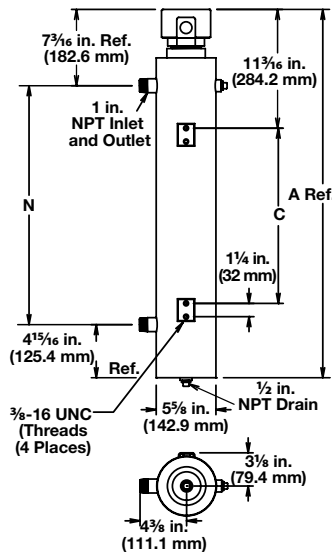
Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
1 1/4 inch NPT Screw Plug (WATROD)											
23 W/in² Steel Tank 2-Alloy 800 Elements (3.6 W/cm²)	120	1.0	1	1	CBEN13G6S	C1-15	C1-12	21 (10)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	1.0	1	1	CBEN13G6S	C1-17	C1-13	21 (10)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	120	1.5	1	1	CBEN19A6S	C1-15	C1-12	29 (14)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	1.5	1	1	CBEN19A6S	C1-17	C1-13	29 (14)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	120	2.0	1	1	CBEN24G6S	C1-15	C1-12	29 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	2.0	1	1	CBEN24G6S	C1-17	C1-13	29 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
2 1/2 inch NPT Screw Plug (WATROD)											
23 W/in² Steel Tank 3-Alloy 800 Elements (3.6 W/cm²)	240	3.0	3	1	CBLNA17G3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	3.0	3	1	CBLNA17G5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	4.5	3	1	CBLNA24R3S	C2-50	C2-92	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	4.5	3	1	CBLNA24R5S	C2-43	C2-35	27 (13)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	6.0	3	1	CBLNA32G3S	C2-50	C2-92	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	6.0	3	1	CBLNA32G5S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	7.5	3	1	CBLNA39R3S	C2-50	C2-92	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	7.5	3	1	CBLNA39R5S	C2-43	C2-35	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	240	9.0	3	1	CBLNA47G3S	C2-50	C2-92	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	9.0	3	1	CBLNA47G5S	C2-43	C2-35	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)

④ Wired for higher voltage

1 1/4 inch NPT Screw Plug



2 1/2 inch NPT Screw Plug



Circulation Heaters



WATROD and FIREBAR Circulation Heaters

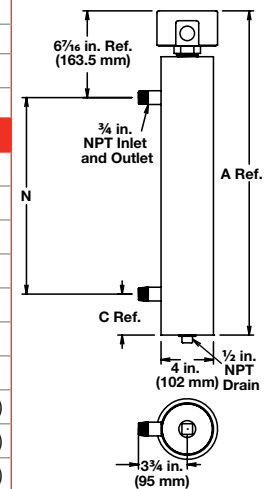


Application: Lightweight Oils and Heat Transfer Oils

- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
1 1/4 inch NPT Screw Plug (WATROD)											
23 W/in² Steel Tank	120	1.5	1	1	CBES19G6S	C1-15	C1-12	29 (14)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	1.5	1	1	CBES19G6S	C1-17	C1-13	29 (14)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
2-Steel Element (3.6 W/cm²)	120	2.0	1	1	CBES25G6S	C1-15	C1-12	29 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 (76.0)
	240	2.0	1	1	CBES25G6S	C1-17	C1-13	29 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 (76.0)
1 1/4 inch NPT Screw Plug (FIREBAR)											
30 W/in² Steel Tank	240	1.7	3	1	CBDNF16G12S	C2-50	C2-92	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	480	1.7	3	1	CBDNF16G13S	C2-43	C2-35	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
1-Alloy 800 Element (4.7 W/cm²)	240	2.2	3	1	CBDNF19G12S	C2-50	C2-92	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	2.2	3	1	CBDNF19G13S	C2-43	C2-35	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	2.8	3	1	CBDNF24L12S	C2-50	C2-92	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	2.8	3	1	CBDNF24L13S	C2-43	C2-35	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	3.5	3	1	CBDNF29R12S	C2-50	C2-92	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	3.5	3	1	CBDNF29R13S	C2-43	C2-35	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	4.3	3	1	CBDNF34R12S	C2-50	C2-92	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	4.3	3	1	CBDNF34R13S	C2-43	C2-35	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	5.7	3	1	CBDNF45G12S	C2-50	C2-92	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	480	5.7	3	1	CBDNF45G13S	C2-43	C2-35	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	240	7.2	3	1	CBDNF55R12S	C2-50	C2-92	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	480	7.2	3	1	CBDNF55R13S	C2-43	C2-35	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
1 1/4 inch NPT Screw Plug (FIREBAR)											
23 W/in² Steel Tank	240	1.25	3	1	CBDNF16G20S	C2-50	C2-92	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	1.65	3	1	CBDNF19G20S	C2-50	C2-92	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
1-Alloy 800 Element (3.6 W/cm²)	240	2.15	3	1	CBDNF24L20S	C2-50	C2-92	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	2.15	3	1	CBDNF24L19S	C2-43	C2-35	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	2.65	3	1	CBDNF29R20S	C2-50	C2-92	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	2.65	3	1	CBDNF29R19S	C2-43	C2-35	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	3.20	3	1	CBDNF34R20S	C2-50	C2-92	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	3.20	3	1	CBDNF34R19S	C2-43	C2-35	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	4.25	3	1	CBDNF45G20S	C2-50	C2-92	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	480	4.25	3	1	CBDNF45G19S	C2-43	C2-35	69 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	240	5.40	3	1	CBDNF55R20S	C2-50	C2-92	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	480	5.40	3	1	CBDNF55R19S	C2-43	C2-35	71 (33)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)

1 1/4 inch NPT Screw Plug



④ Wired for higher voltage

Circulation Heaters



WATROD and FIREBAR Circulation Heaters

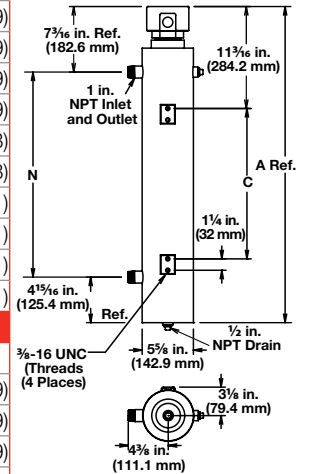


Application: Lightweight Oils and Heat Transfer Oils

- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
2 1/2 inch NPT Screw Plug (WATROD)											
23 W/in² Steel Tank 3-Steel (3.6 W/cm²)	240	3.0	3	1	CBL5717E3S	C2-50	C2-92	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	3.0	3	1	CBL5717E5S	C2-43	C2-35	24 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	4.5	3	1	CBL5724N3S	C2-50	C2-92	27 (13)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	4.5	3	1	CBL5724N5S	C2-43	C2-35	27 (13)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	6.0	3	1	CBL5732E3S	C2-50	C2-92	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	6.0	3	1	CBL5732E5S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	7.5	3	1	CBL5739N3S	C2-50	C2-92	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	7.5	3	1	CBL5739N5S	C2-43	C2-35	31 (14)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	240	9.0	3	1	CBL5747E3S	C2-50	C2-92	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
480	9.0	3	1	CBL5747E5S	C2-43	C2-35	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)	
2 1/2 inch NPT Screw Plug (FIREBAR)											
30 W/in² Steel Tank 3-Alloy 800 Elements (4.7 W/cm²)	240	5.0	3	1	CBLNF15C12S	C2-50	C2-92	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	5.0	3	1	CBLNF15C13S	C2-43	C2-35	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	6.5	3	1	CBLNF18C12S	C2-50	C2-92	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	6.5	3	1	CBLNF18C13S	C2-43	C2-35	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	8.5	3	1	CBLNF23C12S	C2-50	C2-92	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	8.5	3	1	CBLNF23C13S	C2-43	C2-35	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	10.5	3	1	CBLNF28L12S	C2-236	C2-214	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	10.5	3	1	CBLNF28L13S	C2-43	C2-35	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	12.8	3	1	CBLNF33L12S	C2-236	C2-214	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	12.8	3	1	CBLNF33L13S	C2-43	C2-35	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	17.0	3	1	CBLNF44C12S	C2-236	C2-214	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	17.0	3	1	CBLNF44C13S	C2-43	C2-35	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	21.5	3	1	CBLNF54L13S	C2-225	C2-226	52 (24)	63 ³ / ₄ (1618)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)
2 1/2 inch NPT Screw Plug (FIREBAR)											
23 W/in² Steel Tank 3-Alloy 800 Elements (3.6 W/cm²)	240	3.80	3	1	CBLNF15C20S	C2-50	C2-92	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	4.90	3	1	CBLNF18C20S	C2-50	C2-92	23 (11)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	6.40	3	1	CBLNF23C20S	C2-50	C2-92	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	6.40	3	1	CBLNF23C19S	C2-43	C2-35	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	7.90	3	1	CBLNF28L20S	C2-50	C2-92	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	7.90	3	1	CBLNF28L19S	C2-43	C2-35	34 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	9.60	3	1	CBLNF33L20S	C2-50	C2-92	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	9.60	3	1	CBLNF33L19S	C2-43	C2-35	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	12.80	3	1	CBLNF44C20S	C2-236	C2-214	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	12.80	3	1	CBLNF44C19S	C2-43	C2-35	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	240	16.10	3	1	CBLNF54L20S	C2-236	C2-214	52 (24)	63 ³ / ₄ (1618)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)
	480	16.10	3	1	CBLNF54L19S	C2-43	C2-35	52 (24)	63 ³ / ₄ (1618)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)

2 1/2 inch NPT Screw Plug



③ Wired for 3-phase operation only
 ⑧ Can be wired for 1-phase operation

Circulation Heaters



WATROD and FIREBAR Circulation Heaters



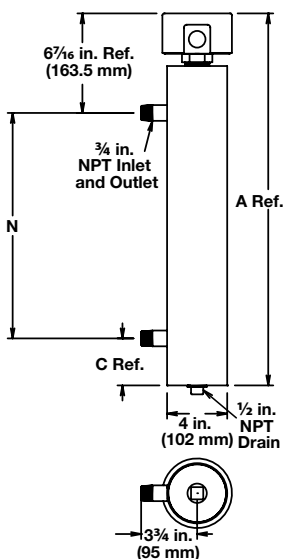
Application: Bunker C, Asphalt and #6 Fuel Oil

- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

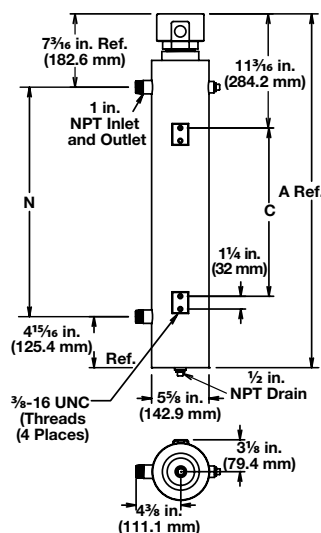
Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
1 1/4 inch NPT Screw Plug (FIREBAR)											
8 W/in² ③ Steel Tank 1-Alloy 800 Element (1.3 W/cm²)	240	0.43	3	1	CBDNF16G22S	C2-50	C2-92	26 (12)	24 ⁵ / ₈ (625.5)	15 (381)	3 ¹ / ₈ (79.4)
	240	0.55	3	1	CBDNF19G22S	C2-50	C2-92	30 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	0.70	3	1	CBDNF24L22S	C2-50	C2-92	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	480	0.70	3	1	CBDNF24L21S	C2-43	C2-35	31 (14)	32 ⁵ / ₈ (828.7)	23 (584)	3 ¹ / ₈ (79.4)
	240	0.88	3	1	CBDNF29R22S	C2-50	C2-92	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	0.88	3	1	CBDNF29R21S	C2-43	C2-35	43 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	1.08	3	1	CBDNF34R22S	C2-50	C2-92	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	480	1.08	3	1	CBDNF34R21S	C2-43	C2-35	44 (20)	42 ⁵ / ₈ (1082.7)	32 (813)	4 ³ / ₈ (111.1)
	240	1.40	3	1	CBDNF45G22S	C2-50	C2-92	69 (31)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	480	1.40	3	1	CBDNF45G21S	C2-43	C2-35	69 (31)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
	240	1.80	3	1	CBDNF55R22S	C2-50	C2-92	71 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)
480	1.80	3	1	CBDNF55R21S	C2-43	C2-35	71 (32)	63 ⁵ / ₈ (1616.1)	53 (1346)	4 ³ / ₈ (111.1)	
2 1/2 inch NPT Screw Plug (WATROD)											
8 W/in² ③ Steel Tank 3-Steel Elements (1.3 W/cm²)	240	2.0	3	1	CBLS732E12S	C2-50	C2-92	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	2.0	3	1	CBLS732E13S	C2-43	C2-35	29 (14)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	3.0	3	1	CBLS747E12S	C2-50	C2-92	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	3.0	3	1	CBLS747E13S	C2-43	C2-35	32 (15)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)

③ Wired for 3-phase operation only

1 1/4 inch NPT Screw Plug



2 1/2 inch NPT Screw Plug



Circulation Heaters



WATROD and FIREBAR Circulation Heaters



Application: Bunker C, Asphalt and #6 Fuel Oil

- WATROD or FIREBAR elements
- Without thermostat
- General purpose enclosure

Description	Volts	kW	Ph	# Circ.	Part Number	WATCONNECT Part Number		Ship Wt. lbs (kg)	"A" Dim. in. (mm)	"N" Dim. in. (mm)	"C" Dim. in. (mm)
						Type J T/C	Type K T/C				
2 1/2 inch NPT Screw Plug (FIREBAR)											
8 W/in² ③ Steel Tank 3-Alloy 800 Elements (1.3 W/cm²)	240	1.25	3	1	CBLNF15C22S	C2-50	C2-92	22 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	1.63	3	1	CBLNF18C22S	C2-50	C2-92	23 (10)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	2.13	3	1	CBLNF23C22S	C2-50	C2-92	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	480	2.13	3	1	CBLNF23C21S	C2-43	C2-35	31 (14)	34 ³ / ₄ (881)	22 ¹ / ₂ (572)	16 ¹ / ₂ (419)
	240	2.63	3	1	CBLNF28L22S	C2-50	C2-92	34 (15)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	2.63	3	1	CBLNF28L21S	C2-43	C2-35	34 (15)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	3.19	3	1	CBLNF33L22S	C2-50	C2-92	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	480	3.19	3	1	CBLNF33L21S	C2-43	C2-35	35 (16)	44 ³ / ₄ (1135)	32 ¹ / ₂ (826)	26 ¹ / ₂ (673)
	240	4.25	3	1	CBLNF44C22S	C2-50	C2-92	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	480	4.25	3	1	CBLNF44C21S	C2-43	C2-35	44 (20)	57 ¹ / ₄ (1453)	45 (1143)	39 (991)
	240	5.38	3	1	CBLNF54L22S	C2-50	C2-92	52 (24)	63 ³ / ₄ (1453)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)
	480	5.38	3	1	CBLNF54L21S	C2-43	C2-35	52 (24)	63 ³ / ₄ (1453)	51 ¹ / ₂ (1308)	46 ¹ / ₂ (1181)

2 1/2 inch NPT Screw Plug

