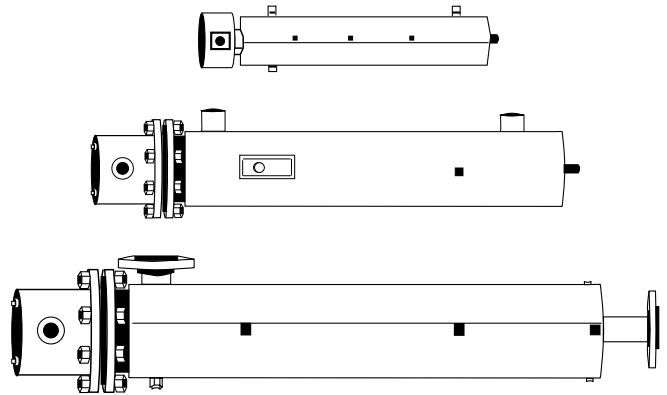


CIRCULATION HEATERS

Heaters Designed to Heat Forced-Circulation Air, Gases or Liquids



Features

- Standard screw plugs and flanges feature a wide selection of WATROD and FIREBAR elements to meet specific application requirements

- Flange ratings meet recognized agency standards. 150 lb. pressure class per ANSI B16.5 on: 4 or 6 inch FIREBAR element flanges; 3 to 14 inch WATROD element flanges

- FIREBAR assemblies

- Compacted MgO insulation filled elements

- Thermal insulated vessels

- Heavy-gauge steel jacket (shroud)

- All catalog units rated to ANSI pressure Class 150

- NPT or ANSI Class 150 nozzle connections

Benefits

- Wide variety of assemblies to meet demands of many applications

Type	Sizes (inch)
NPT	1½, 2½
Screw Plugs	
ANSI flanges	3, 4, 5, 6, 8, 10, 12, 14

- Compatible with standard industry piping and safety standards

- Pack more wattage in a smaller heater bundle and overall package

- Maximize dielectric strength, heat transfer and life

- Reduces heat loss from the vessel

- Protects and restrains thermal insulation

- Compatible with standard industry piping and safety standards

- Make installation easy; inlet and outlet nozzle connections are: threaded MNPT on 8 inch and smaller tanks; class 150 flanged connections on 10 inch and larger tanks

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



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CIRCULATION HEATERS

Features *continued*

- Mounting lugs flushed with outer insulation jacket
- Flange mounting holes
- Standard, general purpose (NEMA 1) terminal enclosures
- UL® and CSA component recognition under files #E52951 and 31388 respectively
- Branch circuits to a maximum of 48 amps per circuit

Benefits *continued*

- Provide easy mounting support
- Straddle centerline to comply with industry standards
- Offer easy access to terminal wiring while providing worker safety
- Designed for safety
- Meets National Electric Code (NEC) safety standards

Options

Terminal Enclosures

General purpose (NEMA 1) terminal enclosures, without thermostats, are supplied on all Watlow circulation heaters. Moisture and explosion resistant ratings are available to meet specific application needs.

Stand-Off Terminal Enclosures

Stand-Off terminal enclosures help protect terminal enclosures against excessive temperatures.

CSA Certified Enclosures

To meet agency recognition requirements, CSA certified moisture and/or explosion resistant terminal enclosures are available.

Thermostats

To provide process temperature control, Watlow offers optional single and double pole thermostats.

Thermostats are typically mounted in the terminal enclosure. Optional side mounting on vessel also available.

Thermocouples

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

Wattages and Voltages

Watlow routinely supplies circulation heaters with 120 to 600VAC as well as wattages from 500 watts to 1 megawatt. If required, Watlow will configure circulation heaters with voltages and wattages outside these parameters.

Branch Circuits

Branch circuits are subdivided by National Electric Code (NEC) requirements to a maximum of 48 amps per circuit.

Sheath Materials

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

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

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.

Performance Capabilities

- Watt densities to 120 W/in² (18.6 W/cm²)
- Wattages to 1 megawatt
- UL and CSA component recognition to 480VAC and 600VAC respectively
- Ratings to 600 lb pressure class
- Incoloy® sheath temperatures to 1600°F (870°C)
- Passivated 316 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)

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

CIRCULATION HEATERS

Pressure Vessels

All standard pressure vessel (tank) materials are rated to 150 lb and made from:

- 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 from Assembly Stock on 2½ inch NPT and 4 or 6 inch ANSI flange circulation heaters.

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

ANSI ratings to 600 lb are available for high-pressure applications. For pressure class ratings above 600 lb, as well as other vessel materials, consult Watlow Process Systems in Troy, Missouri.

Passivated Finish

For critical applications, passivation will remove free iron from all wetted surfaces. Consult factory for details.

Gaskets

Rubber, asbestos-free and spiral wound gaskets are available for all heater flange, and inlet and outlet flange sizes. Watlow recommends ordering spares in case replacement becomes necessary.

Inlet and Outlet Nozzle Connections

All inlet and outlet materials are compatible with the pressure vessel material and pressure class rating. Vessel sizes from 1¼ to 8 inches are typically configured with MNPT (Male National 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.

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. Vessels may be supplied with a primer coating without insulation.

Protective Steel Jacket (Shroud)

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

Support Saddles

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

Control Boxes / Skid Mounted Packages

Circulation heaters can be supplied with control boxes or control panels. To ease field installation, both the heater and control package can be fully interconnected. These may incorporate circulation heaters and control boxes from Watlow Industries.

Ordering Information

How to Order

To order a stock circulation heater, please specify:

- Watlow code number (from Watlow Heater's Catalog)
- Volts / watts
- Phase
- Flange or screw plug size
- Tank material
- Options
- Quantity

If stock units do not meet your application needs, Watlow can provide Made-to-Order heaters. Please provide:

- Application (including vessel orientation)
- Volts / watts
- Phase
- Number of circuits
- Watt density
- Sheath material and number of heating elements
- Flange or screw plug size
- Tank material
- Inlet and outlet mating type and size
- Centerline of inlet and outlet
- Terminal enclosure type
- Options
- Quantity

Availability

Assembly Stock: 5-7 working days

Modified Stock^①: 5-10 working days

Standard: 10 working days

Made-to-Order: 6-8 weeks

^①Assembly Stock units with catalog options.

Options, complexity and quantity may affect availability and leadtimes. Consult factory.