BCE
BELILOVE COMPANY-ENGINEERS

CIRCULATION HEATERS

immersion heaters

OVERVIEW

BCE INC circulation **and Smartflow** heaters are the perfect solution for generating heat and enhancing normal immersion heaters performance. They are designed to heat pressurized circulating fluids to provide effective, controlled heating to water, oil, steam and other gases.

Circulation heaters are composed of all-in-one units with a heater mounted inside an insulated tank. They are made of a flanged or a screwplug immersion heater that is inserted into a pressure vessel or a pipe body. Heaters have inlet and outlet piping where the liquid or gas goes through the tank in order to reach the desired temperature.

KEY FEATURES

- Standard sizes: 1.25" NPT screwplug size to 14" diameter
- Steel vessels fitted with 150 lb. flanges
- Thermal insulated vessels
- Custom unit sizes: up to 44" nominal pipe size
- Custom-designed to meet your specifications
- Special sizes, wattages, and materials are available upon request
- Units are available with larger vessels and heavier flanges
- Supplied with stainless steel parts and special design terminal boxes use in high temperature conditions

BENEFITS

- Easy to install
- Compact
- Clean
- Durable
- Highly energy efficient
- Provide fast response and even heat distribution
- Provide greater wattage in a smaller heater bundle
- Provide maximum dielectric strength
- Reduce heat loss from the vessel
- Protect and prevent thermal insulation
- Easy mounting support
- Suitable to general purpose terminal enclosures, weather or moisture resistant terminal enclosures, and unsafe or explosion proof locations
- Compatible with standard industry piping and safety standards
- Designed and built for safety

FIG.1 – BCE INC Standard Unit

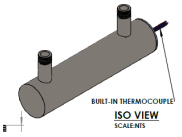


FIG.1A– BCE INC Smartflow

FACTORS

Please consider the following factors in order to select the proper circulation heater:

- Operating temperature
- Heating element watt density
- Sheath material (corrosive or non corrosive)
  - Temperature of the corrodent
  - Degree of aeration of exposed corrodent
  - Velocity of the corrodent

REGISTRATION

Circulation heaters are sometimes considered as boilers or pressure vessels according to the:

- Heated fluid
- KW rating
- Size of vessel
- Operating pressure
- Outlet temperature

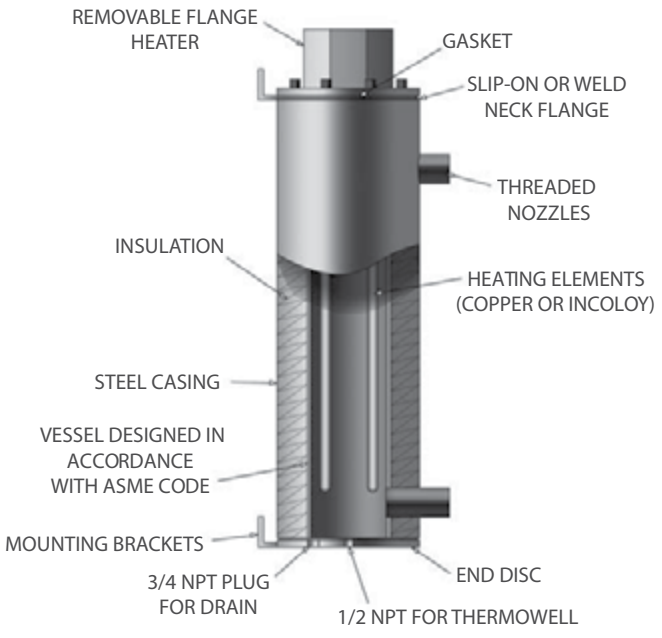
Where applicable, registration requirements are imposed by law and according to the installation location.

EXTRA FEATURES

- Available built-in high limit controls and thermostats
- Standard built-in thermostats: Single pole device limited to 240V up to 30 amps
- For heater voltage over 240V, or heater currents over 30 amps, or three-phase supply, the thermostat is used for pilot duty only and is not factory wired to the elements.

Please call us at **510-274-1990** if you need further assistance.

FIG.2 – CONSTRUCTION – Features and Components



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GENERAL PRINCIPLES:

- The heat you get from an electric heater will leave the heater, as opposed to the steam or liquid heat exchanger.
- Even when the surface area in contact with the application is properly fixed, the sheath temperature of the heating element will increase until the heat achieved is similar to the heat that is transferred to the process.
- Low watt density heaters last longer than high density heaters, particularly with viscous or stagnant liquids. Low density heaters are however more expensive.

For larger systems, please call us at **510-274-1990** for further assistance.

WARNING:

Selecting the wrong watt density can damage the product and control systems that are in place, and cause the heater to fail.

SELECTING BCE INC CIRCULATION HEATER

When heating liquids (forced flow and natural flow heating loops):

- Make sure that the heater vessel remains totally filled when in use
- Use a circulator pump to achieve forced flow heating for heavier liquids or high temperature liquids heating purposes
- Set natural flow systems to "side arm" water heating applications
- Mount the heater in the vertical position where top of the heater is below the minimum liquid level of the tank

When heating gases (steam superheating, heating compressed air, nitrogen, ammonia):

- Make sure that there is enough flow in order to maintain the maximum allowable vessel and sheath temperatures.

NEED ASSISTANCE?

Please call us at **510-274-1990** if you still need further assistance in selecting the circulation heater that best suits the requirements of your application.

HOW TO INSTALL:

The following figures show the proper vertical or horizontal mountings for vessels.

FIG.3 – LIQUID HEATING or LOW TEMPERATURE GAS HEATING - **VERTICAL INSTALLATION**

FIG.4 – GAS or LIQUID HEATING **HORIZONTAL INSTALLATION**

FIG.5 – HIGH TEMPERATURE GAS HEATING **VERTICAL INSTALLATION**

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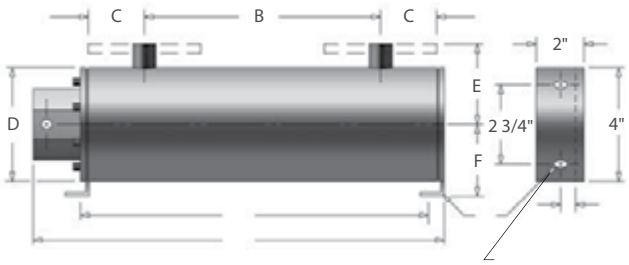
EXAMPLE OF CIRCULATION HEATERS... GENERAL RECOMMENDATIONS - (ALSO APPLICABLE TO: 4" 5" 6" 8" 10" 12" 14" Circulation Heaters)

APPLICATIONS	SHEATH MATERIAL	HEATER TYPE
Water or aqueous solutions not corrosive to the steel vessel and copper sheath Dishwashing and rinsing Hot water storage tanks Process water	Copper	Circultation, Smartflow
Water, such as spray washing and added chemical additives	Incoloy®	Circulation, Smartflow
Circulated oils Molding dies and platens Closed loop heat transfer systems Process liquids not corrosive to steel and incoloy® Compressed air or other gases	Steel	Circulation, Smartflow
Fluid heat transfer devices Tars High to low viscous petroleum oils Asphalt - Wax - Molten salt	Low Carbon Steel	Circulation, Smartflow
Deionized water	Stainless	Circulation, Smartflow

Note: When heating compressed air or gases, please verify if you need lower density heaters for high viscosity liquids or high temperature, low flow steam or gas heating systems. Call us at **510-274-1990** for technical assistance.

HEATER DIMENSIONS IN: mm (in.)

VESSEL SIZE	A	B	C	D	E	F	G
Example Dimensions	1060 (41.7)	780 (30.7)	85 (3.3)	190 (7.5)	235 (9.3)	135 (5.3)	945 (37.2)



WHEN ORDERING, PLEASE SPECIFY: Quantity, voltage, phase, wattage, material to be heated, flowing or static mediums, types of controls to be applied, type of metal or alloy of the container, any extra features.