

CIRCULATION HEATERS



Circulation heater is basically an immersion heater covered by an anti-corrosion metallic vessel chamber. It is accompanied by National Pipe Thread (NPT) screw plug or ANSI flange heater assemblies mated with a pressure vessel. The vessel is mainly used to provide insulation to prevent heat loss in the circulation system. An inlet flange transports the fluid into the circulation system, which is then circulated and heated until the desired temperature is reached. The heating medium will then flow out of the output flange at a fixed flow rate decided by the temperature control mechanism. Since it is a compact heating system, the operation is fast and executed in a short time. The heat generated is evenly distributed and the efficiency of the heater is high. Drain valves are also provided to remove leftover fluids or residues. Temperature sensors can be used with any control to achieve the desired temperature range. To manage the liquid flow rate of the heater, the wattage can be manipulated. When the requirement is such that liquid is to be pumped around anyway, a circulation heater is a logical choice.

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. Such kinds of heaters are ideal for processing fluid, including hazardous liquids that require

intermediate heating while maintaining viscosity and flow rate, waste oil, steam, gases, and liquids like DE-ionized water for use in semiconductor and electronics industries. These heaters are specially used to heat up vegetable oils efficiently, so proper viscosity is maintained during food manufacturing using indirect heating. For maintaining correct viscosity, lower watt densities are recommended. Also no additional terminal box is necessary for this application.

OPTIONS

Sheath Material	Copper, Steel, 316 Stainless steel, INCOLOY
Kilowatt Ratings	500 KW or lesser
Wearing Watt density	6.5, 15, 23, 45, 65 W/in ² or 1.0, 2.3, 3.5, 6.9, 11.6, 15.5 W/cm ²
Flange & Vessel Material	Carbon steel, Stainless steel
Flange size	Up to 42 inches
Flange Rating	Up to 2500 lb pressure class ANSI
Terminal Enclosure	IP 54 Standard Terminal Box IP 66 Water Proof Terminal Box
Control	Thermocouple, RTD, Thermostat, Digitally controlled
Terminal Enclosure Standoff	4 or 6 inches
Terminal Seals	silicon resin, silicone fluid, RTV, epoxy or hermetic

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Standard Size	1.25" NPT Screw Plug size to 14" diameter
Flange Gasket	Standard, Spiral wound or any other
Thermal Insulation	Standard, High temperature or weather proof jacket
Mounting position	Horizontal or Vertical
Diameter	0.26, 0.315, 0.375, 0.43, 0.475 inch or 6.5, 8, 9.5, 11 and 12 mm

Different alloys and materials can be used to suit specific applications. The table below shows working temperatures and watt densities of variety of materials

Sheath Material	Maximum Operating Temperatures		Maximum Watt Density	
	°F	°C	W/in ²	W/cm ²
INCOLOY	1600	870	60	9.3
316 stainless steel	1200	650	60	9.3
Steel	750	400	30	4.6

Some of the typical applications of circulation heaters with their specific attributes are shown in the table below.

APPLICATIONS

Application	Sheath Material	Flange Material
Clean water, hot water storage, portable water, freeze protection of liquid	Copper	Steel
Hot water, steam boilers, mildly corrosive solutions (in rinse tanks, spray washers), vapor degreasers	Incoloy	Steel
Oils (light or medium), Gases, hydraulic oil, stagnant or heavy oils, lubricating oil, crude asphalt	Steel	Steel
Process water, soap and detergent solutions, Boiler and water heaters, deionized water, chemical baths, mildly corrosive solutions	Stainless Steel	Stainless Steel
Severe corrosive solutions, demineralized water, food equipment	Incoloy	Stainless Steel

FEATURES

- Thermal insulation provided to prevent heat loss
- Mounting lugs provided for support
- Different terminal enclosures available for easy wiring
- Digitally controlled for precision
- Baffles and flange mounting holes provided.
- Easy to install, compact, clean and durable
- Works in conjunction with control panels
- Custom designed to meet specifications.
- Highly energy efficient and provide maximum dielectric strength.
- Compatible with standard industry piping and safety standards.
- Gaskets and mounting lugs provided as per specifications.

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