

Heater Options

Built-In Thermostat - For fluid temperature control or high limit control. Available in NEMA 1 or liquidproof boxes. See page 21 for outlet box dimensions. Thermostat suitable for pilot duty operation only.

Specify temperature range:

0-100° F, 40-120° F, 60-250° F or 150-550° F

Pilot duty rating:

125 VA up to 240 Volts

Integral Thermostat Well - To protect and locate the bulb of a remotely mounted thermostat. Specify well length below flange and inside diameter if the thermostat is supplied by others.

Thermocouple Attached to Sheath - To monitor or limit the sheath temperature. Thermocouple is field-connected to control or to indicating device through jacks furnished in the outlet box. Type K Chromel-Alumel thermocouples with 316 stainless steel sheath, suitable for 1500° F maximum, are standard. Thermocouple is attached to an element in the first circuit near the U-bend unless an alternate location is specified.

Liquidproof/Explosion-Resistant Outlet Boxes - Steel boxes with threaded or bolted cover and female threaded hubs for electrical connections. For applications where there is danger of moisture entering the outlet box or for hazardous locations classified by the National Electrical Code. Consult factory for other types of hazard.

Hermetic Seals - For applications where an absolute moisture seal is required. Each element is fitted with ceramic-to-metal hermetic seals, which are airtight and impervious to outside influences. Seals are designed for terminal temperatures up to 1000° F.

Epoxy Seals - For moisture resistance where the fluid temperature does not exceed 250° F. Each element is sealed with epoxy as a barrier against moisture entering the element. Furnished as standard on copper-sheathed heaters.

RTV Seals - For moisture resistance where the fluid temperature does not exceed 400° F.

ASME partial stamp - Please provide design temperature, pressure and corrosion allowance.

Low flow spacers - For applications inside vessels where the pressure drop is critical.

Class 150 Stainless Steel Flanges - Type 304 stainless steel flanges are available where steel flanges may corrode and for fluid temperatures above 800° F. Stainless steel, Incoloy or Inconel elements are welded to the flange; copper elements are silver soldered. See page 19 for pressure/temperature ratings. Consult factory for higher pressure ratings.

Class 300 Steel Flanges - For use where pressure and/or temperature exceed the ratings of standard Class 150 flanges. See Table III for pressure/temperature ratings. Consult factory for steel flanges rated over Class 300, flanges rated Class 600, 900 and 1200 are available with extended lead times.

Larger Flanges - For added KW capacity, or to reduce pressure drop through the heater, larger flanges are available. Standard ANSI flanges available up through 26".

Special Flange Materials - Type 316 stainless steel, Incoloy 800, Inconel 600 and Monel 400 flanges are available with elements of matching sheath material for applications where all wetted surfaces are subject to the same corrosion requirements.

Spirallic Gaskets - Spiral wound Type 304 stainless steel gaskets recommended for extremes in joint relaxation, temperature or pressure cycling, shock or vibration.

Insulated Flange - Ceramic wool insulation 3" thick is used to reduce heat transfer from the fluid into the terminal box. Recommended for fluid temperatures over 500° F where the fluid temperature exceeds the field wiring insulation rating by more than 50° F, and for dual-purpose heating/cooling applications to prevent condensation in the terminal box during the cooling cycle.

Longer Element Cold Ends - Standard cold ends, 2" for copper, stainless and steel; 5" for Incoloy. In vertically mounted heaters and other applications where the liquid will not completely cover the elements, immersion length should be increased by the length of additional cold end.

Longer Elements - Immersion lengths up to 192" available for applications requiring lower watt densities or heat distribution throughout a long vessel.

Special Bending Configurations - For unusual tank designs or to keep elements covered at all times. For example, elements are normally curved or bent for lube oil reservoirs on shipboard to assure coverage as the ship rolls.



Flange Heaters

Heater Options (continued)

Special Sheath Material - For compatibility with fluid composition and fluid temperature. See Table I for material recommendations. Monel 400, Inconel 600 and Type 316 stainless steel are available.

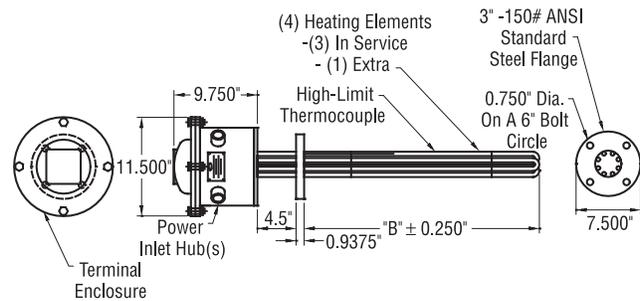
Iron Content - In critical processes where no trace of iron can be tolerated, stainless steel heaters can be electropolished before installation.

Additional Circuits - For staged control of heater load. Standard number of heater stages shown in listing tables. Additional stages available consistent with number of elements. (Multiple of three elements required for three-phase circuits.)

Special Ratings - Non-standard KW ratings and special watt densities, required for certain fluids, are available.

Agency Approval - Most pipe flange heaters listed have been approved by CSA (Canadian Standards Association) under File No. LR11895-35. Ratings available up to 600 volts.

Explosion-proof pipe flange heaters have been approved by FM (Factory Mutual), CSA and L.C.I.E. (French Approval Agency) for use in Class I; Divisions 1, 2; Groups B, C, D hazardous locations. These explosion-proof immersion heater approvals include testing to the requirements of European CENELEC Standards EN50014 and EN50018. Consult factory for more information.



Compliance with Military Specifications - Heaters are available to meet a variety of military specifications. For example, for heating lubricating oil on shipboard, we furnish heaters per MIL-H-24299 with hermetic seals and liquidproof outlet boxes, tested per the specification. For water purification, we have furnished heaters per MIL-H-22577C. For heating hydraulic fluid, we have furnished heaters per MIL-S-901 and MIL-STD-167 covering special shock and vibration requirements.

High Temperature Construction - When the outlet box temperature exceeds 250° F, mica terminal insulators are furnished, and properly sized lugs and conduit openings for incoming wiring are provided. Above 500° F an extended terminal box is standard.