INTRODUCTION TO FLANGED IMMERSION HEATERS

- Hot Water Storage Tanks
- Warming Equipment
- Preheating All Grades of Oil
- Food Processing Equipment
- Cleaning and Rinsing Tanks
- Heat Transfer Systems
- Process Air Equipment
- Boiler Equipment
- Freeze Protection of any Fluid

300 kW flange immersion heater--for heating gas to 538°C (1000°F); 126 Incoloy sheath elements in a 50 cm (20") flange, heat shield (not shown) and element supports.

DESCRIPTION

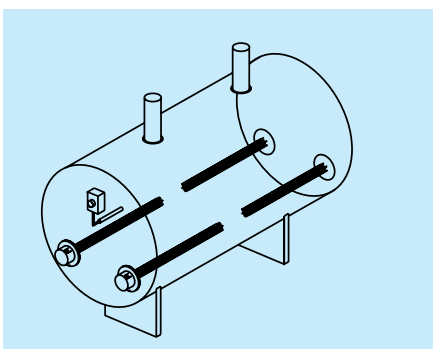
Flanged immersion heaters consist of hairpin bent tubular elements welded or brazed into a flange and provided with wiring boxes for electrical connections. Flange heaters are installed by bolting to a matching flange welded to the tank wall or nozzle. A wide selection of flange sizes, kilowatt ratings, voltages, terminal housings and sheath materials makes these heaters ideal for all types of heating applications.

APPLICATIONS

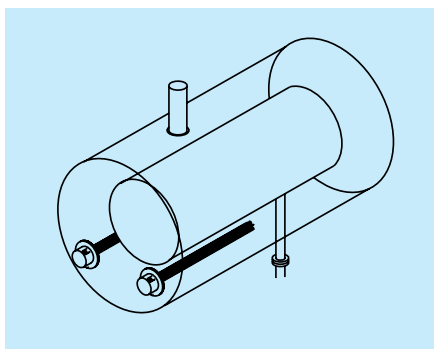
Flanged immersion heaters are one of the most widely used methods for heating gases and liquids (such as water, oil, heat transfer fluid and corrosive solutions). Designed for use in tanks and pressurized vessels, they are easy to install and maintain to provide heat for many processes. The direct immersion method is energy efficient and easily monitored and controlled.

CAUTION AND WARNING!
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

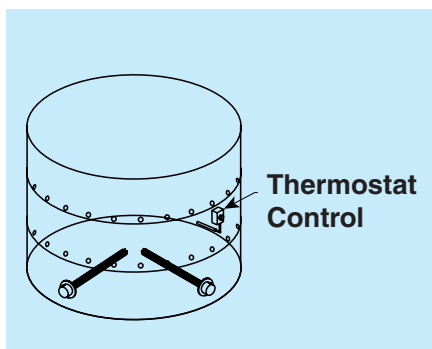
FLANGE HEATER APPLICATIONS



Flange heaters mounted on each end of hot water storage tank for an efficient shower system.



Flange heaters in tank of water to heat inner tank of viscous materials.



Flange heaters mounted angularly around tank bottom permitting free vertical work area.

FLANGED IMMERSION HEATERS

PRODUCT DESCRIPTION

These through-the-side immersion heaters utilize standard pipe flanges ranging from 3" to 14" in diameter to support high tank pressures of super heated stream, compressed gases or liquids They are installed through a matching companion flange, obtainable from local industrial supply houses, to the tank wall. A wide selection of watt densities, heating outputs and flange sizes and ratings make this an excellent heater for all tanks, vats or irregularly shaped vessels.

STANDARD CONSTRUCTION FEATURES

Elements
Materials — Copper, steel, 304 stainless steel, Incoloy
Number of elements in flanges — 3 6, 12, 18, 27, 36, 45 Element diameter — 0.475" Watt density — 6.5, 15, 23, 45, 75W/in^2

Flange
Materials —
Carbon, steel, stainless steel,
Rating — 150 lb. pressure class per ANSI B16.5
Sizes — 3", 5", 6", 8" 10", 12", 14", 150 lb.

High conductivity elements — Filled with highest purity blends of magnesium oxide refractory (MgO) compacted to rock hard density to insure maximum thermal conductivity and maximum electrical resistance, and assure long element life.

Heavy coil construction — Watt density on the heating coil is designed for low watt density operation by increasing the coil diameter and length to give maximum coil surface area and limit coil surface temperature, providing longer coil life.

SPECIAL FEATURES AVAILABLE

Kilowatt ratings — 500 kW and above available
Flanges
Materials — 316, 321, 347 stainless steel. Inconel, Incoloy
Ratings — 300 lb. up to 2500 lb., pressure classes available
Sizes — 10" , 12", 14", 16", and 18" available. Please contact OMEGALUX for other materials or ratings.

Elements
Materials — 316, 321, 347 stainless steel. Inconel. Other materials available, please contact OMEGALUX®.

Other Features
ASME Sections I, IV, and VIII designed and certified. Baffles on elements to distribute flow. Passivation on stainless steel. Immersion lengths up to 240".

Underwriters Laboratories U.L. listing available. Consult OMEGALUX®.

TERMINAL ENCLOSURES

Safe operation of heaters equipped with these enclosures depends on employment of electrical wiring meeting National Electric Code and limiting maximum operating temperatures (including temperatures on outside of vessel, piping, flanges, screwplugs, enclosures and other heat conducting parts) as dictated by flammable liquids, vapors, or gases present. Approved pressure and/or temperature limiting controls must be used to assure safe operation in the event of system malfunction.

Terminal Enclosure Types

General purpose, sheet metal, (NEMA-1) painted with red enamel. Type E-2 combination moisture resistant, explosion resistant.* Type E-3 explosion resistant.* Type E-4 Moisture resistant. Types E-2 and E-3 explosion resistant enclosures involve the use of a wiring enclosure for use in the following locations:

Class I Groups C & D, Division 1 & 2. Class II Groups E, F & G, Division 1 & 2.

Grounding connector standard — A solid terminal connector is standard on all OMEGALUX® immersion heaters insuring positive ground and personal safety.

TEMPERATURE CONTROLS

A thermostat protective well is standard on most models. This well is installed through the flange parallel with the heating elements This ½" thermowell is provided for accepting a temperature sensing probe for use with an AR thermostat or other OMEGALUX type control system. Flexibility of the type of control can be provided to give exact process control precision to match your process needs.

A contactor is needed when the line voltage and/or current exceeds the thermostat rating. See section P, pages 103-104, magnetic contactors.

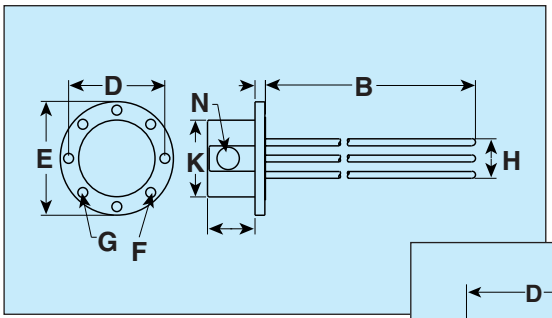
Other types of controls are available where a high degree of accuracy or a more versatile control scheme is required. Electronic controls and complete control panels are easily installed. See the control Temperature Section for a complete selection.

OMEGALUX CORROSION POLICY

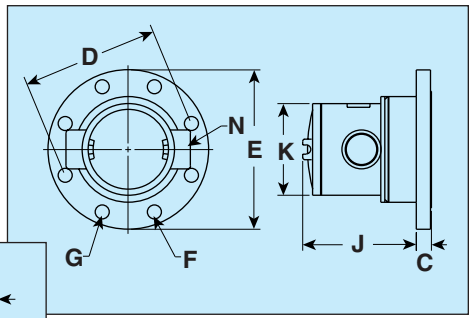
OMEGALUX cannot warrant any electric immersion heater against failure by sheath corrosion if such failure is the result of operating conditions beyond the control of the heater manufacturer. It is the responsibility of the purchaser to make the ultimate choice of sheath material based on his knowledge of chemical composition of corrosive solution, character of materials entering the solution, and controls which he maintains on the process.

* Not intended for use in hazardous locations.

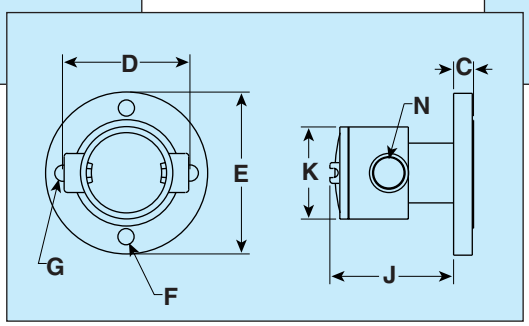
DIMENSIONAL REFERENCES FOR FLANGED IMMERSION HEATERS



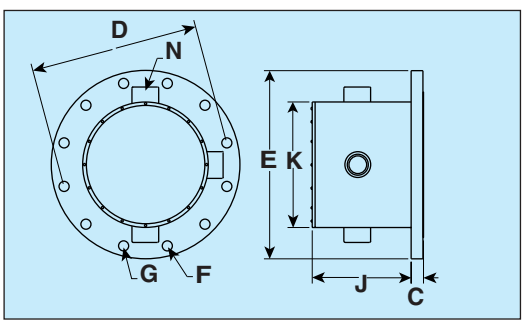
General Purpose Enclosure, Type E-1 all Sizes - the Number of Conduit Openings ("N" Dimension) Varies. See Heater Tables



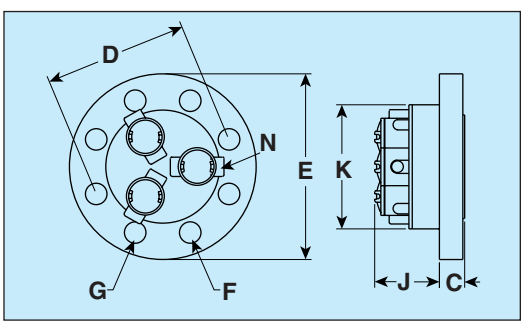
Explosion Resistant,* Type E-3 for 5 and 6-inch Flange



Explosion Resistant/ Moisture Resistant* Type E-2 for 3-Inch Flange



Moisture Resistant, Type E-4 all Flange Sizes- the Number of Conduit Openings ("N" Dimension) Varies. See Heater Tables



Explosion Resistant,* Type E-3 for 8, 10, 12 and 14 inch Flange

150 lb. Rated Flange								Terminal Enclosure					
Dimensions Inches								General Purpose E-1		Explosion* Resistant E-3		Moisture Resistant E-4	
No. Elem.	C	D	E	Dia. F	G No. Holes	H min Hole Dia. Reqd.	Nom. Pipe Sz.	J	K	J	K	J	K
3	15/16	6	7½	¾	4	2¾	3	3½	4 9/16	5⅜	4¼	5⅜	4¼
6	15/16	8½	10	⅞	8	5	5	3½	6 1/16	6 15/16	5¾	3 7/16	7¼
12	1	9½	11	⅞	8	6	6	5⅜	7 1/16	8⅝	8	5 1/32	8
18	1⅛	11¾	13½	⅞	8	7 15/16	8	5⅜	9 13/16	7 9/16	10	5 1/16	10
27	1 3/16	14¼	16	1	12	9¾	10	6 3/16	11 3/16	9⅛	10½	5 1/16	12
36	1¼	17	19	1	12	11¾	12	6 3/16	13 3/16	7 15/16	12¾	6¼	12¾
45	1⅜	18¾	21	1⅛	12	12¾	14	6 3/16	15 3/16	9⅛	14	6 5/16	14

Note: The conduit opening size (N dimension) varies with heater size, kilowatt rating and voltage. The number of conduit openings corresponds with the number of circuits supplied. Consult number of circuits, phase and "N" dimension in this catalog for specifics.

** Not intended for use in hazardous areas.*

CAUTION AND WARNING!

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SELECTION OF FLANGED IMMERSION HEATERS

Flanged Immersion Heater Selection Guide

Application	Solution or Heater Type	Alkaline or Acid Content (Est. % by Volume)	Sheath Material	Watt Density (Watts/In²)	Max. Recommended Sheath Temp. (°F)
Water & Very Mild Solutions	Clean Water	pH 6 to pH 8 Neutral	Copper	45	350
	Process Water or Very Weak Solutions	pH 5 to pH 9 2-3%	Stainless Steel*	45	1200
	Weak Solutions	5-6%	Incoloy	45	1600
	Demineralized Deionized or Pure Water	—	Incoloy with Stainless Flange	45	1600
Corrosive & High Viscous Solution	Mild Corrosive Solution	5-15%	Stainless Steel*	23	1200
	More Severe Corrosive Solution	10-25%	Incoloy	23	1200
	Severe Corrosive Solution	30-60%	Incoloy with Stainless Flange	15	1600
Specialty Water Heating	Steam Boiler Water Storage Tank	Treated Treated	Incoloy, Copper Copper	— —	1600 350
Oil Heating	Low Viscosity Oil Medium Viscosity Oil High Viscosity Oil	— — —	Steel Steel Steel	23 15 6.5	750 750 750
Oil Reservoir Heating	Lubrication Oil	—	Steel	15	750
Air, Gases & Steam Heating	Low Temperature	To 1100°F	Stainless Steel	23	1200
	High Temperature	To 1600°F	Incoloy	23	1600

**Passivated stainless steel recommended for water*

Flanged Immersion Heater Types

Application	Flange Size (cm)	Sheath Material	Flange Material	Heater Type	Page
Clean water heater	3" (8) 5"(13) 6"(15) 8"(20) 10"(25) 12"(30) 14"(36)	Copper Copper Copper Copper Copper Copper Copper	Steel Steel Steel Steel Steel Steel Steel	TM TM TM TM TM TM TM	F-
Process water heater	3"(8) 5"(13) 6"(15) 8"(20)	SS SS SS SS	Steel Steel Steel Steel	TMS TMS TMS TMS	F-
Solution water heaters	3"(8) 5"(13) 6"(15) 8"(20)	Incoloy Incoloy Incoloy Incoloy	Steel Steel Steel Steel	TMI TMI TMI TMI	F-
Mild corrosive heaters	3"(8) 5"(3) 6"(15) 8"(20)	SS SS SS SS	Steel Steel Steel Steel	TMS TMS TMS TMS	F-
Corrosive solution & gas heaters	3"(8) 5"(13) 6"(15) 8"(20) 10"(25) 12"(30) 14"(36)	Incoloy Incoloy Incoloy Incoloy Incoloy Incoloy Incoloy	Steel Steel Steel Steel Steel Steel Steel	TMI TMI TMI TMI TMI TMI TMI	F-
Severe corrosive solution heater	3"(8) 5"(13) 6"(15)	Incoloy Incoloy Incoloy	SS SS SS	TMIS TMIS TMIS	F-
Demineralized or deionized water heater	3"(8) 5"(13)	Incoloy Incoloy	SS SS	TMIS TMIS	F-
Boiler & water heater	2½"sq.(6) 2½"sq.(6)	Copper Incoloy	Steel Steel	TTSF TTSF	F-
Storage water heater	3"(8) 5"(13) 6"(15)	Copper Copper Copper	Steel Steel Steel	TM TM TM	F-
Light weight oil heater	3"(8) 5"(13) 6"(15) 8"(8) 10"(25) 12"(30) 14"(36)	Steel Steel Steel Steel Steel Steel Steel	Steel Steel Steel Steel Steel Steel Steel	TMO TMO TMO TMO TMO TMO TMO	F-
Medium weight oil heater	3"(8) 5"(13) 6"(15)	Steel Steel Steel	Steel Steel Steel	TMO TMO TMO	F-
Heavy weight oil heater	3"(8) 5"(13) 8"(20)	Steel Steel Steel	Steel Steel Steel	TMO TMO TMO	F-
Sump oil heaters	3"(8)	Steel	Steel	TMO	F-
Food equipment heater		Copper	Brass	TTUH-CO TTUH	F-

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