

HELIOS IMMERSION HEATERS

IMMERSION HEATERS

Helios immersion heaters provide a heat source with the highest heating efficiency possible as all heat is generated within the solution. This, combined with easy installation and accurate control, makes electric immersion heaters highly useful in many industrial heating processes. Water, oils, solvents, plating baths, salts, wax, paraffin, asphalts and molasses are some of the many liquids, viscous materials, and solids with low melting points commonly heated with electric immersion heaters.

In addition to a wide variety of shapes, sheaths and mounting methods, immersion heaters are manufactured for various heat intensities (watt densities) - eg. mild heat for thick oils, soft metals etc., more intense for water, salts and other solutions having higher heat absorption rates.

BASIC TYPES OF MOUNTING

The four basic types of mounting represent the most common methods of applying heat to a vessels contents without interfering with working space, either inside or outside the containing vessel.

In general

- 1) The screw plug types are used in small and medium sized containers
- 2) Pipe-flange types give greater heating capacities into larger vessels. Both types can be selected for high pressures and temperatures.
- 3) Over the side types with varied heating capacities permit portability, easy removal for cleaning of tanks, and wide adaptability to working area within the tank.
- 4) Glanded immersion heaters are suitable for mounting through the bottom or sides, usually in small, shallow and confined vessels.

TYPICAL CONSTRUCTION FEATURES

The basic Helios tubular heater, with copper, steel, stainless, incoloy or other sheath, is formed to suit a particular application in tanks, vats etc., and mounted into one of the several types of fixtures available. Wiring connections to the heaters are made inside a protective terminal box (where applicable) with most units designed to accept a thermowell housing a thermostat sensing bulb and/or controller.

Immersion units may be tailor made to suit all applications and we recommend that you consult our engineers during initial stages of tank or process design, for load calculations, heater type, and material selection.

HEATER SHEATH MATERIALS

Copper, steel, incoloy 800, stainless steel types 304 and 316, incoloy 825 and titanium (see sheath selection guide page 70).

*3 phase units (3 heaters per boss) can be manufactured upon request.

*All screw-plug heaters may be fitted with junction boxes.

*Thermostats may be incorporated within these heaters in three temperature ranges (0-40°C) (30-110°C) (50-300°C)

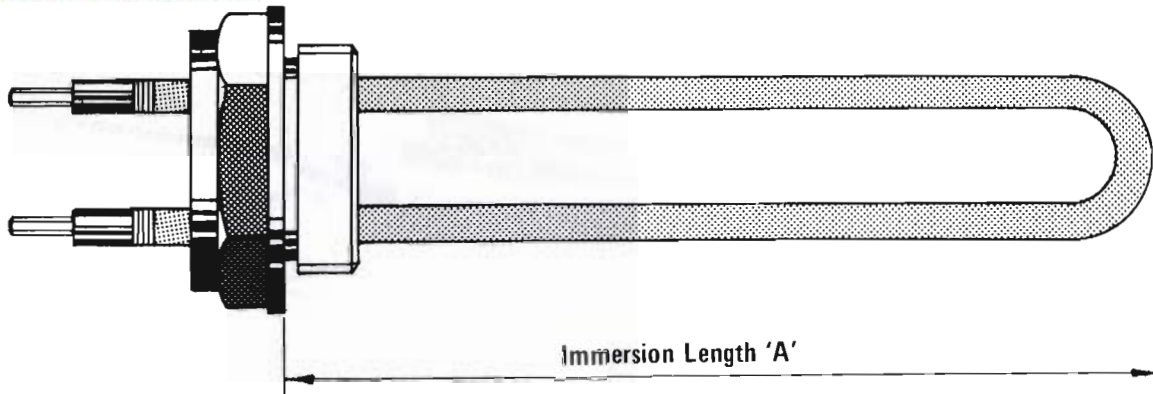
BOSS SIZES AND TYPES AVAILABLE

- | | |
|--|------------------------------|
| 1" BSP brass | 2½" BSP bronze, steel, brass |
| 1¼" BSP brass, steel, stainless steel | 3" BSP steel |
| 2" BSP brass, steel, bronze, stainless steel | |

Non-standard bosses in other materials and size can be manufactured upon request.

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SCREW PLUG TYPE



APPLICATION

For direct immersion by screw mounting through tank walls in the bottom or side of a container, and consists of one or more tubular heaters welded into a standard thread boss.
Units should be near the bottom of the tank and be covered at all times by at least 50mm of liquid.

INCOLOY SHEATHED FOR WATER HEATING 120 kW/m² (75 w/in²)

1 1/4" BSP BOSS

| CATALOGUE NO | WATTAGE | NO HEATERS | DIMENSION 'A' | |
|--------------|---------|------------|---------------|--------|
| | | | MM. | IN. |
| SM5 | 500 | 1 | 230 | 9 |
| SM10 | 1000 | 1 | 270 | 10 1/2 |
| SM15 | 1500 | 1 | 305 | 12 |
| TM10 | 1000 | 2 | 230 | 9 |
| TM15 | 1500 | 2 | 245 | 9 1/2 |
| TM20 | 2000 | 2 | 270 | 10 1/2 |
| TM30 | 3000 | 2 | 305 | 12 |
| TM40 | 4000 | 2 | 410 | 16 |
| TM60 | 6000 | 2 | 560 | 22 |

2" BSP BOSS.

| CATALOGUE NO | WATTAGE | NO HEATERS | DIMENSION 'A' | |
|--------------|---------|------------|---------------|--------|
| | | | MM. | IN. |
| SXM5 | 500 | 1 | 230 | 9 |
| SXM10 | 1000 | 1 | 270 | 10 1/2 |
| SXM15 | 1500 | 1 | 305 | 12 |
| TXM10 | 1000 | 2 | 230 | 9 |
| TXM15 | 1500 | 2 | 245 | 9 1/2 |
| TXM20 | 2000 | 2 | 270 | 10 1/2 |
| TXM30 | 3000 | 2 | 305 | 12 |
| TXM40 | 4000 | 2 | 410 | 16 |
| TXM60 | 6000 | 2 | 560 | 22 |
| GXM90 | 9000 | 3 | 560 | 22 |
| GXM108 | 10800 | 3 | 660 | 26 |

INCOLOY SHEATHED FOR HEATING OF LIGHT OILS, ALKALINE SOLUTIONS ETC. 32 kW/m² (20 w/in²)

1 1/4" B.S.P. BOSS

| CATALOGUE NO | WATTAGE | NO HEATERS | DIMENSION 'A' | |
|--------------|---------|------------|---------------|--------|
| | | | MM. | IN. |
| SS5 | 500 | 1 | 230 | 9 |
| SS7 | 750 | 1 | 305 | 12 |
| SS10 | 1000 | 1 | 395 | 15 1/2 |
| SS12 | 1200 | 1 | 460 | 18 |
| TS15 | 1500 | 2 | 535 | 21 |
| TS20 | 2000 | 2 | 710 | 28 |

2" B.S.P. BOSS

| CATALOGUE NO | WATTAGE | NO HEATERS | DIMENSION 'A' | |
|--------------|---------|------------|---------------|-----|
| | | | MM. | IN. |
| TXS20 | 2000 | 2 | 710 | 28 |
| TXS24 | 2400 | 2 | 840 | 33 |
| GXS30 | 3000 | 3 | 710 | 28 |
| GXS36 | 3600 | 3 | 840 | 33 |
| GXS48 | 4800 | 3 | 1090 | 43 |

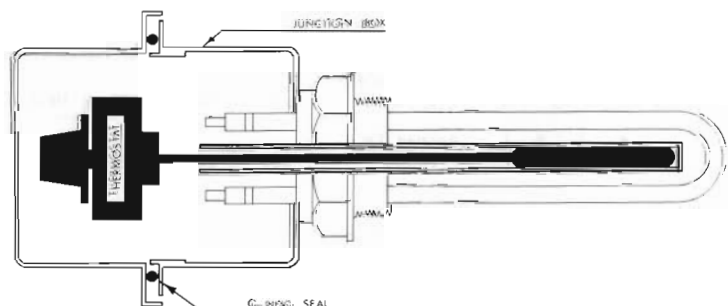
The units listed above represent a range normally held in stock. Non-standard units can be manufactured to suit your specific application upon request.

OPTIONAL CONTROL

Screw plug immersion heaters can be manufactured having an integral control-thermostat housed within an o-ring sealed junction box.

TEMPERATURE RANGES.

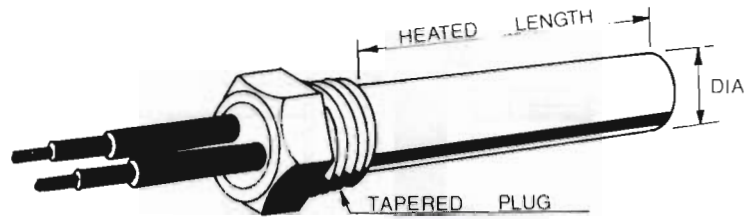
SINGLE PHASE: 0-40 DEG C.
30-110 DEG C.
50-300 DEG C.
THREE PHASE: 30-110 DEG C.



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COMPACT SCREW PLUG TYPE

The Helios compact screw-plug immersion heaters consist of a stainless steel cartridge heater silver soldered into a tapered pipe plug. They have proved to be ideal for use where space is limited such as in engine blocks, crankcases and laboratory equipment etc.



3/8" DIAMETER HEATER X 3/8" BSP PLUG

| | | | | | |
|--------------------|-----|-----|-----|-----|-----|
| HEATED LENGTH (mm) | 50 | 100 | 150 | 200 | 250 |
| MAXIMUM WATTAGE | 120 | 300 | 470 | 650 | 825 |

1/2" DIAMETER HEATER X 1/2" BSP PLUG

| | | | | | |
|--------------------|-----|-----|-----|-----|------|
| HEATED LENGTH (mm) | 50 | 100 | 150 | 200 | 250 |
| MAXIMUM WATTAGE | 165 | 390 | 630 | 860 | 1000 |

5/8" DIAMETER HEATER X 3/4" BSP PLUG

| | | | | | |
|--------------------|-----|-----|-----|------|------|
| HEATED LENGTH (mm) | 50 | 100 | 150 | 200 | 250 |
| MAXIMUM WATTAGE | 180 | 480 | 750 | 1000 | 1300 |

3/4" DIAMETER HEATER X 3/4" BSP PLUG

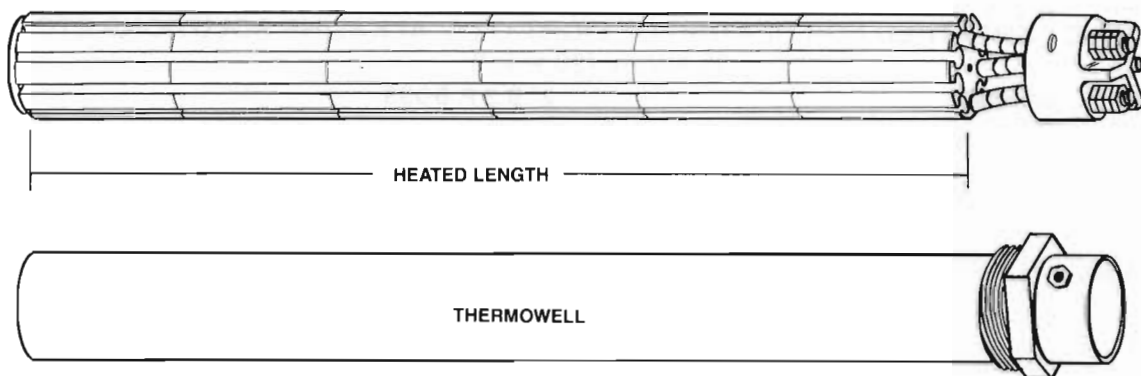
| | | | | | |
|--------------------|-----|-----|------|------|------|
| HEATED LENGTH (mm) | 50 | 100 | 150 | 200 | 250 |
| MAXIMUM WATTAGE | 350 | 700 | 1000 | 1400 | 1750 |

THE TABLES SHOWN ARE AN INDICATION ONLY OF THE MANY COMBINATIONS OF PLUG DIAMETERS AND HEATER LENGTHS AVAILABLE.

CONSULT WITH HELIOS FOR YOUR SPECIFIC REQUIREMENT.

CERAMIC BOBBIN HEATERS

Ceramic bobbin heaters when inserted into a thermowell, offer a large heated area to the liquid or semi-solid to be heated. Materials such as oil, wax, fats and bitumen require low heater surface temperature to prevent product degradation; for these applications the ceramic bobbin heater is ideal. The thermowell may be an integral part of the container or alternatively supplied as a removable sheath as shown below (horizontal mounting recommended). A feature of this type of heater is that it may be removed for repair or replacement without draining the contents of the vessel.



44mm (1 3/4") DIAMETER BOBBIN

| WATTS DENSITY | | MAXIMUM RECOMMENDED WATTAGE | LENGTH(mm) | | | | | |
|-------------------|-------------------|-------------------------------------|------------|------|------|------|------|------|
| k/Wm ² | w/in ² | | 250 | 500 | 750 | 1000 | 1500 | 2000 |
| 8 | 5 | Asphalt, Tar Heavy Components | 300 | 600 | 900 | 1200 | 1500 | 1800 |
| 16 | 10 | Fuel oil, Preheating | 600 | 1200 | 1800 | 2400 | 3000 | 3600 |
| 24 | 15 | Heat Transfer, Oil | 900 | 1800 | 2700 | 3600 | 4500 | 5500 |
| 30 | 20 | Water | 1200 | 2400 | 3600 | 4800 | 6000 | 7300 |

All wattages listed are approximations and depend upon application of allowable watt density ratings to a given product. Check product application guide Page 65 or consult Helios Engineers.

* RECOMMENDED AT 415V WHEN GREATER THAN 4800W

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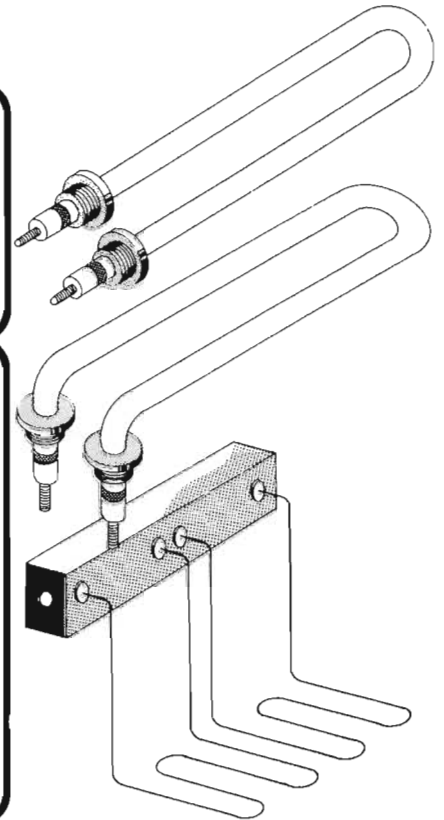
GLANDED TUBULARS

THESE HEATERS ARE MOST SUITABLE FOR PERMANENT INSTALLATION INTO SHEET METAL CONTAINERS, TANKS, AND VATS ETC.

They can be manufactured in a wide range of sizes, ratings and sheath materials to suit.

The two forms illustrated allow the heater to be glanded through the side or bottom of a tank dependent upon tank restrictions, or variations made to suit all installation problems. Refer to page 7 for other common forms of tubular layouts to suit many tank installations.

Information required includes dimensions of container, restrictions inside tank if any, and particulars of the liquid to be heated.



OVER THE SIDE – MULTIPLE TUBULAR

THESE UNITS ARE DESIGNED TO SUIT THE MANY APPLICATIONS WHERE THE TANK SIZE AND QUANTITY OF LIQUID TO BE HEATED IS SUCH THAT ONE LARGE ASSEMBLY OF HEATERS IS PREFERABLE TO NUMEROUS SINGLE UNITS.

GENERAL CONSTRUCTION

A number of metal sheathed tubular heaters are fitted, using mounting bushes, to a common terminal box. This box can be used to accommodate thermostats, contactors, mains terminals etc. making it a very compact unit with power supply the only external requirement.

FORMING

The heaters can be formed to suit any tank dimension or tank projections, to vary heat dissipation over any given area, and constructed around agitators or equipment inside the working area.

SHEATH MATERIAL

Available sheath materials are copper, steel, stainless steel - types 316 or 304, incoloy 800, incoloy 825 and titanium. Consult corrosion guide page 66 for suitability of any given sheath to product.

As these units are custom made to suit any special requirement, enquiries should state dimensions of tank, material being heated, minimum liquid level, any obstructions and temperature required.