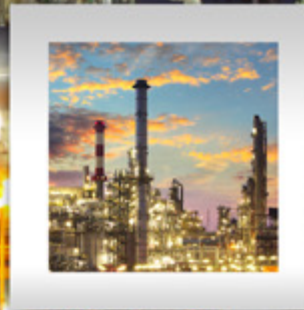
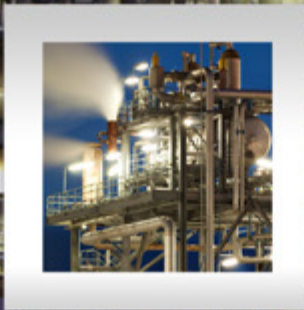


OVER-THE-SIDE HEATERS immersion heaters



OVER-THE-SIDE IMMERSION HEATERS

immersion heaters

OVERVIEW

WATTCO™ over-the-side immersion heaters are made of sidemounted tubular elements. Perfectly designed for freeze protection, for heating viscous solutions, water, oils, solvents, salts, and acids. These heaters are mainly used in solutions requiring easy removal of heaters for cleaning or inspection purposes.

KEY FEATURES

- » Standard size: 1-inch conduit openings
- » 0.315", 0.375", 0.430", 0.475" diameter element
- » Sheath materials:
 - Stainless steel for stainless steel riser
 - Incoloy® for stainless steel riser
 - Steel for steel riser
- » Special sizes, wattages are available upon request
- » Custom-designed to meet your specifications

BENEFITS

- » Lightweight
- » Portable
- » Easy to install and to remove
- » Easy to maintain
- » Allow for 1 or 3 - phase operation
- » Maximize heat transfer
- » Provide uniform temperature
- » Moisture resistant
- » Oxidation and corrosion resistant
- » Built solidly
- » Designed for safety
- » Durable

APPLICATIONS

- » Water heating
- » Freeze protection
- » Viscous oils
- » Storage tanks
- » Degreasing tanks
- » Solvents
- » Salts
- » Paraffin
- » Caustic solutions



HOW TO INSTALL

Please follow these installation steps below (see Figures 1 and 2 on **page 3**) for the heated section of the heater:

Notes:

- » Heating element must always be fully immersed to prevent heater failure.
- » In determining the minimum liquid level required for proper use of heater, take into account the projected reduction of solution volume due to evaporation or removal of solution while heater is in use.

SELECTING

WATTCO™ OVER-THE-SIDE HEATER

The following sections will help you select the WATTCO™ over-the-side immersion heater that will meet the requirements of your application. Please call us at **1-800-4WATTCO (1-800-492-8826)** for further information or assistance.

| APPLICATIONS | SHEATH MATERIAL | FLANGE MATERIAL |
|---|-------------------------|-----------------|
| Water Non-corrosive solutions to copper | Copper | OTSC |
| Water rinse tanks Contaminants corrosive to copper Food solutions | Incoloy® / Stainless | OTSI |
| Oil-based solutions Chemical solutions not corrosive to steel | Steel / Stainless | OTSO |
| Corrosive contaminants where steel, stainless and copper are unusable | Inconel or Titanium | OTST |

- Notes:**
- OTST titanium-sheathed heater comes with no stand-off brackets
 - Single phase or three-phase heaters are available

NEED ASSISTANCE?

Please call us at **1-800-4WATTCO (1-800-492-8826)** for further information.

Note: Lower watt densities usually offer longer service life.



OVER-THE-SIDE IMMERSION HEATERS

immersion heaters

TABLE 1
Single Element Type Over-The-Side Immersion (Figure 1)

| KW | SHEATH | WATTS PER | | CAT. NO. | NET WT LBS (KG) |
|---|----------|---------------------|--------------------|----------|--------------------|
| | | (in. ²) | (cm ²) | | |
| STANDARD VOLTS: 208, 240, 480, 600 (1 PHASE) | | | | | |
| 3 | Copper | 19 | 2.9 | OTSC2530 | 8.8 (4) |
| 5 | Copper | 32 | 5.0 | OTSC2550 | 8.8 (4) |
| 7.5 | Copper | 48 | 7.4 | OTSC2575 | 8.8 (4) |
| 3 | 304 S.S. | 19 | 2.9 | OTSS2530 | 8.8 (4) |
| 5 | 304 S.S. | 32 | 5.0 | OTSS2550 | 8.8 (4) |
| 7.5 | 304 S.S. | 48 | 7.4 | OTSS2575 | 8.8 (4) |
| 3 | Incoloy | 19 | 2.9 | OTSI2530 | 8.8 (4) |
| 5 | Incoloy | 32 | 5.0 | OTSI2550 | 8.8 (4) |
| 7.5 | Incoloy | 48 | 7.4 | OTSI2575 | 8.8 (4) |
| 3 | Inconel | 19 | 2.9 | OTST2530 | 8.8 (4) |
| 5 | Inconel | 32 | 5.0 | OTST2550 | 8.8 (4) |
| 7.5 | Inconel | 48 | 7.4 | OTST2575 | 8.8 (4) |
| 3 | Titanium | 19 | 2.9 | OTSZ2530 | 8.8 (4) |
| 5 | Titanium | 32 | 5.0 | OTSZ2550 | 8.8 (4) |
| 7.5 | Titanium | 48 | 7.4 | OTSZ2575 | 8.8 (4) |

Note: Special dimensions are available upon request.

WHEN ORDERING, PLEASE SPECIFY: Quantity, catalogue number, voltage, phase, and wattage.

TABLE 2
Three Element Type Over-The-Side Immersion (Figure 2)

| KW | SHEATH | WATTS PER | | CAT. NO. | NET WT LBS (KG) |
|--|----------|---------------------|--------------------|----------|--------------------|
| | | (in. ²) | (cm ²) | | |
| STANDARD VOLTS: 208, 240, 480, 600 (1 OR 3 PHASE) | | | | | |
| 9 | Copper | 19 | 2.9 | OTSC3090 | 22.0 (10) |
| 15 | Copper | 32 | 5.0 | OTSC3150 | 22.0 (10) |
| 22.5 | Copper | 48 | 7.4 | OTSC3225 | 22.0 (10) |
| 9 | 304 S.S. | 19 | 2.9 | OTSS3090 | 22.0 (10) |
| 15 | 304 S.S. | 32 | 5.0 | OTSS3150 | 22.0 (10) |
| 22.5 | 304 S.S. | 48 | 7.4 | OTSS3225 | 22.0 (10) |
| 9 | Incoloy | 19 | 2.9 | OTSI3090 | 22.0 (10) |
| 15 | Incoloy | 32 | 5.0 | OTSI3150 | 22.0 (10) |
| 22.5 | Incoloy | 48 | 7.4 | OTSI3225 | 22.0 (10) |
| 9 | Inconel | 19 | 2.9 | OTST3090 | 22.0 (10) |
| 15 | Inconel | 32 | 5.0 | OTST3150 | 22.0 (10) |
| 22.5 | Inconel | 48 | 7.4 | OTST3225 | 22.0 (10) |

Note: Special dimensions are available upon request.

WHEN ORDERING, PLEASE SPECIFY: Quantity, catalogue number, voltage, phase, and wattage.

STAND-OFFS NOT PROVIDED
ON TITANIUM HEATER

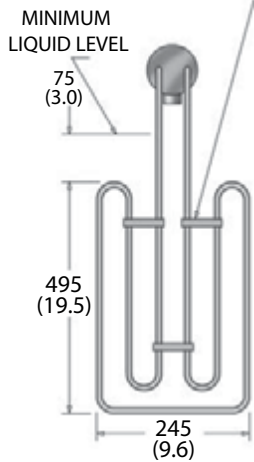
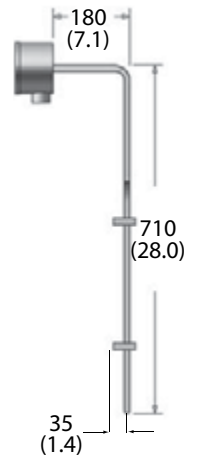


FIG. 1



STAND-OFFS NOT PROVIDED
ON TITANIUM HEATER

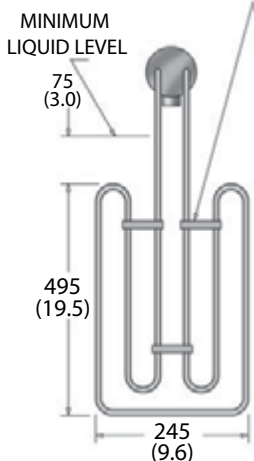
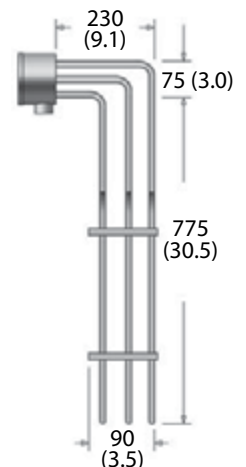


FIG. 2



OVER-THE-SIDE IMMERSION HEATERS

immersion heaters

APPLICATIONS

WATTCO™ bottom mounted heaters come with copper or Incoloy® sheaths for use in most liquid heating applications.

Refer to the construction chart below or call us at 1-800-492-8826 for further assistance in watt density and sheath selection.

CONSTRUCTION

| SHEATH MATERIAL | HEATER TYPE |
|-----------------------|-------------|
| Copper | TLCLC |
| High density Incoloy® | TLCLI |
| Low density Incoloy® | TLCLI |

EXTRA FEATURES

- » Specially configured wattage or voltage
- » Customized riser height
- » Other sheath materials than those listed are available
- » Built-in thermostat or high limit controls are available
- » 4" sludge legs
- » Passivation for Incoloy® and stainless steel sheaths
- » Explosion-proof terminal boxes are available

| BOX TYPE | NO THERMOSTAT | | WITH THERMOSTAT | |
|-------------------------------|---------------|--------|-----------------|--------|
| | K | L | K | L |
| MOISTURE RESISTANT (STANDARD) | 3 1/2" | 4 1/4" | 6 1/4" | 6" |
| EXPLOSIONPROOF | 4 3/4" | 4" | 7" | 5 5/8" |

TABLE 3

Over-The-Side Heaters - Figures 3 & 4

| KW | DIMENSIONS | | | | SHEATH MATERIAL | WATTS PER | | FIGURE 3 - TLCLC CAT. NO. | FIGURE 4 - TLCP CAT. NO. | NET WT. LBS (KG) |
|--|--------------------|---------------------|--------------------|---------------------|-----------------|----------------------|-----------------------|------------------------------|-----------------------------|---------------------|
| | B (FIG. 3) (mm) | B (FIG. 4) (in.) | B (FIG. 3) (mm) | B (FIG. 4) (in.) | | (W/cm ²) | (W/in. ²) | | | |
| STANDARD VOLTS: 208, 240, 480, 600 (1 OR 3 PHASE) | | | | | | | | | | |
| 3 | 315 | 12.4 | — | — | Copper | 8.1 | 53 | TLCLC303053 | TLCP303053 | 11.0 (5) |
| 6 | 565 | 22.2 | 400 | 15.7 | Copper | 9.3 | 60 | TLCLC306060 | TLCP306060 | 11.0 (5) |
| 9 | 765 | 30.1 | 440 | 17.3 | Copper | 8.5 | 55 | TLCLC309055 | TLCP309055 | 13.2 (6) |
| 12 | 940 | 37.0 | 480 | 18.9 | Copper | 8.4 | 54 | TLCLC312054 | TLCP312054 | 13.2 (6) |
| 15 | 1115 | 43.9 | 520 | 20.5 | Copper | 8.4 | 54 | TLCLC315054 | TLCP315054 | 15.4 (7) |
| 18 | 1315 | 51.8 | 560 | 22.0 | Copper | 8.2 | 53 | TLCLC318053 | TLCP318053 | 15.4 (7) |
| 3 | 315 | 12.4 | — | — | Incoloy | 8.1 | 53 | TLCLI303053 | TLCP303053 | 11.0 (5) |
| 6 | 565 | 22.2 | 400 | 15.7 | Incoloy | 9.3 | 60 | TLCLI306060 | TLCP306060 | 11.0 (5) |
| 9 | 765 | 30.1 | 440 | 17.3 | Incoloy | 8.5 | 55 | TLCLI309055 | TLCP309055 | 13.2 (6) |
| 12 | 940 | 37.0 | 480 | 18.9 | Incoloy | 8.4 | 54 | TLCLI312054 | TLCP312054 | 13.2 (6) |
| 15 | 1115 | 43.9 | 520 | 20.5 | Incoloy | 8.4 | 54 | TLCLI315054 | TLCP315054 | 15.4 (7) |
| 18 | 1315 | 51.8 | 560 | 22.0 | Incoloy | 8.2 | 53 | TLCLI318053 | TLCP318053 | 15.4 (7) |
| 3 | 565 | 22.2 | 400 | 15.7 | Incoloy | 4.6 | 30 | TLCLI303030 | TLCP303030 | 11.0 (5) |
| 6 | 940 | 37.0 | 480 | 18.9 | Incoloy | 4.2 | 27 | TLCLI306027 | TLCP306027 | 13.2 (6) |
| 9 | 1315 | 51.8 | 560 | 22.0 | Incoloy | 4.1 | 26 | TLCLI309026 | TLCP309026 | 15.4 (7) |
| 3 | 940 | 37.0 | 480 | 18.9 | Incoloy | 2.1 | 14 | TLCLI303014 | TLCP303014 | 11.0 (5) |
| 4.5 | 1115 | 43.9 | 520 | 20.5 | Incoloy | 2.5 | 16 | TLCLI304516 | TLCP304516 | 13.2 (6) |
| 6 | 1315 | 51.8 | 560 | 22.0 | Incoloy | 2.7 | 18 | TLCLI306018 | TLCP306018 | 15.4 (7) |

WHEN ORDERING, PLEASE SPECIFY: Quantity, catalogue number, voltage, phase, wattage, type of solution and container sheath.

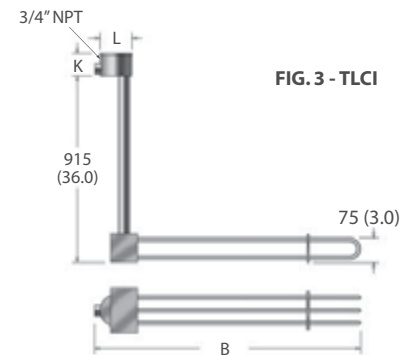


FIG. 3 - TLCLI

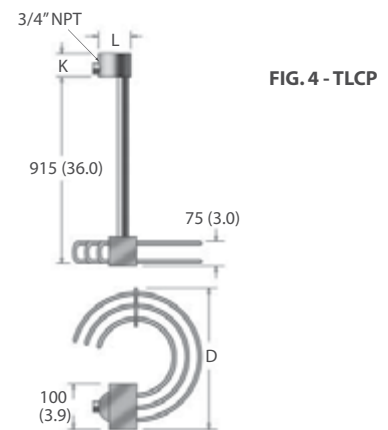


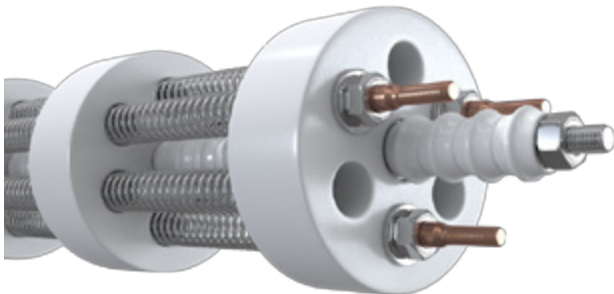
FIG. 4 - TLCP

OVER-THE-SIDE IMMERSION HEATERS

immersion heaters

OVERVIEW

WATTCO™ pipe-insert immersion heaters are perfect for solutions that are difficult to heat as they require low watt density and are mostly stored in large tanks. These heaters are primarily designed for heating viscous fluids. They are mounted in a pipe close to the bottom of a tank. The pipe evenly transfers the heat to stored liquids.



KEY FEATURES

- » Made of superior alloy-sheathed elements.
- » 3" 150 lb steel flange or 2" NPT screwplug.
- » Moisture-resistant terminal box.
- » Single 1" NPT conduit fitting for units without a thermocouple.
- » Extra ½" NPT conduit fitting for units with a built-in thermocouple.

Notes:

- » Thermocouples detect rises in temperature, then automatically shut the system off.
- » If the liquid level is beneath the uppermost part of the heater, the inside temperature of the heater's pipe will increase.
- » For detecting low liquid levels, use K-type thermocouple heaters with one thermocouple per tank.
- » Upon request, WATTCO™ can supply a control panel or ship the control components individually.

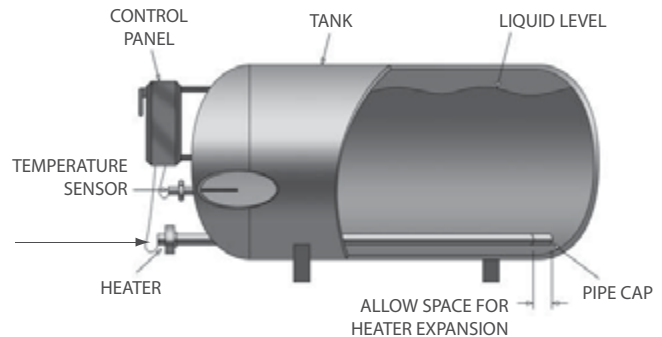
APPLICATIONS

- » Asphalt
- » Molasses
- » Tar
- » Paint
- » Glue
- » Viscous fluids
- » Corrosive liquids

Notes:

- » If devices are required in corrosive liquids, a corrosion-resistant pipe is required.
- » Pipes are normally supplied and installed by the tank manufacturer, unless specifically requested.
- » Removing the heater is done easily without draining the liquid.

FIG. 1 - Standard application of a pipe-insert immersion heater for viscous fluids



HEATING PROCESS

The heating element transfers the heat to the inner wall of the pipe by convection and radiation processes.

Note: Do not fill the pipe with a heat transfer fluid.

SELECTING

AND SIZING YOUR WATTCO™ PIPE-INSERT IMMERSION HEATER

- » Determine the kilowatts required to keep the tank at the required temperature.
- » Select the number of heaters required with an insert length that is long enough for good heat transfer.
- » Use single element or double element heaters in groups of three when installing a three-phase balanced system.
- » Select the single element heater for heating a viscous liquid from a cold start, as the lower watt density you will get on the pipe surface will prevent coking (refer to Table 1).

TABLE 1
Watt Density On Pipe Surface vs. Heater Type

| PIPE SIZE | 1 ELEMENT TYPE | 2 ELEMENT TYPE | 3 ELEMENT TYPE |
|-----------|----------------|----------------|----------------|
| 2" | 5.5 | 7.4 | 6.8 |
| 2 1/2" | 4.6 | 6.2 | 5.7 |
| 3" | 3.8 | 5.1 | 4.7 |
| 4" | 3.0 | 4.0 | 3.7 |

EXTRA FEATURES

- » Bundle control systems
- » Custom voltages
- » Custom wattages
- » Explosion resistant terminal housings
- » Built-in thermostats/controls
- » Custom lengths
- » Custom flange or screwplug sizes
- » Additional conduit fittings