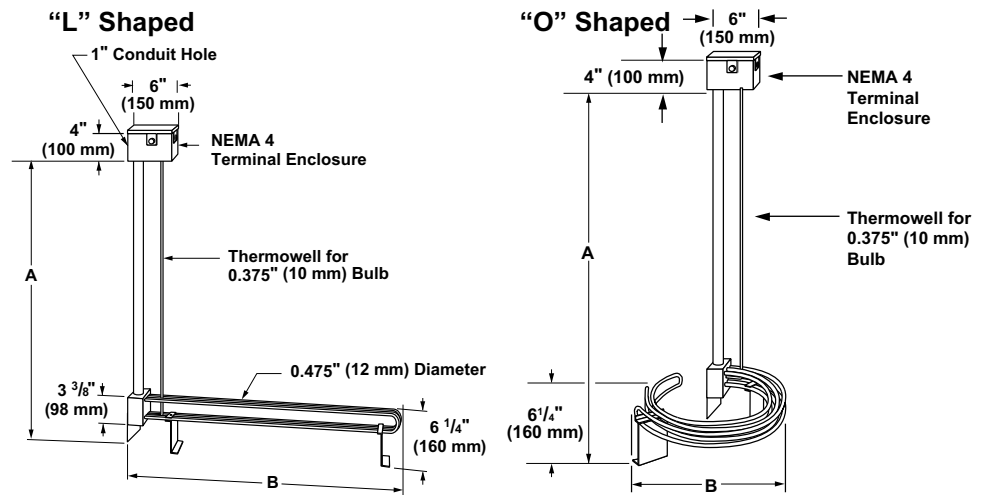


# Tubular and Process Assemblies

F.O.B.: Hannibal, Missouri

## Over-the-Side Heaters

### L and O Shaped



#### "L" Shaped

WATROD Description	kW	A Dimension		B Dimension		Code No.		Est. Ship. Weight
		inch	(mm)	inch	(mm)	240V~(ac) 3-Phase	480V~(ac) 3-Phase	

#### Applications: Process Water, Mild Caustic Solutions (2% Max), Clean Water

48 W/in <sup>2</sup>	3	39 5/16	(1000)	14 3/4	(370)	OLN714L3W	OLN714L13W <sup>①</sup>	30 (14)
Incoloy® (7.5 W/cm <sup>2</sup> )	6	39 5/16	(1000)	22 3/4	(575)	OLN722L3W	OLN722L5W	40 (19)
	9	39 5/16	(1000)	30 1/8	(765)	OLN730C3W	OLN730C5W	45 (21)
	12	51 5/16	(1300)	37 3/8	(955)	OLN737L3W	OLN737L5W	50 (23)
	15	51 5/16	(1300)	45 1/8	(1145)	OLN745C3W	OLN745C5W	65 (30)
	18	51 5/16	(1300)	52 3/8	(1335)	OLN752L3W	OLN752L5W	75 (34)

#### Applications: Citric and Phosphoric Acid Solutions, Caustic Solutions, Water Based Solutions

23 W/in <sup>2</sup>	3	39 5/16	(1000)	22 3/4	(575)	OLNA22L3W	OLNA22L5W	40 (19)
Incoloy® (3.6 W/cm <sup>2</sup> )	6	51 5/16	(1300)	37 3/8	(955)	OLNA37L3W	OLNA37L5W	50 (23)
	9	51 5/16	(1300)	52 3/8	(1335)	OLNA52L3W	OLNA52L5W	75 (34)

#### Applications: Lightweight Oils, Degreasing Solutions, Mineral Oil

23 W/in <sup>2</sup>	3	39 5/16	(1000)	22 3/4	(575)	OLS722L3W	OLS722L5W	40 (19)
Steel (3.6 W/cm <sup>2</sup> )	6	51 5/16	(1300)	37 3/8	(955)	OLS737L3W	OLS737L5W	50 (23)
	9	51 5/16	(1300)	52 3/8	(1335)	OLS752L3W	OLS752L5W	75 (34)

#### "O" Shaped

WATROD Description	kW	A Dimension		B Dimension		Code No.		Est. Ship. Weight
		inch	(mm)	inch	(mm)	240V~(ac) 3-Phase	480V~(ac) 3-Phase	

#### Applications: Process Water, Mild Caustic Solutions (2% Max), Clean Water

48 W/in <sup>2</sup>	3	39 5/16	(1000)	10 3/4	(270)	ORN710N3W	ORN710N13W <sup>①</sup>	30 (14)
Incoloy® (7.5 W/cm <sup>2</sup> )	6	39 5/16	(1000)	13 1/2	(345)	ORN713J3W	ORN713J5W	40 (19)
	9	39 5/16	(1000)	16	(405)	ORN716A3W	ORN716A5W	45 (21)
	12	51 5/16	(1300)	18 1/2	(470)	ORN718J3W	ORN718J5W	50 (23)
	15	51 5/16	(1300)	21 1/2	(540)	ORN721E3W	ORN721E5W	65 (30)
	18	51 5/16	(1300)	23 1/2	(595)	ORN723J3W	ORN723J5W	75 (34)

#### Applications: Citric and Phosphoric Acid Solutions, Caustic Solutions, Water Based Solutions

23 W/in <sup>2</sup>	3	39 5/16	(1000)	13 1/2	(345)	ORNA13J3W	ORNA13J5W	40 (19)
Incoloy® (3.6 W/cm <sup>2</sup> )	6	51 5/16	(1300)	18 1/2	(470)	ORNA18J3W	ORNA18J5W	50 (23)
	9	51 5/16	(1300)	23 1/2	(595)	ORNA23J3W	ORNA23J5W	75 (34)

#### Applications: Lightweight Oils, Degreasing Solutions, Mineral Oil

23 W/in <sup>2</sup>	3	39 5/16	(1000)	13 1/2	(345)	ORS713J3W	ORS713J5W	40 (19)
Steel (3.6 W/cm <sup>2</sup> )	6	51 5/16	(1300)	18 1/2	(470)	ORS718J3W	ORS718J5W	50 (23)
	9	51 5/16	(1300)	23 1/2	(595)	ORS723J3W	ORS723J5W	75 (34)

All units are Assembly Stock.

#### Availability

Assembly Stock: Five to seven working days

Truck Shipment only

① Must be operated 3-phase only.

# Tubular and Process Assemblies

F.O.B.: Hannibal, Missouri

## Over-the-Side Heaters

### L and O Shaped

**Base Code Number** \_\_\_\_\_

Includes moisture resistant (NEMA 4) terminal enclosure without thermostat

**Enclosure with Thermostat** \_\_\_\_\_

See chart below for order code suffix

Thermostat	Temperature °F      (°C)		Max. A Dimension inch      (mm)		Code No. Suffix		
					Moisture Resistant	Explosion Resistant	Exp./Moist. Resistant
Single Pole Single Throw (SPST) ①	30-250 175-550 300-700	(0-120) (80-290) (150-350)	84 84 60	(2135) (2135) (1525)	<b>2A</b> <b>3A</b> <b>10</b>	<b>E2A</b> <b>E3A</b> <b>E10</b>	<b>E/W2A</b> <b>E/W3A</b> <b>E/W10</b>
Double Pole Single Throw (DPST) ②	60-250 60-250 100-550 100-550 100-550	(15-120) (15-120) (40-290) (40-290) (40-290)	52 52 60 52 52	(1320) (1320) (1525) (1320) (1320)	<b>5</b> <b>5A</b> <b>6</b> <b>7</b> <b>7A</b>	<b>E5</b> <b>E5A</b> <b>E6</b> <b>E7</b> <b>E7A</b>	<b>E/W5</b> <b>E/W5A</b> <b>E/W6</b> <b>E/W7</b> <b>E/W7A</b>
On-Off Manual Reset (DPST)	60-250 100-550	(15-120) (40-290)	55 60	(1395) (1525)	<b>8</b> <b>9</b>	<b>E8</b> <b>E9</b>	<b>E/W8</b> <b>E/W9</b>

① SPST thermostats require an electrical contactor if operated at 480V~(ac); at 240V~(ac) over 22 amps; or wired three phase.

② DPST thermostats require an electrical contactor if operated at 480V~(ac) over 21 amps; at 240V~(ac) over 30 amps; or wired three phase wye.

### How to Order

To order a stock unit, please specify:

- Watlow code number
- Volts/watts
- Phase
- Options
- Quantity

If our stock units do not meet your application needs, Watlow will provide **made-to-order** units. Consult your Watlow representative and provide the following information:

- Application
- Volts/watts
- Phase
- Number of circuits
- Watt density
- Number of heating elements and sheath material
- 'A' dimension
- 'B' dimension
- Options, including terminal enclosure type
- Quantity

### Availability

**Assembly Stock:** Five to seven working days

**Modified Stock** ③: Five to seven working days

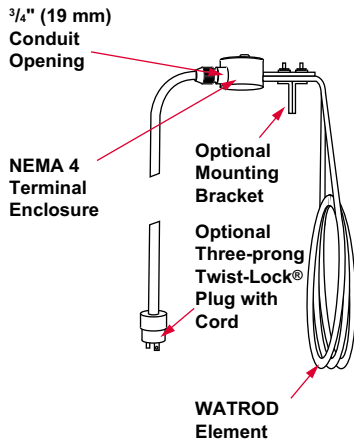
**Made-to-Order:** Five to seven weeks  
Options, complexity and quantity may affect availability and lead times. Consult factory.

③ Assembly Stock units with catalog options.

# Tubular and Process Assemblies

## Over-the-Side Heaters

### Vertical Loop Heater



These light-weight, thin-profile vertical loop heaters are well suited for open tank applications.

A WATROD tubular element, formed into spiral loops, hugs the tank wall to maximize tank work space.

Available with four different sheath materials, vertical loop heaters come

with options to meet application requirements.

Versatility is further enhanced with optional three-prong, Twist-Lock® plug and adjustable mounting brackets.

### Performance Capabilities

- Incoloy® sheath watt densities to 60 W/in<sup>2</sup> (9.3 W/cm<sup>2</sup>)
- Titanium sheath watt densities to 45 W/in<sup>2</sup> (7 W/cm<sup>2</sup>)
- Steel sheath watt densities to 23 W/in<sup>2</sup> (3.5 W/cm<sup>2</sup>)
- Wattages to 9kW
- Voltages to 600V~(ac)

### Features and Benefits

- **WATROD element** is filled with compacted MgO insulation to maximize dielectric strength, heat transfer and life.
- **Long no-heat ends** form the heater's riser. No-heat ends leave only the element's looped portion submerged and heated. These are also formed into a right angle to move the terminal enclosure away from over the tank.

- **Moisture resistant (NEMA 4) terminal enclosure** offers easy access to terminal wiring.
- **Terminal enclosure materials** depend on element sheath material. These include:

<b>Cast iron</b>	Incoloy® Steel 316 stainless steel
<b>PVC</b>	Titanium

- **Conduit openings** accept 3/4 inch conduit fittings to facilitate wiring.
- **Screw lug terminals** accept customer supplied ring-type wire terminals.
- **Ground terminals** are supplied to facilitate equipment grounding.

### Applications

- Water heating
- Lightweight oils
- Salt baths
- Mild acid baths
- Cleaning solutions
- Plating solutions

## Options

### Three-prong, Twist-Lock® Plug

An optional flexible cord, with three-prong, Twist-lock® plug, provides easy connection to standard 220V~(ac) outlets. The 70 inch (1780 mm) cord is rubber insulated

to resist oil, ozone, grease, chemicals, acids, solvents, weather and temperature extremes to 195°F (90°C).

To order, add the suffix letter **C** to the heater's base code number.

### Wattages and Voltages

Watlow supplies stock vertical loop heaters as 240V~(ac), with wattages from five to eight kilowatts. To meet specific application needs, Watlow

can configure heaters with voltages and wattages outside these parameters.

For more information about this option, consult your Watlow representative.

### Passivation

During the manufacturing process, particles of iron or tool steel may become embedded in the stainless steel or alloy sheath. If not removed, these particles may corrode,

produce rust spots and/or contaminate the process.

For critical applications, passivation will remove free iron from the sheath.

To order, specify **passivation**.

Twist-Lock® is a registered trademark of Hubbell Incorporated.

# Tubular and Process Assemblies

F.O.B.: Hannibal, Missouri

## Over-the-Side Heaters

### Vertical Loop Heater Options

Continued

#### Adjustable Mounting Brackets

To accommodate varying tank wall thicknesses, optional stainless steel mounting brackets adjust from 0 to 4¾ inches (0 to 120 mm).

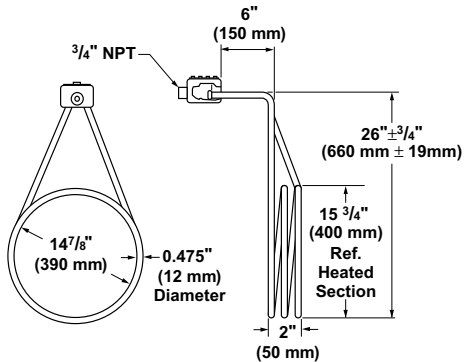
To order, add suffix letter **B** to the vertical loop heater base code number.

#### Application Hints

- Determine recommended sheath material and watt density by using the **Supplemental Applications Chart** on **pages 263 to 266**. If unable to determine the appropriate sheath material and watt density for the fluid being heated, consult your Watlow representative.

- Ensure conduit openings and fittings are compatible with the environment around the heater enclosure.
- Use optional mounting brackets to position the heating element so there is ample space between the tank wall and the heating element.
- Ensure the liquid level stays above the heater's looped section. If not submerged, it will overheat or create a hazardous situation.
- Remove the heater periodically to inspect and clean the element. This maintenance procedure will prolong the heater's life.

### Vertical Loop Heaters



All units are Stock unless otherwise noted.  
**Availability**  
**Stock:** Same day shipment  
**Standard:** Five weeks  
**Made-to-Order:** Eight weeks

Applications	WATROD Description	kW	Code No. 240V~(ac) 1-Phase	Est.Ship. Weight lbs (kg)
Conventional Plating Baths Such as Copper Plating, Cyanide Type; Tin Plating, Alkaline Stannate Type; Brass and Bronze; Nickel, Chrome, Gold and Silver Plating and Iron Chromide. Nitrites, Permanganates, Persulfates and Dichromates.	<b>43 W/in<sup>2</sup> Titanium</b> (6.7 W/cm <sup>2</sup> )	8	<b>VLT10W8</b> ①	28 (13)
Water Heating and Mild Acids	<b>40 W/in<sup>2</sup> Incoloy®</b> (6.2 W/cm <sup>2</sup> )	8	<b>VLN10W8</b>	28 (13)
Mild Acid Baths	<b>40 W/in<sup>2</sup> 316 SS</b> (6.2 W/cm <sup>2</sup> )	8	<b>VLR10W8</b>	28 (13)
Alkaline Solutions Which Do Not Contain Fluorides, Fluoroborates or Fluorosilicates, Pyrophosphate Copper, Ferric Chloride, Iron Chloride; Bright Dips and Pickles Containing Nitric, Phosphoric, and Chromic Acids	<b>27 W/in<sup>2</sup> Titanium</b> (4.2 W/cm <sup>2</sup> )	5	<b>VLT10W5</b> ①	28 (13)
Water Heating, Corrosive Liquids and Salt Baths	<b>23 W/in<sup>2</sup> Incoloy®</b> (3.6 W/cm <sup>2</sup> )	5	<b>VLN10W5</b>	26 (12)
Citrus Juices, Mild Acid Baths and Other Fluids Normally Corrosive to Steel	<b>23 W/in<sup>2</sup> 316 SS</b> (3.6 W/cm <sup>2</sup> )	5	<b>VLR10W5</b>	26 (12)
Oil Tempering Baths, Salt Baths, Alkaline Cleaning Solutions, Cyanide Cleaning Solutions	<b>23 W/in<sup>2</sup> Steel</b> (3.6 W/cm <sup>2</sup> )	5 8	<b>VLS10W5</b> <b>VLS10W8</b>	26 (12) 26 (12)

① Standard

Over-the-Side

# Tubular and Process Assemblies

F.O.B.: Hannibal, Missouri

## Over-the-Side Heaters

### Vertical Loop Heater

#### How to Order

To order a stock vertical loop heater, please specify:

- Watlow code number
- Volts/watts
- Options
- Quantity

If our stock units do not meet your application needs, Watlow will provide **made-to-order** units.

Consult your Watlow representative and provide the following information:

- Application
- Volts/watts
- Watt density
- Dimensions
- No-heat section
- Heating element diameter and sheath material
- Options
- Quantity

#### Availability

**Stock:** Same day shipment

**Modified Stock** ①: Five to seven working days

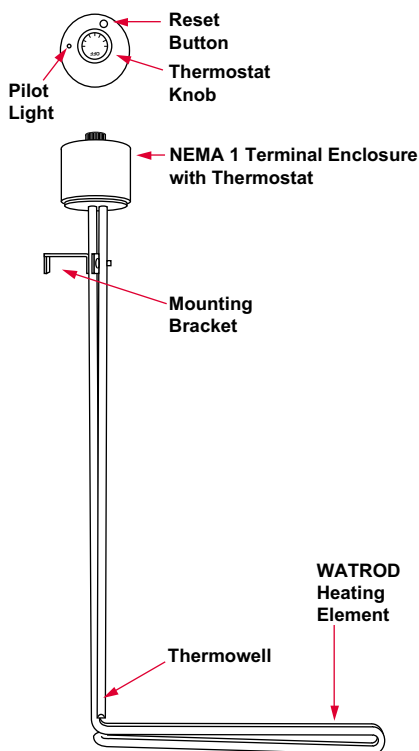
**Standard:** Three weeks

**Made-to-Order:** Five to seven weeks

Options, complexity and quantity may affect availability and lead times. Consult factory.

① Stock units with catalog options.

### Drum



Designed for direct immersion in a standard 55 gallon steel drum, these heaters install easily through the two inch (50 mm) bung hole.

These one to four kilowatt WATROD heaters come prewired with a thermostat, manual reset button and pilot light in a general purpose (NEMA 1) terminal enclosure. This internal tank temperature sensing feature protects against overheating.

#### Performance Capabilities

- Incoloy® sheath watt densities to 60 W/in<sup>2</sup> (9.3 W/cm<sup>2</sup>)
- Wattages to 9kW
- Voltages to 600V~(ac)

#### Features and Benefits

- **Light-weight, rugged construction** resists damage during installation or removal.
- **Stainless steel mounting bracket** adjusts to varying immersion depths to keep the heating element above settled sludge.

- **A 0.475 inch (12 mm) diameter Incoloy® WATROD element** has its hairpins repressed (recompacted) after bending to assure MgO density, dielectric strength, heat transfer and life.
- **Integral, on-off, manual reset, Type 8 thermostat**, rated from 60 to 250°F (15 to 120°C), senses process temperature and helps protect against overheating.
- **Pilot light** indicates if heater is cycled on or off.
- **30 inch (760 mm) long no-heat ends** form the heater's riser. No-heat ends leave only the element's heated portion submerged.
- **General purpose (NEMA 1) terminal enclosure** has one inch (25 mm) conduit openings to facilitate wiring.
- **UL® and CSA component recognition** to 480 and 600V~(ac) maximum under file numbers E52951 and 31388 respectively.

## Tubular and Process Assemblies

### Over-the-Side Heaters

#### Drum

#### Applications

- Melting heat sensitive materials such as wax, lard, grease and coconut oil

- Water and water-based solution heating
- Freeze protection

#### Options

#### Terminal Enclosures

A general purpose (NEMA 1) terminal enclosure, with integral thermostat, is supplied on all Watlow drum heaters. As an option, moisture resistant (NEMA 4) and explosion resistant (NEMA 7) terminal

enclosures are available to protect both wiring and the thermostat. To order, add the suffix letter **W** for moisture resistant (NEMA 4) or **E** for explosion resistant (NEMA 7) to the drum heater's base code number.

#### Wattages and Voltages

Watlow routinely supplies drum heaters in 120, 240 and 480V~(ac) in one or four kilowatt versions. Watlow will configure heaters with

voltages and wattages outside these parameters. For more information about this option, consult your Watlow representative.

#### Three-prong, Twist-Lock® Plug

An optional flexible cord, with three-prong, Twist-lock® plug, provides easy connection to standard 220V~(ac) outlets. The 70 inch (1780 mm) cord is rubber insulated

to resist oil, ozone, grease, chemicals, acids, solvents, weather and temperature extremes to 195°F (90°C). To order, add the suffix letter **CP** to the drum heater base code number.

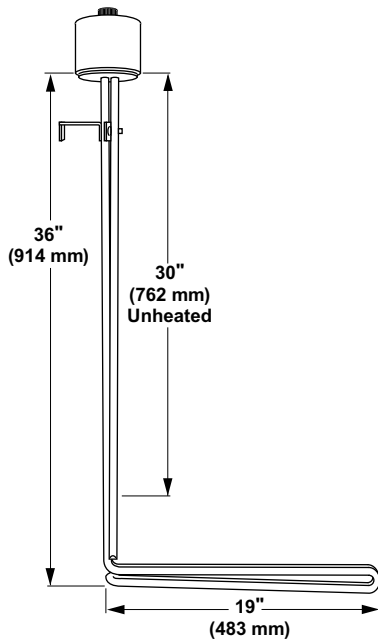
#### Application Hints

- Determine recommended sheath material and watt density by using the **Supplemental Applications Chart** on **pages 263 to 266**. If unable to determine the correct sheath material and watt density, consult your Watlow representative.
- Ensure that the element's heated portion is fully immersed at all times. If the element is not sufficiently submerged, it will overheat and become damaged.
- Use drum heaters only in metal drums.

- Do not use the thermostat as an on-off switch. Use a disconnect switch or circuit breaker to cut power prior to servicing.
- Ensure that conduit openings and fittings are compatible with the environment around the heater enclosure.
- Use the adjustable mounting bracket to raise the heating element above the drum's sludge level.
- Periodically remove the heater to inspect and clean the element. This maintenance procedure will prolong the heater's life.

# Tubular and Process Assemblies

## Over-the-Side Heaters



### Drum Heater

WATROD Description	kW	Code No.			Est. Ship. Weight lbs (kg)
		120V~(ac) 1-Phase	240V~(ac) 1-Phase	480V~(ac) 1-Phase	

#### Applications: Solvents, Water and Water Based Solutions

32 W/in <sup>2</sup> Incoloy® (5 W/cm <sup>2</sup> )	4		OLDN10S4	OLDN10S11	35 (16)
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#### Applications: Melting Oils, Lard, Fats, Tar

8 W/in <sup>2</sup> Incoloy® (1.3 W/cm <sup>2</sup> )	1	OLDN1S1	OLDN10S1		35 (16)
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All units are stock.

### Availability

**Stock:** Same day shipment

### How to Order

To order a stock drum heater, please specify:

- Watlow code number
- Volts/watts
- Options
- Quantity

If stock units do not meet your application needs, Watlow will provide **made-to-order** units.

Consult your Watlow representative and provide the following:

- Application
- Volts/watts
- Watt density
- Dimensions
- No-heat section
- Heating element diameter and sheath material
- Options
- Quantity

### Availability

**Stock:** Same day shipment

**Modified Stock** ①: Five to seven working days

**Standard:** Three weeks

**Made-to-Order:** Five to seven weeks

Options, complexity and quantity may affect availability and lead times. Consult factory.

① Stock units with catalog options.