

WATROD TUBULAR HEATERS

WATROD Tubular Heaters Provide Optimum Manifold Heating



Available in single- or double-ended termination styles, the versatile and economical WATROD tubular heating element lends itself to efficient heating of hot runner manifolds. The single-ended WATROD tubular design has both terminals at one end. The opposite end is sealed to resist contamination. Standard 305 mm (12 in.) flexible lead wires are crimp connected to the terminal pin and have silicone impregnated fiberglass oversleeves. With its round cross-section geometry, the double-ended WATROD is highly adaptable for bending – especially when bending is performed in the field.

Both single- and double-ended WATRODs share many construction features that deliver long life—the resistance wire is centered in the heater sheath and electrically insulated with compact, high-grade magnesium oxide for superior manifold heating. Watlow's double-sided multicoil tubular elements offer various combinations of resistor coils and thermocouples inside one sheath. They have the ability to sense the heater's internal temperature accurately every time, or offer three-phase capability in one element.

Performance Capabilities

Single-Ended WATROD

- Watt densities to 6.9 W/cm² (45 W/in²)
- UL[®] and CSA component recognition to 240V~(ac)
- Incoloy[®] and stainless steel sheath temperatures to 650°C (1200°F)

Double-Ended WATROD

- Watt densities to 18.6 W/cm² (120 W/in²)
- UL[®] and CSA component recognition to 480 and 600V~(ac) respectively
- Inconel[®] sheath temperatures to 982°C (1800°F)

Features and Benefits

Precision wound nickel-chromium resistance wire

- Distributes heat evenly to the sheath for optimum heater performance

Silicone resin seals

- Protect against moisture contamination and manifold leakage and are rated to 200°C (390°F)

MgO insulation filled sheath

- Maximizes dielectric strength, heat transfer and life

Standard sheath materials include

- Copper, steel 316 stainless steel and Inconel[®]
- Optional materials, available on made-to-order, include 304 stainless steel, Inconel[®], Monel[®] and titanium

36 standard bend formations

- Allows for exacting fit to the manifold
- Spirals, compound bends, multi-axis and multi-plane configurations

Resistance wire fusion welded to the terminal pin

- For a stronger, positive electrical connection

Stainless steel studs

- Fusion welded to terminal pins for mechanical strength with ceramic insulator



HAN-WRD-1001

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Moisture Resistance Seals

WATRODs MgO insulating material is hygroscopic. To prevent moisture contamination from entering the heater, an appropriate moisture seal must be used. Choosing the correct seal is important to the life and performance of the heater. Be sure the maximum continuous use temperatures is not exceeded at the seal location. Most end seals are applied with a small cavity in the end of the heater. The seal will also help prevent arching at the terminal ends.

Applications

- Hot runner molds

Bend Formations

Single-Ended WATROD

Watlow does not recommend field bending single-ended WATROD elements. The minimum radius of the bend and the straight length beyond the bend limits formation. The radius must be 76 mm (3 in.) or more for the heated length's end to be inside a bend.

Double-Ended WATROD

Double-ended WATROD heating elements can be formed into spirals, compounds, multi-axis and multi-planes from 36 common bend configurations. Custom bending with tighter tolerances can be made to meet specific application needs.

The minimum bend radius and the straight length required beyond the bend limits formation. In order to locate the end of a heated length within a bend, the radius must be 76 mm (3 in.) or larger. Additionally, overall length tolerances must be included in one or more of the straight lengths.

WATROD Termination Options

Double-ended WATROD elements are available with a variety of terminations. Single-ended WATROD elements are available with only flexible lead wires. The following table and illustrations detail the terminations available with double- or single-ended WATRODs – for each available sheath diameter.

Standard flexible lead wires are 305 mm (12 in.) unless otherwise specified. Insulation options include TGGT (250°C/480°F) plus other temperature ratings. Consult factory for availability. Overmolds are available for flexible lead wires only and are available in silicone rubber (200°C/390°F), neoprene (90°C/212°F) and other materials. Consult your Watlow representative for details.

WATROD Element	Sheath Diameter		Threaded Stud ^a	Screw Lug (Plate)				Quick Connect (Spade)			Flexible Lead Wires	Lead Wire Overmolds
	mm	inch		A	B	C	D	E	F	G		
Double-Ended	6.6	0.260	#6-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	8.0	0.315	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	8.5	0.335	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	9.5	0.375	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	10.9	0.430	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	12.0	0.475	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	12.4	0.490	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	15.9	0.625	#10-32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Single-Ended	9.5	0.375	No	No	No	No	No	No	No	No	Yes	No
	10.9	0.430	No	No	No	No	No	No	No	No	Yes	Yes
	12.0	0.475	No	No	No	No	No	No	No	No	Yes	Yes
	12.4	0.490	No	No	No	No	No	No	No	No	Yes	No
	15.9	0.625	No	No	No	No	No	No	No	No	Yes	Yes