

Quick Ship

• Same day shipment on all stock units.

Cartridge Heaters

FIREROD® Immersion

FIREROD® immersion heaters package to 300 W/in² (46.5 W/cm²) in a compact unit, giving you greater versatility in designing your heating system. This design solution is ideal for replacing large screw-plug immersion heaters.

Aside from its versatile design, these heaters come complete with a brass 3/4 inch NPT double threaded screw plug, which allows you to add conduit boxes. Also, FIREROD immersion heaters are sealed at the lead end with a silicone rubber seal. Solid copper leads, with silicone rubber sleeve, are provided for unconfined wiring. These units are recommended for immersion in water or 90+ percent water soluble solutions.

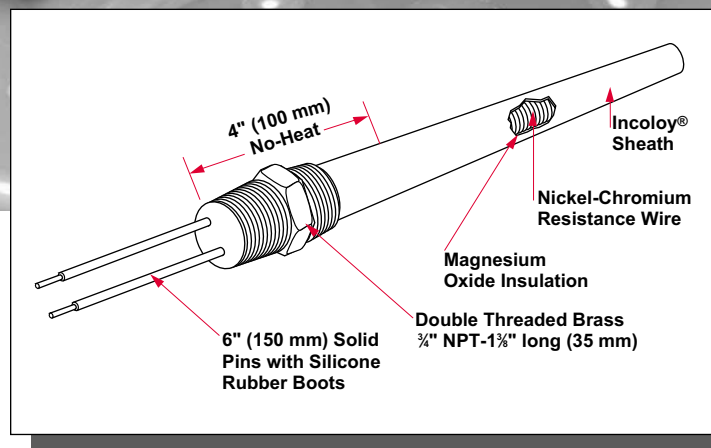
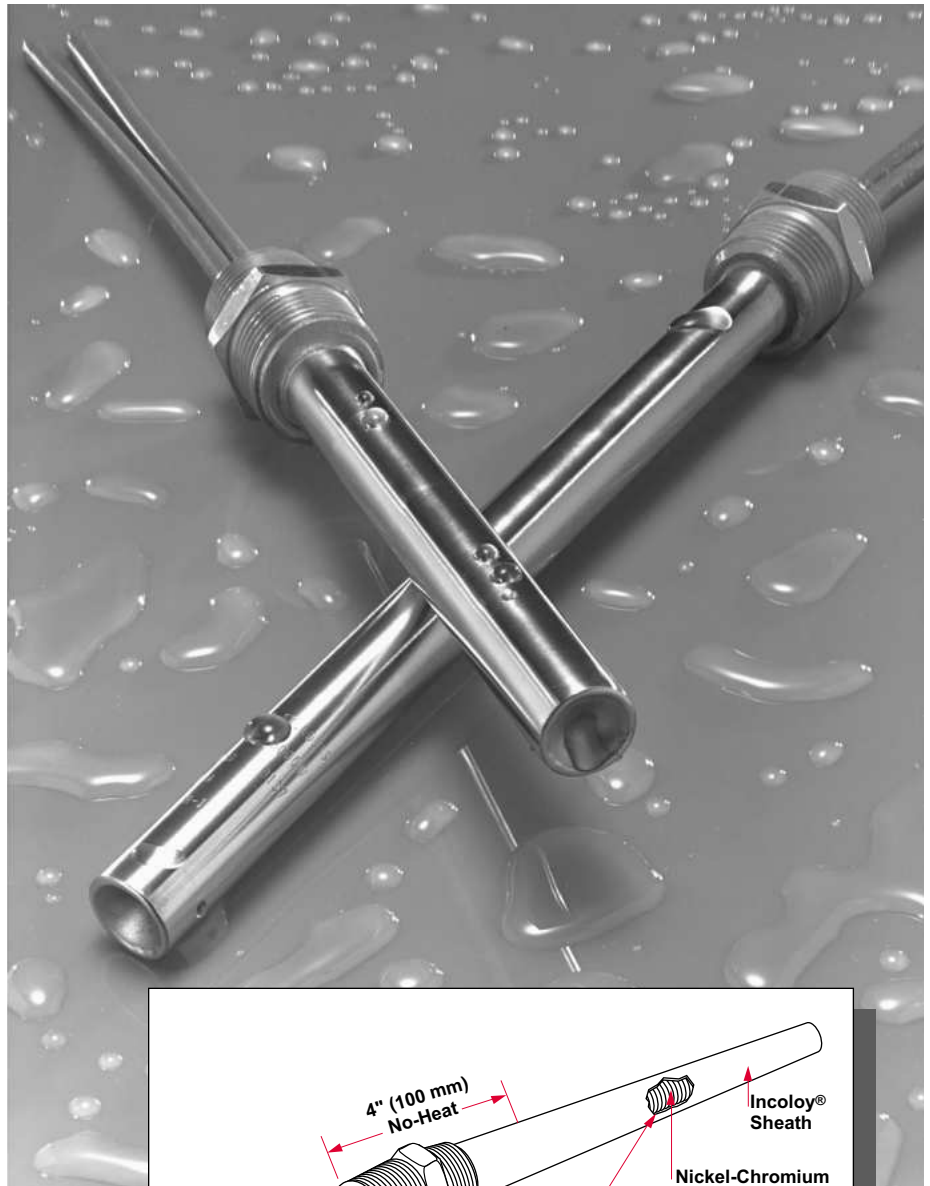
Performance Capabilities

- Maximum operating temperature in water to 212°F (100°C) at atmospheric pressure
- Maximum watt density to 300 W/in² (46.5 W/cm²)
- Maximum voltage to 480V~(ac)

Features and Benefits

- **Nickel-chromium resistance wire**, precisely centered in the unit, assures even, efficient distribution of heat to the sheath.
- **Magnesium oxide insulation**, compacted to the proper density, results in high dielectric strength and contributes to faster heat-up.
- **Incoloy® sheath** resists corrosion from water.
- **Metallurgically-bonded conductor pins** overlap the resistance wire inside the core, ensuring trouble-free electrical continuity.
- **Lead end with silicone rubber seal** protects the heater against moisture contamination.
- **Optional stainless steel fittings** are available for use in corrosive applications.

Incoloy® is a registered trademark of Special Metals Corporation.



- **Horizontal through the wall tank mounting** makes set-up faster.
- **240 and 480V~(ac)** give flexibility in wiring the heater for use in your particular application.

Applications

- Plastic reclamation
- Food preparation
- Lab equipment

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Applications and Technical Data

The small size and big capacity of FIREROD cartridge heating units make them ideal immersion heaters in cramped quarters. When heating liquids of low viscosity, FIRERODs have the high watt density to pack more heat into tight spots. For water heating applications a rating of 150 to 300 W/in² is recommended. (Laboratory tests show that under certain conditions ratings as high as 700 W/in² are safe.) For longer life at high watt densities:

- The FIREROD unit should be in the main body of the liquid and not in a restricted space.
- The FIREROD heater should be covered with liquid at all times.
- The heater should not be allowed to cycle on and off too frequently.
- Scale should not form.

When heating viscous liquids, such as oils, watt densities must be kept low to prevent carbonization at the heater sheath. FIREROD cartridges offer advantages for heating viscous materials where long life and high quality outweigh the usual economic considerations. As in all immersion applications, scale build-up on the sheath and sludge on the bottom of the tank must be carefully controlled to assure long heater life.

Equipped with smaller threaded fittings than conventional immersion heaters, FIRERODs leave room for more units in the same space. Replacement of single FIREROD units in multiheater assemblies is fast and easy, and avoids discarding the complete assembly.

Moisture proof seals are available to give protection from damp atmospheres outside the tank.

Built for sustained operation at high temperatures, the FIREROD is especially valuable in heat-transfer applications with liquid metals. This factor alone has made the FIREROD heater a widely used component in the development of nuclear power systems.

Threaded fittings are furnished in either stainless steel or brass. FIRERODs with Incoloy® or 304 stainless steel sheaths are standard, but other sheath materials can be provided. Headers and sheath material should be suited to the material being heated.



Consult FIREROD section, pages 75 to 76 for more information.

Sheath Material Compositions

Sheath Material	Chemical Composition															
	Al	C	Co	Cr	Cu	Fe	Mn	Mo	Ni	P	S	Si	Ta	Ti	V	W
Stainless Steels																
304		0.08 ①		18/20		Bal	2 ①		8/12			1 ①				
316		0.08 ①		16/18		Bal	2 ①	2/3	10/14			1 ①				
Nickel Alloys																
Incoloy® 800	0.15/0.6	0.1		19/23	0.75	Bal	1.5		30/35		0.015	1.0		0.15/0.6		

① Maximum

See application guide for additional sheath material composition.

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Applications and Technical Data

Continued

How to Order

To order stock FIREROD immersion heaters, specify Watlow code number and quantity.

For **made-to-order** units, please specify:

- Diameter
- Overall length
- Immersed length
- Heated length
- Watts
- Volts
- Threaded fitting material

Ordering Example:

Specify FIREROD immersion heater 5/8 inch diameter, six inches overall length, immersed length of four inches, and two inches heated length. The heater is to be supplied with 1200 watts, 240 volts, 3/4 inch NPT double threaded brass fitting, silicone seal and six inch pins, no leads.

Availability

Stock: Same day shipment

Made-to-Order: Consult Watlow

F.O.B.: St. Louis, Missouri

Diameter in	Overall length in (mm)	Volts	Watts	Watt Density		Approx Fittings Type	Net Wt.		Availability	Code No.
				W/in ²	(W/cm ²)		lbs	(kg)		
5/8	6 1/4 (159)	120	500	127	(19.7)	Brass	0.58	(0.26)	Stock	L6EX12A
	6 1/4 (159)	120	500	127	(19.7)	SS	0.58	(0.26)	Stock	L6EX12B
	6 1/4 (159)	240	500	127	(19.7)	Brass	0.58	(0.26)	Stock	L6EX13A
	6 1/4 (159)	240	500	127	(19.7)	SS	0.58	(0.26)	Stock	L6EX13B*
	6 1/4 (159)	120	750	191	(29.6)	Brass	0.58	(0.26)	Stock	L6EX14A
	6 1/4 (159)	120	750	191	(29.6)	SS	0.58	(0.26)	Stock	L6EX14B
	6 1/4 (159)	240	750	191	(29.6)	Brass	0.58	(0.26)	Stock	L6EX15A
	6 1/4 (159)	240	750	191	(29.6)	SS	0.58	(0.26)	Stock	L6EX15B
	6 1/4 (159)	120	1000	254	(39.4)	Brass	0.58	(0.26)	Stock	L6EX16A
	6 1/4 (159)	120	1000	254	(39.4)	SS	0.58	(0.26)	Stock	L6EX16B
	6 1/4 (159)	240	1000	254	(39.4)	Brass	0.58	(0.26)	Stock	L6EX17A
	6 1/4 (159)	240	1000	254	(39.4)	SS	0.58	(0.26)	Stock	L6EX17B
	6 3/4 (159)	240	1500	300	(46.5)	Brass	0.60	(0.27)	Stock	L6NX7A
	6 3/4 (171)	240	1500	300	(46.5)	SS	0.60	(0.27)	Stock	L6NX7B
	6 3/4 (171)	480	1500	300	(46.5)	Brass	0.60	(0.27)	Stock	L6NX8A
	6 3/4 (171)	480	1500	300	(46.5)	SS	0.60	(0.27)	Stock	L6NX8B
	7 3/4 (197)	240	2000	291	(45.1)	Brass	0.66	(0.30)	Stock	L7NX5A
	7 3/4 (197)	240	2000	291	(45.1)	SS	0.66	(0.30)	Stock	L7NX5B
	7 3/4 (197)	480	2000	291	(45.1)	Brass	0.66	(0.30)	Stock	L7NX6A
	7 3/4 (197)	480	2000	291	(45.1)	SS	0.66	(0.30)	Stock	L7NX6B
8 1/2 (216)	240	2500	300	(46.5)	Brass	0.68	(0.31)	Stock	L8JX16A	
8 1/2 (216)	240	2500	300	(46.5)	SS	0.68	(0.31)	Stock	L8JX16B	
8 1/2 (216)	480	2500	300	(46.5)	Brass	0.68	(0.31)	Stock	L8JX17A	
8 1/2 (216)	480	2500	300	(46.5)	SS	0.68	(0.31)	Stock	L8JX17B*	
9 1/4 (235)	240	3000	300	(46.5)	Brass	0.72	(0.33)	Stock	L9EX11A	
9 1/4 (235)	240	3000	300	(46.5)	SS	0.72	(0.33)	Stock	L9EX11B	
9 1/4 (235)	480	3000	300	(46.5)	Brass	0.72	(0.33)	Stock	L9EX12A	
9 1/4 (235)	480	3000	300	(46.5)	SS	0.72	(0.33)	Stock	L9EX12B	
11 (279)	240	4000	300	(46.5)	Brass	0.80	(0.36)	Stock	L11AX59A	
11 (279)	240	4000	300	(46.5)	SS	0.80	(0.36)	Stock	L11AX59B	
11 (279)	480	4000	300	(46.5)	Brass	0.80	(0.36)	Stock	L11AX60A	
11 (279)	480	4000	300	(46.5)	SS	0.80	(0.36)	Stock	L11AX60B	

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* Limited quantities available, consult factory for delivery.

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F.O.B.: St. Louis, Missouri

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Diameter in	Overall length		Volts	Watts	Watt Density		Approx Fittings Type	Net Wt.		Availability	Code No.
	in	(mm)			W/in ²	(W/cm ²)		lbs	(kg)		
5/8	12 3/4	(324)	240	5000	300	(46.5)	Brass	0.89	(0.41)	Stock	L12NX4A
	12 3/4	(324)	240	5000	300	(46.5)	SS	0.89	(0.41)	Stock	L12NX4B
	12 3/4	(324)	480	5000	300	(46.5)	Brass	0.89	(0.41)	Stock	L12NX5A
	12 3/4	(324)	480	5000	300	(46.5)	SS	0.89	(0.41)	Stock	L12NX5B
1 1/2	14 1/2	(368)	240	6000	300	(46.5)	Brass	0.95	(0.43)	Stock	L14JX8A
	14 1/2	(368)	240	6000	300	(46.5)	SS	0.95	(0.43)	Stock	L14JX8B
	14 1/2	(368)	480	6000	300	(46.5)	Brass	0.95	(0.43)	Stock	L14JX9A
	14 1/2	(368)	480	6000	300	(46.5)	SS	0.95	(0.43)	Stock	L14JX9B
1 3/4	18	(457)	240	8000	295	(45.7)	Brass	1.14	(0.52)	Stock	L18AX43A
	18	(457)	240	8000	295	(45.7)	SS	1.14	(0.52)	Stock	L18AX43B
	18	(457)	480	8000	295	(45.7)	Brass	1.14	(0.52)	Stock	L18AX44A
	18	(457)	480	8000	295	(45.7)	SS	1.14	(0.52)	Stock	L18AX44B
2 1/4	21 1/4	(540)	240	10000	300	(46.5)	Brass	1.3	(0.59)	Stock	L21EX1A
	21 1/4	(540)	240	10000	300	(46.5)	SS	1.3	(0.59)	Stock	L21EX1B
	21 1/4	(540)	480	10000	300	(46.5)	Brass	1.3	(0.59)	Stock	L21EX2A
	21 1/4	(540)	480	10000	300	(46.5)	SS	1.3	(0.59)	Stock	L21EX2B
2 3/4	24 3/4	(629)	480	12000	300	(46.5)	Brass	1.5	(0.68)	Stock	L24NX1A
	24 3/4	(629)	480	12000	300	(46.5)	SS	1.5	(0.68)	Stock	L24NX1B*
	29 3/4	(756)	480	15000	300	(46.5)	Brass	1.8	(0.82)	Stock	L29NX5A
	29 3/4	(756)	480	15000	300	(46.5)	SS	1.8	(0.82)	Stock	L29NX5B*
3 1/2	35	(889)	480	18000	300	(46.5)	Brass	2.0	(0.91)	Stock	L35AX5A
	35	(889)	480	18000	300	(46.5)	SS	2.0	(0.91)	Stock	L35AX5B

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