

Low Mass with High Versatility

The versatile Watlow® coil/cable heater can be formed into a variety of shapes. Small diameter, high performing cable heaters are fully annealed and readily bent to a multitude of configurations.

The heater can be formed into a compact, coiled nozzle heater supplying a full 360 degrees of heat with optional distributed wattage. A straight cable heater can snake through an equipment application. Flat, spiral configurations can be used in high-tech manufacturing while a star wound cable can be used for air and gas heating.

Different applications require different construction methods, including one, two or four resistance wires; parallel coil or straight wire; drawn or swaged sheaths; with or without internal thermocouples; leads exiting from one or both ends, and round, rectangular or square cable cross sectionals.

Whatever the application requirement, a Watlow coil/cable heater can be shaped to fit.

Performance Capabilities

- Continuous operating temperatures up to 1200°F (650°C) with intermittent operating periods achieving up to 1500°F (815°C) dependent on the type of element wire used
- Watt densities up to 33 W/in² (5.1 W/cm²)
- Sheath watt densities on the cable to 30 W/in² (4.65 W/cm²), and as high as 75 W/in² (11.62 W/cm²) subject to factory approval
- Maximum voltage up to 240V

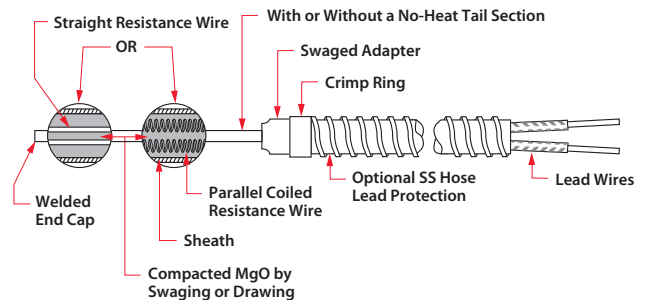
Features and Benefits

High ductility

- Allows the heater to be cold-formed into almost any shape

Low mass

- Allows quick response in both heating and cooling



Features and Benefits (con't)

Constructed with no open seams

- Enables operation in unusual environments, including cryogenic and sub-freezing temperatures, high vacuum, gaseous and liquid immersion heaters
- Decreases opportunity for corrosion

Constructed of standard 304 stainless steel, optional 316 stainless steel or alloy 600

- Provides high-temperature corrosion and oxidation resistance along with ideal expansion properties

Heater sheath can be brazed

- Allows the permanent attachment of mounted fittings to the heater, contact a Watlow representative for further information

Sizes range from 0.040 in. (1.02 mm) to 0.188 in. (4.8 mm) diameter

- Delivers a high volume of heat into a tiny space

Internal construction options

- Allows internal thermocouples and no-heat sections (not available in all sizes)

Typical Applications

- Plastic injection molding nozzles
- Semiconductor manufacturing and wafer processing
- Semiconductor pedestal heating and showerhead
- Hot metal forming dies and punches
- Sealing and cutting bars
- Medical, analytical and scientific instruments
- Restaurant and food processing equipment
- Cast-in heaters
- Laminating and printing presses
- Air heating
- Textile manufacturing
- Heating in a vacuum environment

Electrical Data and Coiling Limits

Sheath Diameter		Max. Voltage	Surface Area Per Linear Foot		Min. Bend Radius		Min. Coiled Inside Diameter	
in.	(mm)		in.	(cm)	in.	(mm)	in.	(mm)
0.040 ± 0.002	(1.016 ± 0.051)	48	1.51	(9.740)	¹ / ₁₆	(1.6)	¹ / ₈	(3.2)
0.062 ± 0.002	(1.575 ± 0.051)	120	2.34	(15.098)	¹ / ₈	(3.2)	¹ / ₄	(6.0)
0.094 + 0.002 - 0.003	(2.388 + 0.051 - 0.076)	240	3.54	(22.840)	³ / ₁₆	(4.8)	³ / ₈	(9.5)
0.102 square ± 0.003	(2.591 ± 0.076)	240	4.90	(31.615)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.102 ± 0.003 x 0.156 ± 0.005 rectangular	(2.591 ± 0.076) x (3.962 ± 0.127)	240	6.19	(39.938)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.125 ± 0.003	(3.175 ± 0.076)	240	4.71	(30.389)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.157 ± 0.004	(3.988 ± 0.102)	240	5.92	(38.196)	⁵ / ₁₆	(7.9)	⁵ / ₈	(15.9)
0.188 + 0.003 - 0.006	(4.775 + 0.076 - 0.152)	240	7.09	(45.745)	³ / ₈	(9.5)	³ / ₄	(19.0)
0.128 square ± 0.003	(3.251 ± 0.076)	240	6.31	(40.712)	¹ / ₄	(6.0)	¹ / ₂	(13.0)

In most cases 30 W/in² (4.65 W/cm²) is the safe allowable limit for cable watt density. Please contact your Watlow representative prior to ordering >30 W/in² cables.

Resistance/Wattage Tolerance ±10%.

Cable heaters can run on both ac and dc. Contact your Watlow representative for amperage limitations.

Coiling Tolerances

Cable Diameters	Coiled Width Tolerances		Coiled I.D. Tolerances			
	Coiled Width in. (mm)	Tolerances in. (mm)	Coil I.D. Range in. (mm)		Tolerances in. (mm)	
All Diameters	Below 6 (152)	+ 0 - ¹ / ₈ (+0.00 - 3.18)	Below 0.625	(Below 15.88)	+0.000 - 0.015	(+0 - 0.38)
	6 to 10 (152 to 254)	+ ¹ / ₈ - ³ / ₈ (+3.18 - 9.53)	0.625 to 0.999	(15.88 to 25.38)	+0.000 - 0.030	(+0 - 0.76)
	Over 10 (Over 254)	+ ¹ / ₄ - ¹ / ₄ (+6.35 - 6.35)	1.000 to 1.999	(25 to 50.78)	+0.000 - 0.062	(+0 - 1.58)
			2.000 to 2.999	(51 to 76.18)	+0.000 - 0.125	(+0 - 3.18)
			3.000 to 3.999	(76 to 101.58)	+0.000 - 0.250	(+0 - 6.35)
			4.000 to 4.999	(102 to 126.98)	+0.000 - 0.375	(+0 - 9.53)
			5.000 and Over	(127 and Over)	+0.000 - 0.500	(+0 - 13.00)

When the O.D. of the coil is required as the critical dimension, it must be specified at the time of ordering so that proper coiling procedures can be determined. I.D. and O.D. dimensions cannot be held on the same unit. Please contact your Watlow representative prior to ordering coiled cable heaters requiring other than standard tolerances.

Cable Straight Length Tolerances

Length	≤ 24 in.	>24 in. ≤ 60 in.	>60 in. ≤ 100 in.	>100 in.
Tolerance	± ³ / ₈ in.	± ¹ / ₂ in.	±1 in.	±1%

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Specialty Heaters



Coil/Cable Heaters

Cable Heater Units (Internal thermocouple is not available)

Straight Cable Length in. (mm)	Volts	Watts	Watt Density W/in ² (W/cm ²)	No-Heat Length in. (mm)	Lead Wire	Part Number
0.062 in. (1.6 mm) Diameter Round (with ±10% wattage tolerance) 0.250 in. x 1.125 in. adapter						
24 (610)	120	240	51 (7.9)	0 (0)	36 in. (914) mm swaged-in fiberglass	62H24A6X-1138
36 (914)	120	400	57 (8.8)	0 (0)		62H36A5X-1015
56 (1422)	120	330	30 (4.7)	0 (0)		62H56A4X-942
65 (1651)	120	500	39 (6.0)	0 (0)		62H65A3X-1111
0.094 in. (2.4 mm) Diameter Round (with ±5% wattage tolerance) 0.132 in. x 1.250 in. adapter— Lead protection not available						
30 (762)	230	125	17 (2.6)	5 (127)	48 in. (1219) mm swaged-in PTFE leads only	94PC30A1X
30 (762)	230	250	34 (5.3)	5 (127)		94PC30A2X
0.125 in. (3.2 mm) Diameter Round (with ±10% wattage tolerance) 0.250 in. x 1.125 in. adapter, *0.375 in. x 2.000 in. adapter						
18 (457)	240	250	35 (5.4)	1.5 (38)	36 in. (914) mm swaged-in fiberglass	125CH18A4X-1066
19 (483)	120	165	21 (3.3)	1.5 (38)		125CH19A1X-879
24 (610)	120	275	29 (4.5)	1.5 (38)		125CH24A1X-1049
24 (610)	240	275	29 (4.5)	1.5 (38)		125CH24A14X-806
38 (965)	240	325	21 (3.3)	1.5 (38)		125CH38A1X-631
38 (965)	120	175	12 (1.9)	1.5 (38)		125CH38A2X-246
47 (1194)	240	260	14 (2.2)	1.5 (38)		125CH47A1X-108
47 (1194)	120	235	12 (1.9)	1.5 (38)		125CH47A2X-182
47 (1194)	120	375	20 (3.1)	1.5 (38)		125CH47A3X-986
47 (1194)	240	345	19 (2.9)	1.5 (38)		125CH47A4X-1081
65 (1651)	240	420	16 (2.5)	1.5 (38)		125CH65A1X-940
65 (1651)	240	675	27 (4.2)	1.5 (38)		125CH65A2X-1115
95 (2413)	240	1000	28 (4.3)	0 (0)		125CH93A1X-1154
126 (3200)	240	1500	30 (4.7)	0 (0)		48 in. (1219) mm swaged-in fiberglass
150 (3810)	240	2000	34 (5.3)	0 (0)	125H150A3A-1168*	
223 (5664)	240	3000	34 (5.3)	0 (0)	125H223A1A-1057*	
0.128 in. (3.3 mm) Square Cross-Section (with ±10% wattage tolerance) 0.250 in. x 1.125 in. adapter						
12 (305)	120	200	36 (5.6)	1.5 (38)	36 in. (914) mm swaged-in fiberglass	125PS12A24A-647
12 (305)	240	200	36 (5.6)	1.5 (38)		125PS12A23A-155
20 (508)	120	300	31 (4.8)	1.5 (38)		125PS20A37A-537
20 (508)	240	300	31 (4.8)	1.5 (38)		125PS20A38A-142
30 (762)	120	450	30 (4.7)	1.5 (38)		125PS30A47A-159
30 (762)	240	450	30 (4.7)	1.5 (38)		125PS30A48A1019
38 (965)	240	600	31 (4.8)	1.5 (38)		125PS38A23A-562

Note: Lead protection is available upon request.



Coil/Cable Heaters

Cable Heater Units (Type J internal thermocouple)

Straight Cable Length in. (mm)	Volts	Watts	Watt Density W/in ² (W/cm ²)	No-Heat Length in. (mm)	Lead Wire	Part Number
0.125 in. (3.2 mm) Diameter Round (with ±10% wattage tolerance), thermocouple located in center of heated section, 0.250 in. x 1.125 in. adapter						
24 (610)	120	275	29 (4.5)	1.5 (38)	48 in. (1219) mm swaged-in fiberglass	125CH24A13X
38 (965)	120	175	12 (1.9)	1.5 (38)		125CH38A18X
47 (1194)	120	235	13 (2.0)	1.5 (38)		125CH47A21X
65 (1651)	240	675	26 (4.0)	1.5 (38)		125CH65A26X
0.157 in. (4 mm) Diameter Round (with ±10% wattage tolerance), thermocouple located at the disk end of the cable, 0.375 in. x 2.000 in. adapter						
124 (3150)	240	1500	25 (3.9)	0 (0)	48 in. (1219) mm swaged-in fiberglass	157CH124AX
150 (3810)	240	2000	27 (4.2)	0 (0)		157CH150AX
220 (5588)	240	3000	28 (4.3)	0 (0)		157CH220AX
0.128 in. (3.3 mm) Square Cross-Section (with ±10% wattage tolerance), thermocouple located in center of heated section, 0.250 in. x 1.125 in. adapter						
12 (305)	240	200	36 (5.6)	1.5 (38)	48 in. (1219) mm swaged-in fiberglass	125PS12A22A
20 (508)	120	300	31 (4.8)	1.5 (38)		125PS20A35A
20 (508)	240	300	31 (4.8)	1.5 (38)		125PS20A36A
30 (762)	240	450	30 (4.7)	1.5 (38)		125PS30A46A
38 (965)	240	600	31 (4.8)	1.5 (38)		125PS38A24A

Note: Lead protection is available upon request.