



Hi-Density Miniature

Hi-Density 1/8" Diameter Miniature Cartridge Heaters

PERFORMANCE RATINGS

Max. Temperature: 1200°F (649°C)

Max. Watt Density: 100-200 W/in² (15.5-31 W/cm²)
depending on operating temperature.

NOTE: The maximum operating temperature and the life expectancy of a cartridge heater is dependent on two main factors:

1. The maximum recommended sheath temperature
 2. The maximum ambient temperature for the termination selected
- Consult Tempco if you require a recommendation for your application.

DIMENSIONAL SPECIFICATIONS

Nominal Diameter	1/8"	
	in	(mm)
Actual Diameter	.122	(3.10)
Diameter Tolerance	±.002	(.051)
Minimum Length	1.25	(31.8)
Maximum Length	12	(305)
Length Tolerance Heaters up to 5" (127 mm) long	±3/32 (2.4)	
Length Tolerance Heaters over 5" (127 mm) long	±2% of Sheath Length	

SHEATH MATERIAL

Type 304 Stainless Steel

ELECTRICAL SPECIFICATIONS

Nominal Diameter	1/8"
Maximum Voltage	240
Maximum Amperage	3.0
Maximum Wattage at 120V	360
Maximum Wattage at 240V	720
Wattage Tolerance	+10,-15%
Resistance Tolerance	+15,-10%

1/8" Actual .122" (3.10 mm) Diameter Hi-Density Cartridge Heaters with Type N Termination (10" leads)

Sheath Length		Watts	Watt Density		Part Number	
in	mm		W/in ²	W/cm ²	120V	240V
1¼	31.8	25	90	14	HDC19100	—
1¼	31.8	35	126	20	HDC19101	—
1½	31.8	50	180	28	HDC19102	—
1½	38.1	30	80	12	HDC19103	—
1½	38.1	60	160	25	HDC19104	—
2	50.8	40	70	11	HDC19105	—

Sheath Length		Watts	Watt Density		Part Number	
in	mm		W/in ²	W/cm ²	120V	240V
2	50.8	50	87	13	HDC19106	HDC19112
2	50.8	100	175	27	HDC19107	HDC19113
2½	63.5	50	68	11	HDC19108	—
3	76.2	60	64	10	HDC19109	—
3½	88.9	70	62	10	HDC19110	—
4	101.6	80	60	9	HDC19111	HDC19114



Note: 1/8" Diameter Hi-Density Cartridge Heaters are made-to-order only.
Standard lead time is 3 weeks.

Custom Engineered/Manufactured 1/8" Hi-Density Cartridge Heaters

(Refer to pages 2-2 through 2-9)

Because cartridge heaters can be very application specific, consult Tempco with your special requirements. For sizes, electrical ratings and any other design features required but not listed in the catalog, Tempco will custom engineer and manufacture to your specifications.

Consult Us with Your Requirements. We Welcome Your Inquiries.

**Custom
Manufactured**



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Cartridge Heaters



Standard Specifications

Hi-Density Cartridge Heater Specifications

PERFORMANCE RATINGS

Max. Temperature: ♦1400°F (760°C)

Max. Watt Density: 100-300 W/in² (15.5-46.5 W/cm²)
depending on heater size & operating temperature.

NOTE: The maximum operating temperature and the life expectancy of a cartridge heater is dependent on two main factors:

1. The maximum recommended sheath temperature (♦1200°F for a standard heater)
2. The maximum ambient temperature for the termination selected.

Consult Tempco if you require a recommendation for your application.

DIMENSIONAL SPECIFICATIONS

Nominal Diameter	1/8"		1/4"		5/16"		3/8"		1/2"		5/8"		3/4"		1"	
	in	(mm)	in	(mm)	in	(mm)	in	(mm)	in	(mm)	in	(mm)	in	(mm)	in	(mm)
Actual Diameter	.122	(3.10)	.246	(6.25)	.308	(7.82)	.371	(9.42)	.496	(12.60)	.621	(15.77)	.746	(18.95)	.996	(25.30)
Diameter Tolerance	±.002	(.051)	±.002	(.051)	±.002	(.051)	±.002	(.051)	±.002	(.051)	±.002	(.051)	±.003	(.076)	±.003	(.076)
Minimum Length	1.25	(31.8)	1	(25.40)	1	(25.40)	1	(25.40)	1	(25.40)	1	(25.40)	1-1/4	(31.75)	1-3/4	(44.45)
Maximum Length	12	(305)	36	(914)	36	(914)	48	(1219)	60	(1524)	72	(1829)	72	(1829)	72	(1829)
Length Tolerance Heaters up to 5" (127 mm) long	±3/32	(2.4)	±3/32	(2.4)	±3/32	(2.4)	±3/32	(2.4)	±3/32	(2.4)	±3/32	(2.4)	±1/8	(3.2)	±1/8	(3.2)
Length Tolerance Heaters over 5" (127 mm) long	—		±2% of Sheath Length													
Camber Tolerance Heaters to 12" (305 mm) long	—		0.010"(.254 mm) per foot of length													
Camber Tolerance Heaters over 12" (305 mm) long	—		0.020"(.508 mm) per foot of length													

A certain amount of Camber is unavoidable. With a slight force, Hi-Density Cartridge Heaters will flex enough to fit into a straight reamed hole.

ELECTRICAL SPECIFICATIONS

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Maximum Voltage	240	240	240	240	240	480*	480*	480*
Maximum Amperage (see next line for exceptions)	3.0	4.4	4.5	6.7	10.5	23	23	23
†Maximum Amperage for Types C1C, C1D, C2C, C2D, CS, F, M3, R1B, S1, S2, SA, W & W3 Terminations	—	3.0	3.0	5.5	7.6	9.7	9.7	9.7
Minimum Wattage at 120V on a 1" long Heater	—	50	45	45	50	50	—	—
Minimum Wattage at 120V on a 2" long Heater	5	20	20	20	20	20	20	20
Maximum Wattage at 120V	360	525	540	800	1260	2760	2760	2760
Maximum Wattage at 240V	720	1050	1080	1600	2520	5520	5520	5520
Maximum Wattage at 480V	—	—	—	—	—	11,000	11,000	11,000
Wattage Tolerance	+10,-15%		Plus 5%, Minus 10%					
Resistance Tolerance	+15,-10%		Plus 10%, Minus 5%					

†Current carrying capacities are for ambient temperatures up to 482°F (250°C) with mica insulated lead wires.

*480V when applicable. Consult Tempco.

LENGTH TOLERANCE FOR:

- LEAD WIRES
- WIRE BRAID LEADS
- ARMOR CABLE LEADS

Up to 36": -1/2", +1" (-12.7 mm, +25.4 mm)

36" to 72": -1", +2" (25.4 mm, +50.8 mm)

Above 72": ±4" (101.6 mm)



Note: Specifications detailed on this page are standard. Consult Tempco if your application requires tighter tolerances or has other special requirements.

TEMPERATURE COEFFICIENT OF RESISTANCE

The electrical resistance (ohms) of the heater resistance wire increases with temperature rise.

Tempco standard Hi-Density Cartridge Heaters are manufactured with ohms (cold ohms) 3.3% lower than the actual calculated ohms (hot ohms) to compensate for this increase.

AVAILABLE ELECTRICAL FEATURES

Diameter	Dual Volts	3-Phase	Dual Circuits	Multiple Heat Zones (maximum 3 zones)
1/8"	No	No	No	No
1/4"	No	No	No	No
5/16"	No	No	No	No
3/8"	Yes*	No	No	Yes*
1/2"	Yes*	Yes	Yes	Yes*
5/8"	Yes	Yes	Yes	Yes
3/4"	Yes	Yes	Yes	Yes
1"	Yes	Yes	Yes	Yes

Consult factory for maximum wattages and voltages.

* Heaters may require a larger diameter transition area at lead end.

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