



Cartridge Heaters

HIGH WATT DENSITY CARTRIDGE HEATERS | LOW WATT DENSITY CARTRIDGE HEATERS



Estd. 1969
Mumbai, INDIA

PRATIK HEAT PRODUCTS
PRIVATE LIMITED
MANUFACTURERS & EXPORTERS OF QUALITY INDUSTRIAL HEATING ELEMENTS

The first choice, to last...™



High Watt Density Cartridge Heaters

PHP's High Watt Density Cartridge Heaters are designed and manufactured out of experience of many years, thus the performance and life expectancy superseeds other cartridge heaters.

Heating Conductor grade NiCr 80:20 is evenly wound over a supporting core which is centrally located in a Chrome Nickel Steel tube and the inner space is filled with specially selected high purity magnesium oxide. This assembled unit is then highly compressed, converting the core, powder and conductor into a homogenous mass. The bottom end of the heater is welded with a disc washer to prevent contamination.

Features

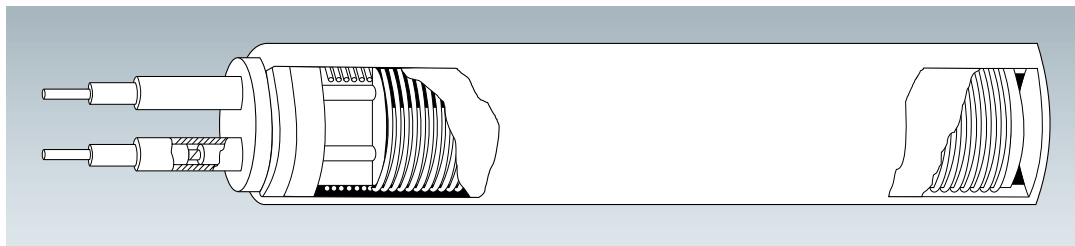
- Min Dia: 1/4" & 6 mm
Max Dia: 1" & 20 mm
- Min length: 1 1/2" & 40 mm
Max length: 40" & 1000 mm
- Available with in built Thermocouple
- Highly Non-corrosive
- Various Watt Density option available
- Even heat profile & Max temp up to 750°C
- Specially selected High Purity Magnesium Oxide
- Standard Sizes Available
- Superior Life Expectancy
- Available with various Lead Exits & Cable Protection options
- Sealed Bottom with Conical End disk to avoid contamination and for easy replacements

Applications

- Packaging Industry
- Hot Runner Bushings
- Marking & Sealing Machinery
- Medical & Laboratory Apparatus
- Shoe Making Industry
- Die and platens

Technical Data

- Outer Sheath material : Chrome Nickel Steel, welded end disc washer of same material.
Maximum operating temperature 750°C.
Sheath can be ground for precision tolerance (only for heaters with crimped on leads)
- Heating Conductor : NiCr 80:20
- Power : ± 10%
- Voltage : 12 to 440 volts
- Leakage Current : < 0.5 mA
- High Voltage : 800 V
- Surface Loading : upto 150 watts / in²
- Lead Orientation : A) Crimped on leads: PTFE/Fibreglass Flexible lead crimped on solid pin emerging from the heater.
B) Swaged in Leads: Flexible Fibre Glass or PTFE leads emerging from within the heater.



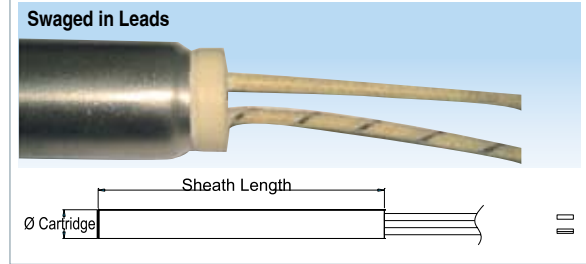
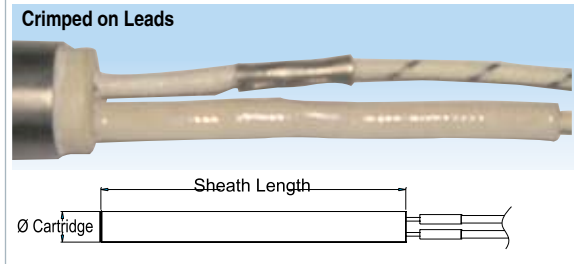
Dimensional Data

Nominal Diameter	1/4"	3/8"	1/2"	5/8"	3/4"	6.5 mm	8 mm	10 mm	12.5 mm	16 mm	20 mm
Minimum Diameter	.246"	.372"	.496"	.621"	.746"	6.42 mm	7.92 mm	9.92 mm	12.42 mm	15.92 mm	19.92 mm
Maximum Diameter	.249"	.374"	.499"	.624"	.749"	6.48 mm	7.98 mm	9.98 mm	12.48 mm	15.98 mm	19.98 mm
Minimum Length	1 1/2"	1 1/2"	2"	2"	3"	40 mm	40 mm	40 mm	50 mm	50 mm	75 mm
Maximum Length	8"	10"	18"	24"	24"	200 mm	200 mm	250 mm	450 mm	600 mm	600 mm
Lead wires in mm ²	.5	.75	1	1.5	2.5	.5	.75	.75	1	1.5	2.5
Maximum Amperes	4	6	8	12	18	4	6	6	8	12	18

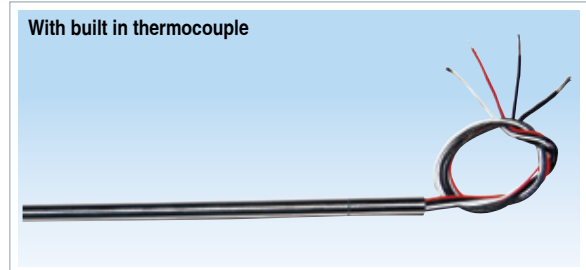
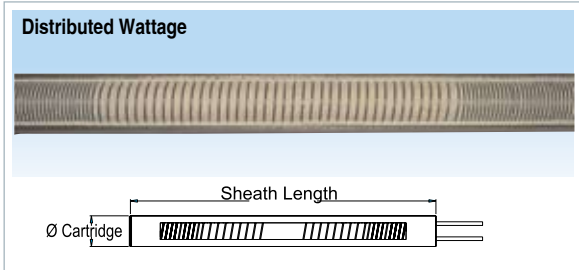
For options other than mentioned above, please consult.



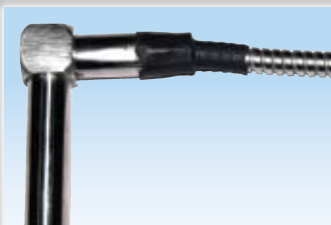
Leads



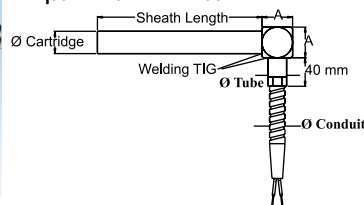
- OPTIONS -



Terminations



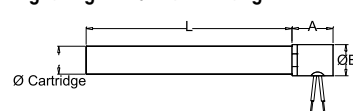
Square End with Conduit



Ø Cartridge	6.5 mm 1/4"	10 mm 3/8"	12.5 mm 1/2"	16 mm 5/8"	20 mm 3/4"
Ø Tube	7.2	9.5	12	14.5	14.5
Ø Conduit	5.7	7.5	10.5	13	13
A	8	12	15	19	22



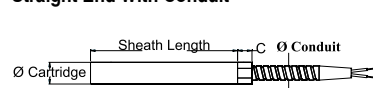
Right Angle End with Pointing



Ø Cartridge	6.5 mm 1/4"	10 mm 3/8"	12.5 mm 1/2"	16 mm 5/8"	20 mm 3/4"
A	15	18	18	20	20
ØB	7.6	11.5	14.3	18	21.4/22



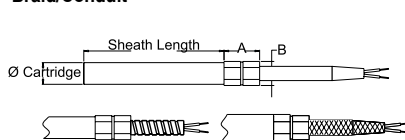
Straight End With Conduit



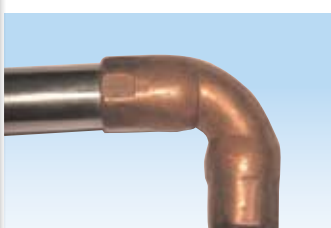
Ø Cartridge	6.5 mm 1/4"	10 mm 3/8"	12.5 mm 1/2"	16 mm 5/8"	20 mm 3/4"
C	-	10	10	12	-
Ø Conduit	-	7.5	10.5	13	-



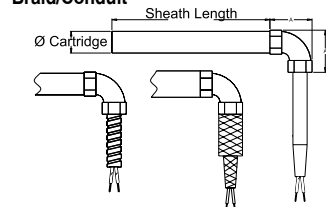
Straight End With Copper Coupler and Braid/Conduit



Ø Cartridge	6.5 mm 1/4"	10 mm 3/8"	12.5 mm 1/2"	16 mm 5/8"	3/4"	20 mm
A	17.5	19.7	23.2	26.1	23.2	26.1
B	8.0	12	14.2	17.9	14.2	17.9
SS Braid	6	6	12	16	12	16
Ø Conduit	5.7	9.5	10.5	13	10.5	13



Straight End With Copper Elbow and Braid/Conduit



Ø Cartridge	6.5 mm 1/4"	10 mm 3/8"	12.5 mm 1/2"	16 mm 5/8"	3/4"	20 mm
A	19.5	25.8	27.3	29.6	27.3	29.6
SS Braid	6	6	12	16	12	16
Ø Conduit	5.7	9.5	10.5	13	13	13

Recommended Standard Sizes for High Watt Density Cartridge Heaters

Diameter	Length	Recommended Watts				Diameter	Length	Recommended Watts				Diameter	Length	Recommended Watts			
1/4" 6.35mm (-.02/.08mm)	1.5" (38mm)	100	125	175	200	6.5mm (-.02/.08mm)	40 mm	100	160	175	175	8mm (-.02/.08mm)	40 mm	100	175	200	250
	2.0" (51mm)	100	175	200	250		50 mm	100	175	200	250		50 mm	150	200	275	300
	2.5" (64mm)	125	200	250	300		60 mm	125	200	250	300		60 mm	100	175	300	350
	3.25" (83mm)	150	200	300	350		80 mm	150	200	300	350		80 mm	150	225	400	
	4.0" (102mm)	200	300	400	450		100 mm	200	300	400	450		100 mm	175	300	450	
	5.0" (127mm)	250	300	500	650		130 mm	250	300	500	650		130 mm	250	400	600	
	6.0" (152mm)	300	400	650	800		160 mm	300	400	650	800		160 mm	300	450	750	

Diameter	Length	Recommended Watts				
3/8" 9.52mm (-.02/.08mm)	1.5" (38mm)	100	125	200	250	300
	2" (51mm)	100	150	250	300	400
	2.5" (64mm)	125	175	300	400	500
	3.25" (83 mm)	150	250	450	550	650
	4" (102mm)	225	350	550	700	850
	5" (127mm)	300	500	750		
	6" (152mm)	400	650	1000		
	7" (178mm)	450	700	1100		
	8" (203mm)	500	750	1200		
	10" (254mm)	650	1000	1500		

Diameter	Length	Recommended Watts				
10mm (-.02/.08mm)	40 mm	100	125	200	250	300
	50 mm	100	150	250	300	400
	60 mm	125	175	300	400	500
	80 mm	150	250	450	550	650
	100 mm	225	350	550	700	850
	130 mm	300	500	750		
	160 mm	400	650	1000		
	175 mm	450	700	1100		
	200 mm	500	750	1200		
	250 mm	650	1000	1500		

Diameter	Length	Recommended Watts				
1/2" 12.7mm (-.02/.08mm)	1.5" (38mm)	100	175	225		
	2.0" (51mm)	100	150	250	350	400
	2.5" (64mm)	200	350	500	650	800
	3.25" (83mm)	200	350	500	650	800
	4" (102mm)	250	400	650	800	
	5" (127mm)	400	650	1000	1250	
	6" (152mm)	500	800	1250		
	7" (178mm)	550	900	1250		
	8" (203mm)	800	1000	1500		
	10" (254mm)	1000	1500	1800		
	12" (305mm)	1000	1750	2000		

Diameter	Length	Recommended Watts				
12.50mm (-.02/.08mm)	40 mm	100	175	225		
	50 mm	100	150	250	350	400
	60 mm	200	350	500	650	800
	80 mm	200	350	500	650	800
	100 mm	250	400	650	800	
	130 mm	400	650	1000	1250	
	160 mm	500	800	1250		
	175 mm	550	900	1250		
	200 mm	800	1000	1500		
	250 mm	1000	1500	1800		
	300 mm	1000	1750	2000		



Diameter	Length	Recommended Watts				
5/8" 15.88mm (-.02/.08mm)	1.5" (38mm)	150	175	275	350	
	2" (51mm)	150	200	350	400	500
	2.5" (64mm)	200	300	450	550	650
	3.25" (83mm)	300	400	650	800	1000
	4" (102mm)	315	400	630	800	1000
	5" (127mm)	500	700	1100	1400	1800
	6" (152mm)	600	900	1600	1800	
	7" (178mm)	750	1000	1750		
	8" (203mm)	800	1250	2000		
	10" (254mm)	1000	1500	2500		
	12" (305mm)	1250	1800			
	14" (355mm)	1500	2500			
16" (405mm)	1600	2000				

Diameter	Length	Recommended Watts				
16.00mm (-.02/.08mm)	40 mm	150	175	275	350	
	50 mm	150	200	350	400	500
	60 mm	200	300	450	550	650
	80 mm	300	400	650	800	1000
	100 mm	315	400	630	800	1000
	130 mm	500	700	1100	1400	1800
	160 mm	600	900	1600	1800	
	175 mm	750	1000	1750		
	200 mm	800	1250	2000		
	250 mm	1000	1500	2500		
	300 mm	1250	1800			
	350 mm	1500	2500			
	400 mm	1600	2000			

Diameter	Length	Recommended Watts				
3/4" 19.05mm (-.02/.08mm)	3" (76mm)	350	500	800	1000	1250
	4" (102mm)	450	650	1000	1400	1600
	5" (127mm)	650	900	1400	1800	2200
	6" (152mm)	800	1100	1800	2200	
	7" (178mm)	900	1200	2000		
	8" (203mm)	1000	1500	2000		
	10" (254mm)	1600	2000			
	12" (305mm)	1600	2000			
	14" (355mm)	1750	2500			
	16" (406mm)	2000	3000			
	18" (457mm)	2500	3500			
20" (508mm)	2500	3500				

Diameter	Length	Recommended Watts				
20.00mm (-.02/.08mm)	80 mm	350	500	800	1000	1250
	100 mm	450	650	1000	1400	1600
	130 mm	650	900	1400	1800	2200
	160 mm	800	1100	1800	2200	
	175 mm	900	1200	2000		
	200 mm	1000	1500	2000		
	250 mm	1600	2000			
	300 mm	1600	2000			
	350 mm	1750	2500			
	400 mm	2000	3000			
	450 mm	2500	3500			
	500 mm	2500	3500			

- Tolerance on length is 3mm upto 150mm above 150mm +/- 2%
- Tolerance on wattage +/-10%
- All standard heaters are with 250 mm long crimped on leads and Fiber Glass or PTFE insulation unless specified.
- J type thermocouple available only at disc end and with PTFE leads.
- Dia 8mm will not be supplied with t/c.

NOTE: For heaters besides above diameter and lengths please contact us.

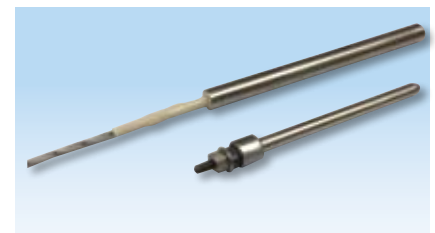
High watt density Cartridge Heaters for Low Voltage

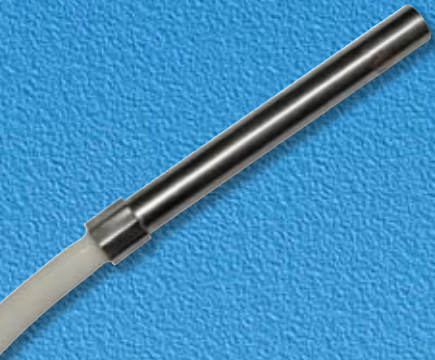
These highly compacted heating elements have been developed primarily for heating of small parts. The sheath is Chrome Nickel Steel, it serve as a return conductor therefore the high performance cartridge heaters only used for the operation at low voltage up to 42 V max.

Technical Data

- The sheath of the cartridge heater for low voltage is not ground.
- The maximum sheath temperature of the heating element is approx 500°C
- The connection cable for the low voltage cartridge heater consist of twisted wire which is insulated by fibers glass / Teflon / or bolt connection of M3 x 0.50 mm

These heating elements are produced to order based on a minimum Quantity 20 pieces.





Low Watt Density Cartridge Heaters

PHP's Low Density Cartridge Heaters are developed for heating applications not requiring high watt densities nor sheath temperatures exceeding 300°C, with maximum watt densities of 30 to 45 watts per square inch depending on applications. The heaters of various sheath diameters can be used in any assembly, equipment or machine.

Features

- Min Dia: 3/8" & 10 mm
Max Dia: 3/4" & 20 mm
- Min length: 50 mm
Max length: 1000 mm
- Highly Non-corrosive
- Various Watt Density option available
- Even heat profile & Max temp up to 300°C
- Specially selected High Purity Magnesium Oxide
- Standard Sizes Available
- Superior Life Expectancy
- Available with various Lead Exits & Cable Protection options
- Sealed Bottom End disk to avoid contamination and for easy replacements

Applications

- Packaging Industry
- Hot Runner Bushings
- Marking & Sealing Machinery
- Medical & Laboratory apparatus
- Shoe Making Industry
- Die and platens

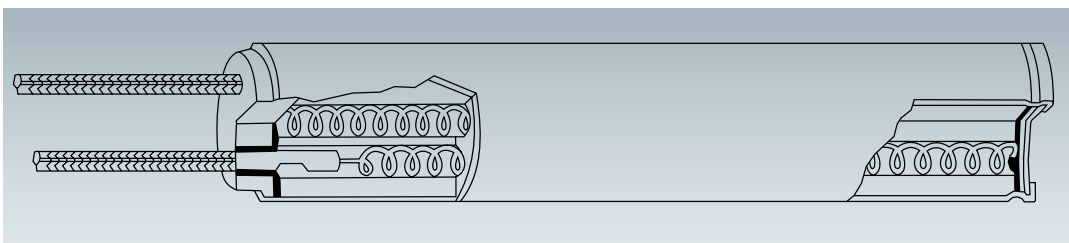
The heater design consists of a helically wound resistance coil made from nickel-chrome wire, evenly stretched and strung through holes in a round ceramic insulator. The element assembly is inserted into a Chrome Nickel Steel. This alloy provides the best combination of physical strength and resistance to heat oxidation up to 450°C.

Specially selected grain size and high purity magnesium oxide is used to fill all remaining space inside the ceramic insulator to increase thermal conductivity, dielectric strength, and provide longer operating heater life.

The heaters are used in operations involving: packaging machinery, labeling machines, plastic injection, shoe machinery, heat sealing, hot stamping, glue guns and wax pots, heating of gases and liquids and various other heating applications.

Technical Data

Outer Sheath material	: Chrome Nickel Steel, welded end disc washer of same material. Maximum operating temperature 300°C.
Heating Conductorx	: NiCr 80:20
Power	: ± 10%
Voltage	: 12 to 440 volts
Leakage Current	: < 0.5 mA
High Voltage	: 800 V
Surface Loading	: upto 30 watts / in ²
Lead Orientation	: A) Crimped on leads: PTFE/Fibreglass Flexible lead crimped on solid pin emerging from the heater. B) Fixed in Leads: Flexible Fibre Glass or PTFE leads emerging from within the heater.



Dimensional Data

Nominal Diameter	3/8"	1/2"	5/8"	3/4"	10 mm	12.5 mm	16 mm	20 mm
Minimum Diameter	.370"	.496"	.620"	.745"	9.90 mm	12.40 mm	15.90 mm	19.85 mm
Maximum Diameter	.375"	.50"	.624"	.750"	10.0 mm	12.50 mm	16.00 mm	20.00 mm
Minimum Length	2"	2"	3"	4"	50 mm	50 mm	75 mm	100 mm
Maximum Length	20"	20"	30"	40"	500 mm	750 mm	750 mm	1000 mm
Lead wires in mm ²	.50	1	1.5	2.5	.50	1	1.5	2.5
Maximum Amperes	4	8	12	18	4	8	12	18

Recommended Standard Sizes for Low Watt Density Cartridge Heaters

Diameter	3/8" --10mm	1/2"--12.5mm	5/8"--16mm	3/4"--20mm
Length	Watt	Watt	Watt	Watt
2"--50mm	50	80	100	120
3"--75mm	100	120	150	180
4"--100mm	120	150	200	250
5"--125mm	150	200	250	300
6"--150mm	180	250	300	375
7"--175mm	200	280	350	425
8"--200mm	250	320	400	475
9"--225mm	275	350	450	550
10"--250mm	300	350	500	600
11"--275mm	330	450	550	660
12"--300mm	360	480	600	725
13"--325mm	400	520	650	800
14"--350mm	420	550	700	850
15"--375mm	450	600	750	900
16"--400mm	480	640	800	960
17"--425mm	500	680	850	1050
18"--450mm	550	720	900	1100
19"--475mm	570	750	950	1150
20"--500mm	600	800	1000	1200

Precautions & Installation (for High Watt Density & Low Watt Density Cartridge Heaters)

① Cartridge units are made with special tubing which is a few thousandth under-size to ensure a free fit for easy installation. To install cartridge heaters, drill and ream holes to proper length and the nominal diameter +/- 0.001 inches maximum of the Cartridge Heater (3/8 Inch, 1/2 Inch, 5/8 Inch etc.). A hole should be drilled & reamed to 1/2 Inch diameter +/- 0.001 Inch to insure a proper fit. Always finish ream, drilled or cast holes to ensure a smooth, uniform metal contact for efficient heat transfer. A knockout hole should be provided if possible to facilitate cartridge removal. For watt density over 150W/In² we recommend press fit split bores. Elements that fit too loosely will have poor heat transfer and shortens life due to excessively high sheath temperature. They should be tight fit with minimum tolerance in reamed holes. ② Prior to installation, the holes must be cleaned & should be free of all contamination that might liquefy under heat and penetrate into the heater thereby carbonizes & becomes conductive. The smallest amount of contamination can cause electrical shorts and results in heater failure. Raw materials (polymers) spillage on the terminals & contamination (oil/grease) penetrating into the heaters results in failure of heaters. Combustible gases & vapours also leads to deposits of carbon on the terminals resulting in failure of heaters. ③ Physical or mechanical damage can also result in failure of the heater as it can damage the element in the heater. ④ Due to hygroscopic in nature moisture absorption can occur when element is exposed or stored in damp or wet climate. If kept unused for longer period, there is moisture deposition on the terminals which results in heater failure. It is recommended to de-moisturize the heaters prior to installation by heating them at 100 - 120 degree centigrade in an oven for approximately 1 to 2 hours or use controllers with soft start function. This will help evaporate any moisture present inside. ⑤ Overheating that leads the heater to operate beyond the maximum capacity can be a cause for destroying an entire heating zone. The wattage should be calculated as close as possible to operating wattage to minimize on-off cycle resulting to power saving. In case of heaters without In-Built thermocouple ensure that the tips of the sensors (External Thermocouples) are clean and free from any contamination and should be checked for good response to temperature changes. Defective temperature sensors and controllers also lead to heater failures. ⑥ Lead ends (Non Heating) once bent should not be re-bent. This could lead to breakage. Sharp edges along the lead wire path should be avoided. Connection lead areas should be protected from combustible gases & liquid to avoid short-circuits. ⑦ Stabilized Voltage supply increases the life of the heater as well as increases the wattage output. ⑧ In case of immersion heaters we recommend you to clean (De-scale) the heaters on regular intervals. This helps increase life of heaters as well as optimum achievement of temperature in a shorter period, there by saves power. ⑨ Overheating that leads the heater to operate beyond the maximum capacity can be a cause for destroying an entire heating zone, defect temperature sensors and controllers. The wattage should be calculated as close as possible to operating wattage to minimize on-off cycle resulting to power saving. Ensure that the tips of the sensors (Thermocouples) are clean and free from any contamination and should be checked for good response to temperature changes. ⑩ Use of substandard raw materials & manufacturing defects is also one of the common cause of heater failure.



Exports across 5 continents



PRATIK HEAT PRODUCTS P R I V A T E L I M I T E D

MANUFACTURERS & EXPORTERS OF QUALITY INDUSTRIAL HEATING ELEMENTS

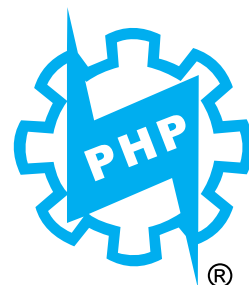
Registered Office & Works:

11/12, Tankiwala Industrial Estate, Steel Made Compound,
Marol Maroshi Road, Andheri(E), Mumbai 400 059. INDIA.

Phones : 29200183 / 29200189 / 29204284

Fax: +91-22-2925 4309

Email: (Support): info@phpheat.com, (Sales): sales@phpheat.com



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Other Products



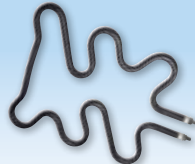
Coil Heaters



Micro Tubular Coil Heaters



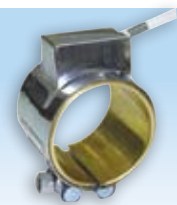
High Performance Nozzle Heaters



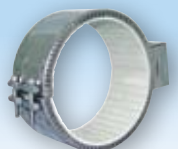
Tubular Heaters



Mica Band Heaters



Mica Nozzle Heaters



Ceramic Band Heaters