CARTRIDGE HEATERS

NIBE ELEMENT

Quality, which warms you.

ELECTRIC CARTRIDGE HEATERS

NIBE ELEMENT

ELTOP PRAHA s.r.o., a Czech company has many years experience of producting cartridge heathers.

This kind of heating element brings lot of advantages, especially:

- intensive heating
- easy changeability
- various designs

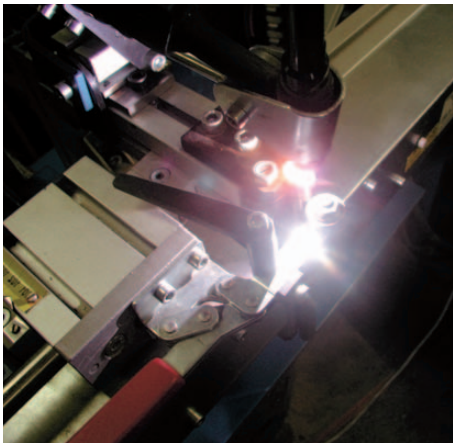
Cartridge heaters are produced to a high standard in a newly refurbished factory. Our cartridge heathers meet the requirements of EN 60 335-1 and for high loaded cartridges to requirements of the special standard DIN 44921-2.

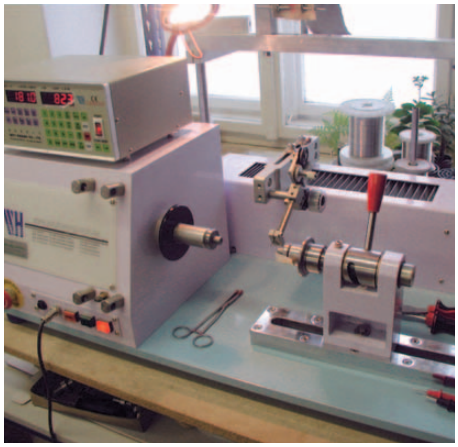
Please, observe local regulations for installation and connection to the electric network.

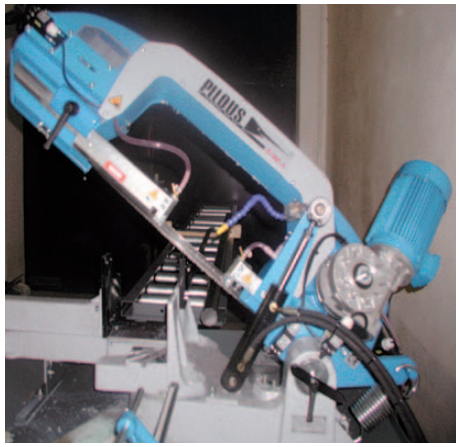
In case you are interested in these products, we recommend consultation with our engineering department to ensure optimal results.

TYPICAL APPLICATIONS:

heating of moulds for plastic and vulcanization
heating of moulds and core boxes for foundry industry
heating of plastic welding machines
heating of markers for thermal marking
warming of heating plates and boards
defrosting of refrigerators and freezers
heating of laboratory equipment
heating of various liquids
heating of machine parts and accesories

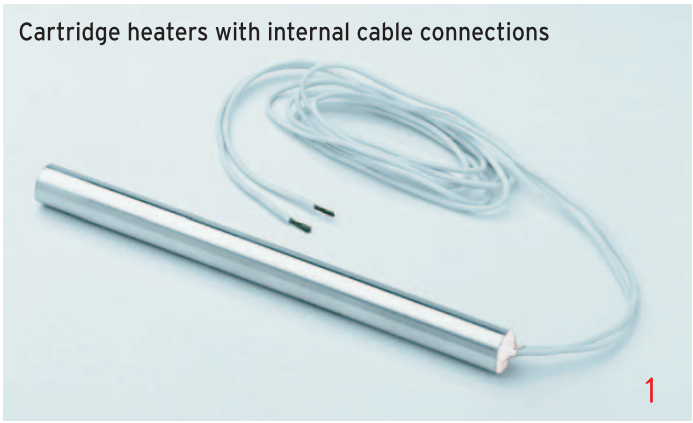


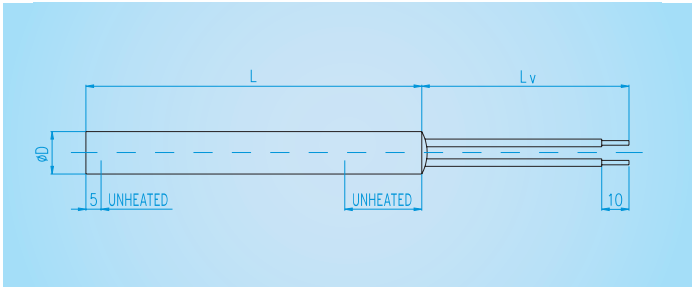




STANDARD TYPES

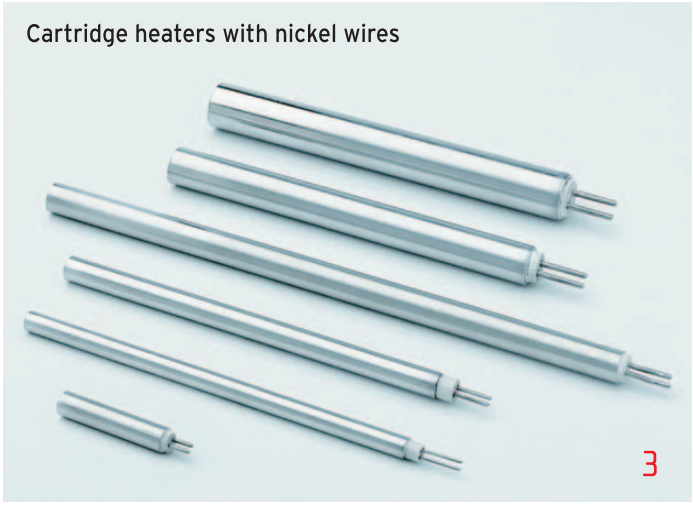
Cartridge heaters with internal cable connections

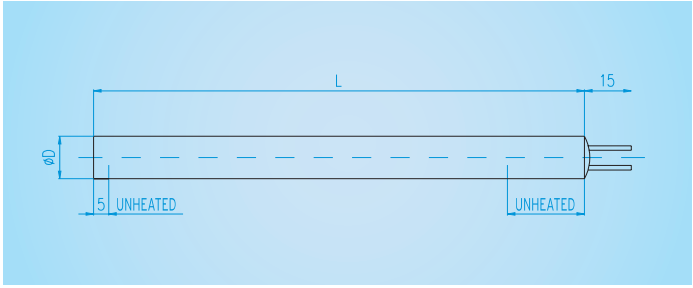




Cartridge heaters with internal cable connections are fitted with two separate cables terminating inside the cartridge.
Cables have glass fibre insulation with thermal resistance 350°C or 450°C.

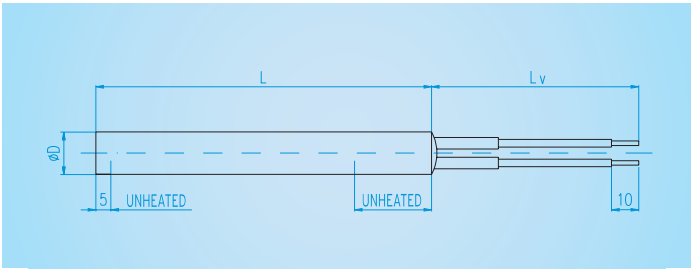
Cartridge heaters with nickel wires





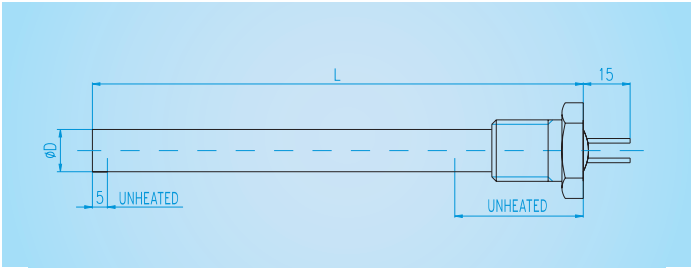
The basic type of cartridge heater is fitted with 15-20 mm long nickel wires.

Cartridge heaters with external cable connections



Cartridge heaters with external cable connections have cables terminating outside the cartridge. The terminations are insulated.
Insulation of cables is a silicone insulation with thermal resistance to 180°C, optionally cartridge can be fitted with cables with glass fibre insulation.

Cartridge heaters with threaded flanges

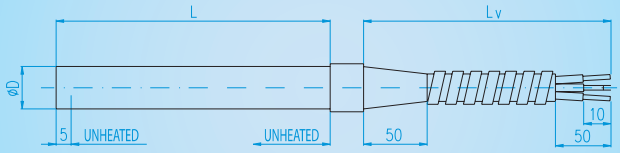


D	6,5	8	10	12,5	16	20
M	10x1	12x1,5	14x1,5	16x1,5	20x1,5	27x1,5

These cartridge heaters are fitted with a threaded flange for easy assembly and disassembly. The flange is fitted at the terminal end of the heater. The thread size, M, depends on the heater diameter, D, please refer to the table. Flanged heaters can be fitted with any terminations shown in the cataloque.

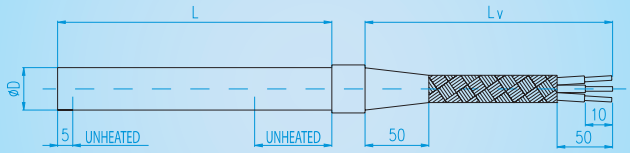
Cartridge heaters with cables protected by a flexible corrugated tube

5



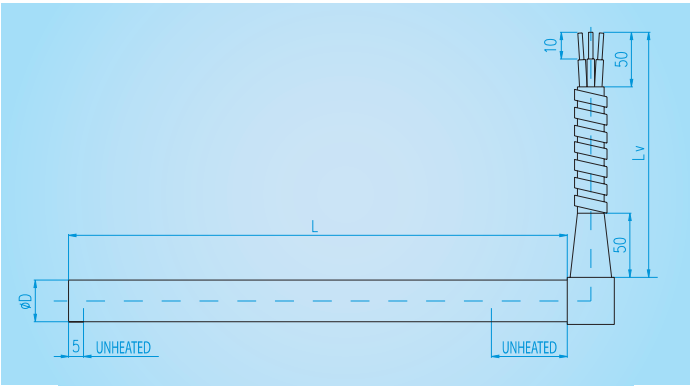
Cartridge heaters with cables protected by a sheath of flexible metal braid

6



Cartridge heaters with cables protected by a flexible corrugated tube with 90° outlet

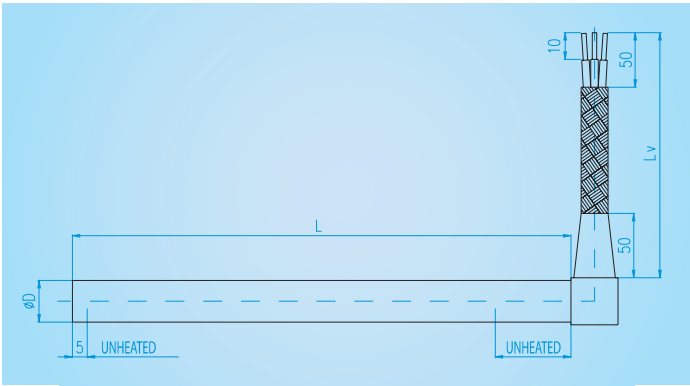
7



Cartridge heaters with either straight or right angle metal cable outlet with a flexible corrugated tube are fitted with wires with glass fibre insulation featuring enhanced thermal resistance. The metal tube provides an excellent protection against mechanical damage or potential hot liquids etc.

Cartridge heaters with cables protected by a sheath of flexible metal braid with 90° outlet

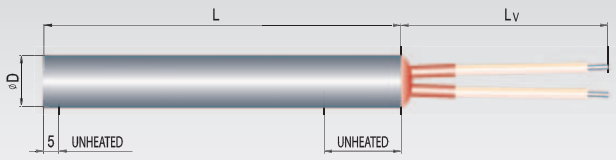
8



Cartridge heaters with either straight or right angle metal cable outlet with a flexible metal braid are fitted with wires with glass fibre insulation featuring enhanced thermal resistance, or silicone cable.
The metal braid protects the cables against mechanical damage and wear, especially at bends over edges.

SPECIAL TYPES

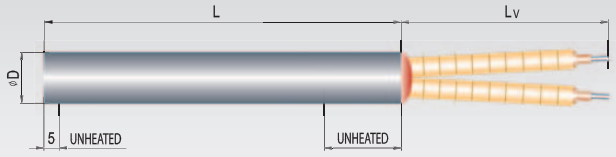
Cartridge heaters with teflon outlets



9

Cartridge heaters can be optionally furnished with teflon cable with thermal resistance to 220°C and resistance as against aggressive chemicals.

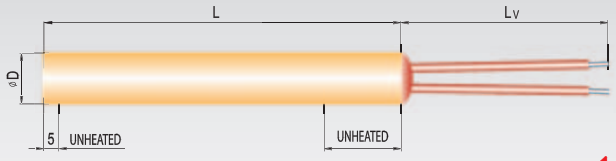
Cartridge heaters with ceramic beads



11

Cartridge heaters can be furnished with outlet leads covered by ceramic beads with a thermal limit of 400°C.

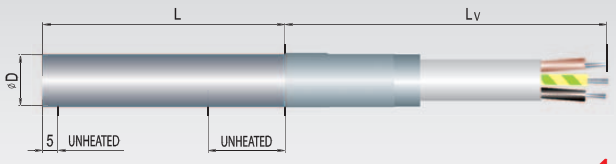
Cartridge heaters with brass sheath



13

The optional brass sheath is used for improved thermal conduction.
Thermal resistance of cartridge is limited 400°C.

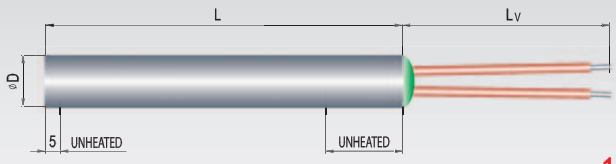
Cartridge heaters with silicone cable



15

Silicone outlet cable with thermal resistance to 180°C.

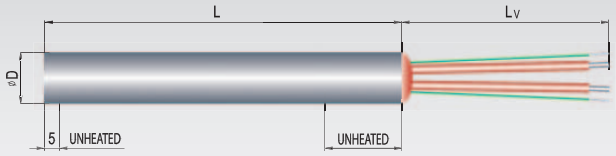
Hermetically sealed cartridges using vitreous enamel



10

The seals use special vitreous enamel material with a thermal limit of 260°C.
This seal is used when the heater is subject to washing, oil leaks corrosive gasses etc.

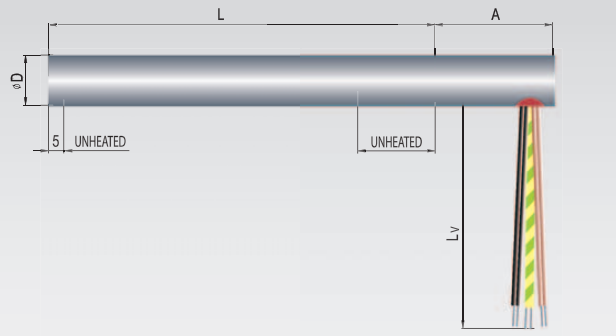
Cartridge heaters with thermocouples



12

Heaters can be optionally furnished with thermocouple of J,K or other type.
Thermal resistance of thermocouple is 350°C.
Any of abovementioned types can be furnished with thermocouple.

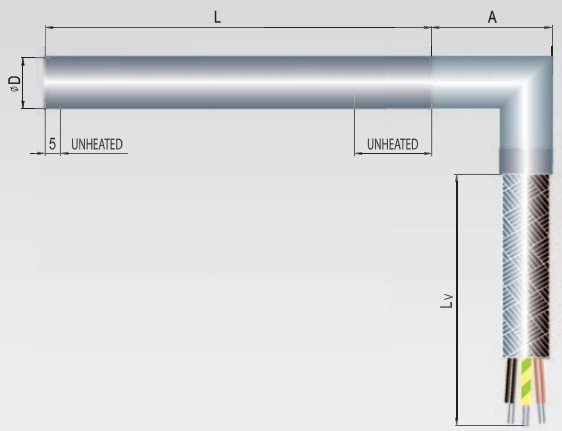
90° outlet without additional mechanical protection



14

Cartridge heaters can be supplied with 90° outlet where the leads emerge directly from the extended body of the cartridge. This is the simplest form of 90°outlet and is normally fitted with glass fibre insulated conductors with a thermal limit of 350°C or 450°C.

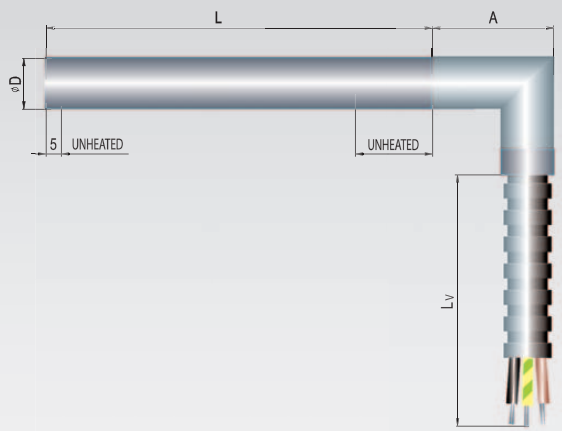
90° tube outlet with leads in protective wire braid



16

These cartridges are fitted with a 90° elbow , the same diameter as the heater body. Wire braid is fitted over glass fibre insulated leads with a thermal limit of 350°C. The wire braid protects the leads against mechanical damage and wear, especially at sharp bends.

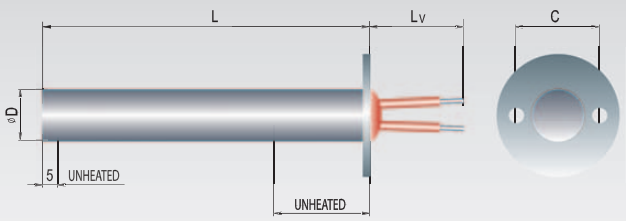
90° tube outlet with leads in metal flexible tube



17

These cartridges are fitted with a 90° elbow , the same diameter as the heater body. Flexible metal tube is fitted over glass fibre insulated leads with a thermal limit of 350°C. The metal casing protects the leads against mechanical damage and wear and against hot or aggressive liquids.

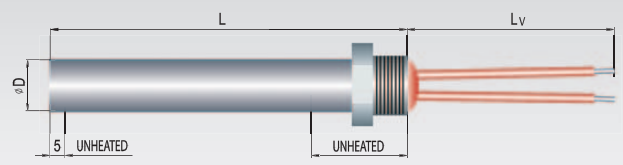
Cartridge heaters with plain flanges



18

These heaters are fitted with a rigid non-rusting flange for accurate positional fixing.

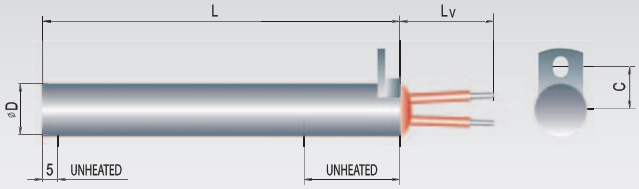
Cartridge heaters with reverse threaded flanges



19

This orientation of threaded flange enables easy connection of additional electrical equipment to the cartridge, for example box of terminal board for explosive medium, etc.

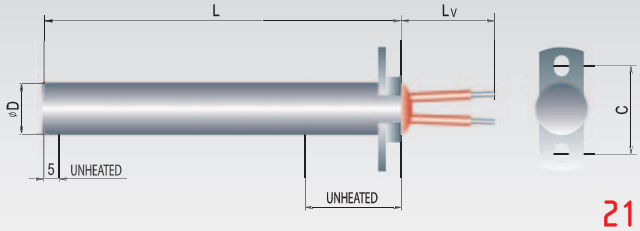
Cartridges with clamp plate



20

Cartridge is fitted with a single-sided clamp securing cartridge against axial movement.

Cartridges with double-sided clamp plate

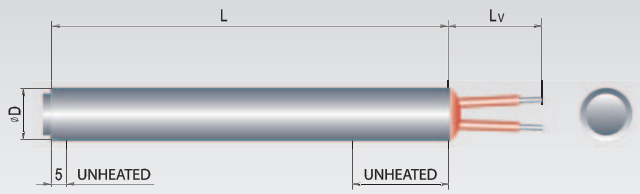


21

Cartridge is fitted with a double-sided clamp securing cartridge against axial movement.

SPECIAL TYPES

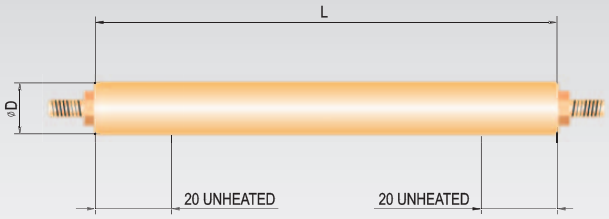
Cartridge heaters with special drift bottom



22

Cartridge heaters with special bottom, designed for better exchanging of cartridges.
All types of cartridges can be equipped with this part.

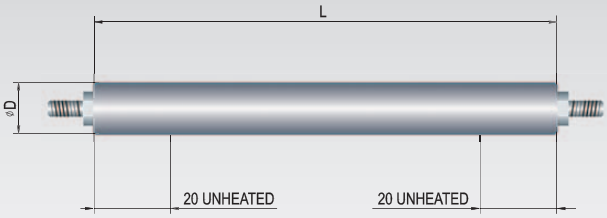
Cartridge heaters with screw terminations at either end and brass sheat



24

These cartridges have the same configuration as design 23 except that the sheath is made from brass for better heat transfer. Maximum surface temperature is limited to 400°C. Termination screws are also made from brass.

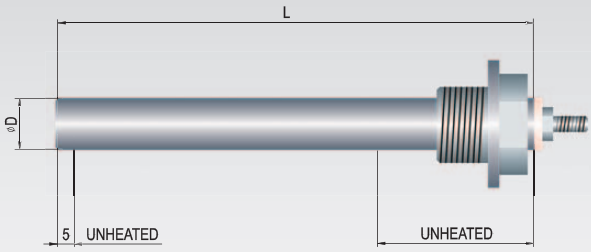
Cartridge heaters with screw terminations at either end



23

Cartridges fitted with screw connections at either end have a number of advantages: where a number of heaters are connected in parallel between bus bars, where the application requires connections at each end or for high current applications.

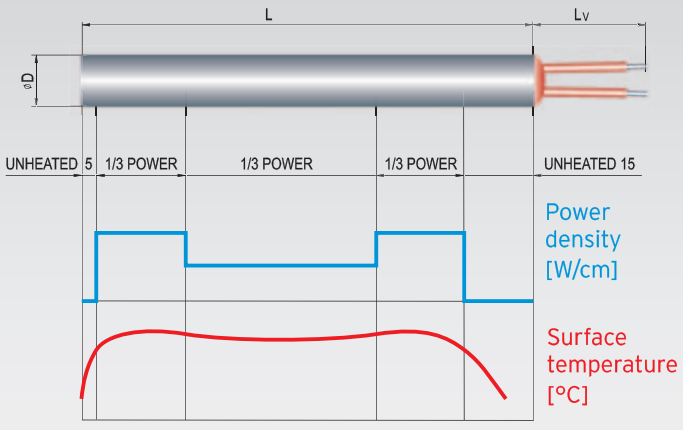
Cartridge heaters with single pole connection



25

This construction is designed for low voltage, where one pole is connected to the ground. This configuration brings easier connection and it is suitable for low voltage applications.

Cartridge heaters with defined power density profiles

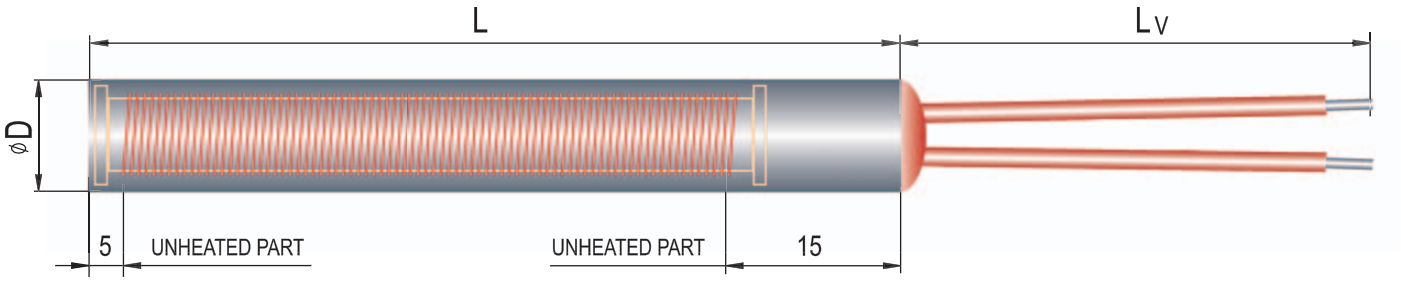


26

It is possible to define the power along the axis of the heater. This is achieved by varying the pitch of the heater spiral along its length. This design is suitable where heat dissipation is concentrated in one area or where different temperatures in different parts of the heated area are required.

TECHNICAL SPECIFICATION OF HIGH POWER DENSITY CARTRIDGE HEATERS

The special construction of our cartridge heaters allows power densities exceeding 20W/cm. The heater is filled with fine grain MgO, with corrosion resistant case and compacted to an optimum reduction. Conductors of various types are available, please refer to previous pages.



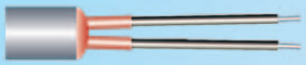
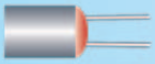
Rated power range: 100 - 3000W, tolerance +5% - 10%
Voltage: 12V - 230V
Diameter tolerance: -0,02 to - 0,06 mm
Length tolerance: +/-2 mm +/-10 mm depending on length.
Recommended tolerance for hole: H7, the hole should be deeper than the length of the cartridge.

Materials:
Casing: Stainless steel AISI 321 / DIN 1,4541
Ceramic former: MgO
Filling powder: MgO
Resistance wire: dependant on design, mostly Nicrothal 80.

DIMENSIONS AND POWERS

diameter	length	input power W (at voltage of 230 V) for standard types								
mm	mm	300	400	500	600	800	1000	1200	1500	2000
6,5	60	x								
	80	x	x	x						
	100	x	x	x						
8	60	x								
	80	x	x	x	x					
	100	x	x	x	x	x				
	130	x	x	x	x	x				
	160	x	x	x	x	x	x			
10	60	x	x							
	80	x	x	x						
	100	x	x	x	x	x				
	130	x	x	x	x	x	x			
	160	x	x	x	x	x	x			
	200	x	x	x	x	x	x	x		
	250	x	x	x	x	x	x	x		
12,5	60	x	x	x						
	80	x	x	x	x					
	100	x	x	x	x	x				
	130	x	x	x	x	x	x			
	160	x	x	x	x	x	x	x		
	200	x	x	x	x	x	x	x	x	
	250	x	x	x	x	x	x	x	x	x
	300	x	x	x	x	x	x	x	x	x
	400	x	x	x	x	x	x	x	x	x
16	60	x	x	x	x	x				
	80	x	x	x	x	x	x			
	100	x	x	x	x	x	x	x		
	130	x	x	x	x	x	x	x	x	
	160	x	x	x	x	x	x	x	x	x
	200	x	x	x	x	x	x	x	x	x
	250	x	x	x	x	x	x	x	x	x
	300	x	x	x	x	x	x	x	x	x
	400	x	x	x	x	x	x	x	x	x
20	80	x	x	x	x	x	x			
	100	x	x	x	x	x	x	x		
	130	x	x	x	x	x	x	x	x	
	160	x	x	x	x	x	x	x	x	x
	200	x	x	x	x	x	x	x	x	x
	250	x	x	x	x	x	x	x	x	x
	300	x	x	x	x	x	x	x	x	x
	400	x	x	x	x	x	x	x	x	x

TYPE OF CONNECTIONS

	Type of connections	material of conductor / insulation	characteristic
	conductors with glass-textile insulation	Ni / glass-textile	Thermal resistance 350 °C or 450°C
	conductors with silicone insulation	Cu-Ni / silicone	Thermal resistance 180 °C
	conductors with teflon insulation	Ni / teflon	Thermal resistance 220 °C and chemical resistance
	cable with ceramic beads	Ni or Ms / steatite	Thermal resistance 400 °C
	nickel wire	Ni	Thermal resistance 350 °C or 450 °C
	silicone cable	Cu-Ni / silicone	Thermal resistance 180 °C
	metal braid cable	Cu-Ni / silicone / Fe-Ni Ni / glass-textile / Fe-Ni	Thermal resistance 180 °C Thermal resistance 450 °C
	conductors in metal flexible tube	Cu-Ni / silicone / Fe-Ni Ni / glass-textile / Fe-Ni	Thermal resistance 180 °C Thermal resistance 450 °C

INFORMATION FOR ORDER

Customer .....

Address.....

Contact person .....

Phone ..... fax ..... E-mail .....

Your supplier

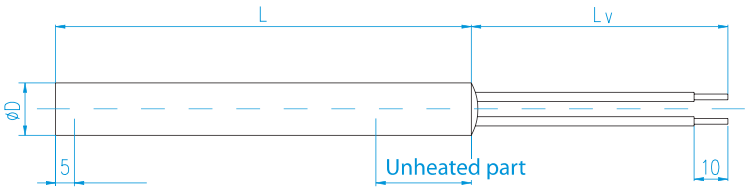
Cartridge Heater Information

Using ..... Operating temperature °C

.....

Voltage V

Input power W



Thermocouple ☐ yes ☐ no

Type ☐

Diameter of cartridge D

Length of cartridge body L

Unheated length at therminal end N

Connections - quote reference number - see catalogue

Diameter of hole

Material of sheet ☐ stainless steel ☐ brass

☐ Length of terminations mm

☐ other outlets - description .....

Note .....

ELECTRICAL CARTRIDGE HEATERS

NIBE
ELEMENT

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