
Sinus Jevi

Cartridge Heaters

Cartridge heaters, also called heating rods come in cylindrical form elements, in different diameters and in variable lengths. The heat transfer process varies according to the required application, such as heating: a metal mass, a liquid or gas.



SINUS
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Liquids



Gasses



Solids



Spaces



Resistors

- Standard cartridge heaters are manufactured according to high density technology.

- This technology requires a H7 bore fit (see p.11)

- Maximum Watt density over the surface of the cartridge can reach 50 W/cm², under specific conditions.

- Rated Wattage: from 75 to 2500 W.

- Rated Voltage: 230V single phase.

- Stainless steel sheath.

- Ceramic end cap protecting the connection leads.

- Standard connection leads; flexible multi strands, nickel core wire with fiberglass silk silicone impregnated insulation.

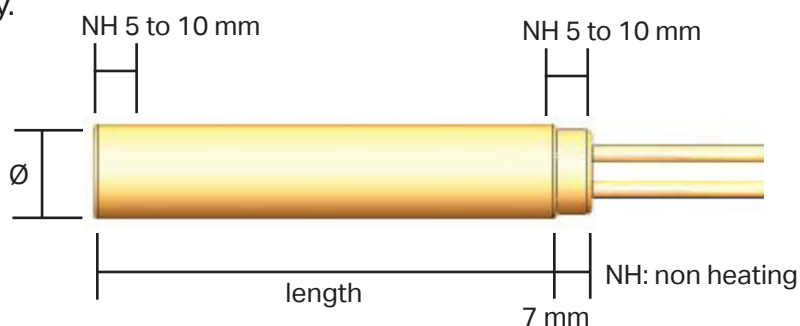
- Tolerance over the length:
L<100 mm: +/- 2 mm
L>100 mm: +/- 2%

- Manufactured in accordance with EN 60335-1 standards
Tolerance over the Wattage: +5% -10%
Leakage current < 0.5 mA/kW

- Some standard cartridge heaters can be fitted with built in "J" thermocouples shown in the table as P + tcj (see the layout sketches p. 28) In this case, the standard length of connection leads and thermocouple wire is 1000 mm

- Standard cartridge heaters can be fitted with several types of connection (see p.12) and/or accessories (see p.21)

- Special manufacturing (see p.29): odd sizes, variable power zone, built in thermocouple...



Nominal Ø-mm (equiv. inches)	Tolerance over Ø-mm	Min. length-mm (equiv. inches)	Max. length-mm (equiv. inches)
6.35 (1/4")	-0.03 / -0.05	31.75 (1 1/4")	152.4 (6")
6,5	-0.03 / -0.05	32	160
8	-0.04 / -0.06	32	160
9.52 (3/8")	-0.04 / -0.07	31.75 (1 1/4")	203.22 (8")
10	-0.04 / -0.07	32	250
12,5	-0.05 / -0.08	40	300
12.7 (1/2")	-0.05 / -0.08	38.1 (1 1/2")	304.8 (12")
15.87 (5/8")	-0.05 / -0.08	50.8 (2")	304.8 (12")
16	-0.05 / -0.08	40	300
19.05 (3/4")	-0.06 / -0.1	76.2 (3")	304.8 (12")
20	-0.06 / -0.1	60	300

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
6.35 (1/4")	31.7 (1 1/4")	75	250	H1/4X1.2X75
		100	250	H1/4X1.2X100
		150	250	H1/4X1.2X150
		175	250	H1/4X1.2X175
		175+tcj	1000	HJ1/4X1.2X175
	38.1 (1 1/2")	75	250	H1/4X1.5X75
		100	250	H1/4X1.5X100
		100+tcj	1000	HJ1/4X1.5X100
		125	250	H1/4X1.5X125
		150	250	H1/4X1.5X150
		150+tcj	1000	HJ1/4X1.5X150
		175	250	H1/4X1.5X175
		200	250	H1/4X1.5X200
		200+tcj	1000	HJ1/4X1.5X200
		250	250	H1/4X1.5X250

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
6.35 (1/4")	50.8 (2")	100	250	H1/4X2X100
		100+tcj	1000	HJ1/4X2X100
		125	250	H1/4X2X125
		150	250	H1/4X2X150
		175	250	H1/4X2X175
		175	500	H1/4X2X175A
		200	250	H1/4X2X200
		200+tcj	1000	HJ1/4X2X200
		250	250	H1/4X2X250
	63.5 (2 1/2")	300	250	H1/4X2X300
		100	250	H1/4X2.5X100
		125	250	H1/4X2.5X125
		150	250	H1/4X2.5X150
		175	250	H1/4X2.5X175
		200	250	H1/4X2.5X200
		200	250	H1/4X2.5X200

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
6.35 (¼")	63.5 (2½")	200+tcj	1000	HJ1/4X2.5X200
		250	250	H1/4X1.5X250
		250+tcj	1000	HJ1/4X1.5X250
	76.2 (3")	100	250	H1/4X3X100
		150	250	H1/4X3X150
		175	250	H1/4X3X175
		200	250	H1/4X3X200
		200+tcj	1000	HJ1/4X3X200
		250	250	H1/4X3X250
		250+tcj	1000	HJ1/4X3X250
		300	250	H1/4X3X300
		300+tcj	1000	HJ1/4X3X300
		400	250	H1/4X3X400
	88.9 (3½")	150	250	H1/4X3.5X150
		200	250	H1/4X3.5X200
		250	250	H1/4X3.5X250
		300	250	H1/4X3.5X300
	101.6 (4")	125	250	H1/4X4X125
		150	250	H1/4X4X150
		175	250	H1/4X4X175
		200	250	H1/4X4X200
		250	250	H1/4X4X250
		300	250	H1/4X4X300
		300+tcj	1000	HJ1/4X4X300
		350	250	H1/4X4X350
	127 (5")	150	250	H1/4X5X150
		200	250	H1/4X5X200
		250	250	H1/4X5X250
		300	250	H1/4X5X300
		350	250	H1/4X5X350
		400	250	H1/4X5X400
		500	250	H1/4X5X500
	152.4 (6")	150	250	H1/4X6X150
		200	250	H1/4X6X200
		300	250	H1/4X6X300
		350	250	H1/4X6X350
		400	250	H1/4X6X400
		500	250	H1/4X6X500
		75	250	H6.5X32X75
6.5	32	100	250	H6.5X32X100
		150	250	H6.5X32X150
		175	250	H6.5X32X175
		200	250	H6.5X32X200
	40	100	250	H6.5X40X100
		100+tcj	1000	HJ6.5X40X100
		125	250	H6.5X40X125
		150	250	H6.5X40X150
		200	250	H6.5X40X200

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
6.5	40	175	250	H6.5X40X175
		200	250	H6.5X40X200
		200+tcj	1000	HJ6.5X40X200
		250	250	H6.5X40X250
	50	125	250	H6.5X50X125
		150	250	H6.5X50X150
		150+tcj	1000	HJ6.5X50X150
		175	250	H6.5X50X175
		200	250	H6.5X50X200
		200+tcj	1000	HJ6.5X50X200
		250	250	H6.5X50X250
		250+tcj	1000	HJ6.5X50X250
	60	125	250	H6.5X60X250
		125	500	HJ6.5X60X125A
		150	250	H6.5X60X150
		175	250	H6.5X60X175
		200	250	H6.5X60X200
		200+tcj	1000	HJ6.5X60X200
		250	250	H6.5X60X250
		250+tcj	1000	HJ6.5X60X250
		300	250	H6.5X60X300
	80	125	250	H6.5X80X125
		175	250	H6.5X80X175
		200	250	H6.5X80X200
		200+tcj	1000	HJ6.5X80X200
		250	250	H6.5X80X250
		300	250	H6.5X80X300
		300+tcj	1000	HJ6.5X80X300
		350	250	H6.5X80X350
	100	125	250	H6.5X100X125
		150	250	H6.5X100X150
		200	250	H6.5X100X200
		250	250	H6.5X100X250
		300	250	H6.5X100X300
		300+tcj	1000	HJ6.5X100X300
		350	250	H6.5X100X350
		400	250	H6.5X100X400
	130	125	250	H6.5X130X125
		150	250	H6.5X130X150
		200	250	H6.5X130X200
		250	250	H6.5X130X250
		300	250	H6.5X130X300
		300+tcj	1000	HJ6.5X130X300
		350	250	H6.5X130X350
		400	250	H6.5X130X400
		200	250	H6.5X130X200
		250	250	H6.5X130X250

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
6.5	160	150	250	H6.5X160X150
		200	250	H6.5X160X200
		300	250	H6.5X160X300
		350	250	H6.5X160X350
		400	250	H6.5X160X400
		500	250	H6.5X160X500
8	32	200	250	H8X32X200
	40	50	250	H8X40X50
		100	250	H8X40X100
		125	250	H8X40X125
		125+tcj	1000	HJ8X40X125
		150	250	H8X40X150
		200	250	H8X40X200
		200+tcj	1000	HJ8X40X200
	50	125	250	H8X50X125
		125+tcj	1000	HJ8X50X125
		150	250	H8X50X150
		200	250	H8X50X200
		200+tcj	1000	HJ8X50X200
		250	250	H8X50X250
	60	125	250	H8X60X125
		125+tcj	1000	HJ8X60X125
		150	250	H8X60X150
		200	250	H8X60X200
		200+tcj	1000	HJ8X60X200
		250	250	H8X60X250
		250+tcj	1000	HJ8X60X250
		300	250	H8X60X300
		400	250	H8X60X400
		400+tcj	1000	HJ8X60X400
	80	150	250	H8X80X150
		175	250	H8X80X175
		200	250	H8X80X200
		200+tcj	1000	HJ8X80X200
		250	250	H8X80X250
		300	250	H8X80X300
		400	250	H8X80X400
		400+tcj	1000	HJ8X80X400
	100	175	250	H8X100X175
		200	250	H8X100X200
		250	250	H8X100X250
		250+tcj	1000	HJ8X100X250
		300	250	H8X100X300
		300+tcj	1000	HJ8X100X300
		400	250	H8X100X400

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
8	100	400+tcj	1000	HJ8X100X400
		600	250	H8X100X600
	130	175	250	H8X130X175
		200	250	H8X130X200
		250	250	H8X130X250
		300	250	H8X130X300
		400	250	H8X130X400
		400	500	H8X130X400A
		400+tcj	500	HJ8X130X400
	160	200	250	H8X160X200
		250	250	H8X160X250
		250+tcj	1000	HJ8X160X250
		300	250	H8X160X300
		400	250	H8X160X400
		400+tcj	1000	HJ8X160X400
		500	250	H8X160X500
		600	250	H8X160X600
9.52 (³ / ₈ ")	31.75 (1¼")	75	250	H3/8X1.2X75
		100	250	H3/8X1.2X100
		150	250	H3/8X1.2X150
		200	250	H3/8X1.2X200
	38.1 (1½")	100	250	H3/8X1.5X100
		125	250	H3/8X1.5X125
		150	250	H3/8X1.5X150
		200	250	H3/8X1.5X200
		200+tcj	1000	HJ3/8X1.5X200
		250	250	H3/8X1.5X250
		250+tcj	1000	HJ3/8X1.5X250
		400	250	H3/8X1.5X400
	50.8 (2")	100	250	H3/8X2X100
		125	250	H3/8X2X125
		150	250	H3/8X2X150
		175	250	H3/8X2X175
		175	500	H3/8X2X175A
		200	250	H3/8X2X200
		250	250	H3/8X2X250
		250+tcj	1000	HJ3/8X2X250
		300	250	H3/8X2X300
		400	250	H3/8X2X400
	63.5 (2½")	500	250	H3/8X2X500
		100	250	H3/8X2.5X100
		125	250	H3/8X2.5X125
		150	250	H3/8X2.5X150
		200	250	H3/8X2.5X200
		250	250	H3/8X2.5X250

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
9.52 (³ / ₈ ")	63.5 (2½")	300	250	H3/8X2.5X300
		350	250	H3/8X2.5X350
		400	250	H3/8X2.5X400
	76.2 (3")	150	250	H3/8X3X150
		200	250	H3/8X3X200
		250	250	H3/8X3X250
		300	250	H3/8X3X300
		300+tcj	1000	H3/8X3X300
		400	250	H3/8X3X400
		400+tcj	1000	HJ3/8X3X400
		500	250	H3/8X3X500
		600	250	H3/8X3X600
	88.9 (3½")	250	250	H3/8X3.5X250
		300	250	H3/8X3.5X300
		350	250	H3/8X3.5X350
		400	250	H3/8X3.5X400
		400+tcj	1000	HJ3/8X3.5X400
		500	250	H3/8X3.5X500
	101.6 (4")	150	250	H3/8X4X150
		200	250	H3/8X4X200
		250	250	H3/8X4X250
		300	250	H3/8X4X300
		400	250	H3/8X4X400
		400+tcj	1000	HJ3/8X4X400
		500	250	H3/8X4X500
		600	250	H3/8X4X600
		750	250	H3/8X4X750
	127 (5")	175	250	H3/8X5X175
		250	250	H3/8X5X250
		300	250	H3/8X5X300
		400	250	H3/8X5X400
		500	250	H3/8X5X500
		800	250	H3/8X5X800
		1000	250	H3/8X5X1000
	152.4 (6")	250	250	H3/8X6X250
		300	250	H3/8X6X300
		400	250	H3/8X6X400
		500	250	H3/8X6X500
		500	1000	H3/8X6X500B
		600	250	H3/8X6X600
		800	250	H3/8X6X800
		1000	250	H3/8X6X1000
	165.1 (6½")	400	250	H3/8X400X250

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
9.52 (³ / ₈ ")	177.8 (7")	350	250	H3/8X7X350
		400	250	H3/8X7X400
		500	250	H3/8X7X500
		600	250	H3/8X7X600
		750	250	H3/8X7X750
		1000	250	H3/8X7X1000
	203.2 (8")	300	250	H3/8X8X300
		400	250	H3/8X8X400
		500	250	H3/8X8X500
		600	250	H3/8X8X600
		750	250	H3/8X8X750
		1000	250	H3/8X8X1000
10	32	75	250	H10X32X75
		100	250	H10X32X100
		150	250	H10X32X150
		200	250	H10X32X200
	40	100	250	H10X40X100
		125	250	H10X40X125
		150	250	H10X40X150
		200	250	H10X40X200
		200+tcj	1000	HJ10X40X200
		250	250	H10X40X250
		300	250	H10X40X300
		300+tcj	1000	HJ10X40X300
	50	125	250	H10X50X125
		150	250	H10X50X150
		150+tcj	1000	HJ10X50X150
		200	250	H10X50X200
		250	250	H10X50X250
		300	250	H10X50X300
		400	250	H10X50X400
		400+tcj	1000	HJ10X50X400
	60	125	250	H10X60X125
		150	250	H10X60X150
		200	250	H10X60X200
		200+tcj	1000	HJ10X60X200
		250	250	H10X60X250
		300	250	H10X60X300
		400	250	H10X60X400
		400+tcj	1000	HJ10X60X400
	80	150	250	H10X80X150
		200	250	H10X80X200
		250	250	H10X80X250
		300	250	H10X80X300
		400	250	H10X80X400

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
10	80	400+tcj	1000	HJ10X80X400
		500	250	H10X80X500
		630	250	H10X80X630
	100	200	250	H10X100X200
		250	250	H10X100X250
		250+tcj	1000	HJ10X100X250
		300	250	H10X100X300
		350	250	H10X100X350
		350+tcj	1000	HJ10X100X350
		400	250	H10X100X400
		500	250	H10X100X500
		500+tcj	1000	HJ10X100X500
		600	250	H10X100X600
		700	250	H10X100X700
		250	250	H10X130X250
		300	250	H10X130X300
		400	250	H10X130X400
	130	500	250	H10X130X500
		600	250	H10X130X600
		800	250	H10X130X800
		800	500	H10X130X800A
	160	300	250	H10X160X300
		400	250	H10X160X400
		400+tcj	1000	HJ10X160X400
		500	250	H10X160X500
		600	250	H10X160X600
		600	500	H10X160X600A
		800	250	H10X160X800
	200	400	250	H10X200X400
		500	250	H10X200X500
		600	250	H10X200X600
		750	250	H10X200X750
		1000	250	H10X200X1000
	250	1000	250	H10X250X1000
12.5	40	125	250	H12.5X40X125
		160	250	H12.5X40X160
		200	250	H12.5X40X200
		250	250	H12.5X40X250
		300	250	H12.5X40X300
		350	250	H12.5X40X350
		400	250	H12.5X40X400
		500	250	H12.5X40X500
	50	160	250	H12.5X50X160
		200	250	H12.5X50X200
		250	250	H12.5X50X250

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
12.5	50	300	250	H12.5X50X300
		350	250	H12.5X50X350
		400	250	H12.5X50X400
		500	250	H12.5X50X500
		600	250	H12.5X50X600
	60	125	250	H12.5X60X125
		160	250	H12.5X60X160
		200	250	H12.5X60X200
		250	250	H12.5X60X250
		300	250	H12.5X60X300
		350	250	H12.5X60X350
		400	250	H12.5X60X400
		500	250	H12.5X60X500
		600	250	H12.5X60X600
	80	125	250	H12.5X80X125
		160	250	H12.5X80X160
		200	250	H12.5X80X200
		250	250	H12.5X80X250
		300	250	H12.5X80X300
		350	250	H12.5X80X350
		400	250	H12.5X80X400
		500	250	H12.5X80X500
		600	250	H12.5X80X600
		600	500	H12.5X80X600A
	100	750	250	H12.5X80X750
		160	250	H12.5X100X160
		200	250	H12.5X100X200
		250	250	H12.5X100X250
		300	250	H12.5X100X300
		400	250	H12.5X100X400
		400+tcj	1000	HJ12.5X100X400
		500	250	H12.5X100X500
		600	250	H12.5X100X600
		800	250	H12.5X100X800
	130	1000	250	H12.5X100X1000
		250	250	H12.5X130X250
		350	250	H12.5X130X350
		400	250	H12.5X130X400
		500	250	H12.5X130X500
		600	250	H12.5X130X600
		800	250	H12.5X130X800
		800	500	H12.5X130X800A
		1000	250	H12.5X130X1000
		1000	1000	H12.5X130X1000B
	160	400	250	H12.5X160X400

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
12.5	160	400+tcj	1000	HJ12.5X160X400
		500	250	H12.5X160X500
		500	1000	H12.5X160X500B
		600	250	H12.5X160X600
		800	250	H12.5X160X800
		800	500	H12.5X160X800A
		800	2000	H12.5X160X800E
		1000	250	H12.5X160X1000
		1000	1000	H12.5X160X1000B
		1200	250	H12.5X160X1200
	180	630	250	H12.5X180X630
		1000	250	H12.5X180X1000
	200	300	250	H12.5X200X300
		500	250	H12.5X200X500
		600	250	H12.5X200X600
		800	250	H12.5X200X800
		800	2000	H12.5X200X800E
		1000	250	H12.5X200X1000
		1200	250	H12.5X200X1200
		1500	250	H12.5X200X1500
		2000	250	H12.5X200X2000
	250	500	250	H12.5X250X500
		800	250	H12.5X250X800
		1000	250	H12.5X250X1000
		1000	1000	H12.5X250X1000B
		1250	250	H12.5X250X1250
		1500	250	H12.5X250X1500
		2000	250	H12.5X250X2000
	300	500	250	H12.5X300X500
		800	250	H12.5X300X800
		1000	250	H12.5X300X1000
		1250	250	H12.5X300X1250
		1500	250	H12.5X300X1500
		2000	250	H12.5X300X2000
12.7 (½")	38.1 (1½")	125	250	H1/2X1.5X125
		150	250	H1/2X1.5X150
		200	250	H1/2X1.5X200
		250	250	H1/2X1.5X250
		300	250	H1/2X1.5X300
	50.8 (2")	150	250	H1/2X2X150
		200	250	H1/2X2X200
		250	250	H1/2X2X250
		300	250	H1/2X2X300
		400	250	H1/2X2X400

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
12.7 (½")	63.5 (2½")	150	250	H1/2X2.5X150
		250	250	H1/2X2.5X250
		300	250	H1/2X2.5X300
		400	250	H1/2X2.5X400
		500	250	H1/2X2.5X500
	76.2 (3")	200	250	H1/2X3X200
		250	250	H1/2X3X250
		300	250	H1/2X3X300
		400	250	H1/2X3X400
		500	250	H1/2X3X500
		500	500	H1/2X3X500
		600	250	H1/2X3X600
		750	250	H1/2X3X750
	88.9 (3½")	250	250	H1/2X3.5X250
		300	250	H1/2X3.5X300
		350	250	H1/2X3.5X350
		500	250	H1/2X3.5X500
		750	250	H1/2X3.5X750
	101.6 (4")	250	250	H1/2X4X250
		300	250	H1/2X4X300
		300+tcj	1000	HJ1/2X4X300
		350	250	H1/2X4X350
		400	250	H1/2X4X400
		500	250	H1/2X4X500
		600	250	H1/2X4X600
		800	250	H1/2X4X800
		1000	250	H1/2X4X1000
	127 (5")	300	250	H1/2X5X300
		350	250	H1/2X5X350
		400	250	H1/2X5X400
		500	250	H1/2X5X500
		600	250	H1/2X5X600
		750	250	H1/2X5X750
		900	250	H1/2X5X900
		1000	250	H1/2X5X1000
	152.4 (6")	300	250	H1/2X6X300
		400	250	H1/2X6X400
		500	250	H1/2X6X500
		600	250	H1/2X6X600
		750	250	H1/2X6X750
		850	250	H1/2X6X850
		1000	250	H1/2X6X1000
	165.1 (6½")	1000	250	H1/2X6.5X1000

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
12.7 (½")	177.8 (7")	500	250	H1/2X7X500
		600	250	H1/2X7X600
		700	250	H1/2X7X700
		1000	250	H1/2X7X1000
	203.2 (8")	500	250	H1/2X8X500
		800	250	H1/2X8X800
		1000	250	H1/2X8X1000
		1500	250	H1/2X8X1500
		2000	250	H1/2X8X2000
	228.6 (9")	500	250	H1/2X9X500
		600	250	H1/2X9X600
		750	250	H1/2X9X750
		1000	250	H1/2X9X1000
		1200	250	1/2X9X1200
		1500	250	H1/2X9X1500
		2000	250	H1/2X9X2000
	254 (10")	500	250	H1/2X10X500
		750	250	H1/2X10X750
		1000	250	H1/2X10X1000
		1200	250	H1/2X10X1200
		1500	250	H1/2X10X1500
		2000	250	H1/2X10X2000
	279.4 (11")	800	250	H1/2X11X800
	304.8 (12")	600	250	H1/2X12X600
		800	250	H1/2X12X800
		1000	250	H1/2X12X1000
		1500	250	H1/2X12X1500
		2000	250	H1/2X12X2000
15.87 (5/8")	50.8 (2")	200	250	H5/8X2X200
		300	250	H5/8X2X300
		500	250	H5/8X2X500
	63.5 (2½")	175	250	H5/8X2.5X175
		250	250	H5/8X2.5X250
		300	250	H5/8X2.5X300
		400	250	H5/8X2.5X400
		500	250	H5/8X2.5X500
		750	250	H5/8X2.5X750
	76.2 (3")	250	250	H5/8X3X250
		300	250	H5/8X3X300
		400	250	H5/8X3X400
		500	250	H5/8X3X500
		600	250	H5/8X3X600
		750	250	H5/8X3X750
		1000	250	H5/8X3X1000

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
15.87 (5/8")	101.6 (4")	300	250	H5/8X4X300
		400	250	H5/8X4X400
		500	250	H5/8X4X500
		600	250	H5/8X4X600
		750	250	H5/8X4X750
		1000	250	H5/8X4X1000
		1200	250	H5/8X4X1200
	127 (5")	400	250	H5/8X5X400
		500	250	H5/8X5X500
		600	250	H5/8X5X600
		800	250	H5/8X5X800
		1000	250	H5/8X5X1000
	152.4 (6")	400	250	H5/8X6X400
		600	250	H5/8X6X600
		800	250	H5/8X6X800
		1000	250	H5/8X6X1000
	177.8 (7")	500	250	H5/8X7X500
		600	250	H5/8X7X600
		1000	250	H5/8X7X1000
		1500	250	H5/8X7X1500
	203.2 (8")	500	250	H5/8X8X500
		750	250	H5/8X8X750
		1000	250	H5/8X8X1000
		1200	250	H5/8X8X1200
		1500	250	H5/8X8X1500
		2000	250	H5/8X8X2000
	228.6 (9")	500	250	H5/8X9X500
		1000	250	H5/8X9X1000
		1250	250	H5/8X9X1250
	254 (10")	750	250	H5/8X10X750
		1000	250	H5/8X10X1000
		1300	250	H5/8X10X1300
		1600	250	H5/8X10X1600
		2000	250	H5/8X10X2000
	304.8 (12")	750	250	H5/8X12X750
		1000	250	H5/8X12X1000
		1500	250	H5/8X12X1500
		1800	250	H5/8X12X1800
		2000	250	H5/8X12X2000
		2500	250	H5/8X12X2500
16	40	160	250	H16X40X160
		200	250	H16X40X200

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
16	40	250	250	H16X40X250
		300	250	H16X40X300
		400	250	H16X40X400
		500	250	H16X40X500
	50	160	250	H16X50X160
		200	250	H16X50X200
		250	250	H16X50X250
		315	250	H16X50X315
		400	250	H16X50X400
		500	250	H16X50X500
		600	250	H16X50X600
	60	160	250	H16X60X160
		200	250	H16X60X200
		250	250	H16X60X250
		300	250	H16X60X300
		400	250	H16X60X400
		400+tcj	1000	HJ16X60X400
		500	250	H16X60X500
		600	250	H16X60X600
	80	250	250	H16X80X250
		300	250	H16X80X300
		400	250	H16X80X400
		500	250	H16X80X500
		600	250	H16X80X600
		800	250	H16X80X800
		1000	250	H16X80X1000
	100	300	250	H16X100X300
		400	250	H16X100X400
		500	250	H16X100X500
		600	250	H16X100X600
		800	250	H16X100X800
		1000	250	H16X100X1000
		1200	250	H16X100X1200
	130	400	250	H16X130X400
		500	250	H16X130X500
		600	250	H16X130X600
		800	250	H16X130X800
		1000	250	H16X130X1000
		1200	250	H16X130X1200
	160	400	250	H16X160X400
		500	250	H16X160X500
		600	250	H16X160X600
		800	250	H16X160X800
		800	1000	H16X160X800B
		900	250	H16X160X900

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
16	160	1000	250	H16X160X1000
		1000	1500	H16X160X1500
		1250	250	H16X160X1250
		1600	250	H16X160X1600
	180	850	250	H16X180X850
		1000	250	H16X180X1000
		1250	250	H16X180X1250
	200	500	250	H16X200X500
		800	250	H16X200X800
		1000	250	H16X200X1000
		1000	1500	H16X200X1000D
		1250	250	H16X200X1250
		1500	250	H16X200X1500
		2000	250	H16X200X2000
	250	500	250	H16X250X500
		800	250	H16X250X800
		1000	250	H16X250X1000
		1300	250	H16X250X1300
		1600	250	H16X250X1600
		1600	500	H16X250X1600A
		2000	250	H16X250X2000
	300	500	250	H16X300X500
		800	250	H16X300X800
		1000	250	H16X300X1000
		1300	250	H16X300X1300
		1500	250	H16X300X1500
		1800	250	H16X300X1800
		2000	250	H16X300X2000
		2500	250	H16X300X2500
19.05 (3/4")	76.2 (3")	300	250	H3/4X3X300
		400	250	H3/4X3X400
		500	250	H3/4X3X500
	101.6 (4")	350	250	H3/4X4X350
		450	250	H3/4X4X450
		600	250	H3/4X4X600
		1000	250	H3/4X4X1000
	127 (5")	400	250	H3/4X127X400
		500	250	H3/4X127X500
		1000	250	H3/4X127X1000
		1500	250	H3/4X127X1500
	152.4 (6")	350	250	H3/4X6X350
		500	250	H3/4X6X500
		1000	250	H3/4X6X1000
		1500	250	H3/4X6X1500

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
19.05 (3/4")	203.2 (8")	500	250	H3/4X8X500
		600	250	H3/4X8X600
		1000	250	H3/4X8X1000
		2000	250	H3/4X8X2000
	254 (10")	800	250	H3/4X10X800
		1000	250	H3/4X10X1000
		2000	250	H3/4X10X2000
	304.8 (12")	800	250	H3/4X12X800
		1000	250	H3/4X12X1000
		1500	250	H3/4X12X1500
		2000	250	H3/4X12X2000
		2500	250	H3/4X12X2500
20	60	200	250	H20X60X200
		300	250	H20X60X300
		500	250	H20X60X500
		600	250	H20X60X600
		800	250	H20X60X800
	80	300	250	H20X80X300
		400	250	H20X80X400
		500	250	H20X80X500
		600	250	H20X80X600
		800	250	H20X80X800
		1000	250	H20X80X1000
		1250	250	H20X80X1200
	100	350	250	H20X100X350
		450	250	H20X100X450
		600	250	H20X100X600
		800	250	H20X100X800
		1000	250	H20X100X1000

Diameter Ø (mm)	Length (mm)	Watt P (W)	Leads (mm)	Article number
20	100	1400	250	H20X100X1400
		1600	250	H20X100X1600
	130	400	250	H20X130X400
		500	250	H20X130X500
		600	250	H20X130X600
		800	250	H20X130X800
		1000	250	H20X130X1000
		1500	250	H20X130X1500
		2000	250	H20X130X2000
	160	500	250	H20X160X500
		800	250	H20X160X800
		1000	250	H20X160X1000
		1500	250	H20X160X1500
		2000	250	H20X160X2000
	200	800	250	H20X200X800
		1000	250	H20X200X1000
		1500	250	H20X200X1500
		1800	250	H20X200X1800
		2000	250	H20X200X2000
	250	800	250	H20X250X800
		1000	250	H20X250X1000
		1500	250	H20X250X1500
		2000	250	H20X250X2000
		2500	250	H20X250X2500
	300	1000	250	H20X300X1000
		1500	250	H20X300X1500
		2000	250	H20X300X2000
		2500	250	H20X300X2500

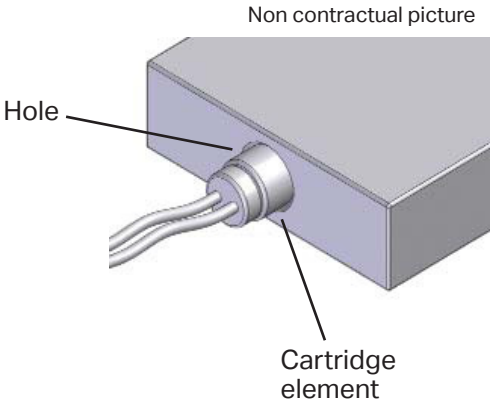
- All these cartridge heaters can be fitted with specific accessories and connection types.

Boring and fit of standard cartridge heaters

In order to facilitate the heat transfer between the cartridge heater and the mass to be heated, a bore with an H7 tolerance is recommended.

Nominal boring diameter (mm)	H7 Bore	
	Min. value (mm)	Max. value (mm)
6.35 (1/4") - 6.5 - 8 - 9.52 (3/8") - 10	- 0	+0.015
12.5 - 12.7 (1/2") - 15.87 (5/8") - 16	- 0	+0.018
19.05 (3/4") - 20	- 0	+ 0.021

Standard cartridge heaters require a H7 bore fit. However, when needed for applications with high watt density or high temperature requirements, fitting tolerances can be tighter.



Assembly recommendations

In order to improve heat transfer, some basic cares should be taken. For further details, see our technical assembly section.

- Cartridge heaters should never operate in the open air.
- To protect the heater from damage, we recommend using thermal transfer between the heater and the object to be heated.
Caution! Do not apply paste over connection wires.
- It is highly recommended to protect connections from excessive bending and to keep lead wires away from moisture, and from any possible matter spillover.
- Cartridge heaters are manufactured to be part of an assembly. As standard, they are not fitted with an earth wire; it is up to the user to make sure that the systems are in accordance with the local safety standards.



Article number	Description	Volume
A819 000 012	Assembly spray	100 ml
A819 000 013	Assembly paste	120 g

Straight connections

Flexible wires, nickel conductor, fiberglass insulated, designed to support a maximum operating temperature of 350°C. (except for CCT.4)

2-insulated wires connection

are made of:

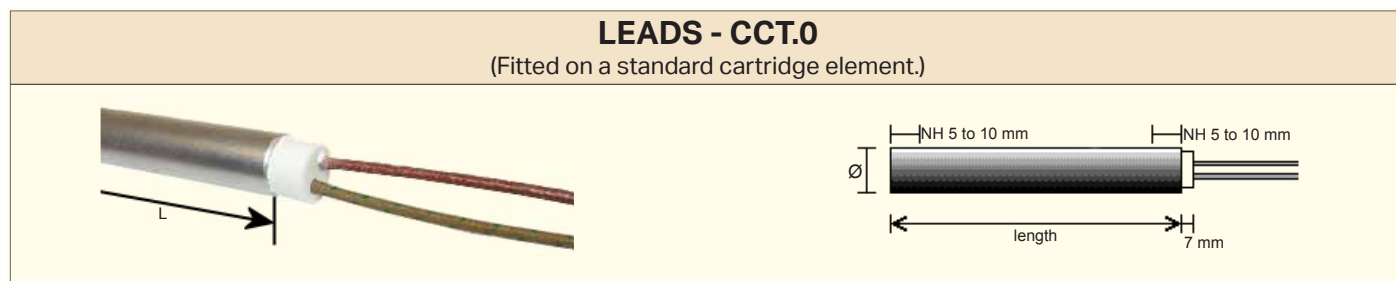
- Nickel flexible core
- silicon fiberglass insulation

Voltage of utilisation 300 / 500V.

Test Voltage 2000V.

Continuous operation temperature from -60°C to +350°C maximum.

Temperature for a short time: +400°C.



Standard voltage: 230V (220/240V)
Standard leads length: 250 mm (flexible lead-wires)

NH = Unheated length
length = length of the steel sheath

standard in metrics						
nominal diameter	6.5 mm	8 mm	10 mm	12.5 mm	16 mm	20 mm
tolerances	- 0.03% - 0.05%	- 0.04% - 0.06%	- 0.04% - 0.07%	- 0.05% - 0.08%	- 0.05% - 0.08%	- 0.06% - 0.10%
Ø Real max. min.	6.47 mm 6.45 mm	7.96 mm 7.94 mm	9.96 mm 9.93 mm	12.45 mm 12.42 mm	15.95 mm 15.92 mm	19.94 mm 19.90 mm
minimum length	32 mm	32 mm	32 mm	40 mm	40 mm	40 mm
maximum standard	160 mm	160 mm	200 mm	300 mm	300 mm	300 mm
maximum on request	1000 mm	1000 mm	1350 mm	1350 mm	2000 mm	2000 mm

standard in inches						
nominal diameter	1/4" 6.35 mm	3/8" 9.52 mm	1/2" 12.7 mm	5/8" 15.87	3/4" 19.05 mm	1" 25.4 mm
tolerances	- 0.03% - 0.05%	- 0.04% - 0.06%	- 0.04% - 0.07%	- 0.05% - 0.08%	- 0.05% - 0.08%	- 0.06% - 0.10%
Real max. min.	6.32 mm 6.30 mm	9.48 mm 9.45 mm	12.65 mm 12.62 mm	15.82 mm 15.79 mm	18.99 mm 18.95 mm	25.34 mm 25.24 mm
minimum length	1"1/4 31.75 mm	1"1/4 31.75 mm	1"1/2 38.1 mm	2" 50.8 mm	2"1/2 63.5 mm	2"1/2 63.5 mm
maxi standard	6" 152.4 mm	8" 203.2 mm	12" 304.8 mm	12" 304.8 mm	12" 304.8 mm	
maxi on request	36" 914 mm	36" 914 mm	52" 1320 mm	52" 1320 mm	78" 1981 mm	78" 1981 mm

Tolerances on the length:

Length of less than 100 mm : + or - 2 mm

Length of more than 100 mm : + or - 2% of the total length

Tolerance on the camber: 0.15% of the length

Nickel leads with silicone fiberglass oversleeve, insulate the wires to temperatures of 320°C

wire section in mm ²	0.22 ²	0.5 ²	0.75 ²	1 ²	1.5 ²	2 ²	2.5 ²	4 ²
Intensity	0 to 1.74A	0 to 2.6A	0 to 4.5A	4.51 to 5.5A	5.51 to 7A	7.01 to 8.7A	8.71 to 10.86A	10.87 to 15A

Diameter	1/4" 6.5 mm	8 mm	3/8" 10 mm	1/2" 12.5 mm	5/8" 16 mm	3/4" 20 mm	1"
Voltage max.	240V	240V	240V	400V	400V	400V	400V
Amps max. Standard	2.6A	4.5A	5.5A	7A	8.7A	10.8A	
Max. Outside lead connection without head (option 29)	4.5A	4.5A	7A	11A	14A	18A	23A

Minimum Wattage at 230 Volts for a length of:

Diameter	1/4" 6.5 mm	8 mm	3/8" 10 mm	1/2" 12.5 mm	5/8" 16 mm	3/4" 20 mm	1"
32 mm or 1 1/4"	100 Watt	100 Watt	75 Watt				
40 mm or 1 1/2"	60 Watt	55 Watt	45 Watt	30 Watt	25 Watt		
50 mm or 2"	40 Watt	35 Watt	30 Watt	20 Watt	15 Watt		
60 mm or 2 1/2"	30 Watt	25 Watt	25 Watt	15 Watt	10 Watt	10 Watt	10 Watt

Maximum Wattage for a Voltage of:

Diameter	1/4" 6.5 mm	8 mm	3/8" 10 mm	1/2" 12.5 mm	5/8" 16 mm	3/4" 20 mm	1"
12V	31 Watt	54 Watt	66 Watt	104 Watt	129 Watt	129 Watt	
24V	62 Watt	108 Watt	132 Watt	208 Watt	259 Watt	259 Watt	
48V	124 Watt	216 Watt	264 Watt	416 Watt	518 Watt	518 Watt	
110V	286 Watt	495 Watt	605 Watt	957 Watt	1188 Watt	1188 Watt	
230V (standard)	598 Watt	1035 Watt	1265 Watt	2001 Watt	2484 Watt	2484 Watt	
230 Volt outside lead connection without head (option 29)	1035 Watt	1035 Watt	1610 Watt	2530 Watt	3220 Watt	4140 Watt	5290 Watt
230 Volt tri outside lead connection without head (option 29)						7170 Watt	9200 Watt
400V (standard)				3480 Watt	4104 Watt	4104 Watt	9200 Watt
400V tri Outside lead connection without head (option 29)						12420 Watt	15870 Watt

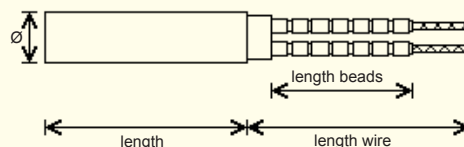
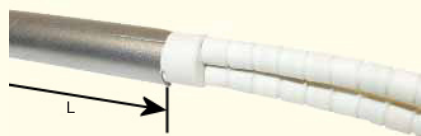
Electric tolerances

Wattage (Watt) and European norm EN 60335: +5% -10%

Resistance (Ohm): +10% -5%

The Ohmic resistance of the cartridge heater is linked to the temperature. On a cold CCHC it will be reduced by 5% to the nominal value used for the following calculation (under heat). All Wattage figures are calculated when operating. Leakage current are under 0,5 mA/kW or 0,5 mA according to the International Standard.

CERAMIC BEADS INSULATIONS - CCT.1



Ceramic beads protect the leads and are suitable for high working temperatures in excess of 350°C. The diameter of the ceramic beads is indicative, it will depend on the diameter of the leadwires.

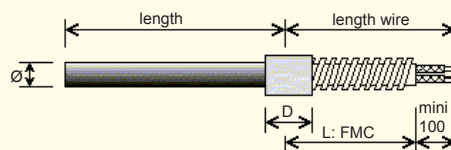
ØCCHC	Ø of the beads
6.35 - 6.5 mm	4 mm
8 mm	4 mm
9.52 - 10 mm	4 tot 5.9 mm

ØCCHC	Ø of the beads
12.5 - 12.7 mm	5.9 mm
15.87 - 16 mm	5.9 or +
19.05 - 20 mm	5.9 or +

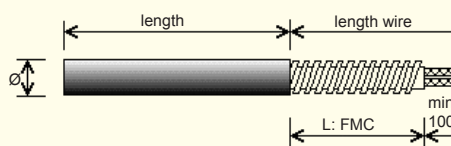
FLEXIBLE METALLIC CONDUIT - CCT.2 (FMC)



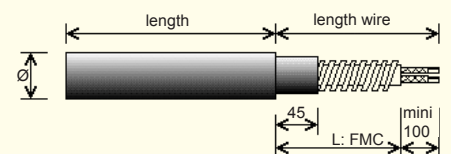
6.35 mm ≤ Ø cartridge ≤ 10 mm: C Type



12.5 mm ≤ Ø cartridge ≤ 16 mm: B Type



19.05 mm ≤ Ø cartridge ≤ 20 mm: D Type



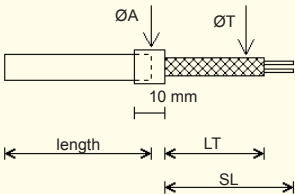
FMC : Flexible Metallic Conduit in galvanised steel, crimped or silver brazed, depending on the diameter of the cartridge heater.

ØCCHC	ØFMC	D	Model	Compatible with Thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	10	C	Yes	Yes
8 mm	10 mm	25	C	Yes	Yes
9.52 - 10 mm	10 mm	25	C	Yes	Yes
12.5 - 12.7 mm	10 mm (I < 7A) 13 mm (I > 7A)	-	B	Yes	Yes
15.87 - 16 mm	13 mm	-	B	Yes	Yes
19.05 mm	13 mm	-	D	Yes	Yes
20	13 mm	-	D	Yes	Yes

BRAID - CCT.3

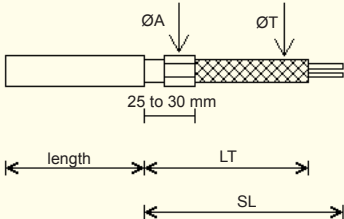


6.35 mm ≤ Ø cartridge ≤ 10 mm: A Type





12.5 mm ≤ Ø cartridge ≤ 20 mm: B Type



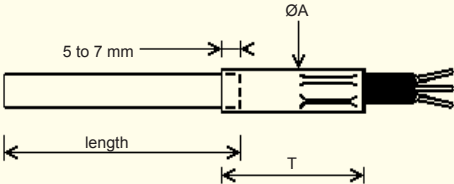
Galvanised steel braid. They are suitable for a good mechanical protection.

ØCCHC	Type	ØA	ØT	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	A	9.5 mm	6 mm	Yes	Yes
8 mm	A	11.5 mm	6 mm	Yes	Yes
9.52 - 10 mm	A	13 mm	6 mm	Yes	Yes
12.5 - 12.7 mm	B	14 mm	10 mm	Yes	Yes
15.87 - 16 mm	B	16 mm	10 mm	Yes	Yes
19.05 - 20 mm	B	16 mm	10 mm	Yes	Yes

CONNECTION WITH A MULTICONDUCTOR CABLE - CCT.4

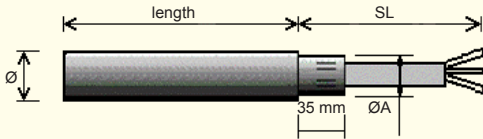


6.35 mm ≤ Ø cartridge ≤ 10 mm: A Type





12.5 mm ≤ Ø cartridge ≤ 20 mm: B Type



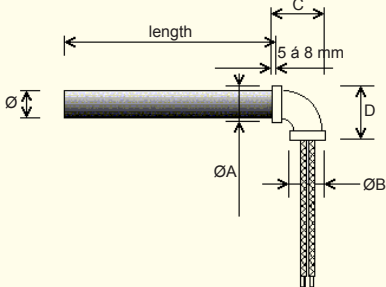
Copper cable silicone insulated, 2 wires + earth, Tmax: 180°C. Brazed waterproof assembly. Silicone seal.

ØCCHC	ØA x T	Amps max.	P (W) max. at 230 V
6.35 - 6.5 mm	10 mm	5.1 A	1170 Watt
8 mm	10 mm	5.1 A	1170 Watt
9.52 - 10 mm	11 mm	5.1 A	1170 Watt
12.5 - 12.7 mm	10 mm	5.1 A	1170 Watt
15.87 - 16 mm	12.7 mm	5.1 A	1170 Watt
19.05 - 20 mm	12.7 mm	5.1 A	1170 Watt

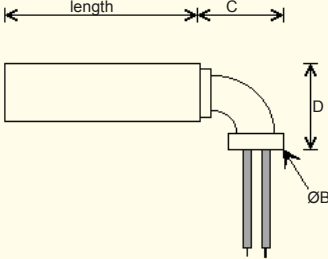
90° bent connections

- Flexible wires, nickel core, fiberglass insulated, designed to support a maximum operating temperature of 350°C.
- Copper elbow brazed with silver.
- Flexible metal conduit made of galvanized steel.

BENDED EXIT - CCT.5



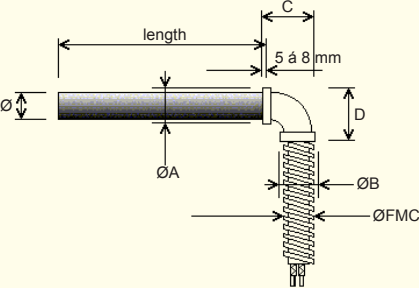
6.35 mm ≤ Ø cartridge ≤ 12.7 mm



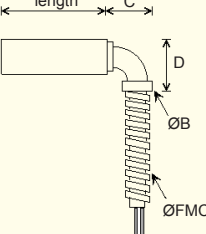
15.87 mm ≤ Ø cartridge ≤ 20 mm

ØCCHC	ØA	ØB	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	10 mm	No	No
8 mm	10 mm	10 mm	No	No
9.52 - 10 mm	12 mm	12 mm	Yes	No
12.5 - 12.7 mm	16 mm	14 mm	Yes	No
15.87 - 16 mm		14 mm	Yes	No
19.05 - 20 mm		14 mm	Yes	No

BENDED FLEXIBLE METALLIC CONDUIT - CCT.6



6.35 mm ≤ Ø cartridge ≤ 12.7 mm



15.87 mm ≤ Ø cartridge ≤ 20 mm

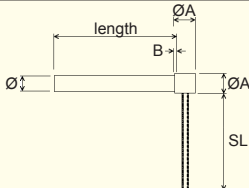
FMC : Flexible Metallic Conduit in galvanised steel, crimped or silver brazed, depending on the diameter of the cartridge heater.

ØCCHC	ØA	ØB	C	D	ØFMC	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	10 mm	24 mm	21 mm	8 mm	No	No
8 mm	10 mm	10 mm	21 mm	21 mm	8 mm	No	No
9.52 - 10 mm	12 mm	12 mm	23 mm	23 mm	10 mm	No	No
12.5 - 12.7 mm	16 mm	14 mm	26 mm	26 mm	13 mm	No	No
15.87 - 16 mm		14 mm	23 mm	30 mm	13 mm	Yes	No
19.05 - 20 mm		14 mm	28 mm	33 mm	13 mm	Yes	No

90° square block connections

- Flexible wires, nickel core, fiberglass insulated, designed to support a maximum operating temperature of 350°C.
- Copper elbow brazed with silver.
- Flexible metal conduit made of galvanized steel.

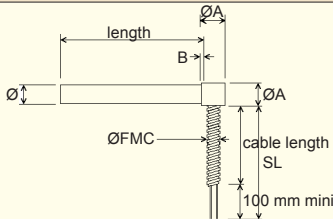
WIRES - CCT.7



ØCCHC	A	B	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	1 mm	No	Yes
8 mm	10 mm	1 mm	Yes	Yes
9.52 - 10 mm	12 mm	1 mm	Yes	Yes
12.5 - 12.7 mm	14 mm	2 mm	Yes	Yes
15.87 - 16 mm	18 mm	2 mm	Yes	Yes
19.05 - 20 mm	22 mm	3 mm	Yes	Yes

FMC : Flexible Metallic Conduit in galvanised steel, crimped or silver brazed, depending on the diameter of the cartridge heater.
Sealed with plasma non-watertight.

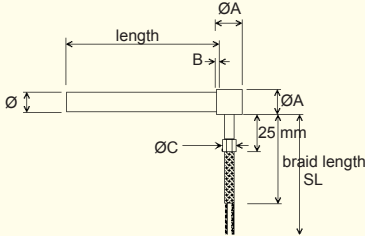
FLEXIBLE METAL CONDUIT - CCT.8



Ø cartridge ≥ 9.52 mm (3/8")

ØCCHC	A	B	Ø FMC	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	cf option 9 of 28				
8 mm	cf option 28				
9.52 - 10 mm	12 mm	1 mm	10 mm	Yes	Yes
12.5 - 12.7 mm	14 mm	2 mm	10 mm	Yes	Yes
15.87 - 16 mm	18 mm	2 mm	13 mm	Yes	Yes
19,05 -20 mm	22 mm	3 mm	13 mm	Yes	Yes

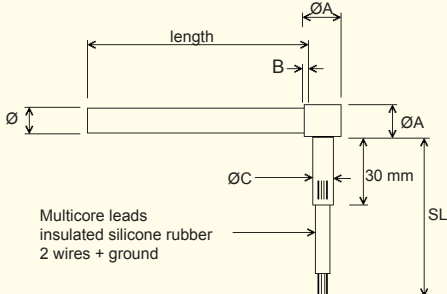




Leadwires braided with galvanised steel.
Sealed with plasma non - watertight.

ØCCHC	A	B	ØC	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	1 mm	9.5 mm	No	Yes
8 mm	10 mm	1 mm	11.5 mm	No	Yes
9.52 - 10 mm	12 mm	1 mm	13 mm	Yes	Yes
12.5 - 12.7 mm	14 mm	2 mm	13 mm	Yes	Yes
15.87 - 16 mm	18 mm	2 mm	16 mm	Yes	Yes
19,05 - 20 mm	22 mm	3 mm	16 mm	Yes	Yes



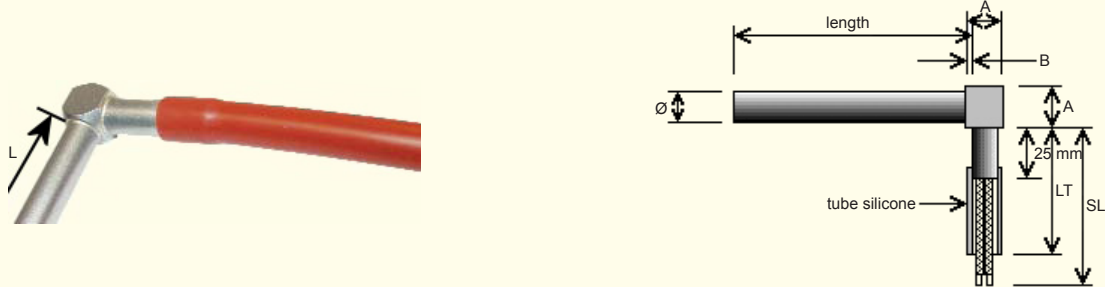


Ø cartridge ≥ 9.52 mm (3/8")

Copper cable silicone insulated, 2 wires + earth, Tmax: 180°C.
Brazed waterproof assembly. Silicone seal. Brazed watertight mounting.

ØCCHC	A	B	ØC	Amps Max. at 170°C	Wattage Max. at 230 V
6.35 - 6.5 mm	cf option 22				
8 mm					
9.52 - 10 mm	12 mm	1 mm	10 mm	5.1 A	1170 Watt
12.5 - 12.7 mm	14 mm	2 mm	10 mm	5.1 A	1170 Watt
15.87 - 16 mm	18 mm	2 mm	10 mm	5.1 A	1170 Watt
19.05 - 20 mm	22 mm	3 mm	12 mm	5.1 A	1170 Watt

RIGHT ANGLE WITH SILICONE TUBE - CCT.22



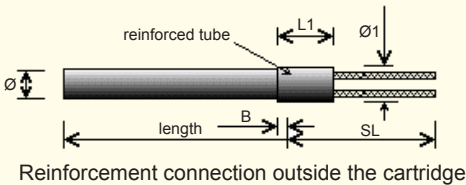
In addition to option 10.
Cables are protected with watertight silicone sleeve and withstands vibrations and movements. Maximum operating temperature on the cables: 200°C (392°F).

ØCCHC	A	B	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	1 mm	No	No
8 mm	10 mm	1 mm	No	No
9.52 - 10 mm	12 mm	1 mm	Yes	No
12.5 - 12.7 mm	14 mm	2 mm	Yes	No
15.87 - 16 mm	18 mm	2 mm	Yes	No
19.05 - 20 mm	22 mm	3 mm	Yes	No

REINFORCED CONNECTION - CCT.25



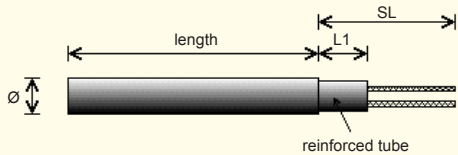
6.35 mm ≤ Ø cartridge ≤ 10 mm: A Type



Reinforcement connection outside the cartridge



12.5 mm ≤ Ø cartridge ≤ 20 mm: B Type

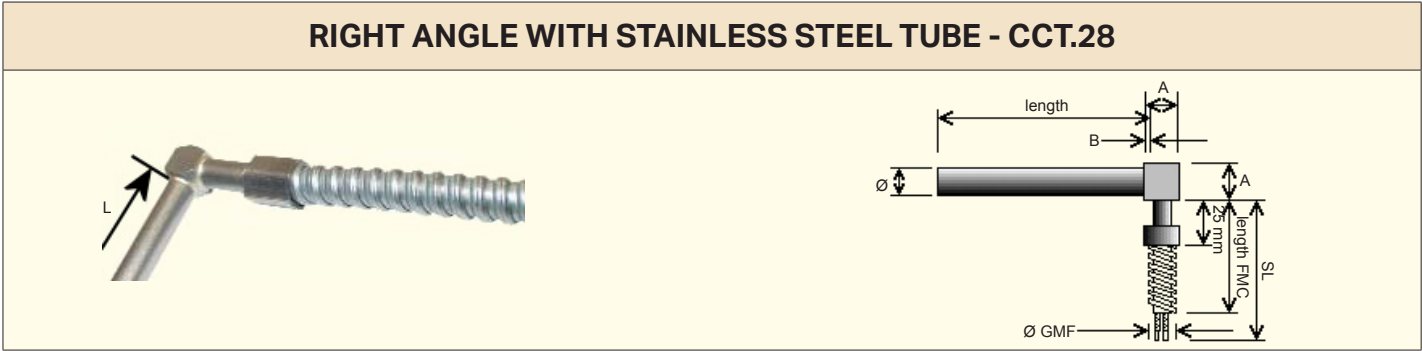


Reinforcement connection inside the cartridge

ØCCHC	Max. intensity	L1	reinforced tube
6.35 - 6.5 mm		7.5 mm	25 mm
8 mm	5.5 A	9.5 mm	25 mm
9.52 - 10 mm	5.5 A	25 mm	11 mm

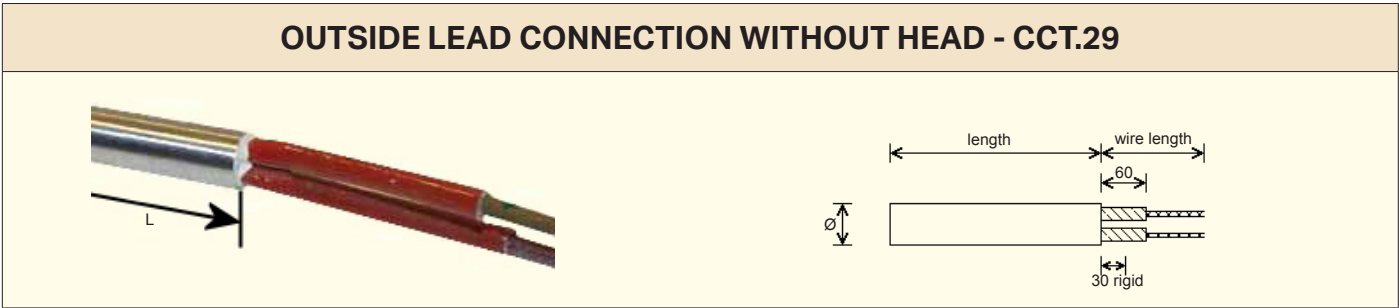
ØCCHC	Max. intensity	L1
12.5 - 12.7 mm	7 A	23 mm
15.87 - 16 mm	8.7 A	23 mm
19.05 - 20 mm	10.8 A	23 mm

It is used to reinforced the connection when the cartridge and the cables are moving. Then the connection is doubly maintained in the ceramic lead (standard assembly) and in the reinforcement tube filled with cement. Cables are flexible or very flexible depending of the assembly.



The right angle is plasma welded. Non-watertight assembly. Stainless steel tube.
Galvanised steel sheath.

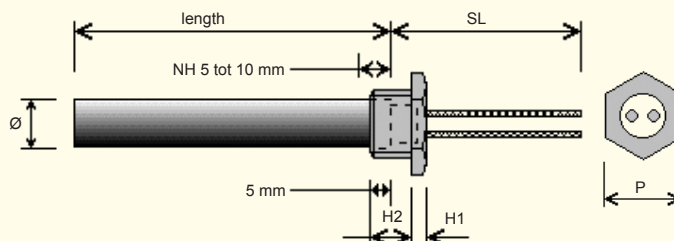
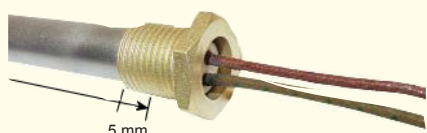
ØCCHC	A	B	ØFMC	Compatible with thermocouple	Compatible with ground wire
6.35 - 6.5 mm	8 mm	1 mm	8 mm	No	No
8 mm	10 mm	1 mm	8 mm	No	No
9.52 - 10 mm	12 mm	1 mm	10 mm	Yes	Please consult
12.5 - 12.7 mm	14 mm	2 mm	10 mm	Yes	Please consult
15.87 - 16 mm	18 mm	2 mm	13 mm	Yes	Please consult
19.05 - 20 mm	22 mm	3 mm	13 mm	Yes	Please consult



This type of CCHC is used when the intensity exceeds standard chart values.
Sealing with refractory cement.
This solution is usually used for intensities which are higher than those of standard CCHC. Cables are connected on the outside lead connection.
They are insulated with a high-temperature protection sleeve and they are fixed in the refractory cement.

ØCCHC	1/4" 6.5 mm	8 mm	3/8" 10 mm	1/2" 12.5 mm	5/8" 16 mm	3/4" 20 mm
Max. intensity	4,5 A	4,5 A	7 A	11 A	14 A	18 A
Max. power in 230 V	1035 Watt	1035 Watt	1600 Watt	2500 Watt	3220 Watt	4140 Watt

THREADED GLAND - ACCESSORY 11

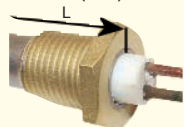


For a different gland position, see accessory 11 A.

Brazed watertight threaded gland over the cold zone. The gland sticks out of the heater. Threading according to the diameter of the heater. Metrical or gas thread.

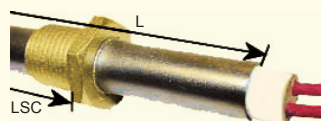
THREADED GLAND - ACCESSORY 11A & 11B

Such a mounting leveled with the metallic part of the CCHC requires a special unheated section (NH) which means, a special launching in production

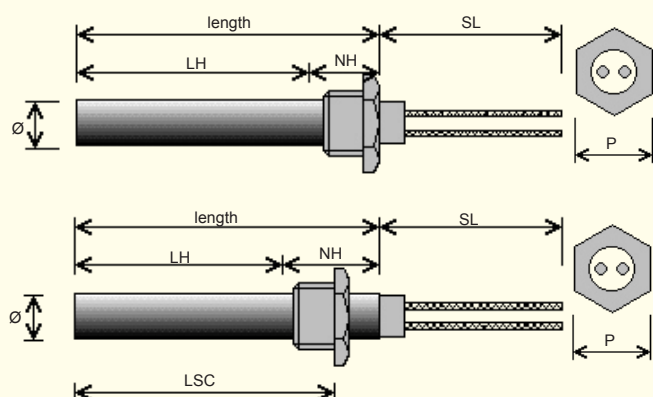


A Type

The fitting can be positionned specifically upon your requirements.



B Type

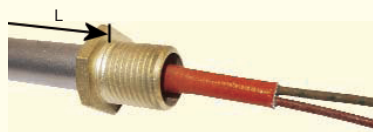


ØCCHC	Thread	H1	H2	P
1/4"	1/8"	4 mm	7 mm	14 mm
3/8"	1/4"	3 mm	6 mm	15 mm
1/2"	3/8"	4 mm	7 mm	21 mm
5/8"	1/2"	4 mm	7 mm	24 mm
3/4"	3/4"	4 mm	7 mm	30 mm
6.5 mm	**M10 x 100	4 mm	12 mm	17 mm
	*M11 x 100	4 mm	10 mm	17 mm
8 mm	*M11 x 100	4 mm	10 mm	17 mm
	**M12 x 100	4 mm	12 mm	17 mm
10 mm	M14 x 100	4 mm	15 mm	19 mm
12.5 mm	M16 x 150	4 mm	17 mm	19 mm
16 mm	M20 x 150	4 mm	15 mm	27 mm
20 mm	M24 x 150	4 mm	20 mm	30 mm

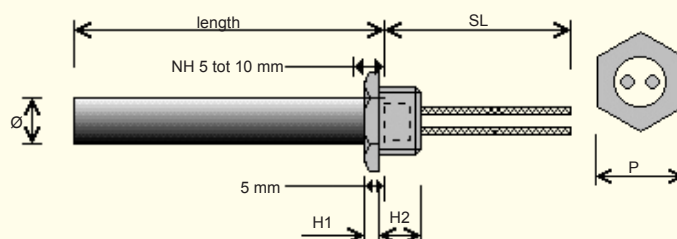
* M11 x 100 = standard threaded fitting.

**M10 x 100 en M12 x 100 = threaded fitting assembly on special request.

REVERSE THREADED GLAND - ACCESSORY 12

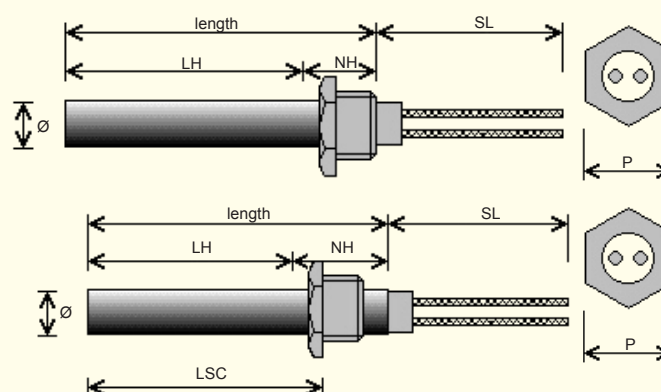
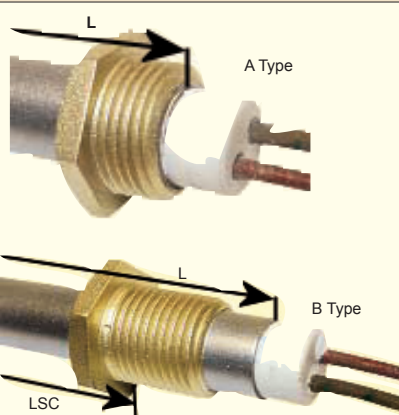


For a different gland position, see our section "Accessories for a special cartridge heater", accessory 12 A.



Brazed watertight threaded gland over the cold zone. The gland sticks out of the heater. Threading according to the diameter of the heater. Metrical or gas thread.

REVERSE THREADED GLAND - ACCESSOIRE 12A & 12B



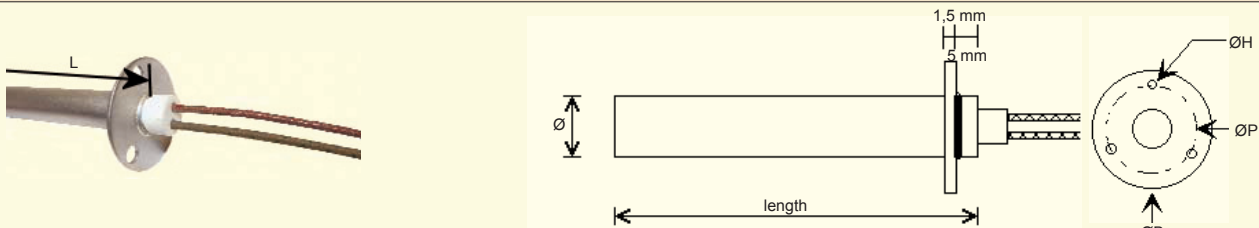
Such a mounting, leveled with the metallic sheath of the CCHC, requires a special unheated zone (NH) which means a specific launching in production. The fitting can be positionned upon your requirements.

ØCCHC	Thread	H1	H2	P
1/4"	1/8"	4 mm	7 mm	14 mm
3/8"	1/4"	3 mm	6 mm	15 mm
1/2"	3/8"	4 mm	7 mm	21 mm
5/8"	1/2"	4 mm	7 mm	24 mm
3/4"	3/4"	4 mm	7 mm	30 mm
6.5 mm	**M10 x 100	4 mm	12 mm	17 mm
	*M11 x 100	4 mm	10 mm	17 mm
8 mm	*M11 x 100	4 mm	10 mm	17 mm
	**M12 x 100	4 mm	12 mm	17 mm
10 mm	M14 x 100	4 mm	15 mm	19 mm
12.5 mm	M16 x 150	4 mm	17 mm	19 mm
16 mm	M20 x 150	4 mm	15 mm	27 mm
20 mm	M24 x 150	4 mm	20 mm	30 mm

*M11 x 100 = standard threaded fitting.

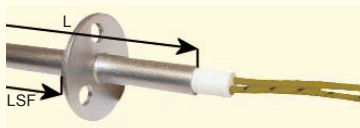
**M10 x 100 en M12 x 100 = threaded fitting assembly on special request.

MOUNTING FLANGE - ACCESSORY 13

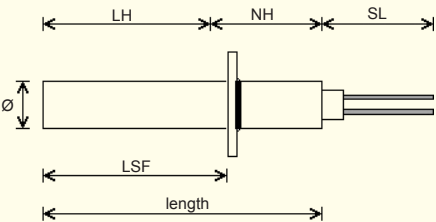


Stainless steel flange brazed over the cold zone. Length between the head and the flange: 5 mm.

MOUNTING FLANGE - ACCESSORY 13A



LSF : length under the flange or inserted length.
Such a mounting appear very useful to lessen the temperature on the leadwires.

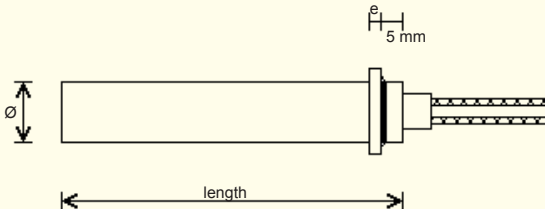


Ø CCHC	6.35 - 6.58 mm	9.52 - 10 mm 12.5 - 12.7 mm	15.87 - 16 mm 19.05 - 20 mm
Ø B	24 mm	35 mm	45 mm
Ø P	16 mm	25 mm	35 mm
Ø H	4 mm	5 mm	5 mm

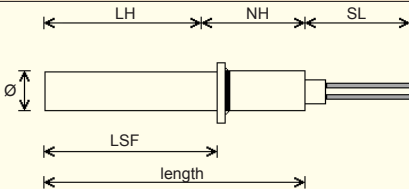
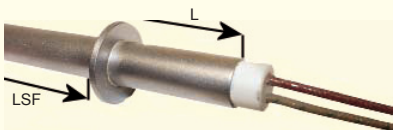
ABUTMENT - ACCESSORY 14



Stainless steel abutment brazed over the cold zone.
Length between the ceramic head and the abutment: 5 mm



ABUTMENT - ACCESSORY 14A



LSF: Length under the abutment.
The LSF must always exceed the heating length or LC.

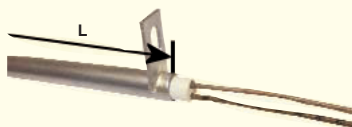
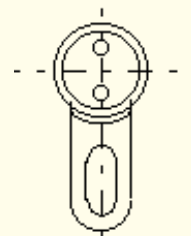
Such a mounting is very useful for reducing the temperature on the cables or in case of a silicone watertight cartridge.

ØCCHC	Ø flange	e
6.35 - 6.5 mm	12 mm	1.2 mm
8 - 9.52 mm	16 mm	1.5 mm
10 mm	20 mm	2 mm
12.5 - 12.7 mm	24 mm	2.5 mm
15.87 mm	27 mm	2.5 mm
16 mm	30 mm	3 mm
19.05 mm	32 mm	3 mm
20 mm	36 mm	3 mm

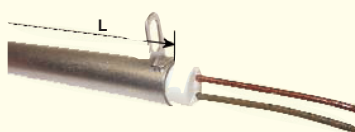
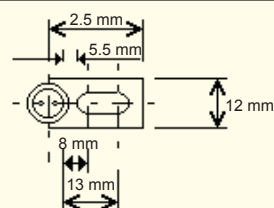
TABS - ACCESSORY 19



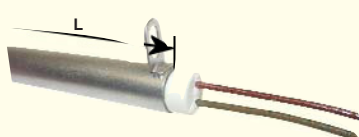
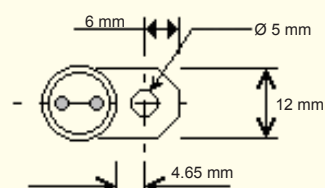
6.35 mm ≤ Ø cartridge ≤ 6.5 mm: A type
(overall dimensions 18.6 x 6.2 mm)



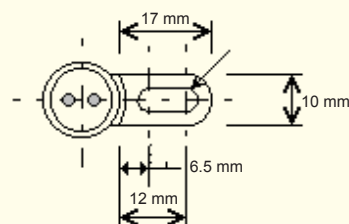
9.52 mm ≤ Ø cartridge ≤ 10 mm: B type
(overall dimensions 25 x 12 mm)



12.50 mm ≤ Ø cartridge ≤ 12.7 mm: C type
(overall dimensions 11 x 12 mm)

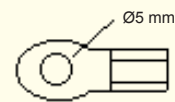
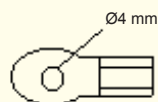


15.87 mm ≤ Ø cartridge ≤ 20 mm: D type
(overall dimensions 17 x 10 mm)



The fixing anchor clip is usually used to maintain the cartridge as it could go out of its casing during the heating and cooling cycles.
An anchor clip can be set up on each type of heater.

LUG TERMINALS - ACCESSORY 20



Several end lead terminations are available for the electrical connecting of your installations. Circular end lead terminations of Ø4 and 5.
Please consult us for any other type.

CONNECTORS - ACCESSORY 26



CEE 2 pins connector (Hirschmann connection)



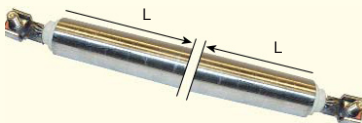
CEE 3 pins connector (Hypra connection)

FLEXIBLE SPRING - ACCESSORY 27



This system protects cables while the cartridge heater is in motion.

BOTH ENDS RIGID CONNECTION



This type of connection is particularly used for replacing a tubular heating element.

THREADED FITTING - ACCESSORY 31



10 mm external Ø flexible metal conduit

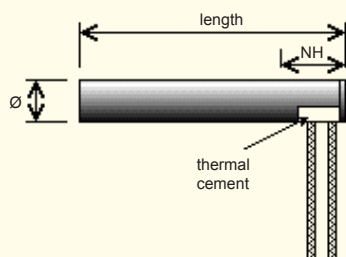
Gland brazed to a flexible metal conduit, used for coupling it to a plug or for connecting it to an electrical box.
Gland threaded to electrical standards.

COPPER END DISK - ACCESSORY 32

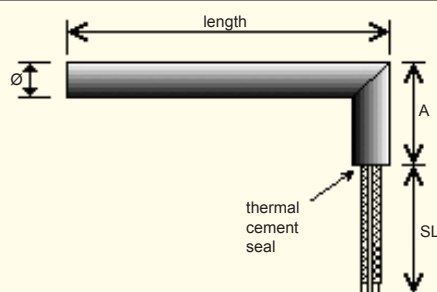


Ø cartridge ≥ 12.5 mm
Copper end disk welded to the bottom of the cartridge.
Enables easy removal of the heater.

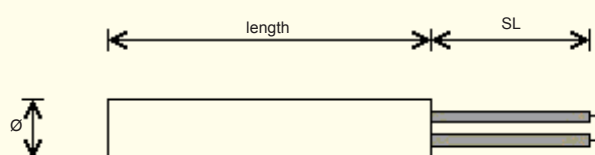
- The sizes of these accessories vary according to the diameter of the heater. In case of space restrictions (overall dimensions) for these accessories, please indicate your limitation.
- Combining connections and accessories is possible, after checking with our engineering department.

90° SQUARE CONNECTION COMING OUT OF THE TUBE - CCT.21

The cartridge is cut to an end over about 5 mm in the centre and 2 nickel pins are perpendicular over 20/25 mm, followed by 2 cables. This product requires a non heating length of 12 mm on the connection side. A stainless steel cap seals the cartridge.

"L" SHAPE SIDE CONNECTION AT 90° - CCT.23

The cartridge and the stainless steel tube are welded edge to edge at 90°. This option is possible on every cartridge diameter from 9.52 mm and above. Sealing with refractory cement
There is an internal cables connection to the heater.

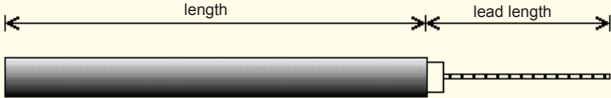
FLEXIBLE CONNECTION WITHOUT CERAMIC CAP - CCT.30

Flexible wires, nickel conductor, fiberglass insulated designed to support a maximum operating temperature of 350°C.

ØCCHC	1/4" 6 mm	8 mm	3/8" 10 mm	1/2" 12.5 mm	5/8" 16 mm	3/4" 20 mm
Max intensity (Amp)	2.6 A	2.6 A	5.5 A	8.7 A	10.8 A	10.8 A
Max power in 230V	600 Watt	600 Watt	1250 Watt	2000 Watt	2500 Watt	2500 Watt

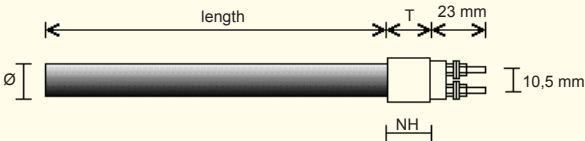
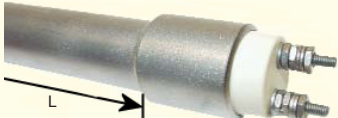
Straight Connections

EARTH RETURN - CCT.16

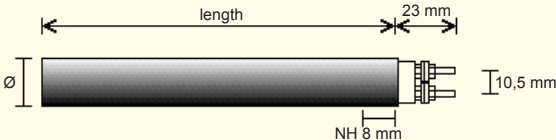
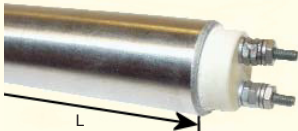


Single wire termination + earth return

STUD TERMINALS - CCT.17



9.45 mm ≤ Ø cartridge ≤ 16 mm : A type.
18 ≤ Ø cartridge ≤ 21 mm : A type

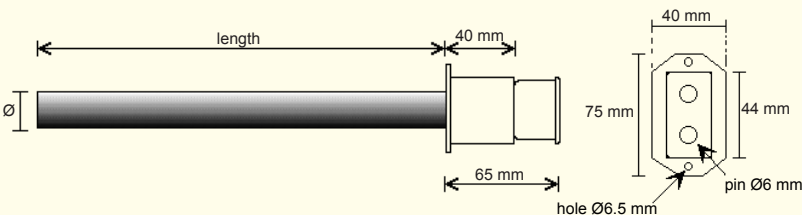


22 mm ≤ Ø cartridge ≤ 32 mm: B type

Ø	Type	T	BF
9.45 tot 16 mm	A	22 mm	M3 with 2 washers en 2 nuts
18 tot 21 mm	A	13 mm	
22 tot 32 mm	B	-	

Pins and receptacle socket

PINS AND RECEPTACLE SOCKET - CCT.18



9.45 mm ≤ Ø cartridge ≤ 18 mm
Supplied with 2 Ø6 mm pins, 19 mm CTC, nickel plated steel, specially designed for a quick connection.

- Legend: LU = length under - L = total length of the cartridge.
According to the model: (C = cap, T = tab, F = flange)
- The sizes of these accessories vary according to the diameter of the heater. In case of space restrictions (overall dimensions) for these accessories, please indicate your limitation.
- Combining connections and accessories is possible, after checking with our engineering department.

The whole range of cartridge heaters can be equipped with TCJ: Iron/Constantan or the TCK: Nickel Chrome/Nickel Alloyed, with or without special leads and accessories.

Standard: leads and TC length: 1000 mm (maxi)
On demand: length 500 or 250 mm

We can provide 4 different positions for the internal thermocouple according to the final use and accuracy required:

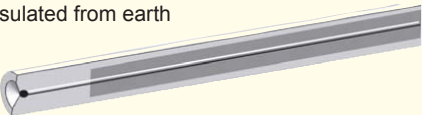
- TC at the bottom of the CCHC.
- TC at the bottom of the CCHC, insulated from earth.
- TC in the center of the heating core.
- TC in the center of the cartridge near the tube.

Polarity		International	French	American	German	English	Japanese
Norms		IEC 584	NFC 42324	ANSI MC 96.1	DIN 43714	BS 1843	JICS 1610.1981
J: 0 - 760°C	Iron (+) magnetic	Black	Yellow	White	Red	Yellow	Red
	Constantan (-) no magnetic	White	Black	Red	Blue	Blue	White
K: 0 - 1260°C	Ni. Chrom (+) no magnetic	Green	Yellow	Yellow	Red	Brown	Red
	Ni. Alloyed (-) magnetic	White	Purple	Red	Green	Blue	White

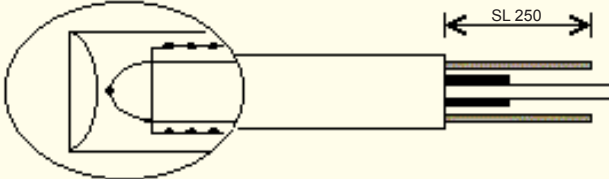
IMPORTANT:
ALL OPERATING TEMPERATURES OF THE CHART ARE MEASURED ON THE CONDUCTING WIRES OF THE THERMOCOUPLE PROBES.
ACCORDING TO THE MOUNTING AND USE THE TC CAN BE FACING TEMPERATURES MUCH HIGHER THAN INDICATED FOR THE REGULATION SYSTEM (ESPECIALLY FOR TC 1 AND TC 2) AND RESULT TO BE DAMAGED (SEE BELOW GRAPH).

NON INSULATED FROM EARTH / THERMOCOUPLE LOCATED AT THE BOTTOM OF THE CARTRIDGE - TCJ1 OR TCK1

Non insulated from earth



At the bottom of the cartridge

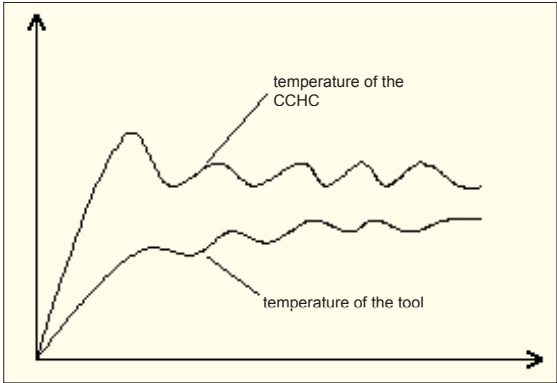


When inserted into a blind hole, it provides a good temperature reading with an average response time.

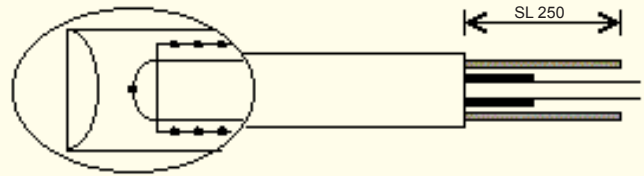
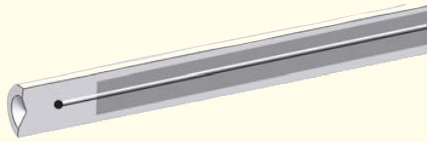
Solution not recommended for high temperature or flux (W/cm²). The thermocouple is located at the bottom of the CCHC, not insulated from the earth.
If the cartridge is mounted in a blind hole it will supply a good reading of the temperature with an average response time.

Mounted in a hole opened at both ends, or too big, the thermocouple will lead to overheating, rapid damages on the cartridge heater, and non-precise regulation of the mold.

- Average inertia
- Quick temperature rise
- Not insulated from earth.

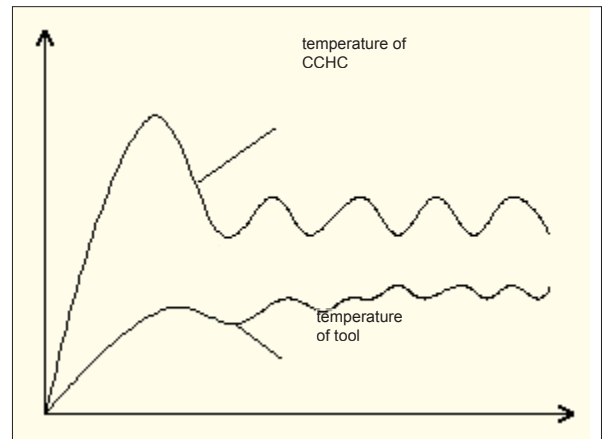


INSULATED FROM EARTH / THERMOCOUPLE AT THE BOTTOM OF THE CARTRIDGE - TCJ2 OR TCK2

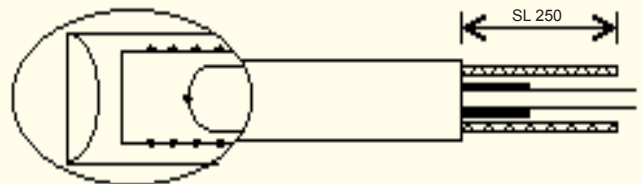
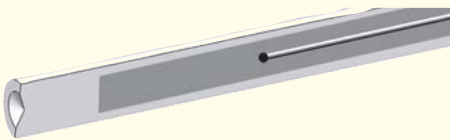


Fitted as standard on all $\varnothing$ 6.35 mm (1/4") to 8 mm cartridge heaters with built in thermocouple unless otherwise specified.

Fitted on cartridges when a built in thermocouple is required at the bottom of cartridge and when insulations not precisely defined. Earth insulation, allows a good protection of the electric elements of the control system.

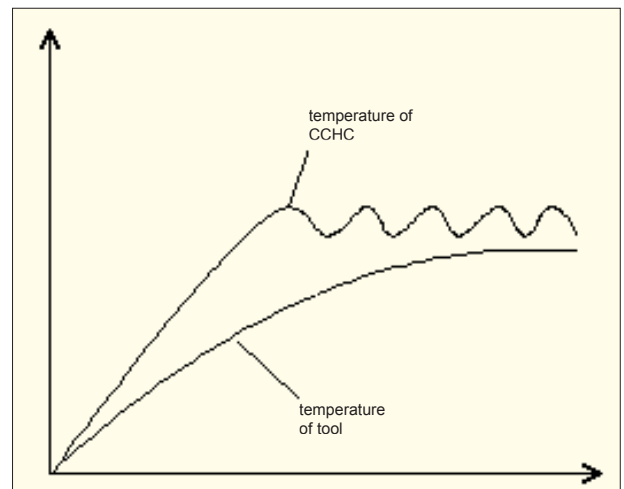


INSULATED THERMOCOUPLE IN THE CENTER OF THE HEATING CORE - TCJ3 OR TCK3

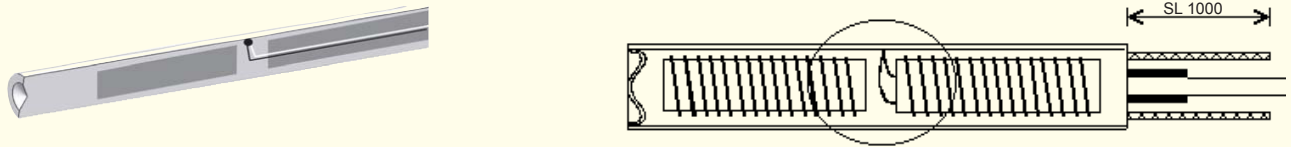


Fitted as standard on all $\varnothing$ 9.52 mm (3/8") to 20 mm-cartridge heaters with built in thermocouple unless otherwise specified.

Highly recommended for all kind of applications, as the thermocouple monitors the internal temperature of the cartridge with an accurate reading and a very fast time of response.



UNGROUNDED THERMOCOUPLE IN THE CENTER, IN CONTACT WITH METAL TUBE - TCJ4 OR TCK4

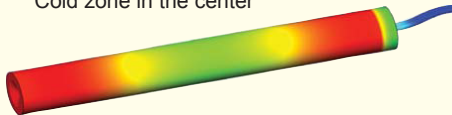


Assembly for: $12.5 \text{ mm} \leq \varnothing \text{ cartridge} \leq 20 \text{ mm}$
Monitoring of the outer sheet metal temperature. This system saves the adding of a sensor to the part to be heated by the cartridge.

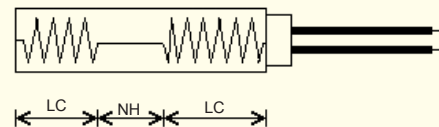
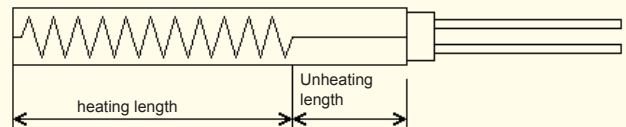
COLD ZONES

Examples of application

Cold zone in the center



Cold zone at both ends

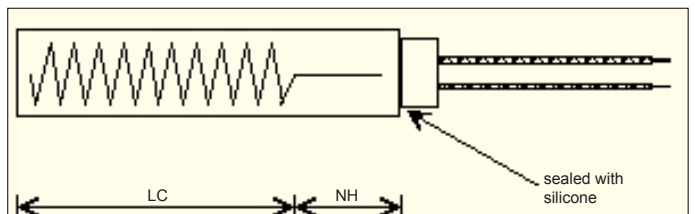
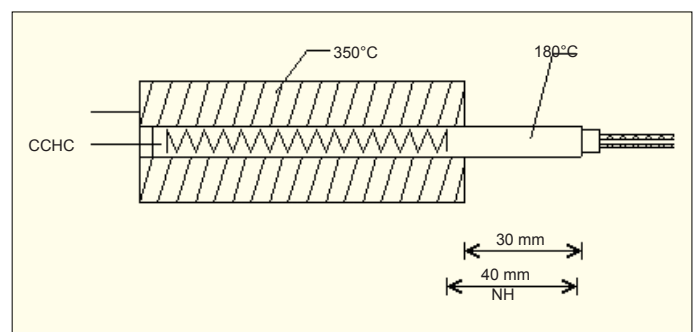


For instance: The location of the cold zone on the wiring side is particularly used when the heater emerges from the part to be heated. Thus, the cartridge heater will not overheat and it will not conk out.

Maximum operating temperature of the silicone rubber : 250°C .

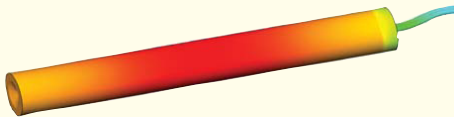
Always consider enough unheated length to lessen the temperature of the end under 250°C to avoid irreversible damage on the sealing.

If the tool or the mold use to operate over 250°C , the unheating section must be located out of it to avoid destruction of the sealing.

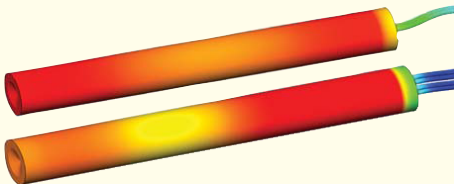


AREA(S) WITH VARIABLE WATTAGE

Reinforced power in the center - 2 lead connection



Reinforced power at both ends - 2 or 4 wires connection



Multiple-zone manufacture, to distribute the heating power.

4 wires connection: different heating circuits available for Ø cartridge heater ≥ 14 mm

Compensated power at both ends of the cartridge allows a good compensation of the heat losses at each end of the mold or the tooling.

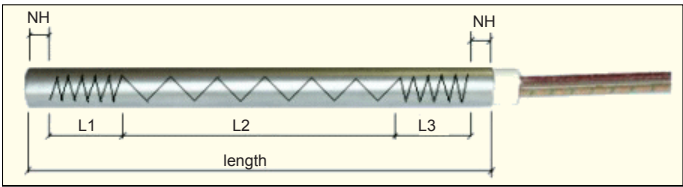
Applications :

- Plastic processing industry.
- Hot runners
- For compensating heat losses on edges of tools or injection presses heating plates

Multi-sections process with:

1. Constant flux per section.
2. Flux more or less powerful per section.
3. With unheated section.
4. With built-in J or K type insulated thermo-couple probe.
5. With built-in J or K type non-insulated thermocouple probe.

Example of variable wattage distribution



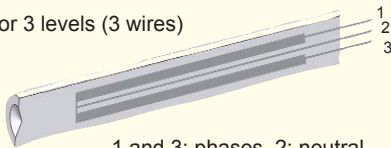
Cartridge Ø:	mm of inch		
length:	mm		
Total wattage:	Watt		
L1:	mm	Wattage:	Watt
L2:	mm	Wattage:	Watt
L3:	mm	Wattage:	Watt

Approximate non-heating length at both ends of cartridge

Cartridge Ø	Non-heating length (NH)
6.5 - 8 mm	6 mm
9.52 - 12.7 mm	7 mm
15.87 - 16 mm	8 mm
19.05 - 20 mm	10 mm

MULTIPLE TEMPERATURE LEVELS

2 or 3 levels (3 wires)



1 and 3: phases, 2: neutral

Dual voltage applications.

The above example will provide quick heating of the system by only using the necessary power to achieve the required temperature
Assembly for Ø cartridge heater ≥ 14 mm

• This type of heater is made of two semicircular halves containing a continuous heating element. When energized, the heater expands to make wall-to-wall contact with the bore, maximizing heat transfer:

- After cooling, the heater will contract for ease of removal and elimination of bore seizure.
- Manufactured to suit customer requirements.
- Rated wattage: 500 to 5100 W.
- Rated voltage: 230 V single phase
- Incoloy 800 external metal sheath.
- Leads: Woven PTFE-Glass-PTFE over stranded nickel wire rated to 250°C. Length 12" (300 mm)
- Length tolerance: L < 500 mm: +/- 3%
L > 500 mm: +/- 2%
- Diameter tolerance: +/- 0.0051 mm (0.002")
- Wattage tolerance: +/- 10 %

Terminations

LEADS



Leads: possible angle to 0° or to 90°.

FLEXIBLE METAL BRAID

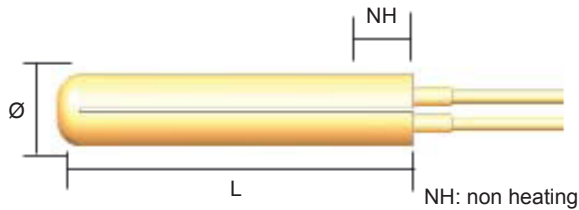


THREADED POST TERMINAL



FLEXIBLE METAL CONDUIT -
TERMINATION TO 0° OR TO 90°





ØNominal	Unheated lengths	Length mini	Length maxi
6.35 (1/4")	7.9 (5/16")	31.75 (1"1/4)	559 (22")
8	8	38	660
9.52 (3/8")	9.52 (3/8")	38.1 (1"1/2)	914 (36")
10	9.5	38	915
12	15.9	50	1140
12.5	15.9	50	1140
12.7 - (1/2")	15.9 (5/8")	51 (2")	1143 (45")
15	15.9	65	1250
15.87 (5/8")	15.9 (5/8")	63.5 (2"1/2)	1524 (60")
16	15.9	65	1525
17.5 (11/16")	15.9 (5/8")	89 (3"1/2)	1625 (64")
19.05 (3/4")	15.9 (5/8")	89 (3"1/2)	1829 (72")
20	15,9	100	1525
25.4 (1")	25.4 (1")	254 (10")	1524 (60")

FLANGE



Manufacturing options

- Thermocouple:



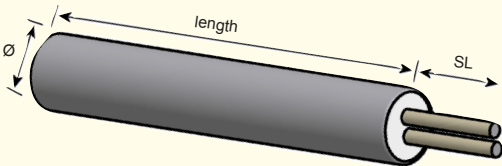
- Ground (earth) wire
- Distributed watt density

Options

- Wire length made to suit customer requirements.
High temperature resistant:
 - * Ceramic beads
 - * Mica insulated wire - fiberglass
- Hot or cool tip - opposite end from termination.
- Non heating areas, to suit customer requirements.

Bore sizing

The bore should be sized to accommodate a cartridge heater. These heaters are manufactured 0.13 mm (.005") undersized. The bore can be 0.18 mm (.007") to 0.25 mm (.010) over the manufactured diameter or 0.05 mm (.002") to 0.13 mm (.005") over the specified diameter.

	Legend: Ø: diameter L: total length, excluded ceramic cap SL: leads length	
Company:	Tel:	Fax:
Contact:	E-mail:	Date:
To process your order or quotation please specify the following information:		
Unless specified otherwise, your cartridge heaters will be manufactured as follows:		
• With standard cold zone (from 5 to 10 mm at each extremity) • Standard wiring supplied with a ceramic cap and a termination lead of 250 mm • Heat resistant cement sealing. • Diameter Ø (mm)Total length of the heater L (mm): • Voltage (V): Wattage (W): • Material: ☐ Stainless steel ☐ Brass • Termination* (p) : type: • Lead termination: ☐ Standard (nickel conductor, fiberglass insulated) ☐ PTFE (nickel conductor, PTFE insulated) ☐ CS (copper conductor, silicone insulated) ☐ CSES (copper conductor, silicone insulated, extra flexible) - Lead length (mm) (by multiple of 250 mm) : • Type of protection: ☐ beads ☐ Flexible conductors ☐ Metal braid - Protection length (mm): (This length must be shorter than the length of the lead)		
• Accessory :type: Position of the accessory (Please, send a sketch for special assembly) (length under...):.....		
• Thermocouple: ☐ J Type ☐ K Type Wire length (mm): - Position of the accessory: • Cold zone(s), zones with compensated power outputs, zones with different power output levels: For all special manufactures please send us complete specifications.		
• Bore (compulsory):		
• Working temperature:		
• Expected temperature control system:		
• Complementary information concerning the applications:		
• Number of pieces:		
Productions of cartridge heaters are subject to our approval depending on power rating, current sizes, connections and accessories. • In case of restriction of overall dimensions on accessories and/or on connections, please indicate your limitation.		



Sinus is one of the pioneers in the field of explosion proof heating equipment, today we are still operating at the forefront. We manufacture according to ATEX as well as IECEx and EAC directives.

For the production of Ex-proof equipment a PQAN (Product Quality Assurance Notification) is issued by TUV-Nord. Our ISO-9001 and ISO-14001 systems are also monitored by this organisation.

NIBE