



Zoppas Industries
Heating Element Technologies



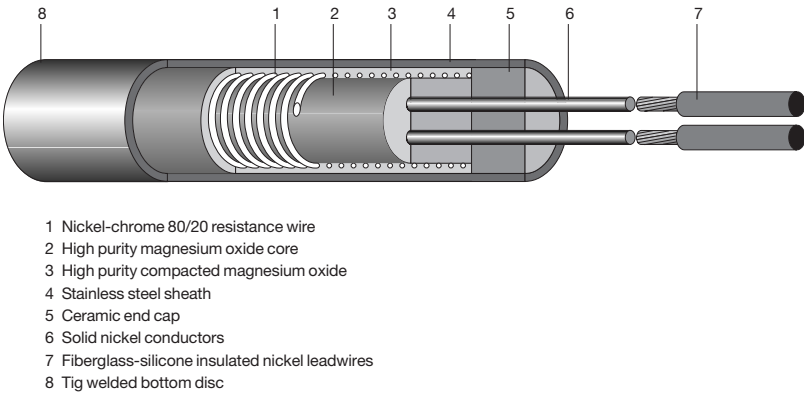
CARTRIDGE HEATERS



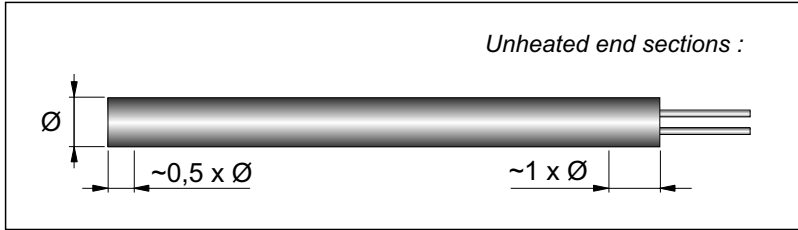
HI-DENSITY CARTRIDGE HEATERS

We design and manufacture cartridge heaters of high quality and reliability. From design to laboratory validation, we work in synergy with our customers to customize heating elements and assemblies to their specific needs.

Depending on the type of application, working temperature and specific load, we offer different types of cartridge heating elements: with evenly distributed power, differentiated or with several independent heating elements.



CONSTRUCTIVE SPECIFICATIONS AND TOLERANCES:											
Wattage	+ 5% - 10%										
Resistance	+ 10% - 5%										
Insulation (cold 500 Vdc)	> 10 MΩ										
Leakage current (cold)	< 0,5 mA										
Maximum working temperature allowed on sheath	750 °C										
Length tolerance	± 2 %										
Ø mm	4	5	6,5	8	10	12,5	16	20	25*	32*	
Ø in			1/4"		3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	
Max V	240	240	240	240	240	240	400	400	400	400	
Max A	2	2,5	4	5	8	14	18	22	25	25	
Dielectric Strength (V)	800	800	1000	1250	1500	1500	1500	1500	1500	1500	

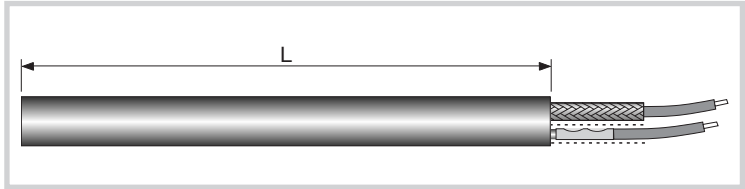


* Upon request only

Ø	Lmin	Lmax
25 -1"	150	1500
32 -1 1/4"	300	2000

HI-DENSITY CARTRIDGE HEATERS

Both Ø heaters 6,5 and 8 mm are provided with 250mm long leads, fiberglass-silicone insulated nickel, internally connected. For diameters =>10mm, see pag. 11.



METRIC SIZES

Ø mm	L mm	W 230V	W cm²	CODICE CODE	
6,5 - 0,02 - 0,04	40	80	15	10.065.040.0080	
		100	18	10.065.040.0100	
		125	22	10.065.040.0125	
		160	28	10.065.040.0160	
	50	200	36	10.065.040.0200	
		125	16	10.065.050.0125	
		160	21	10.065.050.0160	
		200	26	10.065.050.0200	
	60	250	32	10.065.050.0250	
		315	42	10.065.050.0315	
		125	13	10.065.060.0125	
		160	17	10.065.060.0160	
	80	200	21	10.065.060.0200	
		250	26	10.065.060.0250	
		315	33	10.065.060.0315	
		160	12	10.065.080.0160	
	100	200	15	10.065.080.0200	
		250	19	10.065.080.0250	
		315	24	10.065.080.0315	
		200	12	10.065.100.0200	
	130	250	15	10.065.100.0250	
		315	18	10.065.100.0315	
		400	24	10.065.100.0400	
		250	11	10.065.130.0250	
	160	315	13	10.065.130.0315	
		400	17	10.065.130.0400	
		500	22	10.065.130.0500	
		250	9	10.065.160.0250	
	8	40	315	11	10.065.160.0315
			400	14	10.065.160.0400
			500	18	10.065.160.0500
		50	125	18	10.080.040.0125
	160		23	10.080.040.0160	
	200		30	10.080.040.0200	
	125		14	10.080.050.0125	
	60	160	18	10.080.050.0160	
200		22	10.080.050.0200		
250		28	10.080.050.0250		
160		14	10.080.060.0160		
80	200	17	10.080.060.0200		
	250	22	10.080.060.0250		
	315	27	10.080.060.0315		
	200	12	10.080.080.0200		
100	250	15	10.080.080.0250		
	315	19	10.080.080.0315		
	400	24	10.080.080.0400		
	200	9	10.080.100.0200		
130	250	12	10.080.100.0250		
	315	14	10.080.100.0315		
	400	18	10.080.100.0400		
	250	9	10.080.130.0250		
160	315	11	10.080.130.0315		
	400	14	10.080.130.0400		
	500	18	10.080.130.0500		
	250	7	10.080.160.0250		
10	40	315	9	10.080.160.0315	
		400	11	10.080.160.0400	
		500	14	10.080.160.0500	
		125	16	10.100.040.0125	
- 0,03 - 0,06	160	160	20	10.100.040.0160	
		200	25	10.100.040.0200	
		250	32	10.100.040.0250	
		315	39	10.100.040.0315	

Ø mm	L mm	W 230V	W cm²	CODICE CODE			
10 - 0,03 - 0,06	50	160	15	10.100.050.0160			
		200	18	10.100.050.0200			
		250	23	10.100.050.0250			
		315	28	10.100.050.0315			
		400	36	10.100.050.0400			
		60	500	46	10.100.050.0500		
			160	12	10.100.060.0160		
			200	15	10.100.060.0200		
			250	18	10.100.060.0250		
			315	23	10.100.060.0315		
			400	30	10.100.060.0400		
			500	37	10.100.060.0500		
			200	10	10.100.080.0200		
			250	13	10.100.080.0250		
			315	16	10.100.080.0315		
			400	20	10.100.080.0400		
			500	26	10.100.080.0500		
			630	32	10.100.080.0630		
			250	10	10.100.100.0250		
			315	12	10.100.100.0315		
			400	16	10.100.100.0400		
			500	20	10.100.100.0500		
			630	25	10.100.100.0630		
			800	31	10.100.100.0800		
				130	250	7	10.100.130.0250
	315	9			10.100.130.0315		
	400	12			10.100.130.0400		
	500	14			10.100.130.0500		
	630	18			10.100.130.0630		
			800	23	10.100.130.0800		
			315	7	10.100.160.0315		
			400	9	10.100.160.0400		
			500	11	10.100.160.0500		
			630	14	10.100.160.0630		
			800	18	10.100.160.0800		
			1000	22	10.100.160.1000		
			400	7	10.100.200.0400		
			500	9	10.100.200.0500		
			630	11	10.100.200.0630		
			800	14	10.100.200.0800		
			1000	18	10.100.200.1000		
			12,5 - 0,04 - 0,07	40	160	16	10.125.040.0160
					200	20	10.125.040.0200
					250	25	10.125.040.0250
	315	32			10.125.040.0315		
		50	160	11	10.125.050.0160		
			200	14	10.125.050.0200		
			250	18	10.125.050.0250		
315			22	10.125.050.0315			
		400	28	10.125.050.0400			
		200	11	10.125.060.0200			
		250	14	10.125.060.0250			
		315	18	10.125.060.0315			
		400	22	10.125.060.0400			
		500	28	10.125.060.0500			
		200	8	10.125.080.0200			
		250	10	10.125.080.0250			
		315	13	10.125.080.0315			
		400	16	10.125.080.0400			
		500	20	10.125.080.0500			
		630	25	10.125.080.0630			
	100	315	10	10.125.100.0315			
		400	12	10.125.100.0400			

BRITISH SIZES

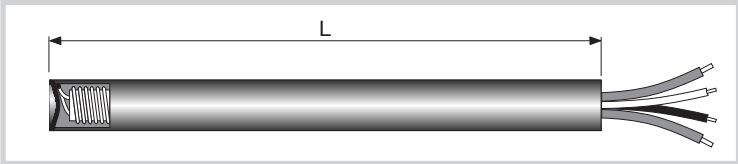
HI-DENSITY CARTRIDGE HEATERS

Ø	L	W 230V	W cm²	CODICE CODE
3/8" 9,52 mm - 0,03 - 0,06	4" 101,6 mm	250	10	10.095.101.0250
		315	12	10.095.101.0315
		400	16	10.095.101.0400
		500	20	10.095.101.0500
		630	25	10.095.101.0630
		800	32	10.095.101.0800
	5" 127 mm	250	7	10.095.127.0250
		315	9	10.095.127.0315
		400	12	10.095.127.0400
		500	15	10.095.127.0500
		630	18	10.095.127.0630
		800	24	10.095.127.0800
	6" 152,4 mm	315	8	10.095.152.0315
		400	10	10.095.152.0400
		500	12	10.095.152.0500
		630	15	10.095.152.0630
		800	20	10.095.152.0800
		1000	24	10.095.152.1000
	7" 177,8 mm	400	8	10.095.177.0400
		500	10	10.095.177.0500
		630	13	10.095.177.0630
		800	16	10.095.177.0800
	8" 203,2 mm	1000	21	10.095.177.1000
		400	7	10.095.203.0400
		500	9	10.095.203.0500
		630	11	10.095.203.0630
1/2" 12,7 mm - 0,04 - 0,07	1 1/2" 38,1 mm	160	18	10.127.038.0160
		200	22	10.127.038.0200
		250	28	10.127.038.0250
		315	35	10.127.038.0315
	2" 50,8 mm	160	11	10.127.050.0160
		200	14	10.127.050.0200
		250	18	10.127.050.0250
		315	22	10.127.050.0315
	2 1/2" 63,5 mm	400	28	10.127.050.0400
		200	10	10.127.063.0200
		250	13	10.127.063.0250
		315	16	10.127.063.0315
	3" 76,2 mm	400	20	10.127.063.0400
		500	26	10.127.063.0500
		250	10	10.127.076.0250
		315	13	10.127.076.0315
	3 1/2" 88,9 mm	400	16	10.127.076.0400
		500	20	10.127.076.0500
		630	26	10.127.076.0630
		800	33	10.127.076.0800
	4" 101,6 mm	250	9	10.127.088.0250
		315	11	10.127.088.0315
		400	14	10.127.088.0400
		500	18	10.127.088.0500
	5" 127 mm	630	22	10.127.088.0630
		800	28	10.127.088.0800
		315	9	10.127.101.0315
		400	12	10.127.101.0400
	6" 152,4 mm	500	15	10.127.101.0500
		630	18	10.127.101.0630
		800	24	10.127.101.0800
		1000	36	10.127.101.1000
	7" 177,8 mm	315	7	10.127.127.0315
		400	9	10.127.127.0400
		500	11	10.127.127.0500
		630	14	10.127.127.0630
	8" 203,2 mm	800	18	10.127.127.0800
		1000	23	10.127.127.1000
		400	7	10.127.152.0400
		500	9	10.127.152.0500
		630	12	10.127.152.0630
		800	15	10.127.152.0800

Ø	L	W 230V	W cm²	CODICE CODE
1/2" 12,7 mm - 0,04 - 0,07	6" 152,4 mm	1000	18	10.127.152.1000
		1250	23	10.127.152.1250
		400	6	10.127.177.0400
		500	8	10.127.177.0500
		630	10	10.127.177.0630
		800	12	10.127.177.0800
	8" 203,2 mm	1000	16	10.127.177.1000
		500	7	10.127.203.0500
		630	8	10.127.203.0630
		800	11	10.127.203.0800
		1000	14	10.127.203.1000
		1250	17	10.127.203.1250
	9" 228,6 mm	1600	22	10.127.203.1600
		500	6	10.127.228.0500
		630	8	10.127.228.0630
		800	10	10.127.228.0800
		1000	12	10.127.228.1000
		1250	15	10.127.228.1250
	10" 254 mm	1600	19	10.127.228.1600
		630	7	10.127.254.0630
		800	9	10.127.254.0800
		1000	11	10.127.254.1000
5/8" 15,87 mm - 0,05 - 0,08	12" 304,8 mm	1250	13	10.127.254.1250
		1600	17	10.127.254.1600
		2000	21	10.127.254.2000
		630	6	10.127.304.0630
	12" 304,8 mm	800	7	10.127.304.0800
		1000	9	10.127.304.1000
		1250	11	10.127.304.1250
		1600	14	10.127.304.1600
	2" 50,8 mm	2000	18	10.127.304.2000
		200	11	10.158.050.0200
		250	14	10.158.050.0250
		315	18	10.158.050.0315
	2 1/2" 63,5 mm	400	23	10.158.050.0400
		200	8	10.158.063.0200
		250	10	10.158.063.0250
		315	13	10.158.063.0315
	3" 76,2 mm	400	16	10.158.063.0400
		500	20	10.158.063.0500
		250	8	10.158.076.0250
		315	11	10.158.076.0315
	4" 101,6 mm	400	13	10.158.076.0400
		500	17	10.158.076.0500
		630	21	10.158.076.0630
		800	26	10.158.076.0800
	5" 127 mm	315	8	10.158.101.0315
		400	10	10.158.101.0400
		500	12	10.158.101.0500
		630	15	10.158.101.0630
	6" 152,4 mm	800	20	10.158.101.0800
		1000	24	10.158.101.1000
		400	7	10.158.127.0400
		500	8	10.158.127.0500
	7" 177,8 mm	630	10	10.158.127.0630
		800	14	10.158.127.0800
		1000	17	10.158.127.1000
		1250	21	10.158.127.1250
	8" 203,2 mm	1250	21	10.158.127.1250
		1600	24	10.158.127.1600
		500	7	10.158.152.0500
		630	9	10.158.152.0630
	9" 228,6 mm	800	12	10.158.152.0800
		1000	15	10.158.152.1000
		1250	19	10.158.152.1250
		1600	24	10.158.152.1600
	10" 254 mm	500	6	10.158.177.0500
		630	8	10.158.177.0630
		800	10	10.158.177.0800
		1000	13	10.158.177.1000
	11" 279,4 mm	1250	16	10.158.177.1250
		1600	20	10.158.177.1600

Ø	L	W 230V	W cm²	CODICE CODE
5/8" 15,87 mm - 0,05 - 0,08	8" 203,2 mm	630	7	10.158.203.0630
		800	9	10.158.203.0800
		1000	11	10.158.203.1000
		1250	14	10.158.203.1250
		1600	18	10.158.203.1600
		2000	22	10.158.203.2000
	10" 254 mm	630	5	10.158.254.0630
		800	7	10.158.254.0800
		1000	9	10.158.254.1000
		1250	11	10.158.254.1250
		1600	14	10.158.254.1600
		2000	17	10.158.254.2000
	12" 304,8 mm	800	6	10.158.304.0800
		1000	7	10.158.304.1000
		1250	9	10.158.304.1250
		1600	11	10.158.304.1600
		2000	14	10.158.304.2000
		2500	17	10.158.304.2500
	14" 355,6 mm	800	5	10.158.355.0800
		1000	6	10.158.355.1000
		1250	7	10.158.355.1250
		1600	9	10.158.355.1600
		2000	12	10.158.355.2000
		2500	15	10.158.355.2500
	16" 406,4 mm	1000	5	10.158.406.1000
		1250	6	10.158.406.1250
		1600	8	10.158.406.1600
		2000	10	10.158.406.2000
2500		12	10.158.406.2500	
3/4" 19,05 mm - 0,06 - 0,10	3" 76,2 mm	400	11	10.190.076.0400
		500	14	10.190.076.0500
		630	18	10.190.076.0630
	4" 101,6 mm	400	8	10.190.101.0400
		500	10	10.190.101.0500
		630	13	10.190.101.0630
	5" 127 mm	500	7	10.190.127.0500
		630	9	10.190.127.0630
		800	11	10.190.127.0800
		1000	14	10.190.127.1000
	6" 152,4 mm	630	8	10.190.152.0630
		800	10	10.190.152.0800
		1000	13	10.190.152.1000
		1250	16	10.190.152.1250
	8" 203,2 mm	800	7	10.190.203.0800
		1000	9	10.190.203.1000
		1250	11	10.190.203.1250
		1600	15	10.190.203.1600
	10" 254 mm	1000	7	10.190.254.1000
		1250	9	10.190.254.1250
		1600	11	10.190.254.1600
		2000	14	10.190.254.2000
	12" 304,8 mm	1000	6	10.190.304.1000
		1250	7	10.190.304.1250
		1600	9	10.190.304.1600
		2000	12	10.190.304.2000
	14" 355,6 mm	1250	6	10.190.355.1250
		1600	8	10.190.355.1600
		2000	10	10.190.355.2000
		2500	13	10.190.355.2500
	16" 406,4 mm	1250	5	10.190.406.1250
		1600	7	10.190.406.1600
		2000	9	10.190.406.2000
		2500	11	10.190.406.2500
	18" 457,2 mm	1600	6	10.190.457.1600
		2000	8	10.190.457.2000
		2500	10	10.190.457.2500
		3200	12	10.190.457.3200
20" 508 mm	1600	6	10.190.508.1600	
	2000	7	10.190.508.2000	
	2500	9	10.190.508.2500	
	3200	11	10.190.508.3200	

HI-DENSITY CARTRIDGE HEATERS WITH BUILT-IN 'J' THERMOCOUPLE



TC1 Type

Standard supply 1000 mm long fiberglass-silicone insulated nickel leads, and PTFE thermocouple insulated leads, both internally connected.

METRIC SIZES

Ø mm.	L mm.	W 230V	W cm²	CODICE CODE
6,5 -0,02 -0,04	40	125	22	11.065.040.0125
		160	28	11.065.040.0160
		200	36	11.065.040.0200
	50	125	16	11.065.050.0125
		160	21	11.065.050.0160
		200	26	11.065.050.0200
	60	160	17	11.065.060.0160
		200	21	11.065.060.0200
		250	26	11.065.060.0250
	80	200	15	11.065.080.0200
		250	19	11.065.080.0250
		315	24	11.065.080.0315
	100	250	15	11.065.100.0250
		315	18	11.065.100.0315
		400	24	11.065.100.0400
	130	315	13	11.065.130.0315
400		17	11.065.130.0400	
500		22	11.065.130.0500	
160	315	11	11.065.160.0315	
	400	14	11.065.160.0400	
	500	18	11.065.160.0500	
8 -0,03 -0,05	40	160	23	11.080.040.0160
		200	30	11.080.040.0200
	50	160	18	11.080.050.0160
		250	28	11.080.050.0250
	60	200	17	11.080.060.0200
		315	27	11.080.060.0315

Ø mm.	L mm.	W 230V	W cm²	CODICE CODE
8 -0,03 -0,05	80	250	15	11.080.080.0250
		315	19	11.080.080.0315
		400	24	11.080.080.0400
	100	250	12	11.080.100.0250
		400	18	11.080.100.0400
		500	24	11.080.100.0500
	130	315	11	11.080.130.0315
		500	18	11.080.130.0500
		500	18	11.080.130.0500
	160	315	9	11.080.160.0315
		500	14	11.080.160.0500
		500	14	11.080.160.0500
10 -0,03 -0,06	40	160	20	11.100.040.0160
		200	25	11.100.040.0200
		250	32	11.100.040.0250
	50	200	18	11.100.050.0200
		250	23	11.100.050.0250
		315	28	11.100.050.0315
	60	200	15	11.100.060.0200
		250	18	11.100.060.0250
		315	23	11.100.060.0315
	80	250	13	11.100.080.0250
		315	16	11.100.080.0315
		400	20	11.100.080.0400
10 -0,03 -0,06	100	315	12	11.100.100.0315
		400	16	11.100.100.0400
		500	20	11.100.100.0500
	130	315	9	11.100.130.0315
		400	12	11.100.130.0400
		500	14	11.100.130.0500

Ø mm.	L mm.	W 230V	W cm²	CODICE CODE
10 -0,03 -0,06	160	400	9	11.100.160.0400
		500	11	11.100.160.0500
		630	14	11.100.160.0630
	200	500	9	11.100.200.0500
		800	14	11.100.200.0800
		800	14	11.100.200.0800
12,5 -0,04 -0,07	40	200	20	11.125.040.0200
		250	25	11.125.040.0250
		315	22	11.125.050.0315
	50	200	14	11.125.050.0200
		315	22	11.125.050.0315
		400	28	11.125.050.0400
	60	250	14	11.125.060.0250
		400	22	11.125.060.0400
		400	22	11.125.060.0400
	80	250	10	11.125.080.0250
		400	16	11.125.080.0400
		400	16	11.125.080.0400
12,5 -0,04 -0,07	100	400	12	11.125.100.0400
		630	19	11.125.100.0630
		630	19	11.125.100.0630
	130	400	9	11.125.130.0400
		630	14	11.125.130.0630
		630	14	11.125.130.0630
	160	500	9	11.125.160.0500
		800	14	11.125.160.0800
		800	14	11.125.160.0800
	200	630	9	11.125.200.0630
		1000	14	11.125.200.1000
		1000	14	11.125.200.1000
12,5 -0,04 -0,07	250	800	9	11.125.250.0800
		1250	13	11.125.250.1250
		1250	13	11.125.250.1250
	300	1000	9	11.125.300.1000
		1600	15	11.125.300.1600
		1600	15	11.125.300.1600

BRITISH SIZES

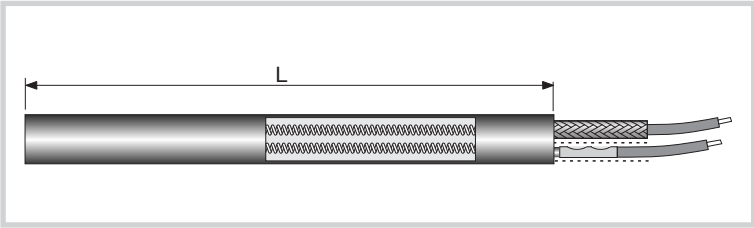
Ø	L	W 230V	W cm²	CODICE CODE
1/4" 6,35 mm -0,02 -0,04	1"	160	53	11.063.025.0160
	25,4 mm			
	1 1/4"	125	31	11.063.031.0125
	31,8 mm	160	40	11.063.031.0160
		200	50	11.063.031.0200
	1 1/2"	125	23	11.063.038.0125
	38,1 mm	160	29	11.063.038.0160
		200	36	11.063.038.0200
	1 3/4"	125	19	11.063.044.0125
	44,5 mm	160	25	11.063.044.0160
		200	31	11.063.044.0200
	2"	160	21	11.063.050.0160
	50,8 mm	200	27	11.063.050.0200
		250	33	11.063.050.0250
	2 1/2"	200	20	11.063.063.0200
	63,5 mm	250	25	11.063.063.0250
		315	32	11.063.063.0315
	3"	200	16	11.063.076.0200
	76,2 mm	250	20	11.063.076.0250
		315	25	11.063.076.0315
	3 1/2"	200	13	11.063.088.0200
	88,9 mm	250	17	11.063.088.0250
		315	21	11.063.088.0315
	4"	250	14	11.063.101.0250
3/8" 9,52 mm -0,03 -0,06	101,6 mm	315	18	11.063.101.0315
		400	23	11.063.101.0400
	5"	315	14	11.063.127.0315
	127 mm	400	18	11.063.127.0400
		500	23	11.063.127.0500
	6"	315	12	11.063.152.0315
	152,4 mm	400	15	11.063.152.0400
		500	18	11.063.152.0500

Ø	L	W 230V	W cm²	CODICE CODE
3/8" 9,52 mm -0,03 -0,06	1"	200	44	11.095.025.0200
	25,4 mm			
	1 1/4"	160	26	11.095.031.0160
	31,8 mm	200	33	11.095.031.0200
		160	21	11.095.038.0160
	1 1/2"	200	27	11.095.038.0200
	38,1 mm	250	33	11.095.038.0250
		160	17	11.095.044.0160
	1 3/4"	200	21	11.095.044.0200
	44,5 mm	250	26	11.095.044.0250
		315	33	11.095.044.0315
	2"	200	19	11.095.050.0200
	50,8 mm	250	24	11.095.050.0250
		315	30	11.095.050.0315
	2 1/2"	200	14	11.095.063.0200
	63,5 mm	250	17	11.095.063.0250
		315	22	11.095.063.0315
	3"	400	28	11.095.063.0400
	76,2 mm	250	14	11.095.076.0250
		315	18	11.095.076.0315
		400	22	11.095.076.0400
		500	28	11.095.076.0500
	3 1/2"	250	11	11.095.088.0250
	88,9 mm	315	14	11.095.088.0315
1/2" 12,7 mm -0,04 -0,07		400	18	11.095.088.0400
		500	23	11.095.088.0500
	4"	315	12	11.095.101.0315
	101,6 mm	400	16	11.095.101.0400
		500	20	11.095.101.0500
	5"	400	12	11.095.127.0400
	127 mm	500	15	11.095.127.0500
		400	10	11.095.152.0400
	6"	500	12	11.095.152.0500
	152,4 mm	630	15	11.095.152.0630

Ø	L	W 230V	W cm²	CODICE CODE
3/8" 9,52 mm -0,03 -0,06	7"	500	10	11.095.177.0500
	177,8 mm	800	16	11.095.177.0800
	8"	500	9	11.095.203.0500
	203,2 mm	800	14	11.095.203.0800
	1 1/2"	200	22	11.127.038.0200
	38,1 mm	250	28	11.127.038.0250
1/2" 12,7 mm -0,04 -0,07	2"	200	14	11.127.050.0200
	50,8 mm	315	22	11.127.050.0315
		250	13	11.127.063.0250
	2 1/2"	400	20	11.127.063.0400
	63,5 mm	250	10	11.127.076.0250
	3"	250	10	11.127.076.0250
	76,2 mm	400	16	11.127.076.0400
		315	11	11.127.088.0315
	3 1/2"	400	14	11.127.088.0400
	88,9 mm	500	18	11.127.088.0500
		400	12	11.127.101.0400
	4"	400	12	11.127.101.0400
	101,6 mm	500	15	11.127.101.0500
		630	18	11.127.101.0630
	5"	400	9	11.127.127.0400
	127 mm	630	14	11.127.127.0630
		800	18	11.127.127.0800
	6"	500	9	11.127.152.0500
	152,4 mm	800	15	11.127.152.0800
	7"	500	8	11.127.177.0500
	177,8 mm	800	12	11.127.177.0800
	8"	630	8	11.127.203.0630
	203,2 mm	1000	14	11.127.203.1000
	9"	630	8	11.127.228.0630
	228,6 mm	1000	12	11.127.228.1000
1/2" 12,7 mm -0,04 -0,07	10"	800	9	11.127.254.0800
	254 mm	1250	13	11.127.254.1250
		1600	17	11.1

MEDIUM-DENSITY CARTRIDGE HEATERS

Medium density cartridge heaters are manufactured with one or more nickel-chrome 80/20 resistive wire spirals, in compacted MgO mass. Suitable for heating applications not requiring high watt density (working temperatures up to 500°C).



The heaters are provided with 250mm long leads, fiberglass-silicone or PTFE insulated nickel, externally connected.

Ø	6,5 1/4"	8 -	10 3/8"	12,5 1/2"	16 5/8"	20 3/4"
L. min. mm	160	160	200	300	400	500
L. max. mm	1000	1000	1400	1800	2000	2000
Ampere max.	4	5	7	10	14	18
Watt max / cm²	15	15	15	14	14	13
Volt max	240	240	240	240	400	400
Watt max (V240)	900	1000	1400	2000	3400	4500
Watt max (V400)	-	-	-	-	5000	7000

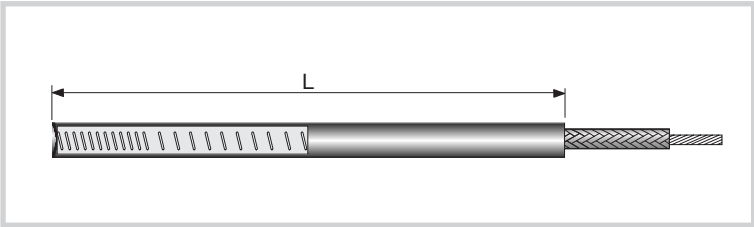
TECHNICAL DATA FOR DESIGN

CONSTRUCTIVE SPECIFICATIONS AND TOLERANCES:

Wattage	+ 10% - 10%
Resistance	+ 10% - 10%
Dielectric strength (voltage applied)	1500 V
Insulation (cold 1000 Vdc)	> 10 MΩ
Leakage current (cold)	< 0,5 mA
Maximum working temperature allowed on sheath	500 °C
Length tolerance	± 2 %

GROUNDING CARTRIDGE HEATERS

Grounded cartridge heaters are manufactured with one spiral of nickel-chrome 80/20 resistive wire, connected to the lead and the bottom disk, in compactedMgOmass.



The heaters are provided with 500mm long leads, fiberglass-silicone insulated nickel.

METRIC SIZES

Ø mm	L mm	W 24V	W cm²	CODICE CODE
4,5 -0,02 -0,04	40	60	15	40.045.040.0060
		100	25	40.045.040.0100
	50	60	11	40.045.050.0060
		100	18	40.045.050.0100
	60	80	11	40.045.060.0080

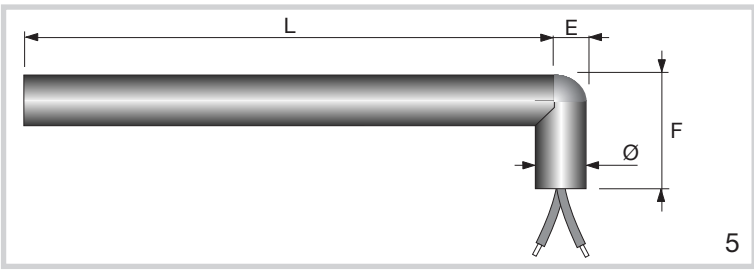
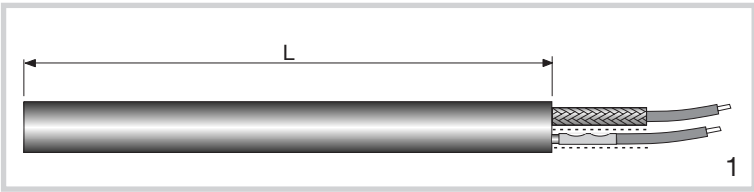
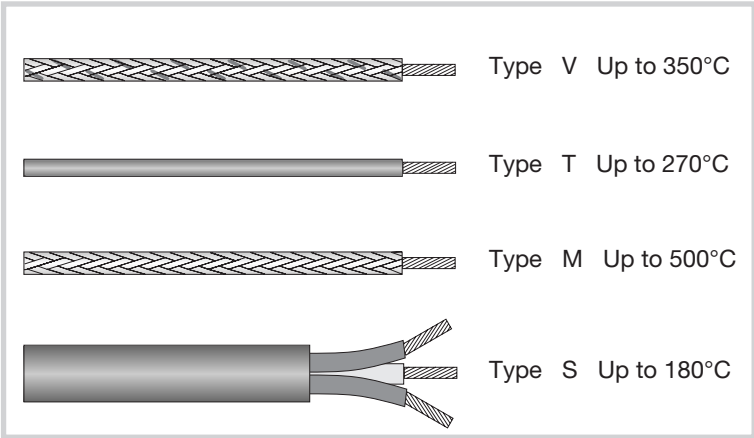
Ø mm	L mm	W 24V	W cm²	CODICE CODE
4,5 -0,02 -0,04	60	125	17	40.045.060.0125
	70	80	10	40.045.070.0080
		125	15	40.045.070.0125
	80	100	11	40.045.080.0100
		160	17	40.045.080.0160

Ø mm	L mm	W 24V	W cm²	CODICE CODE
4,5 -0,02 -0,04	100	100	8	40.045.100.0100
		160	13	40.045.100.0160
	130	125	7	40.045.130.0125
		200	12	40.045.130.0200

LARGER DIAMETERS AND/OR THREADED TERMINAL UPON REQUEST.

MINIMUM VOLTAGE 6V, MAXIMUM 48V.

FITTINGS



STANDARD LEADS

Fiberglass-silicone insulated Ni conductor.

PTFE insulated Ni conductor.

Fiberglass-mica insulated Ni conductor.

Silicone bi-tripolar cable insulated Cu conductor.

LEADWIRES EXTERNALLY CONNECTED

Ø	3/8" - 10	12.5 - 1/2"	5/8" - 16	3/4" - 20
---	-----------	-------------	-----------	-----------

FLEXIBLE EXIT

Ø	3/8" - 10	12.5 - 1/2"	5/8" - 16	3/4" - 20
T ~	5	6	7	8

LEADWIRES EXIT 90° Type A

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
A	5	5.5	6.5	9.5	12	14

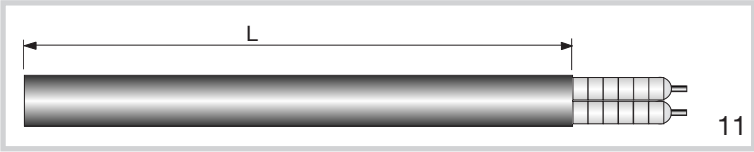
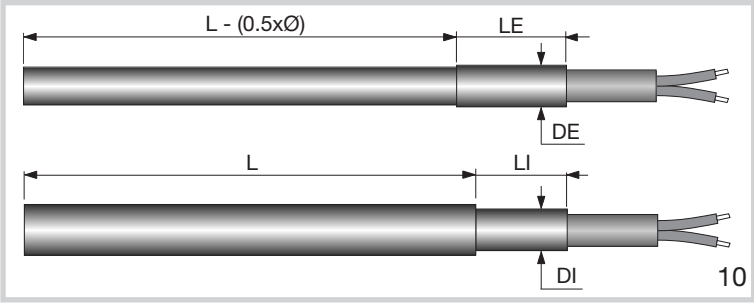
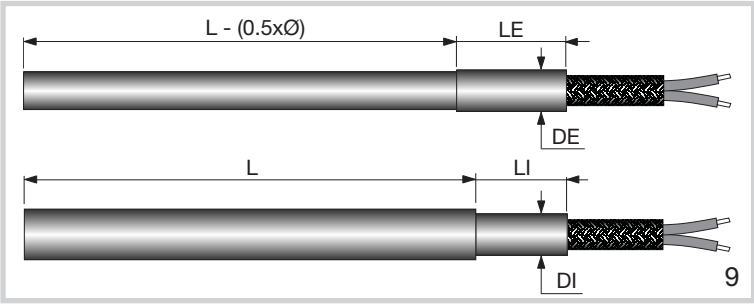
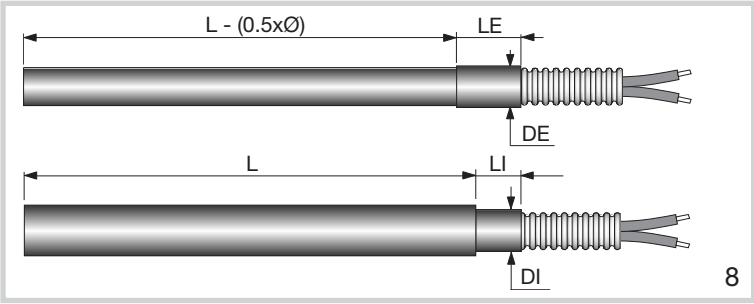
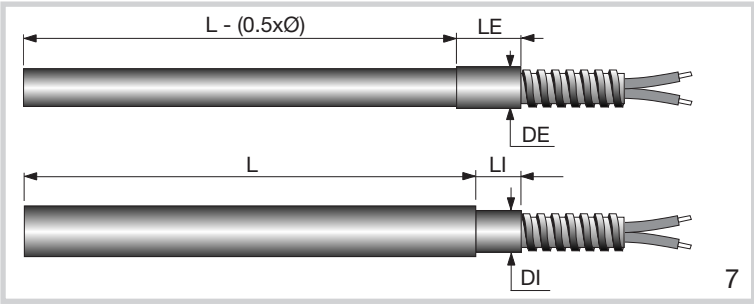
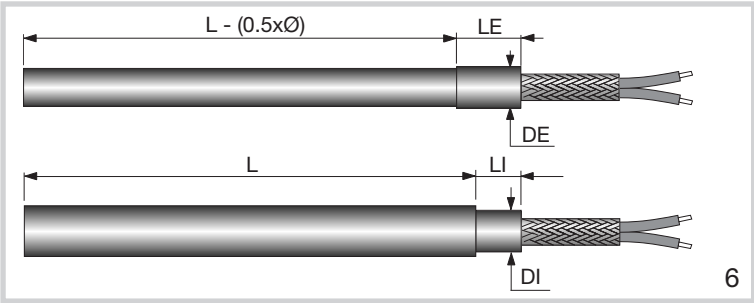
LEADWIRES EXIT 90° Type B

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
B	8	10	12	14	18	22
C	6	7	7	8	10	10
D	8	10	10	12.5	16	16

LEADWIRES EXIT 90° Type C

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
E	4.2	5.2	6.5	8	10.5	13
F	16	18	22	26	30	36

FITTINGS - LEADWIRES PROTECTION



FIBERGLASS - SILICONE HOSE

Connection tube							
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	3/4"	20
DE	--	--	11	--	--	--	--
LE	--	--	15	--	--	--	--
DI	--	--	--	10.5	14	17	18
LI	--	--	--	12	16	20	20

METAL GALVANIZED CONDUIT

Connection tube							
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	3/4"	20
DE	7.5	9.2	11	14 *	--	--	--
LE	10	12	15	16 *	--	--	--
DI	--	--	--	10.5	14	17	18
LI	--	--	--	12	16	20	20

* For Leads Hi Temp. or Amp. >10

WATERTIGHT STAINLESS STEEL CONDUIT

Connection tube							
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	3/4"	20
DE	--	--	11	14	--	--	--
LE	--	--	15	16	--	--	--
DI	--	--	--	--	14	17	18
LI	--	--	--	--	16	20	20

BRAIDED STEEL HOSE

Connection tube							
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	3/4"	20
DE	7.5	9.2	11	14	--	--	--
LE	30	30	35	35	--	--	--
DI	--	--	--	--	14	17	18
LI	--	--	--	--	35	40	40

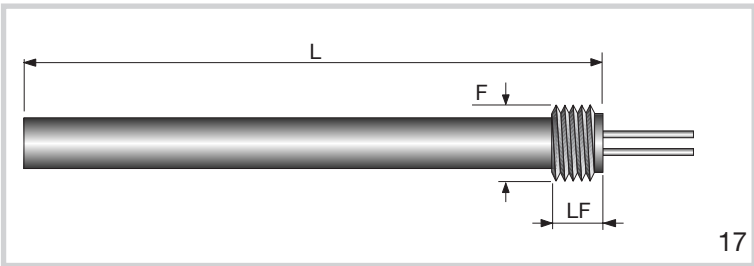
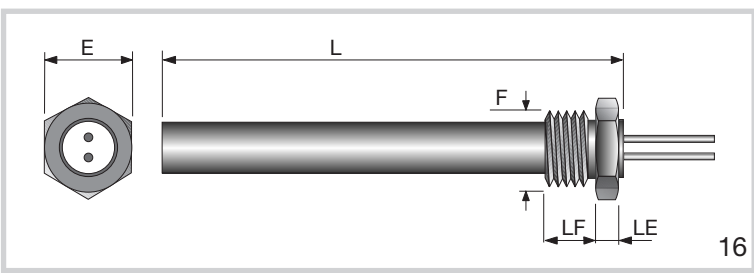
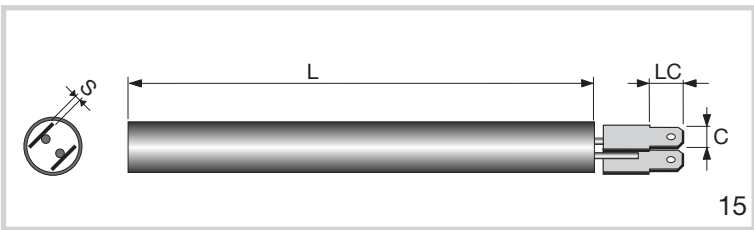
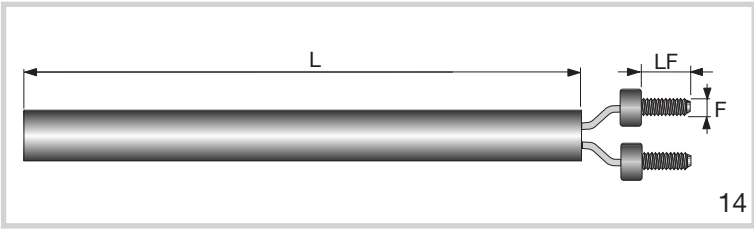
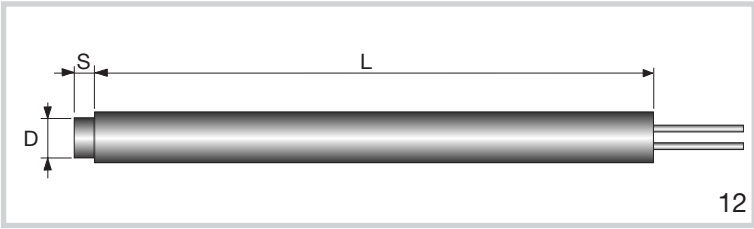
SILICONE CABLE

Connection tube							
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	3/4"	20
DE	7.5	9.2	11	14	--	--	--
LE	30	30	35	35	--	--	--
DI	--	--	--	10.5	14	17	18
LI	--	--	--	30	35	40	40

CERAMIC BEADS

Ø	3/8"- 10 - 12.5 - 1/2"- 5/8"- 16 - 3/4"- 20
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FITTINGS



EXTRACTION NIB

Upon request

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
D	--	--	7.5	9	12	16
S	--	--	4	5	6	8

THREADED PIN

Upon request

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
F	M3	M3	M4	M5	M6	M8
LF	15	15	15	20	20	20

STAINLESS STEEL SCREW

Upon request

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
F	--	--	--	M3	M4	M4
LF	--	--	--	8	10	10

STAINLESS STEEL FASTON

Upon request

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
C	--	--	--	6.3	6.3	6.3
LC	--	--	--	8	8	8
S	--	--	--	0.8	0.8	0.8

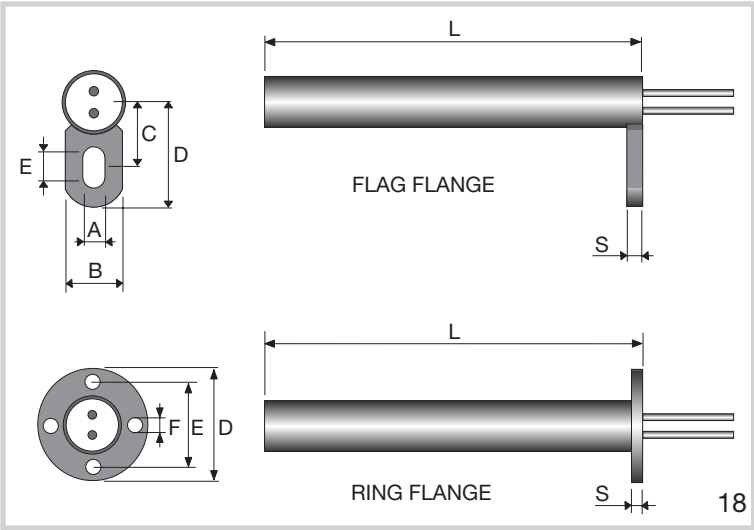
STAINLESS STEEL BUSHING WITH
HEXAGON HEAD

Ø	6.5	8	10	12.5	16	20
F	M10x1	M12x1.5	M14x1.5	M16x1.5	M20x1.5	M27x1.5
Ø	1/4"	--	3/8"	1/2"	5/8"	3/4"
F	1/8" Gas	--	1/4" Gas	3/8" Gas	1/2" Gas	3/4" Gas
LF	7	9	9	10.5	13	13.5
E	12	14	17	19	24	30
LE	3.5	4	4	4.5	5	6.5

STAINLESS STEEL THREADED COLLAR

Ø	6.5	8	10	12.5	16	20
F	M10x1	M12x1.5	M14x1.5	M16x1.5	M20x1.5	M27x1.5
Ø	1/4"	--	3/8"	1/2"	5/8"	3/4"
F	1/8" Gas	--	1/4" Gas	3/8" Gas	1/2" Gas	3/4" Gas
LF	7	9	9	10.5	13	13.5

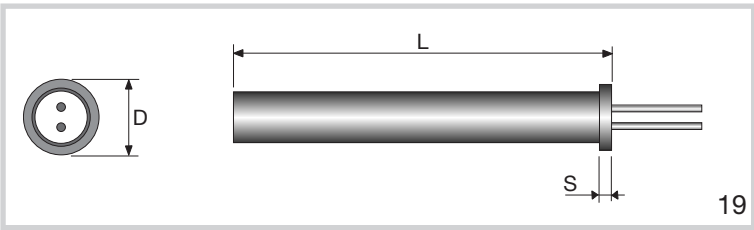
FITTINGS



STAINLESS STEEL FIXING FLANGE

Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
A	3.2	3.5	3.5	4.5	5.5	6.5
B	6	7	9	10	13	15
C	8.5	9.5	10.5	13.5	16.5	19.5
D	13	14.5	16.5	20.5	25.5	29.5
E	3	3	3	4	5	6
S	1.2	1.2	1.5	1.5	2	2

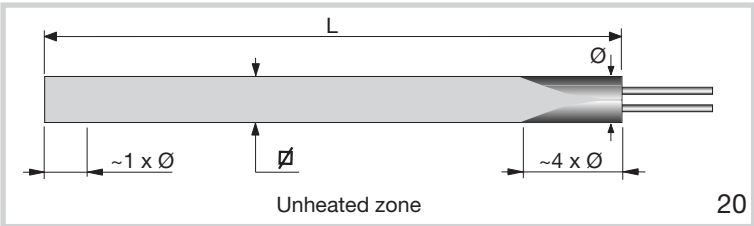
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
D	20	20	25	25	33	33
E	14	14	19	19	27	27
F	3.2	3.2	3.2	3.2	3.2	3.2
S	1.2	1.2	1.5	1.5	2	2



STAINLESS STEEL STOP RING

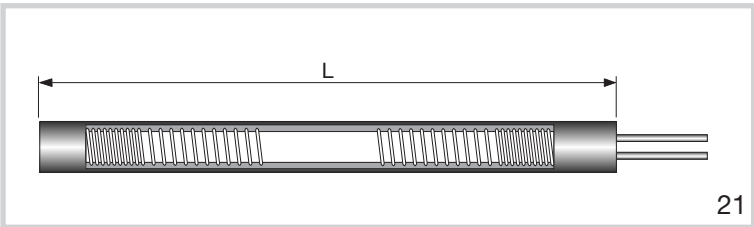
Ø	6.5 1/4"	8	10 3/8"	12.5 1/2"	16 5/8"	20 3/4"
D	10	12	15	17.5	22	26
S	1.2	1.2	1.5	1.5	2	2

SPECIAL EXECUTIONS UPON REQUEST

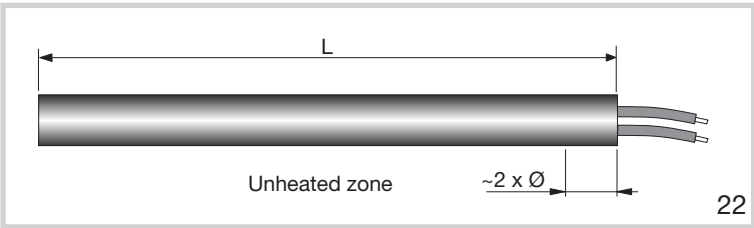


SQUARE CROSS-SECTION
EITHER STAINLESS STEEL OR NICKEL

Ø	4.5 ±0.1	6 ±0.1	8 ±0.1	10 ±0.15	6x12 ±0.15
Ø	4.5 ±0.1	6 ±0.1	8 ±0.1	10 ±0.15	10 ±0.15



POWER DISTRIBUTION AND UNHEATED
ZONES ACCORDING TO REQUEST



INTERNAL LEADWIRES CONNECTION
(INTEGRALS)

Max length 1000mm

Ø	3/8"- 10 - 12.5 - 1/2"- 5/8"- 16 - 3/4"- 20
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ENGINEERING AND TECHNICAL DATA

$$\text{Watt} = VI = I^2R = \frac{V^2}{R}$$
$$\text{Volt} = IR = \frac{W}{I} = \sqrt{WR}$$
$$\text{Ohm} = \frac{V}{I} = \frac{W}{I^2} = \frac{V^2}{W}$$
$$\text{Ampere} = \frac{V}{R} = \sqrt{\frac{W}{R}} = \frac{W}{V}$$

DETERMINING REQUIRED WATTAGE

$$KW = \frac{Kg \cdot Cs \cdot \Delta T}{864 \cdot tm}$$

Compensare le perdite di calore aumentando la potenza del:

- 30 / 40 % per piccole masse senza isolamento
- 10 / 20 % per piccole masse con isolamento
- 15 / 25 % per grosse masse senza isolamento
- 5 / 10 % per grosse masse con isolamento
- 20 / 30 % per bagni non isolati
- 10 / 20 % per bagni isolati

Replace heat losses increasing the wattage of:

- 30 / 40 % for little uninsulated mass
- 10 / 20 % for little insulated mass
- 15 / 25 % for big uninsulated mass
- 5 / 10 % for big insulated mass
- 20 / 30 % for uninsulated baths
- 10 / 20 % for insulated baths

VARIATIONE DELLA POTENZA AL VARIARE DELLA TENSIONE

WATTAGE CHANGE WITH VOLTAGE CHANGE

Watt che si ottengono cambiando la tensione V1 alla tensione V2

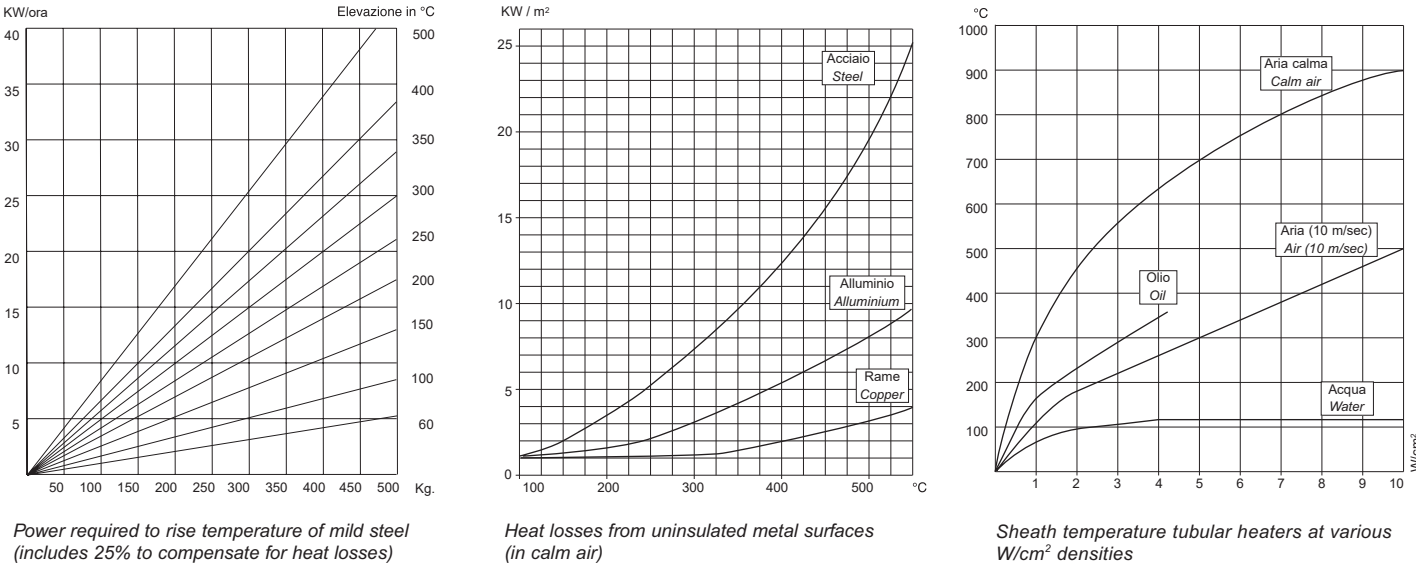
Watts obtained when nominal voltage V1 changes to voltage V2

$$W_2 = W_1 \cdot \left(\frac{V_2}{V_1}\right)^2$$

Tensione V2 che si deve applicare per ottenere la potenza desiderata W2

Voltage V2 to be used to obtain new wattage W2

$$V_2 = V_1 \cdot \sqrt{\frac{W_2}{W_1}}$$



PROPERTIES OF VARIOUS MATERIALS

MATERIALI	MATERIALS	PESO SPECIFICO (Kg/dm³)	CALORE SPECIFICO (KCal/Kg · °C)	CONDUCIBILITÀ TERMICA "K" (Kcal/m · °C)	TEMP. DI FUSIONE (°C)	MATERIALI	MATERIALS	PESO SPECIFICO (Kg/dm³)	CALORE SPECIFICO (KCal/Kg · °C)	CONDUCIBILITÀ TERMICA "K" (Kcal/m · °C)	TEMP. DI FUSIONE (°C)
Acciaio	Steel	7,86	0,122	57,00	1515	Oro	Gold	19,32	0,032	251,00	1062
Acciaio inox 304	Stainless steel 304	7,91	0,120	13,02	1398	Ottone	Brass-yellow	8,47	0,096	103,00	932
Acciaio inox 430	Stainless steel 430	7,61	0,110	19,22	1454	Paraffina	Paraffin	0,88	0,690	0,20	56
Acqua	Water	1,00	1,000	1,36	0	Piombo liquido	Lead liquid	10,71	0,037	13,39	
Alluminio	Aluminium	2,71	0,240	190,00	643	Piombo solido	Lead solid	11,34	0,032	29,76	326
Argento	Silver	10,49	0,057	359,00	960	Platino	Platinum	21,45	0,035	59,52	1773
Asfalto	Asphalt	2,10	0,400	0,65		Rame	Copper	8,91	0,095	332,00	1082
Cemento armato	Cement board	1,94	0,250	0,64		Resine fenoliche	Phenolic	1,27	0,400	0,07-0,14	
Ghisa	Iron, cast	7,20	0,120	42,90	1176	Lega (Sn-Pb 50%)	Solder (Sn-Pb 50%)	8,92	0,051	38,44	182
Inconel 600	Inconel 600	8,41	0,126	12,77	1371	Stagno liquido	Tin liquid	7,00	0,065	27,03	
Incoloy 800	Incoloy 800	8,00	0,130	9,92	1371	Stagno solido	Tin solid	7,27	0,052	56,42	232
Magnesio	Magnesium	1,74	0,270	137,00	650	Steatite	Steatite	2,60	0,200	2,17-2,85	
MgO (Compattato)	MgO (Compacted)	3,10	0,209	2,48		Tantalio	Tantalium	16,60	0,035	46,50	2996
Mica	Mica	2,82	0,210	0,37		Teflon	Teflon	2,15	0,250	0,21	
Molibdeno	Molybdenum	10,21	0,071	121,00	2621	Titanio	Titanium	4,53	0,130	13,88	1668
Monel 400	Monel 400	8,82	0,110	18,72	1315	Tungsteno	Tungsten	19,30	0,040	140,00	3410
Muro di mattoni	Brickwork	2,10	0,220	0,37-0,62		Zinco	Zinc	7,14	0,096	91,76	419
Nichel 200	Nickel 200	8,88	0,120	64,48	1435	Zirconio	Zirconium	6,47	0,067	17,98	1843
Ni Cr 80/20	Nichrome 80/20	8,35	0,110	12,89	1398	Zolfo	Sulfur	2,07	0,175	0,23	119



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