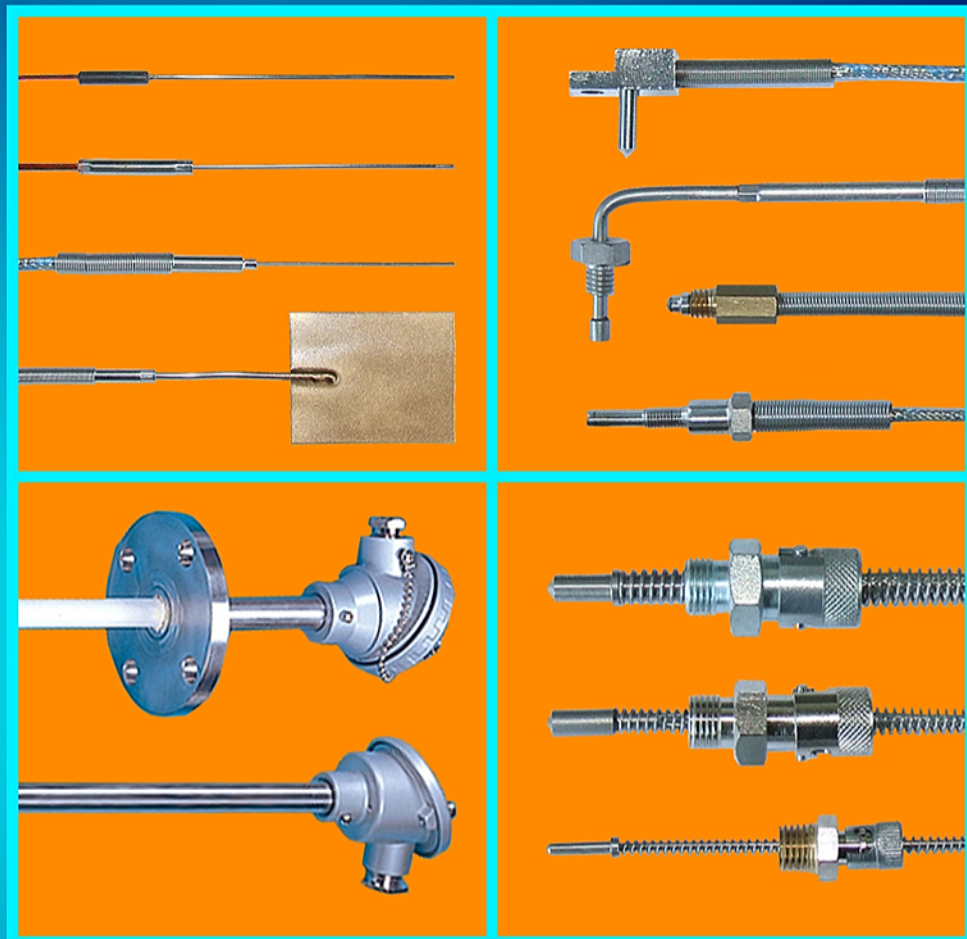


TERMOCOPPIE
THERMOCOUPLES
SONDES DE TEMPERATURE



FEPA

TERMOCOPPIA PRINCIPIO THERMOCOUPLE PRINCIPLE THERMOCOUPLE PRINCIPE

Una termocoppia consiste di due qualsiasi fili di metalli dissimili uniti meccanicamente ad una estremità, chiamata giunto caldo; l'altra estremità o giunto freddo è ad una temperatura nota di riferimento (normalmente 0° C) inferiore rispetto a quella del giunto caldo.

A thermocouple consists of two different metal wires which are mechanically connected at one edge which is named Hot Junction. The other edge is named cold junction which is at a fixed known temperature (usually 0°C) which is lower in comparison to the hot junction .

Un thermocouple est constitué de deux fils métalliques qui sont différents et ils sont mécaniquement reliés par un bord qui est nommé jonction chaude. L'autre bord est appelé soudure froide et il est à une température connue fixe (généralement 0 ° C) qui est inférieure par rapport à la soudure chaude.

Quando il giunto caldo è riscaldato si genera una forza elettromotrice che mediamente è proporzionale alla temperatura. Il rapporto temperatura/tensione è ripetibile.

When hot junction is heated , it is generated an electromotive force normally proportional to temperature . The rate temperature / voltage is repeatible .

Lorsque la jonction chaude est chauffée, il est généré une force électromotrice normalement proportionnelle à la température. Le ratio température / tension est répétable

Sono state selezionate e standardizzate quelle leghe rispondenti ai seguenti requisiti:

The following alloys have been selected since they comply the following features:

Ont été sélectionnés et normalisés ces alliages qui répondent aux exigences suivantes:

- elevata emissione per °C - high emission / °C - emission élevé par ° C
- buona stabilità e ripetibilità - good stability and repeatability - bonne stabilité et répétabilité
- buone proprietà meccaniche - good mechanical properties - bonnes propriétés mécaniques
- purezza metallurgica - metal purity - pureté métallurgique

Le più comuni termocoppie industriali sono

Most common industrial thermocouples are

Les thermocouples industriels les plus courants sont

Type B : (Pt 30% Rh / Pt 6% Rh)

Type E : (Chromel / Constantan)

Type J : (Iron / Constantan)

Type K : (Chromel / Alumel)

Type S : (Pt 10% Rh / Platinum)

Type R : (Pt 13% Rh / Platinum)

Type T : (Copper / Constantan)

Type N : (Nicrosil / Nisil)

TIPI DI GIUNTO CALDO - HOT JUNCTION TYPES - TYPES DE SOUDURE CHAUDE



**GIUNTO CALDO ISOLATO
INSULATED HOT JUNCTION
SOUDURE CHAUDE ISOLEE**

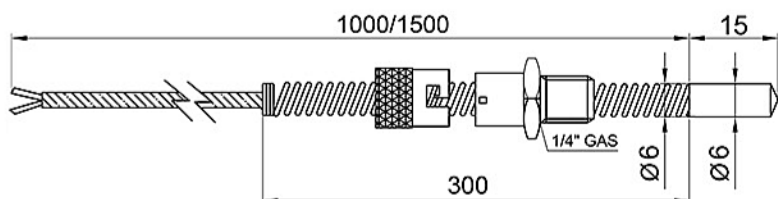


**GIUNTO CALDO A MASSA
GROUNDED HOT JUNCTION
SOUDURE CHAUDE NON ISOLEE**



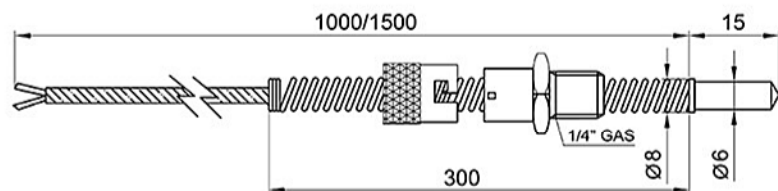
**GIUNTO CALDO ESPOSTO
EXPOSED HOT JUNCTION
SOUDURE CHAUDE EXPOSEE**

TERMOCOPPIE - THERMOCOUPLES - SONDES



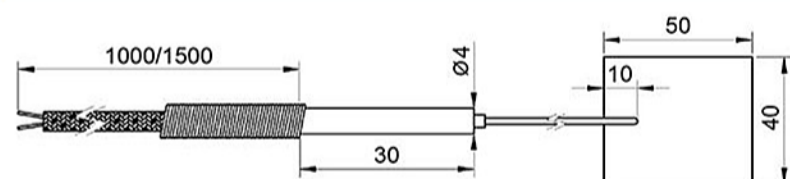
BJ TIPO J/K - TYPE J/K

Dia. 6x15 FIL. 1/4" GAS
CAVO ISOL. F.V. + TRECCIA METALLICA
Dia. 6x15 1/4" GAS THREADED
METAL BRAIDED CABLE + F.G. INSULATION
Dia. 6x15 FIL. 1/4" GAS
CABLE SOIE DE VERRE + TRESSE



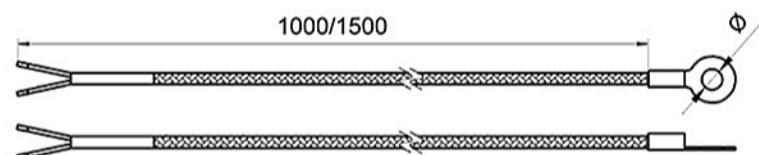
BJF TIPO J/K - TYPE J/K

Dia. 6x15 FIL. 1/4" GAS
CAVO ISOL. F.V.+TRECCIA METALLICA
Dia. 6x15 1/4" GAS THREADED
METAL BRAIDED CABLE + F.G. INSULATION
Dia. 6x15 FIL. 1/4" GAS
CABLE SOIE DE VERRE + TRESSE



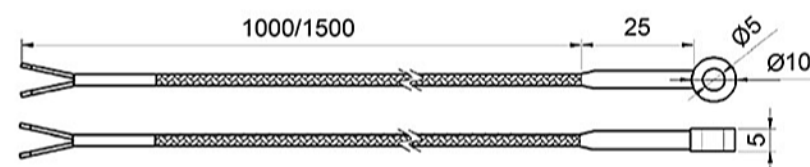
FLT TIPO J/K - TYPE J/K

STELO - TC - SONDE Dia. 1 - 1.5 - 2 mm
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



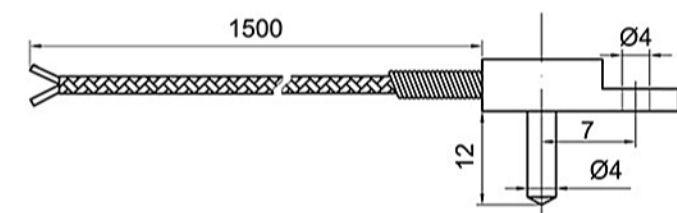
RNG TIPO J/K - TYPE J/K

Dia. 4 ... 10 mm
G. A MASSA - GROUNDED J. - NON ISOLEE
SONDA TIPO J/K - CAVO 2 x 0.5mmq CAVO
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



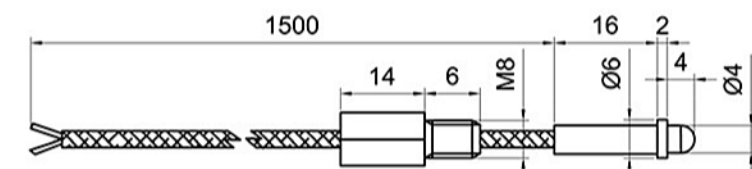
TRNG TIPO J/K - TYPE J/K

Dia. 5 mm
G. A MASSA - GROUNDED J. - NON ISOLEE
SONDA TIPO J/K - CAVO 2 x 0.5mmq CAVO
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



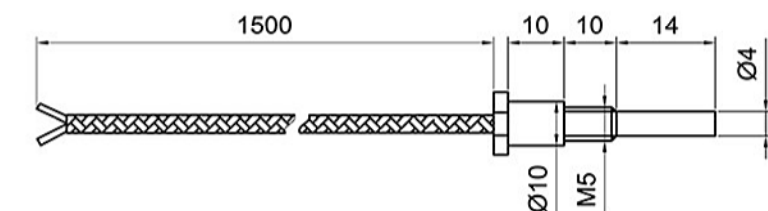
SQ TIPO J/K - TYPE J/K

PUNTALE - TIP - SONDE Dia. 4 x 12 mm
G. ISOLATO - INSULATED J. - ISOLEE
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE
PER CAMERE CALDE - FOR MANIFOLDS -
POUR BLOQUES CHAUDES



PNT44 TIPO J/K - TYPE J/K

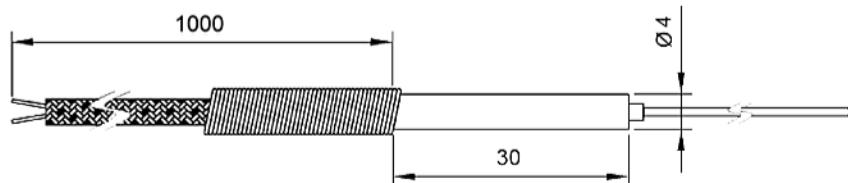
PUNTALE - TIP - SONDE Dia. 4 x 4 mm
RACCORDO FIL M8 - M8 THREADED
CONNECTION - VIS LIBRE M8
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



PNT414M5 TIPO J/K - TYPE J/K

PUNTALE - TIP - SONDE Dia. 4 x 14 mm
RACCORDO FIL M5 - M5 THREADED
CONNECTION - VIS LIBRE M5
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE
PER CAMERE CALDE - FOR MANIFOLDS -
POUR BLOQUES CHAUDES

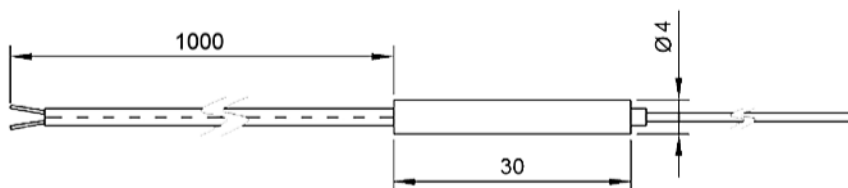
TERMOCOPPIE MgO - MgO INSUL. TC - SONDES en MgO



MgOSt

TIPO J/K - TYPE J/K

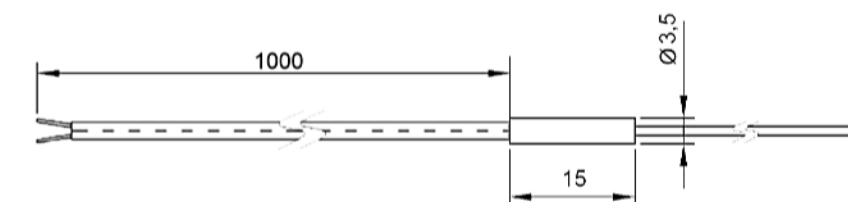
STELO - TC - SONDE Dia. 1 - 1,5 - 2mm
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 300°C
MAX CABLE WORKING TEMP. : 300°C
TEMP. MAX SUR LE CABLE : 300°C



MgOKt

TIPO J/K - TYPE J/K

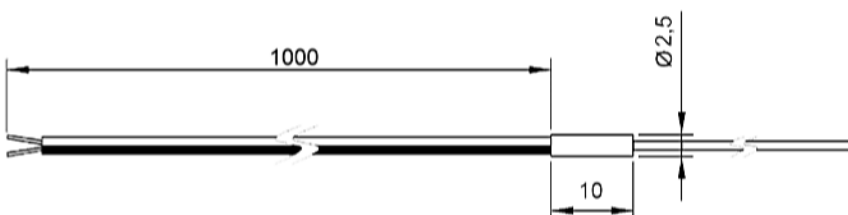
STELO - TC - SONDE Dia. 1 - 1,5 - 2mm
CAVO ISOLAMENTO KAPTON-KAPTON
KAPTON - KAPTON CABLE INSULATION
CABLE ISOLEE EN KAPTON - KAPTON
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 400°C
MAX CABLE WORKING TEMP. : 400°C
TEMP. MAX SUR LE CABLE : 400°C



MgOMn

TIPO J/K - TYPE J/K

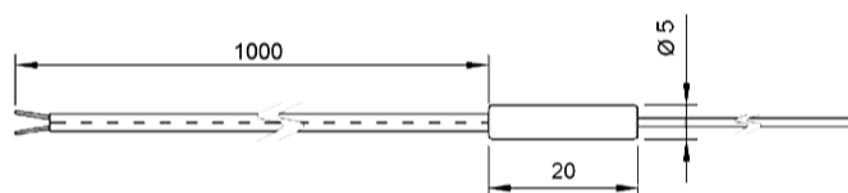
STELO - TC - SONDE Dia. 1 - 1,5mm
CAVO ISOLAMENTO KAPTON-KAPTON
KAPTON - KAPTON CABLE INSULATION
CABLE ISOLEE EN KAPTON - KAPTON
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 400°C
MAX CABLE WORKING TEMP. : 400°C
TEMP. MAX SUR LE CABLE : 400°C



MgOMc

TIPO J/K - TYPE J/K

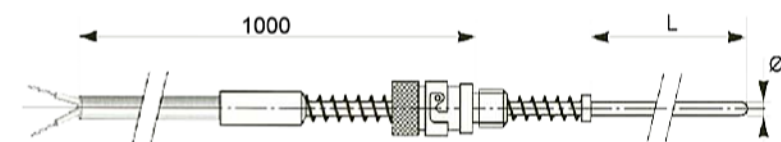
STELO - TC - SONDE Dia. 1 - 1,5 mm
CAVO ISOLATO IN TEFLON
TEFLON INSULATED CABLE
CABLE ISOLEE EN TEFLON
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 200°C
MAX CABLE WORKING TEMP. : 200°C
TEMP. MAX SUR LE CABLE : 200°C



MgOMithic

TIPO J/K - TYPE J/K

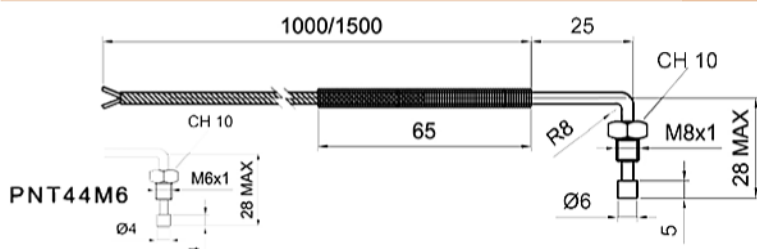
STELO - TC - SONDE Dia. 1 - 1,5mm
CAVO ISOLAMENTO KAPTON-KAPTON
KAPTON - KAPTON CABLE INSULATION
CABLE ISOLEE EN KAPTON - KAPTON
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 400°C
MAX CABLE WORKING TEMP. : 400°C
TEMP. MAX SUR LE CABLE : 400°C



MgOBj

TIPO J/K - TYPE J/K

STELO - TC - SONDE Dia. 1 - 1,5 - 2mm
RACC. A BAIONETTA - BAJONET - BAIONNETTE
CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE
TEMP. MAX ESERCIZIO: J 600°C - K 1000°C
MAX WORKING TEMP. : J 600°C - K 1000°C
TEMP. MAX DE TRAVAILLE: J 600°C - K 1000°C
TEMP. MAX SUL CAVO: 300°C
MAX CABLE WORKING TEMP. : 300°C
TEMP. MAX SUR LE CABLE : 300°C



PNT65M8

Dia. 6 x 5 mm
RACC. FIL. M8
M8 THREADED
VIS LIBRE M8

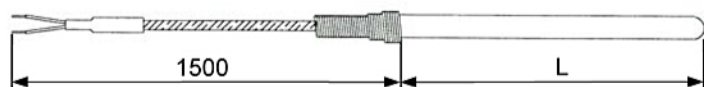
PNT44M6

Dia. 4 x 4 mm
RACC. FIL. M6
M6 THREADED
VIS LIBRE M6

TIPO J/K - TYPE J/K

CAVO ISOL. F.V.+TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE

TERMOCOPPIE - THERMOCOUPLES - SONDES



TB

TIPO J/K - TYPE J/K

STELO - TC - SONDE dia. 3 - 4 - 5 - 6 - 7 - 8
CAVO ISOL. F.V. + TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE

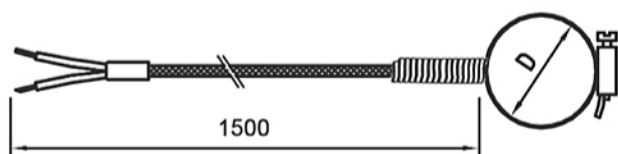


RACCORDO INOX GIREVOLE (filettatura GAS) CONTRO BATTUTA

PNTRG

TIPO J/K - TYPE J/K

STELO - TC - SONDE Dia. 3 - 4 - 5 - 6 - 7 - 8
RACCORDO - NIPPLE - VIS LIBRE 1/4" GAS
CAVO ISOL. F.V. + TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



RNGTB

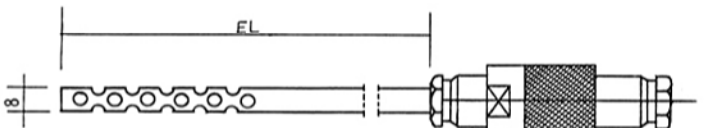
TIPO J/K - TYPE J/K

dia. 12 ... 100mm
STELO - TC - SONDE dia. 2mm
CAVO ISOL. F.V. + TRECCIA METALLICA
METAL BRAIDED CABLE + F.G. INSULATION
CABLE SOIE DE VERRE + TRESSE



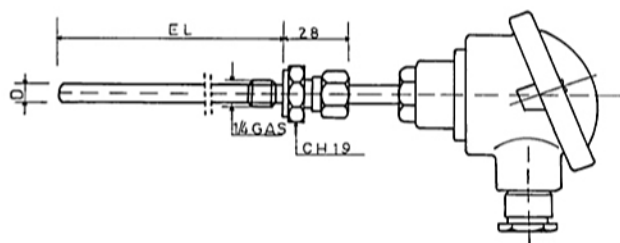
PT100TB

STELO - TC - SONDE dia. 3 - 4 - 5 - 6 - 7 - 8
TERMORESISTENZA A 2 / 3 FILI
2 / 3 LEADS RESISTANCE TEMP. DETECTOR
THERMORESISTANCE AVEC 2 / 3 CABLES
CAVO ISOLATO IN FIBRA DI VETRO O SILICONE
METAL BRAIDED CABLE OR SILICON INSULATION
CABLE SOIE DE VERRE + TRESSE OU SILICON



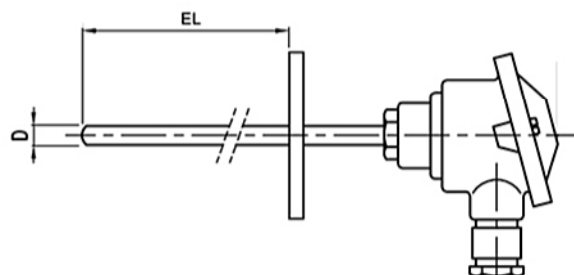
PT100AER

PER MISURAZIONI AEROTERMICHE
FOR AERO-THERMAL MEASUREMENT
POUR MESURE AEROTHERMIQUE
STELO - TC - SONDE dia. 8 mm
TERMORESISTENZA A 2 / 3 FILI
2 / 3 LEADS RESISTANCE TEMP. DETECTOR
THERMORESISTANCE AVEC 2 / 3 CABLES
CAVO ISOLATO IN FIBRA DI VETRO O SILICONE
METAL BRAIDED CABLE OR SILICON INSULATION
CABLE SOIE DE VERRE + TRESSE OU SILICON



PT100IMM

PER MISURAZIONI IN IMMERSIONE IN LIQUIDI
FOR IMMERSION MEASUREMENT (LIQUIDS)
POUR MESURE EN PLONGÉE (LIQUIDES)
STELO - TC - SONDE dia. 6 - 8 - 10 - 12 mm
2 / 3 FILI - 2 / 3 LEADS - 2 / 3 FILS
TESTA TIPO DIN - DIN HEAD - TÊTE DIN



PT100IMMF

PER MISURAZIONI IN IMMERSIONE IN LIQUIDI
FOR IMMERSION MEASUREMENT (LIQUIDS)
POUR MESURE EN PLONGÉE (LIQUIDES)
STELO - TC - SONDE dia. 6 - 8 - 10 - 12 mm
2 / 3 FILI - 2 / 3 LEADS - 2 / 3 FILS
TESTA TIPO DIN - DIN HEAD - TÊTE DIN
CON FLANGIA - WITH FLANGE - AVEC FLANGE

FEM VS TEMPERATURA - EMF VS TEMPERATURE

FEM VS TEMPERATURE

TERMOCOPPIA TIPO "J" (Fe-Co) SECONDO IEC 584-1 (ITS 90)

THERMOCOUPLE TYPE "J" (Fe-Co) - IEC 584-1 (ITS 90)

°C	0	10	20	30	40	50	60	70	80	90	°C
FEM [mV] - EMF [mV]											
0	0,000	0,507	1,019	1,537	2,059	2,585	3,116	3,650	4,187	4,726	0
100	5,269	5,814	6,360	6,909	7,459	8,010	8,562	9,115	9,669	10,224	100
200	10,779	11,334	11,889	12,445	13,000	13,555	14,110	14,665	15,219	15,773	200
300	16,327	16,881	17,434	17,986	18,538	19,090	19,642	20,194	20,745	21,297	300
400	21,848	22,400	22,952	23,504	24,057	24,610	25,164	25,720	26,276	26,834	400
500	27,393	27,953	28,516	29,080	29,647	30,216	30,788	31,362	31,939	32,519	500
600	33,102	33,689	34,279	34,873	35,470	36,071	36,675	37,284	37,896	38,512	600
700	39,132	39,755	40,382	41,012	41,645	42,281	42,919	43,559	44,203	44,848	700
800	45,494	46,141	46,786	47,431	48,074	48,715	49,353	49,989	50,622	51,251	800
900	51,877	52,500	53,119	53,735	54,347	54,956	55,561	56,164	56,763	57,360	900
1.000	57,953	58,545	59,134	59,721	60,307	60,890	61,473	62,054	62,634	63,214	1.000
1.100	63,792	64,370	64,948	65,525	66,102	66,679	67,255	67,831	68,406	68,980	1.100
1.200	69,553										1.200
°C	0	10	20	30	40	50	60	70	80	90	°C

TERMOCOPPIA TIPO "K" (Cr-Al) SECONDO IEC 584-1 (ITS 90)

THERMOCOUPLE TYPE "K" (Cr-Al) - IEC 584-1 (ITS 90)

°C	0	10	20	30	40	50	60	70	80	90	°C
FEM [mV] - EMF [mV]											
0	0,000	0,397	0,798	1,203	1,612	2,023	2,436	2,851	3,267	3,682	0
100	4,096	4,509	4,920	5,328	5,735	6,138	6,540	6,941	7,340	7,739	100
200	8,138	8,539	8,940	9,343	9,747	10,153	10,561	10,971	11,382	11,795	200
300	12,209	12,624	13,040	13,457	13,874	14,293	14,713	15,133	15,554	15,975	300
400	16,397	16,820	17,243	17,667	18,091	18,516	18,941	19,366	19,792	20,218	400
500	20,644	21,071	21,497	21,924	22,350	22,776	23,203	23,629	24,055	24,480	500
600	24,905	25,330	25,755	26,179	26,602	27,025	27,447	27,869	28,289	28,710	600
700	29,129	29,548	29,965	30,382	30,798	31,213	31,628	32,041	32,453	32,865	700
800	33,275	33,685	34,093	34,501	34,908	35,313	35,718	36,121	36,524	36,925	800
900	37,326	37,725	38,124	38,522	38,918	39,314	39,708	40,101	40,490	40,885	900
1.000	41,276	41,665	42,053	42,440	42,826	43,211	43,595	43,978	44,359	44,740	1.000
1.100	45,119	45,497	45,873	46,249	46,623	46,995	47,367	47,737	48,105	48,473	1.100
1.200	48,838	49,202	49,565	49,926	50,286	50,644	51,000	51,355	51,708	52,060	1.200
1.300	52,410	52,759	53,106	53,451	53,795	54,138	54,479	54,819			1.300
°C	0	10	20	30	40	50	60	70	80	90	°C

ACCESSORI - ANCILLARIES - ACCESSOIRES

- 1.- CAVI DI ESTENSIONE - EXTENSION CABLES - CABLES D'EXTENSION
ISOLAMENTO IN FIBRA DI VETRO + ARMATURA METALLICA OPPURE SILICONE
FIBERGLASS + METAL BRAID INSULATION OR SILICON INSULATION
ISOLEMENT EN SOIE DE VERRE + TRESSE



TIPO J - ARMATO
TYPE J - METAL BRAID
TYPE J - TRESSE



TIPO K - ARMATO
TYPE K - METAL BRAID
TYPE K - TRESSE

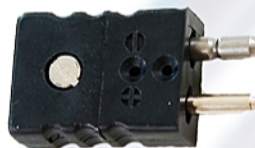


TIPO J - SILICONE
TYPE J - SILICON
TYPE J - SILICON



TIPO K - SILICONE
TYPE K - SILICON
TYPE K - SILICON

- 2.- CONNETTORI COMPENSATI - TIPO STANDARD
COMPENSATED CONNECTORS - STANDARD TYPE
CONNECTEUR COMPENSEE - TYPE STANDARD



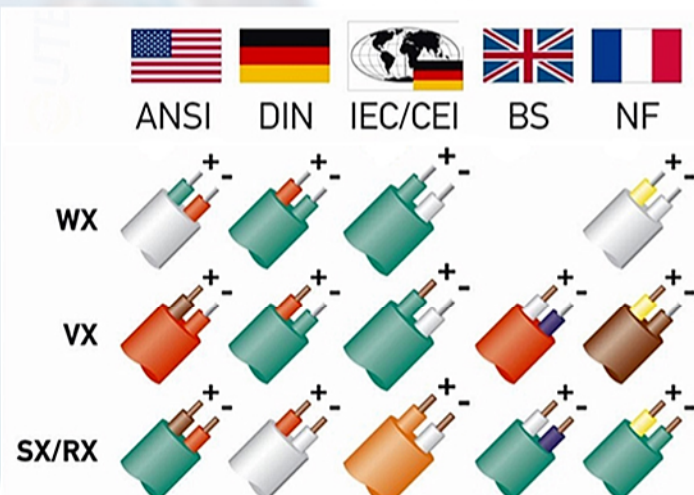
MATERIALE TERMOPLASTICO - MADE BY THERMOPLASTIC MATERIAL - CORPS EN THERMOPLASTIQUE
TEMPERATURA MASSIMA DI ESERCIZIO 200°C - MAX WORKING TEMP. 200°C - TEMPERATURE DE TRAVAILLE MAXIMUM 200°C
PER TERMOCOPPIE TIPO J, K - FOR THERMOCOUPLES TYPE J, K - POUR THERMOCOUPLES TYPE J, K
DIMENSIONI PRESA 36x21x12,5 (H) mm - SOCKET DIMENSIONS 36x21x12,5 (H) mm - DIMENSIONS PRISE 36x21x12,5 (H) mm
DIMENSIONI SPINA 30x21x12,5 (H) mm - PLUG DIMENSIONS 30x21x12,5 (H) mm - DIMENSIONS FICHE 30x21x12,5 (H) mm

- 3.- CONNETTORI COMPENSATI - TIPO MIGNON
COMPENSATED CONNECTORS - TYPE MINI
CONNECTEUR COMPENSEE - TYPE PETIT



MATERIALE TERMOPLASTICO - MADE BY THERMOPLASTIC MATERIAL - CORPS EN THERMOPLASTIQUE
TEMPERATURA MASSIMA DI ESERCIZIO 200°C - MAX WORKING TEMP. 200°C - TEMPERATURE DE TRAVAILLE MAXIMUM 200°C
PER TERMOCOPPIE TIPO J, K - FOR THERMOCOUPLES TYPE J, K - POUR THERMOCOUPLES TYPE J, K
DIMENSIONI PRESA 26x16,5x8 (H) mm - SOCKET DIMENSIONS 26x16,5x8 (H) mm - DIMENSIONS PRISE 26x16,5x8 (H) mm
DIMENSIONI SPINA 21x16,5x8 (H) mm - PLUG DIMENSIONS 21x16,5x8 (H) mm - DIMENSIONS FICHE 21x16,5x8 (H) mm

CODIFICAZIONE STANDARD - STANDARD CODES - CODIFICATION STANDARD





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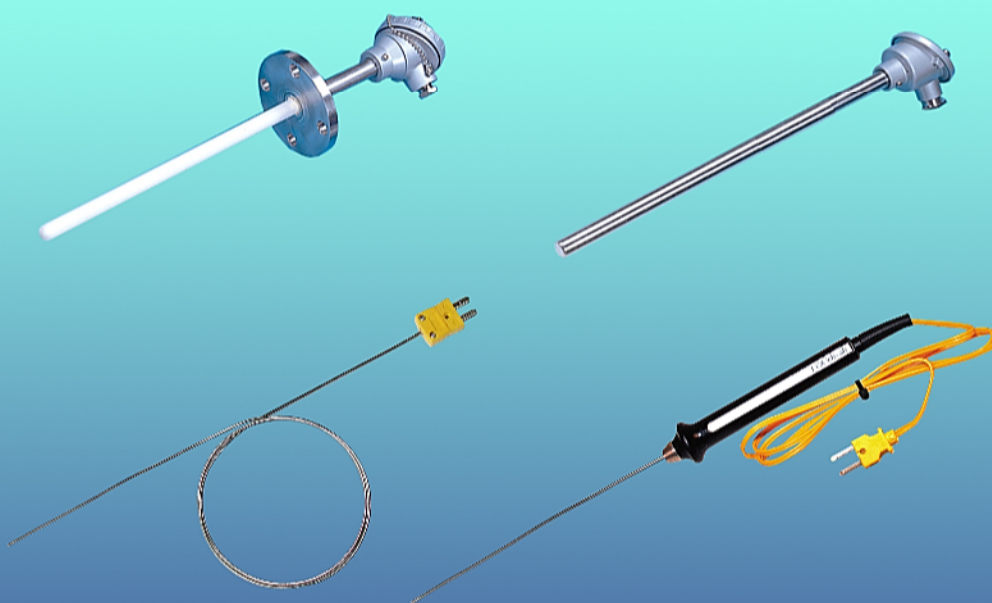
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