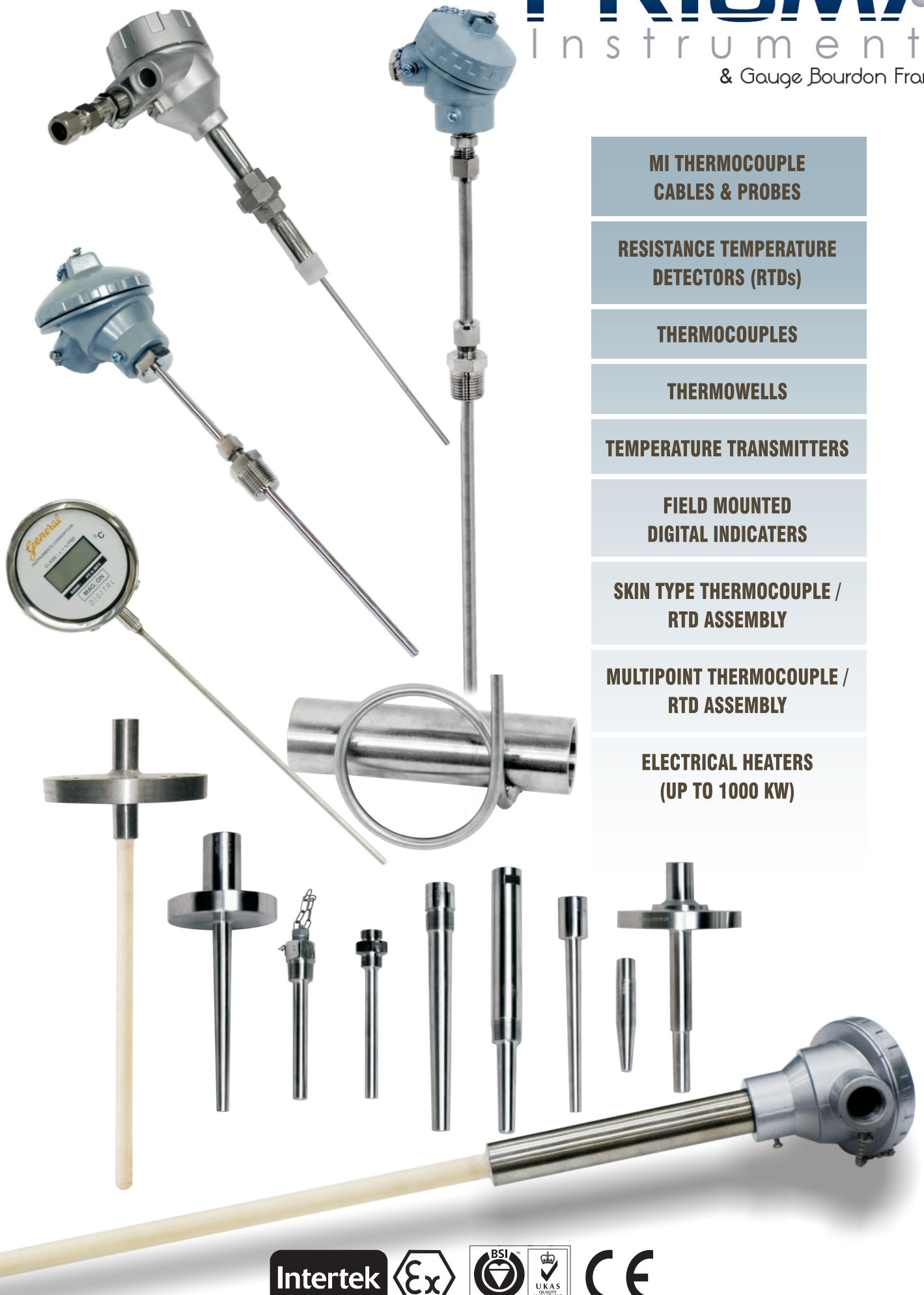
PRISMA Instruments

& Gauge Bourdon France



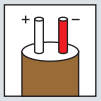
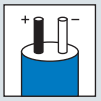
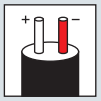
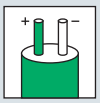
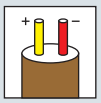
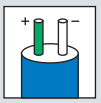
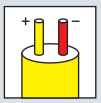
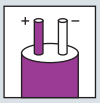
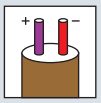
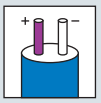
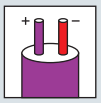
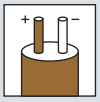
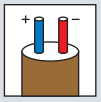
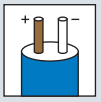
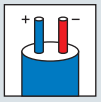
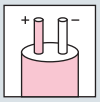
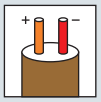
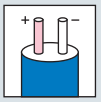
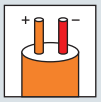
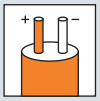
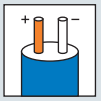
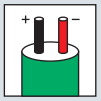
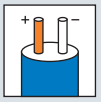
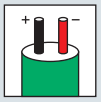
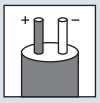
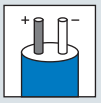
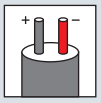
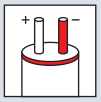
- MI THERMOCOUPLE CABLES & PROBES
- RESISTANCE TEMPERATURE DETECTORS (RTDs)
- THERMOCOUPLES
- THERMOWELLS
- TEMPERATURE TRANSMITTERS
- FIELD MOUNTED DIGITAL INDICATERS
- SKIN TYPE THERMOCOUPLE / RTD ASSEMBLY
- MULTIPOINT THERMOCOUPLE / RTD ASSEMBLY
- ELECTRICAL HEATERS (UP TO 1000 KW)

Intertek

Mineral Insulated Thermocouples

Our Mineral Insulated Thermocouple Assemblies consist of two, four or six thermocouple wires embedded in compact MgO - mineral insulation, enclosed in a metallic tube. The assembly is compact, flexible enough to route, has a high insulation resistance and high thermal conductivity. Mineral insulated thermocouple assemblies are robust in construction and offer good mechanical strength.

Beside the standard construction, complex, custom built designs are available. Our expert design team can assist you solve your temperature related problems to satisfaction.

Thermocouple Grade		T/C Type	Temp range	Sheath OD	Sheath Material*	Std limits of error	Spl limits of error	Extension Grade	
ICE 584 (+/-)	ANSI MC 96.1 (+/-)							ICE 584 (+/-)	ANSI MC 96.1 (+/-)
		J Iron Constantan	0-700°C	2 mm, 3 mm 4.5 mm, 6 mm 8 mm	SS316, SS321 Inconel 600®	±2.2°C or ±0.75%	±1.1°C or ±0.4%		
		K Chromel Alumel	(-) 200°C to 1150°C	1 mm, 1.5 mm 2 mm, 3 mm 4.5 mm, 6 mm 8 mm	SS316, SS321 Inconel 600®, SS310, SS446	±2.2°C or ±0.75%	±1.1°C or ±0.4%		
		E Chromel Constantan	(-) 200°C to 800°C	2 mm, 3 mm 4.5 mm, 6 mm 8 mm	SS316, SS321	±1.7°C or ±0.75%	±1.0°C or ±0.4%		
		T Copper Constantan	(-) 200°C to 300°C	2 mm, 3 mm 4.5 mm, 6 mm 8 mm	SS316, SS321	±1.0°C or ±0.75%	±0.5°C or ±0.4%		
		N Nicrosil Nisil	0 to 1280°C	2 mm, 3 mm 4.5 mm, 6 mm 8 mm	Inconel 600®, nicrobel/pyrosil	±2.2°C or ±0.75%	±1.1°C or ±0.4%		
	None Established	R Pt PtRh 13%	0 to 1400°C	3 mm, 4.5 mm 6 mm	Inconel® or ceramic	±1.5°C or ±0.25%	±0.6°C or ±0.1%		
	None Established	S Pt PtRh 10%	0 to 1400°C	3 mm, 4.5 mm 6 mm	Inconel® or ceramic	±1.5°C or ±0.25%	±0.6°C or ±0.1%		
	None Established	B PtRh 6% PtRh 30%	800°C to 1700°C	3 mm, 4.5 mm 6 mm	Inconel® or ceramic	±0.5%	None Established		
No Std. Use ANSI Colour Code	None Established	C (W5) Tungsten-5% Rhenium Tungsten-26% Rhenium	0-2320°C	3 mm, 4.5 mm 6 mm		±4.5% or ±1.0%	None Established	No Std. Use ANSI Colour Code	

Other sheath OD and sheath material available on request.

Specifications

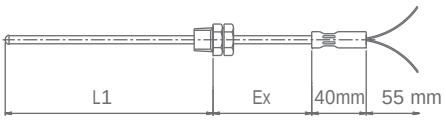
Element	:	J, K, E, T, N, R, S, B type thermocouple, single, duplex (triplex on request)
Sheath OD	:	1 mm, 2 mm, 3 mm, 4.5 mm, 6 mm, 8 mm, 9.5 mm, 10 mm, 12.7 mm
Sheath material	:	SS316, SS321, Inconel 600 as standard. Other sheath on request
Insulation	:	Mineral, Compact MgO (over 99% purity)
Calibration	:	In accordance with ANSI MC 96.1/ IEC 584 (class B) (class A as option)
Junction	:	Grounded, ungrounded, exposed
Cold end	:	a) Pot seal with PVC or PTFE insulated flexible tails b) Quick connect / disconnect plug and Jack c) Ceramic spring loaded terminal block with silver plated brass terminals d) Ceramic to metal seal e) Other termination on request
Head	:	Diecast aluminium LM6 grade / SS304 / SS316, single or double entry with ¾" ET (F) or ½" NPT (F) cable entry as standard, ½" NPT (F) for well or nipple. Other materials on request
Protection	:	Weatherproof to IP-68 (IS :13947 Part I) : Flameproof to Gr.I, IIA IIB (Equivalent to NEC. C1, I, Div 2 Gr. C & D) - CCOE Certified : Flameproof to IIC (Equivalent to NEC. C1, I, Div 2 Gr. B, C & D) - CCOE Certified : Increased safety : ATEX certified : CE certified
Extension	:	Provided in the form of nipple or nipple - union - nipple in Cd plated CS or SS. Other extension on request
Optional	:	a) Thermowell (refer section on Thermowell) b) Head mounted temperature transmitter c) Adjustable compression fitting or flange.
Note	:	Beaded thermocouples also can be offered on request. (Specify conductor diameter in such case)

Tests*:

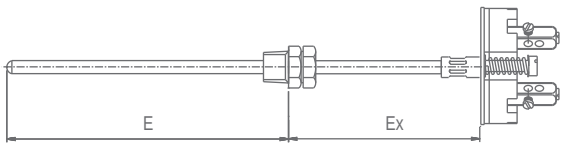
1) Calibration
2) Nitrogen leak test
3) Dimensional check
4) Insulation resistance (>100M Ohm @ 500 VDC at 25oC)
5) Hot IR test

* Refer seperate sheet which mentions complete list of tests carried out.

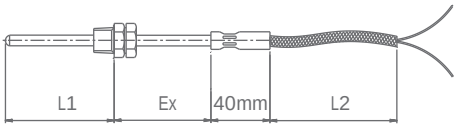
How to Order



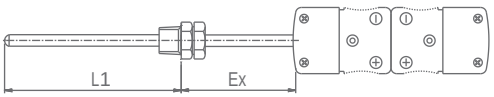
TYPE : TC IA



TYPE : TC-I-TB



TYPE : TC IB



TYPE : TC-I-PJ

ELEMENT
1K, 2K, 1J, 2J, 1E, 2E, 1T, 2T, 1N, 2N

SHEATH OD
2, 3, 3.2, 4.5, 6, 8, 9.5, 10, 12.7mm

SHEATH MATERIAL

S6 : SS316	S3 : SS310
S2 : SS321	HC : Hastelloy® C
I6 : Inconel® 600	SH : SS446
I8 : Incoloy® 800	

L1
Specify in mm

Ex
Specify in mm

EXTENSION CABLE TYPE
1. PTFE insulated tails-55mm long
2. PTFE insulated, PTFE overall cable
3. PTFE insulated, overall PTFE & SS braided cable
4. FG insulated, overall FG cable
5. FG insulated, overall FG, SS braided cable

OPTION / SPECIAL
1. Adjustable compression fitting in SS316 (specify the size)
2. Spring loaded bayonet fitting
3. Lugs for tails
4. Special limits of error
5. Grounded junction
6. Calibration standard (specify other than IEC-584)
7. Triplex element
8. Bulk head connector
9. Thermowell
10. Any other requirement
0. None

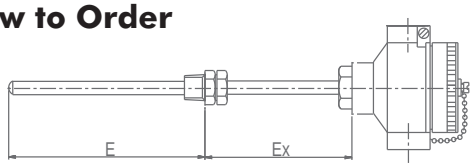
EXTENSION CABLE LENGTH
L_2 metre

Standard Features : a - Reference standard IEC 584 Class B
b - Ungrounded junction
c - Mineral (compact MgO) insulation

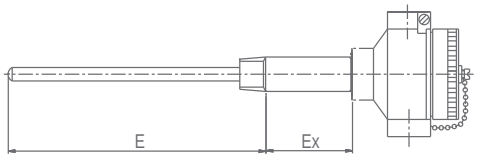
Typical Model No : TC-I-A-2J-3-S6-200-50-1-0-0

TC	IA	2J	3	S6	200	50	1	0	0
Thermocouple	Construction Type	Element Type	Sheath OD	Sheath Material	"L1" Length (mm)	"Ex" Length (mm)	Extension Cable Type	"L2" Extension Cable Length	Option / Special Requirement

How to Order



TYPE : TC-H-A



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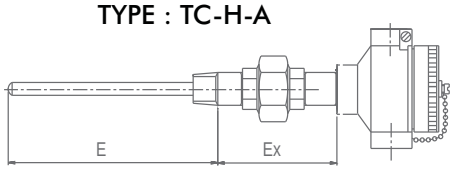
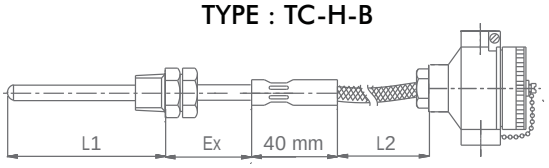


TYPE : TC-H-C



TYPE : TC-H-D

ELEMENT
1K, 2K, 1J, 2J, 1E, 2E, 1T, 2T, 1N, 2N

ELEMENT OD
4.5, 6, 8, 9.5, 10, 12, 12.7mm

SHEATH MATERIAL

S6 : SS316	I6 : Inconel® 600
S2 : SS321	I8 : Incoloy® 800
S3 : SS310	SH : SS446
	HC : Hastelloy® C

HEAD
WAL : Aluminium (LM6 Gr.), Weatherproof (IP-66)
WS4 : SS304, Weatherproof (IP-66)
WS6 : SS316, Weatherproof (IP-66)
FLAL : Aluminium (LM6 Gr.), Flameproof (IIA, IIB)
FLS4 : SS304, Flameproof (IIA, IIB)
FLS6 : SS316, Flameproof (IIA, IIB)
FCAL : Aluminium (LM6 Gr.), Flameproof (IIC)
FCS4 : SS304, Flameproof (IIC)
FCS6 : SS316, Flameproof (IIC)
FCCAL: Aluminium (LM6 Gr.), Flameproof (IIC + CCOE)
ATAL : Aluminium (LM6 Gr.), ATEX certified
FMAL : Aluminium (LM6 Gr.), FM/UL certified

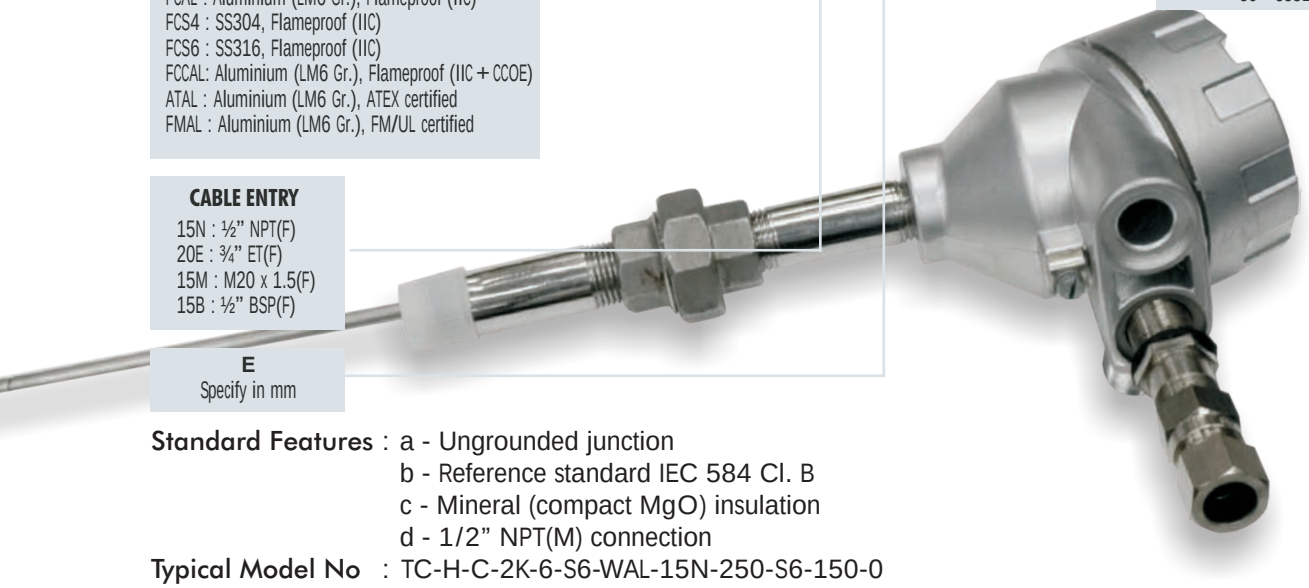
CABLE ENTRY
15N : ½" NPT(F)
20E : ¾" ET(F)
15M : M20 x 1.5(F)
15B : ½" BSP(F)

E
Specify in mm

OPTION / SPECIAL
1. Cable gland (specify material)
2. Two cable entries
3. Head mounted transmitter
4. Plug for cable entry (specify material)
5. Connection(other than specified)
6. FG/FG, SS braided cable
   (specify length e.g. 6(3) i.e. 3 Mtr cable)
7. Grounded junction
8. Thermowell
9. Special limits of error
0. None

Ex
Specify in mm

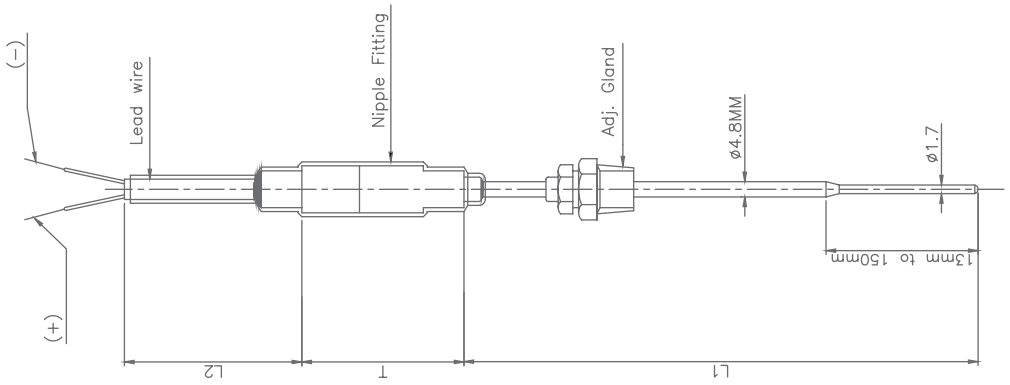
CONNECTION MATERIAL
C - Cd plated CS
S4 - SS304
S6 - SS316



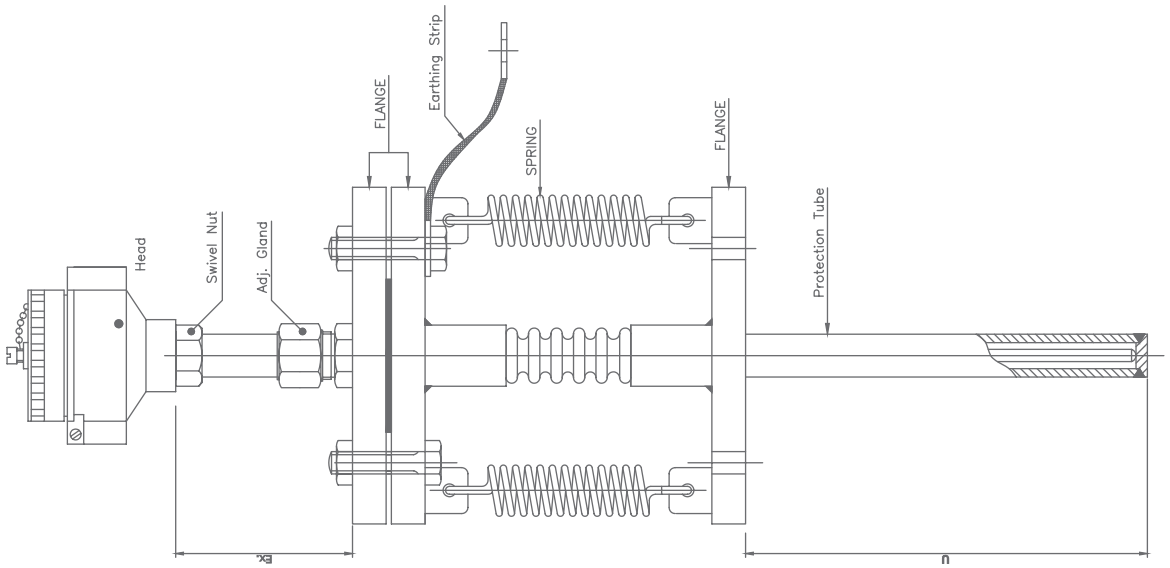
Standard Features : a - Ungrounded junction
b - Reference standard IEC 584 Cl. B
c - Mineral (compact MgO) insulation
d - 1/2" NPT(M) connection

Typical Model No : TC-H-C-2K-6-S6-WAL-15N-250-S6-150-0

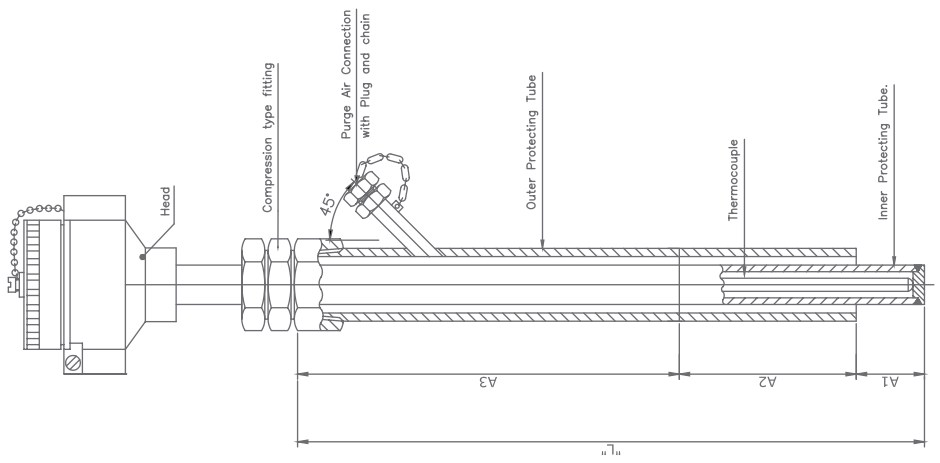
TC	H-C	2K	6	S6	WAL	15N	250	S6	150	0
Thermocouple	Construction Type	Element Type	Sheath OD (mm)	Sheath Material	Head	Cable entry	"E" Length (mm)	Connection material	"Ex" Length (mm)	Option / Special Requirement



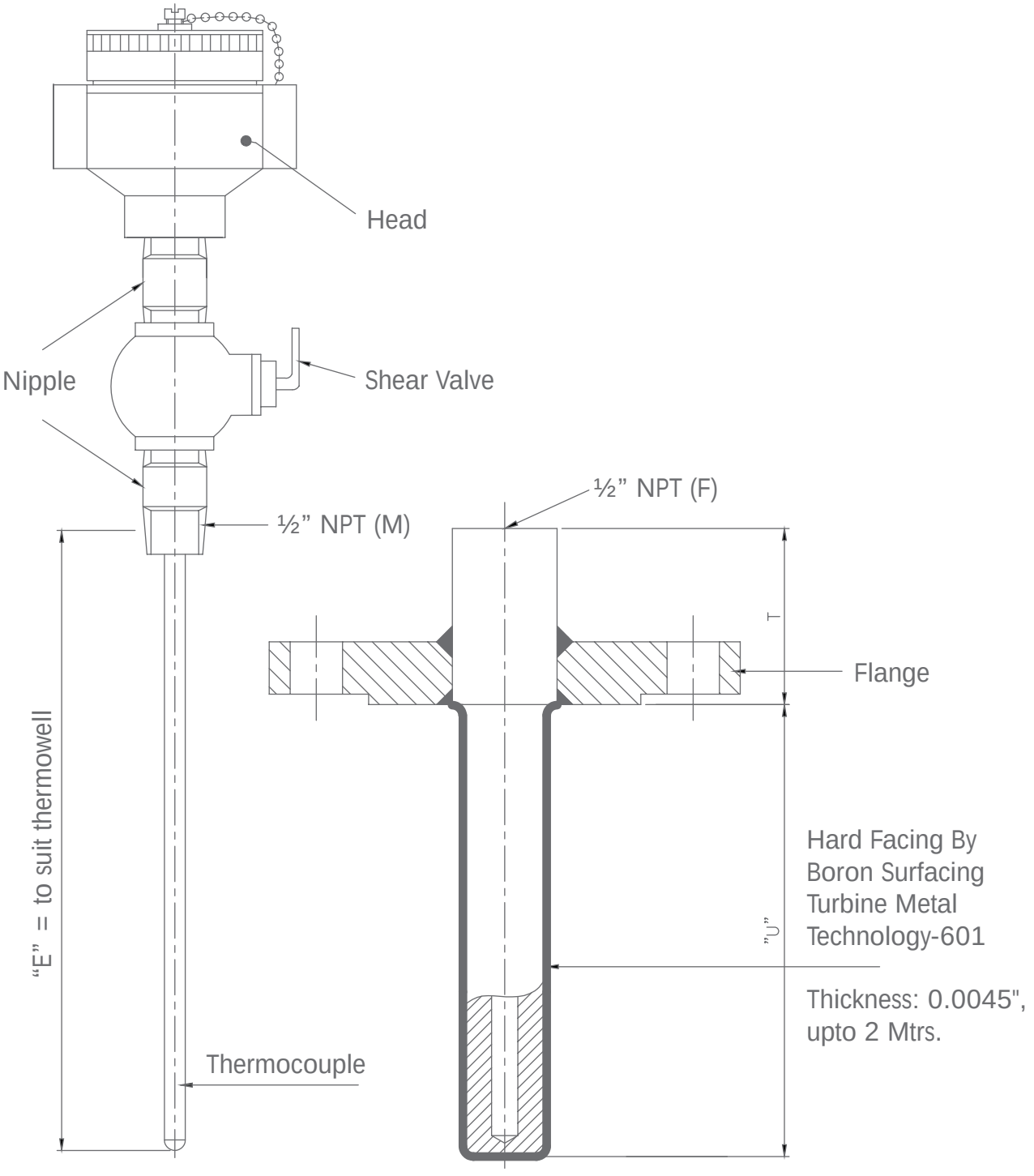
Swaged Type Special Thermocouple
Assembly for Quick Response



Fully Spring Loaded Thermocouple / RTD
Assembly for Vibration Application



BED Type Thermocouple Assembly



Thermocouple Assembly with NORDSTRAM SHEAR
Valve & Thermowell with BORON DIFFUSION HARD FACING (TMT-601)

MI Thickwall Thermocouple

The conventional thermocouple is used with an outer protecting tube or thermowell to protect it from aggressive and corrosive process condition. This improves longevity of the thermocouple. However, response time is poor. To overcome above problem, We have designed MI Thickwall Thermocouple having thicker wall with relatively larger conductor diameters. This construction enable the user to insert the thermocouple directly in the process without a protecting tube or thermowell, improving response time considerably.

Type of thermocouple offered under Thickwall:

J (Iron constantan)
K (Chromel alumel)
E (Chromel constantan)

Normal applications:
Furnaces, rotary kilns, recuperators,
skin temperature measurement of heater tubes.

Advantages:

- ❑ Faster response
- ❑ Longer lengths can be offered
- ❑ Pliable and easily routed
- ❑ Available in SS316, SS310, Inconel® 600, Incoloy® 800, SS446 sheath materials

SHEATH DIA	WALL THICKNESS*	CONDUCTOR DIA*	
		(Nominal) Single	(Nominal) Duplex
8 mm	1.65 mm	1.12 mm	0.65 mm
9.5 mm	2.00 mm	1.40 mm	1.20 mm
10 mm	2.10 mm	1.40 mm	0.85 mm
12.7 mm	3.00 mm	1.80 mm	1.10 mm
15 mm	3.60 mm	2.00 mm	1.65 mm
17 mm	4.00 mm	2.20 mm	1.85 mm
19 mm	4.50 mm	2.45 mm	2.00 mm

* These are standard dimensions. Special dimensions available on request.

MI Tube Skin Thermocouple Assembly

iWe ndegenised the Skin Thermocouple assemblies first time in India. Tube Skin Thermocouples manufactured by us are reliable for measurement and control of tube surface temperature in fire heaters. Accurate temperature measurement is important for prolonging heater tube life, for ensuring safe and efficient operation. We have been supplying tube skin thermocouple assemblies in quantities to majority of the projects in India as well as exporting to various countries.

The basic thermocouple is normally of 12.7 mm OD with relatively higher sheath wall thickness, mineral insulated (compacted MgO) and in variety of sheath materials such as SS310, SS446, Inconel® 600, Incoloy® 800 etc. The Junction is generally grounded. However ungrounded junction also is offered, as customer requires. Mineral Insulated (MI) thermocouple is manufactured by Cold drawing and annealing (heat treatment) process in controlled atmosphere. The heat treatment (which is controlled within +/- 2^{0}C) is carried out in hydrogen atmosphere to avoid surface defects & partial oxidation of conductor.

Major user industries

- Refineries & Petrochemical
- Oil & Gas
- Chemical
- Fertiliser
- Metal (ferrous/non ferrous)

Different types available

a. Knife edge wedge type
b. Washer type
c. Retractable type
d. Assemblies with single or multiple expansion loop

Technical Notes on Tube Skin Type Assembly

1. General was the first company to actually indigenise the product. Earlier the product was fully imported. The product was started in Technical Collaboration with M/s BICC - Pyrotenax of Hebburn UK. General has also supplied this assembly in very big quantities to several countries such as UK, Germany, Italy & Middle East. General has approval for this product from most consultants in India & abroad.

2. **Raw Materials:** There are basically three raw materials that go in to manufacturing of Tube Skin, Thermocouple, they are as given below.

   Basic Mother Tube: This is mostly SS310, SS446, Inconel® 600, Incoloy® 800 etc. This tube is required in seamless form and as it goes under several reduction, quality of input tube has to be very good. In view of this, tubes are procured only from established mills.

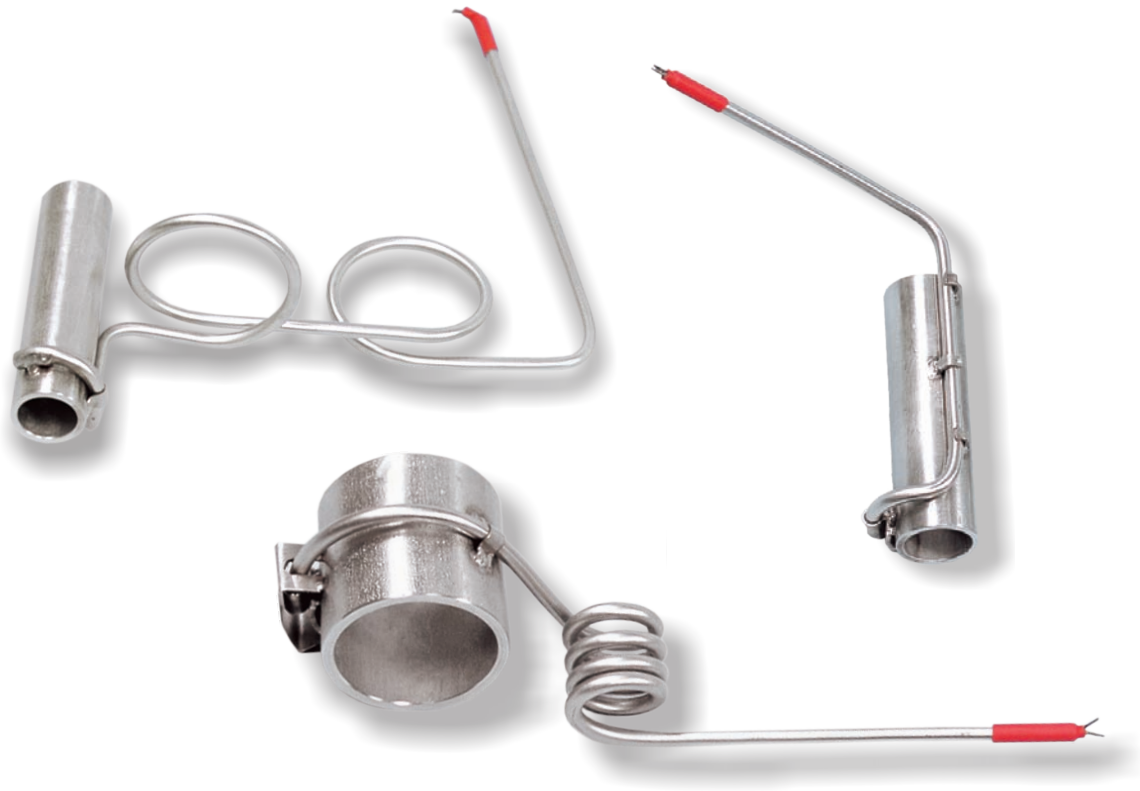
   Insulators: MgO is used as mineral insulation. The material is imported from a German company - Who are pioneers in this field worldwide. The purity is very important for long life of thermocouple. We use over 99% pure MgO.

   Conductor: Type K in most cases, conductors are of virgin quality. The initial conductor calibration as well as final calibration falls within half tolerance as a standard.

3. **Manufacturing Process of Mineral Insulated Thermocouple Thick-wall Cable (MITTC):** The manufacturing process involves cold drawing and heat treatment. The three raw materials are assembled as per requirement and are cold drawn on draw benches. The heat treatment process, in this case strand annealing, is the key area of concern as it decides the final quality of product. General has capability of drawing and annealing in very controlled conditions. The annealing is controlled within +/- 2^0C. The heat treatment is requirement to be carried out in hydrogen atmosphere to avoid surface defects as well as partial oxidation of conductor material.

4. Final product conforms to specification as given.

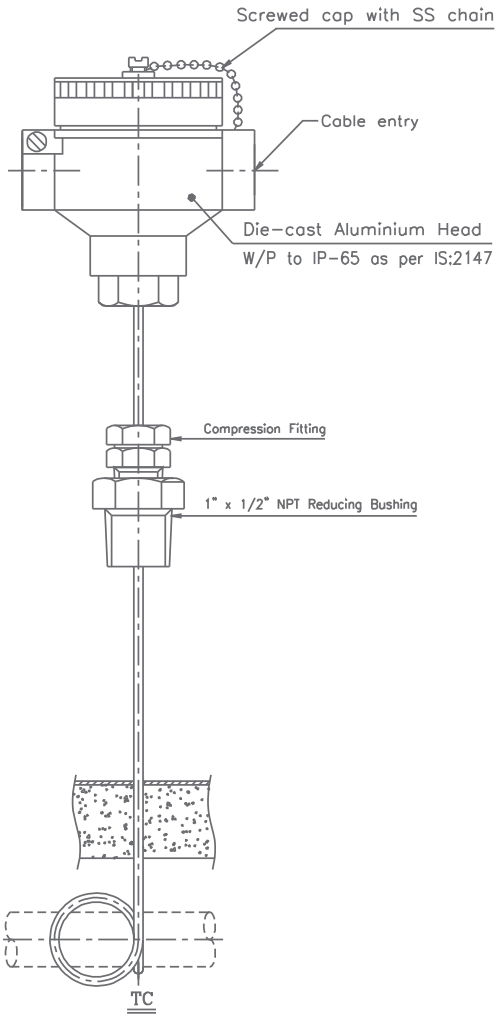
5. **Bending Process & Welding:** After the thick-wall cable is bent on automatic bending machines to get even circular diameters. The bends (D & 2D) are the expansion loops of the thermocouple.

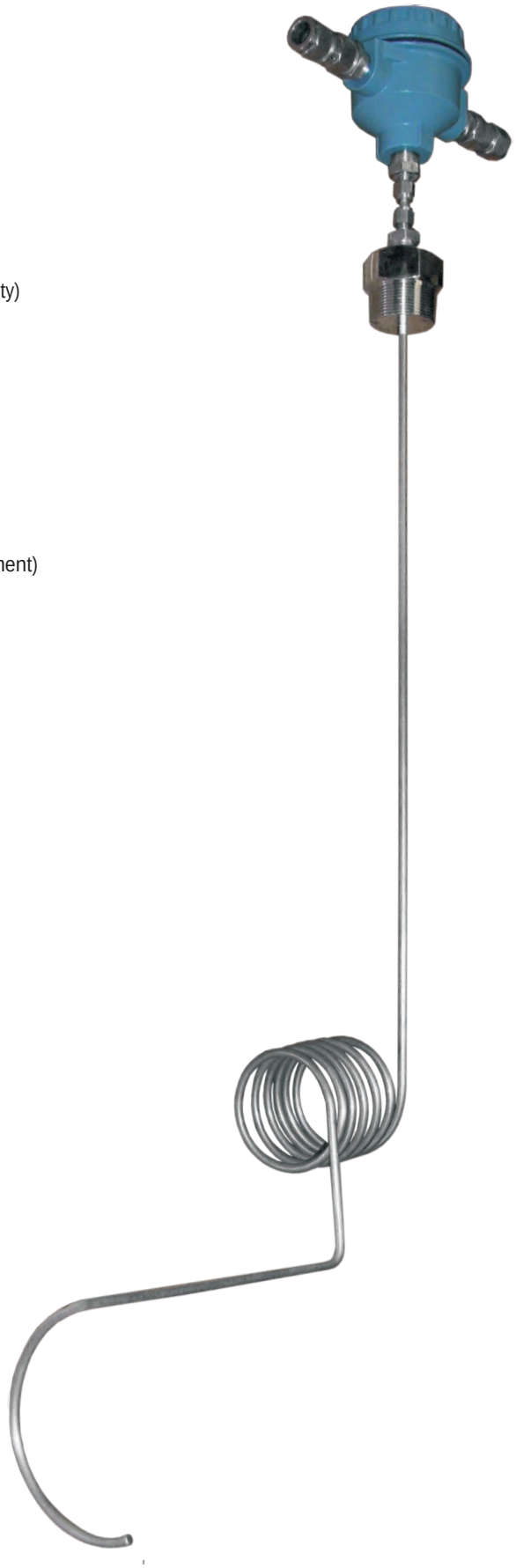


MI Tube Skin Thermocouple Assembly

Specifications

Sheath Materials Offered	: SS446, Inconel® 600/601, SS310 (Other materials on request)
Sheath Diameter	: 9.5, 12.7 mm (½") (Higher diameter on request)
Thermocouple Types	: ANSI Type K, J, E, N
Conductor Diameter	: 1.8 mm (nominal) for 12.7 mm OD
Sheath Thickness	: 3.20 mm (nominal) for 12.7 mm OD
Insulation Material	: Compact mass of MgO (99% min Purity)
Insulation Resistance	: > 100 M Ohm @ 500VDC (Before grounding)
Calibration	: ANSI MC 96.1 / IEC 584 (Special Tolerance)
Response Time	: 10 seconds (after grounding)
Heat Shield	: Provided on request
Junction Type	: Grounded, Knife Edge Wedge Type
Expansion Loop	: Provided ex-factory (In accordance with customer requirement)





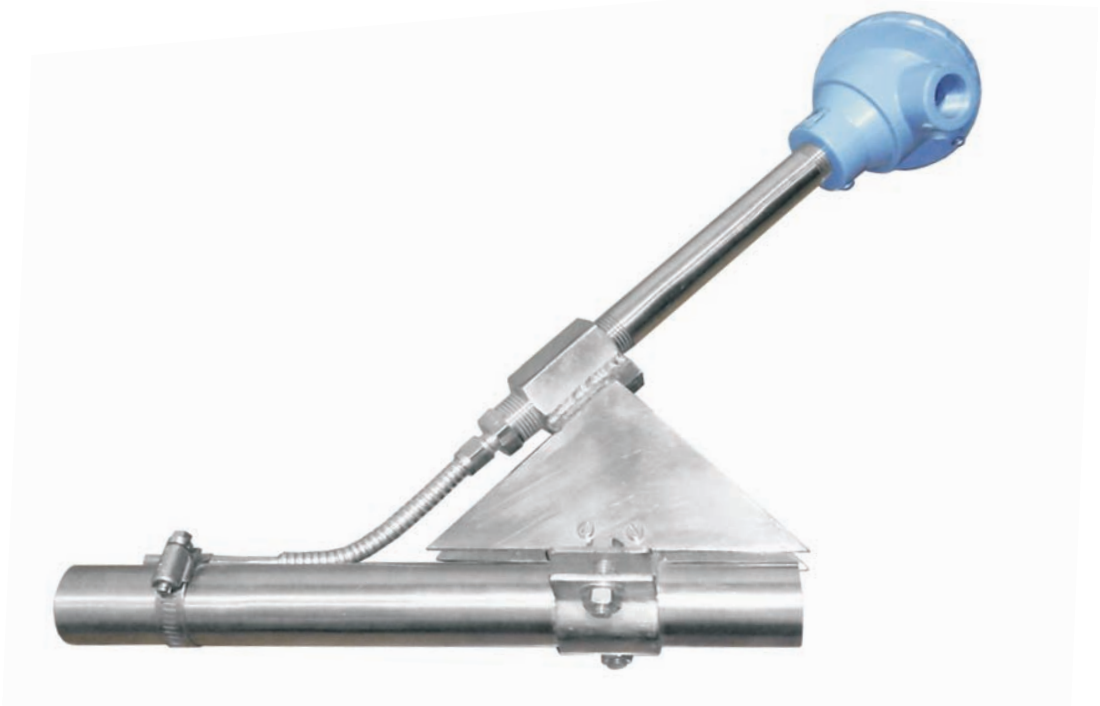
Welding Procedure

1. Grind the surface of heater tube in the area of thermocouple junction location for removing scale and rust. Clean the area.
2. Clamp the thermocouple in the desired location.
3. Centre of the wedge type pad must be ensured to be in contact with the heater tube.
4. Perform root weld pass on both sides of the pad using 1.57 mm dia filler rod. Welds must overlap each other & run full length of the pad.
5. Perform secondary weld pass on both sides of the pad using 2.36 mm dia filler rod. Welds to run full length of the pad.
6. Perform final weld pass on both sides of the pads using 2.36 mm dia filler rod. Welds must extend 9.5mm minimum above tube surface & run full length of the pad.
7. For transverse mounted thermocouple, locate the retaining clip at the tangent point of the thermocouple and tube & weld at both ends using 2.36 mm dia filler rod.
8. For Axial mounted thermocouple, locate the retaining clip as desired & weld as mentioned under point no. 7 above.

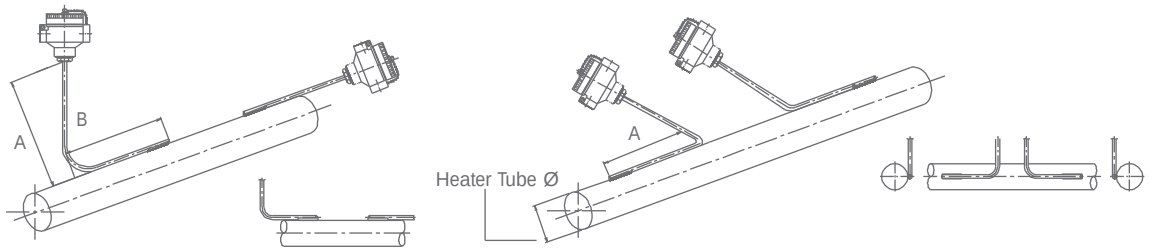
Recommended weld filler rod material for SS446 sheathed thermocouple

HEATER TUBE MATERIAL	FILLER ROD MATERIAL
ASTM A312 TP 304, TP 309, TP 310	SS309-AWS A5.9, Class ER 309
ASTM A321 (Ti Stabilised)	SS309-AWS A5.9, Class ER309
ASTM A3347 (Cb Stabilised)	SS309-AWS A5.9, Class ER309
ASTM A335 P11, P22, P5, P9, ASTM A106	Inconel® 82-AWS A5.14, Class ER Ni Cr 3
Incoloy® 800	Inconel® 82-AWS A5.14, Class ER Ni Cr 3

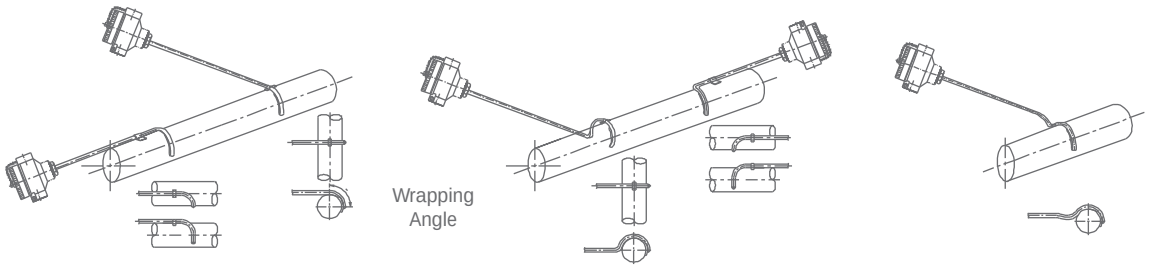
Note: Filler rods & welding procedures for other sheath materials, types of thermocouples will be furnished on request



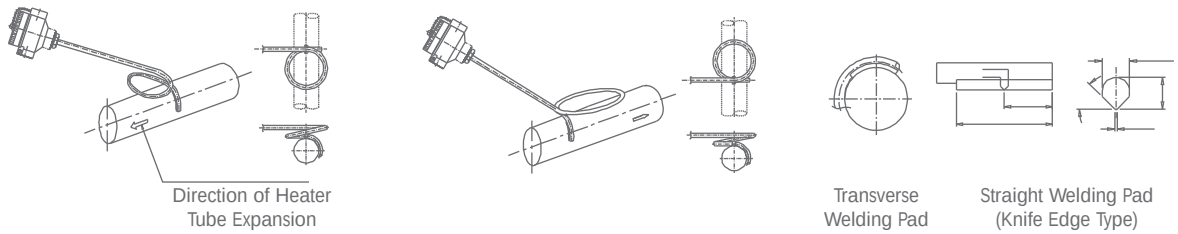
Typical Installations of Tube Skin Thermocouple



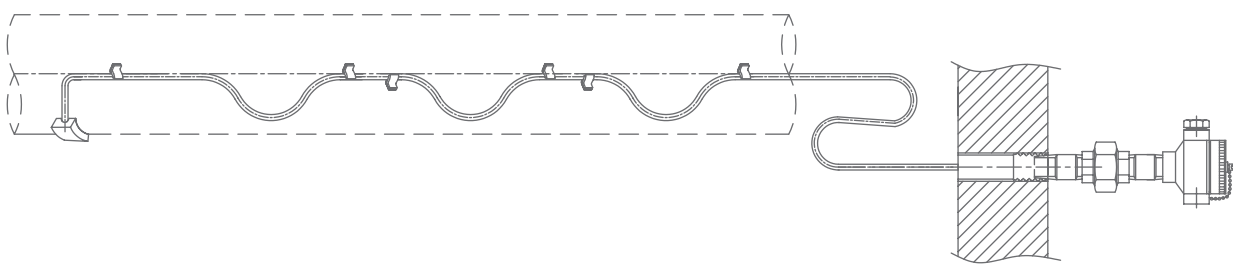
Right angle / Straight Mounting



Wrap up angular mounting



Mounting with expansion loop



Special Skin Type Thermocouple Assembly

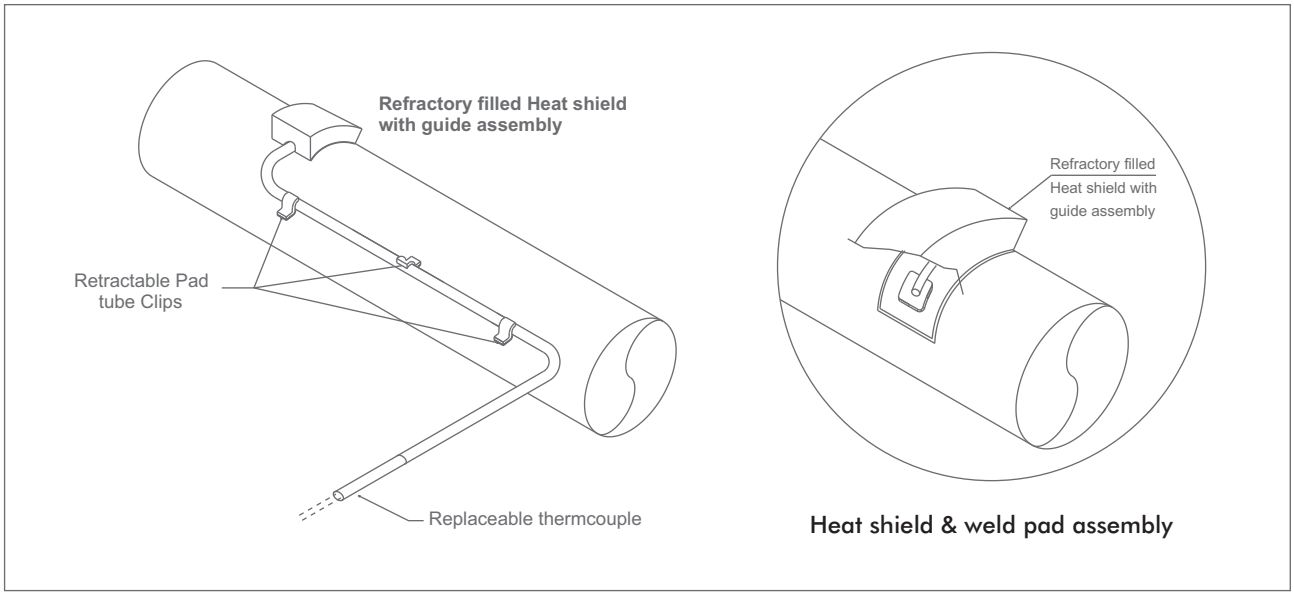
Retractable Type Tube Skin Thermocouples

Conventional Tube Skin Thermocouple are to be welded to the heater tube. As this is hot working on heater tube, it poses several problems in terms of maintenance and longer shut down time. Each and every time a conventional tube skin thermocouple is installed, the heater tubes are required to be pressure tested as it has undergone welding.

Our retractable type thermocouples make replacement of thermocouple possible without any welding or any hot work on the tube. This results in significant amount of saving in terms of time as well as shut down costs.

Major differences between conventional knife edge type thermocouple and retractable type thermocouple:

KNIFE EDGE TYPE	RETRACTABLE TYPE
■ Weld pad welded to thermocouple	■ Weld pad fabricated has guide assembly.
■ Weld Clips hold thermocouple in place can be used only once	■ Weld Clips can be reused.
■ Thermocouple cannot be removed without hot work on tube.	■ Thermocouples are replaceable without performing hot work on heater tube.



Typical installation

Multipoint Thermocouple Assemblies

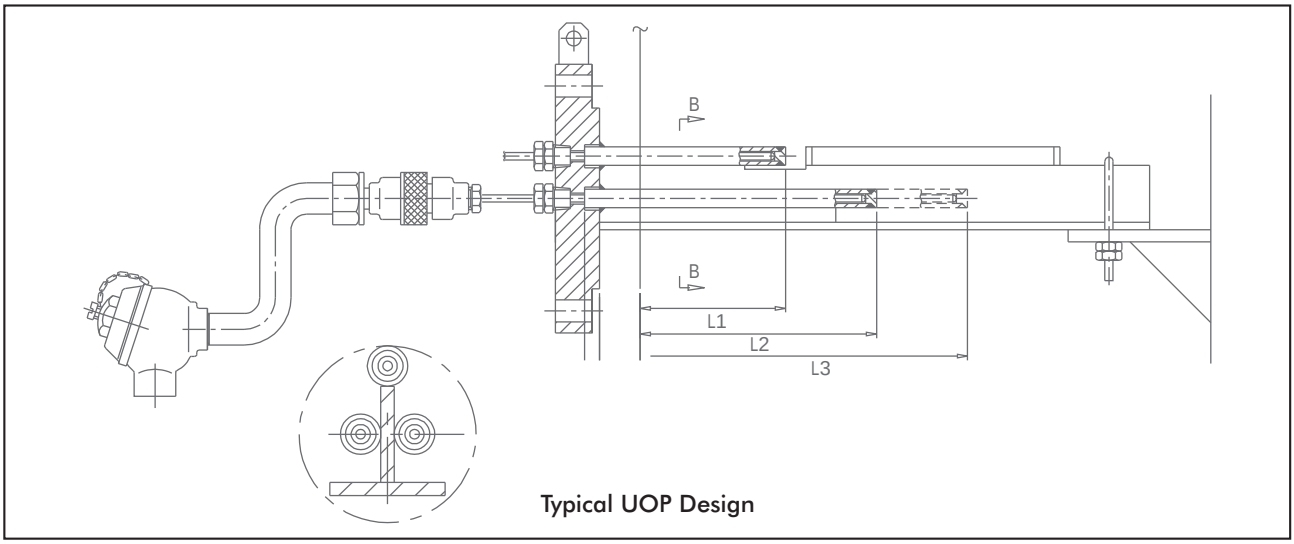
Features

- Ideal for measuring temperature at various elevations
- Fully tailormade
- Proven track record in cross section of industries
- Can be offered with practically any length
- Cost effective & overcomes space limitation
- Different thermocouples with varied MOC possible.
- Construction enables user to remove thermocouple for maintenance

Where space limitations and cost consideration are of prime importance, multi-point thermocouple assemblies come into picture which are used for measuring and controlling temperature in a reactor having different temperature zones. Any thermocouple assembly with measuring junctions located at more than a one-immersion depth is commonly referred to as a multi-point. As the number of variations possible in multi-point assemblies is virtually limitless they are generally designed and manufactured to meet the requirements of individual applications. As different multi-point designs vary tremendously, careful consideration should be given to such variables as the positive location of measuring junctions and the ease/cost of replacement.

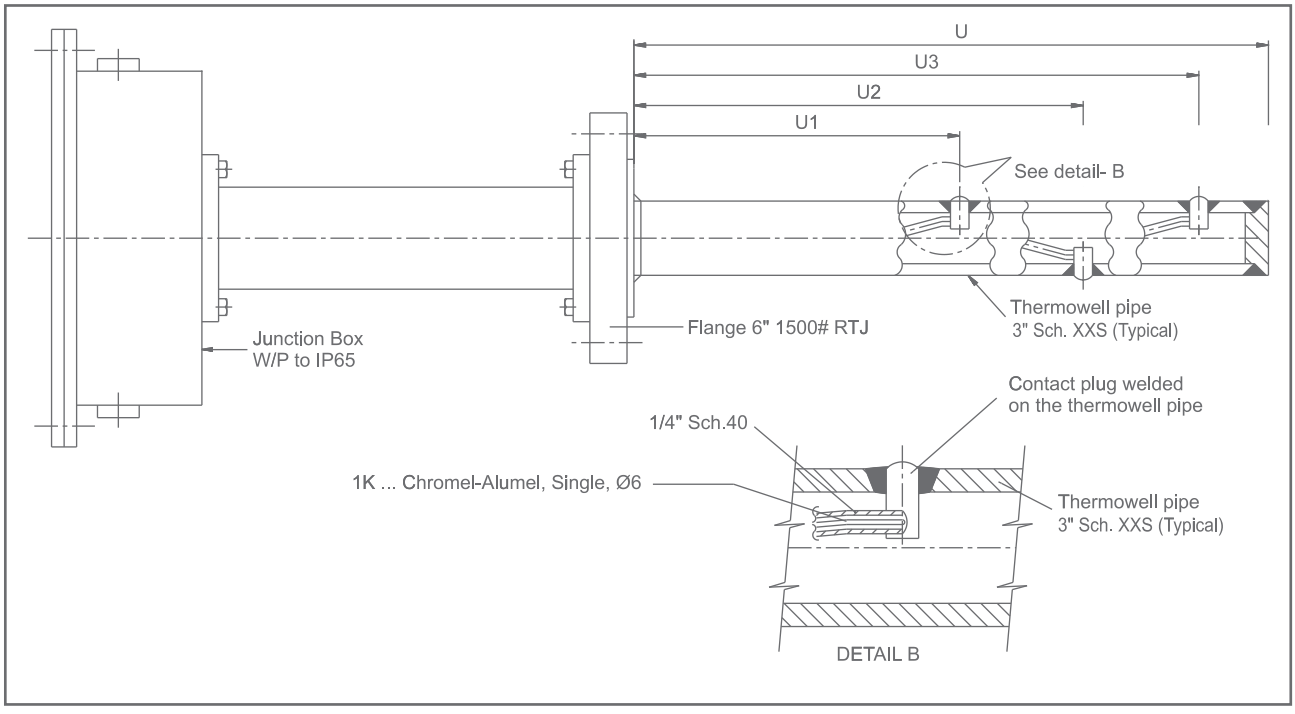
General with its vast experience has designed and developed several types of multipoint assemblies, which are performing satisfactorily at hundreds of installations in several parts of world. Some designs allow for replacement of individual elements while others require replacement of the entire assembly. In either case, complete shut down of the process line may not be required depending upon important design considerations. Testing of multipoint is another specialised area. Our manufacturing set-up is equipped with all latest testing equipments to perform all stringent tests.

Major user industries: Refineries & Petrochemical, Oil & Gas, Chemical & Fertiliser.

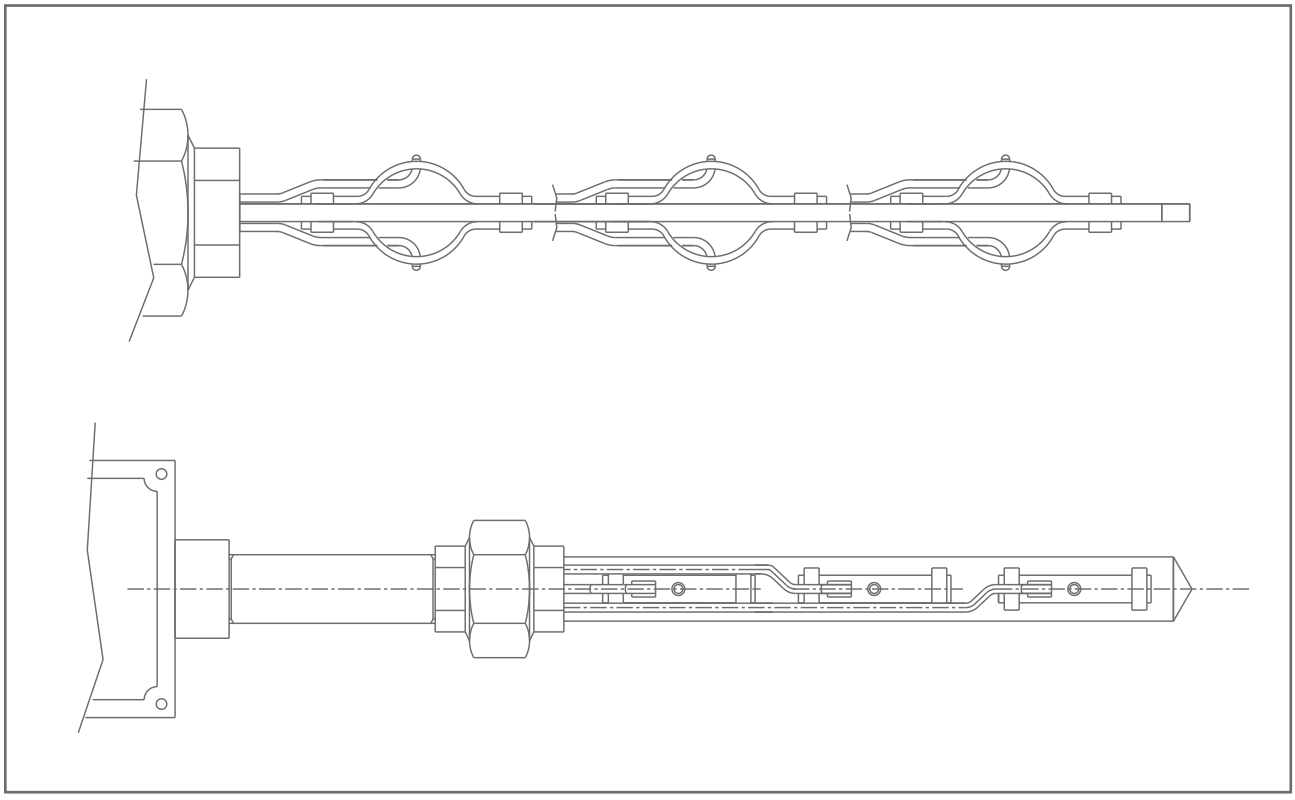


Typical UOP Design

Typical Constructions



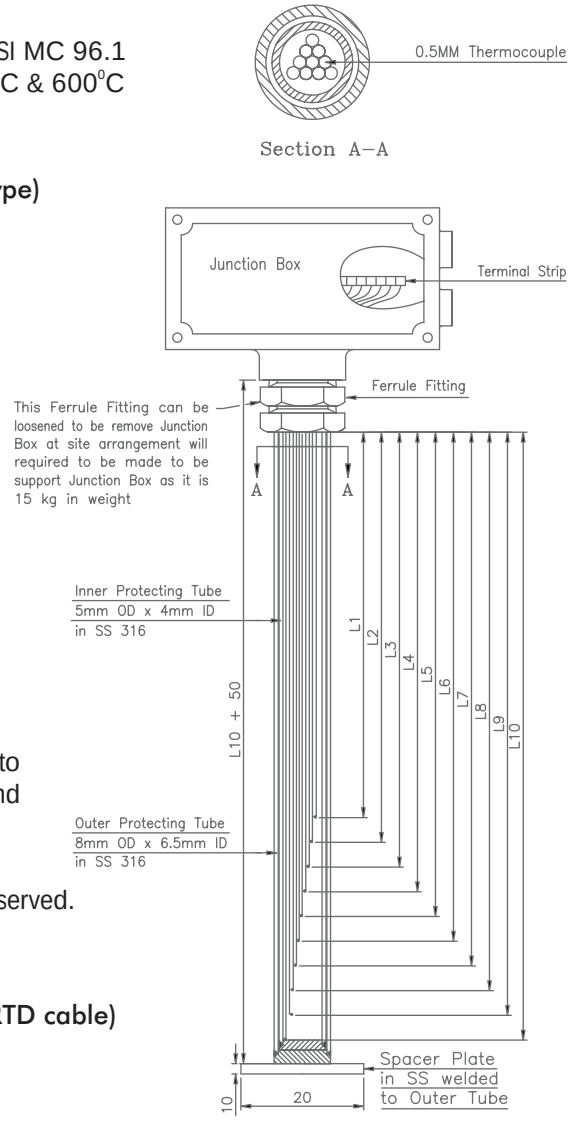
Thermocouples at various levels inserted in individual guiding tubes which in turn are welded to outer protecting tube as shown.



Spring loaded (with the help of 'S' spring or leaf spring) thermocouples located at various points mounted on a plate enclosed in a protecting tube as shown above. The springs ensure proper contact with the protecting tube. As many as 33 points assembly was supplied as import substitution for a reputed fertiliser plant.

In-House tests carried out for thermocouple assemblies

1. **Calibration**
   Thermocouple calibration in accordance with IEC 584 / ANSI MC 96.1 Class 1 & 2. Typical test is conducted at two points viz. 100°C & 600°C for J, K, E & at 100°C & 900°C or 1100°C for R, S & B type. Optionally for 3 points or more on request.
2. **Insulation Resistance Test at ambient at 500 VDC (MI type)**
   Should be more than 100 M ohms for sheath OD greater than 3 mm
   Should be more than 100 M ohms at 75 V DC in case of sheath OD 1 to 3 mm
3. **Insulation Resistance Test at 540°C at 500 VDC**
   IR should be more than 2 M ohms as standard.
   IR > 20 M ohms can also be offered on request.
4. **N_2 Leakage Test**
   For thermocouple tip sensor after cap welding the same test is conducted & no leakage should be observed at 40 kg/cm^2 as per IEC 1515.
5. **Response Time Test/Thermal Cycling/Thermal Inertia**
   As per IS7358 - ASTM E-839 (63.2% step change from ambient to 80° C)
6. **Flame Test**
   This test is applicable for multipoint thermocouple assembly to find out exact location of thermocouple in protecting tube and to ensure touching of thermocouple tip to tube.
7. **Continuity Test: By using continuity tester/multimeter**
   To confirm the element is proper and no open junction is observed.
8. **Grounding & Ungrounding Junction**
   By using continuity tester/multimeter.
9. **Ductility - (Bending Test) - (For MI thermocouple & MI RTD cable)**
   Minimum bending radius should be 5 times sheath OD.
10. **Sheath Integrity Test - Water Immersion test**
    To check sheath integrity of mineral insulated (MI) thermocouple/RTD cable.
11. **Dye Penetration Test**
    For skin type Dye Penetration test for weld joints of weld pad and tip of sensor.
12. **Helium Leak Test** on request.



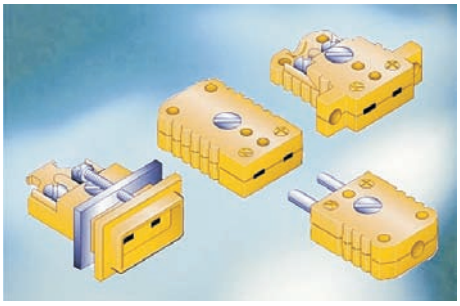
Miniature Multipoint Thermocouple Assembly with 0.5 mm OD Thermocouple

Standard Thermocouple Connectors

Type : Suitable for Thermocouple & RTD
Construction : Solid Round Pin, Polarized Pins, Molded Barrier to prevent Short Circuit. Spring Loaded to ensure full contact
Body Material : Thermoplastic Compound
Operating Temperature : Permanent 200°C, Short Term upto 250°C
Connection : Stainless Steel Screws & Plates

Miniature Thermocouple Connectors

Type : Miniature - Suitable for Thermocouple & RTD
Construction : Solid Round Pin, Polarized Pins, Molded Barrier to prevent Short Circuit. Spring Loaded to ensure full contact
Body Material : Thermoplastic Compound
Operating Temperature : Permanent 200°C, Short Term upto 250°C
Connection : Stainless Steel Screws & Plates



Connector Colour Code

Thermocouple Type	Iron-Constantan	Chromel – Alumel	Copper – Constantan	Pt PtRh 10%	Pt PtRh 13%	Uncompensated (Cu)
T/C Code ANSI IEC	J type Black Black	K type Yellow Green	T type Blue Brown	S type Green Orange	R type Green Orange	U White White

Wire Clamp Bracket

Wire clamp bracket will provide optimum strain relief. Construction allows a large difference in maximum and minimum wire diameter

Material : Stainless Steel
Type : Available for Standard & Miniature Plug & Jacks

Crimp Bushing

Used for Clamping of extension and mineral insulated Thermocouple wires.

Material : Brass
Typical Diameters : 1.1 mm, 1.7 mm, 2.1 mm, 3.1 mm, 3.3 mm, 3.5 mm, 4.0 mm, 5.2 mm.
Shapes : Hex for Miniature & Square for Standard

Grommet

Fitted in entrance hole of the connector. Prevents moisture & dust or dirt particles from entering the connector, hence increasing reliability of functionality

Material : Neoprene
Types : Available for Standard & Miniature Plug & Jacks