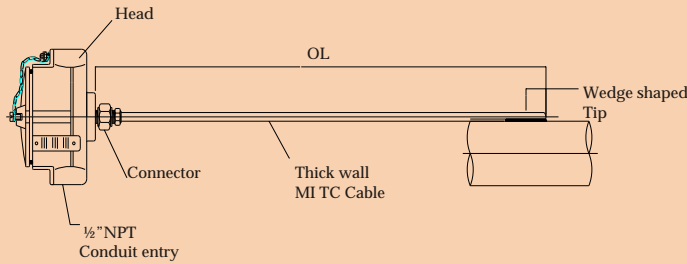
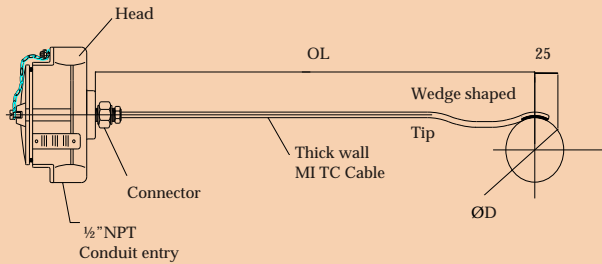


800 Series Wedge shaped Skin Thermocouples



INSTALLATION CODE 1



INSTALLATION CODE 2

- Almost accurate temperature measurements of :
 - Fired Heater tubes
 - Boiler Tubes
 - Reformer tubes
 - Thick wall for longer usage life.
 - Grounded hot junction in a "Wedge Shaped" tip for direct welding to tube surface.
 - Flameproof or weatherproof head in 316SS or Aluminum
 - Many Thermocouple Types and sheath materials to choose from.

Code	No of Elements
1	Simplex
2	Duplex

Code	Options
0	None
1	Head in 304SS
2	Head in 316SS
3	Extension in 304SS
4	Other Conduit entry
6	In Head Transmitter
7	Brass Cable Gland
8	SS Cable Gland
10	Special requirement
31	Spring loaded cover
32	UnGrounded junction

Code	Elements
J	Iron-Constantan
K	Chromel-Alumel
E	Chromel-Constantan
N	Nicrosil Nisil

Code	Sheath Dia	Nominal wire gauge	
		(S)	(D)
12.7	12.7mm	14AWG	16AWG
10.0	10.0mm	16AWG	18AWG

Code	Tube OD
D	Define

Code	Overall Length
OL	Define OL=U+T+95

Code	Sheath Material
446	446SS
310	310SS
Inc 6	Inconel 600
Inc 8	Incoloy 800

Code	Expansion Loop
N	None

Code	Head Type
D	Weatherproof
F	Flameproof IIA/IIB
C	Flameproof IIC
JB	Junction Box

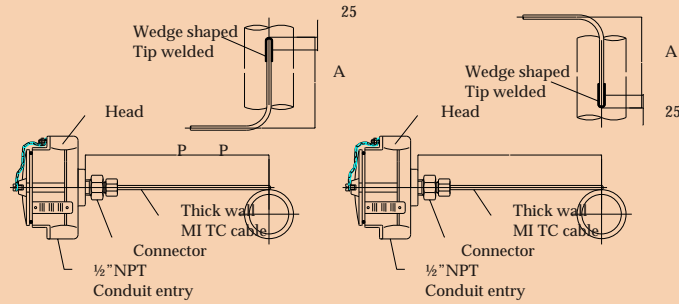
Code	Installation Type
1	Axial with tube
2	Perpendicular to tube axis

Code	No of entries
1	One entry
2	Two entries

ORDERING EXAMPLE
800 SERIES 1-K-12.7-446-D-1-1-N-OL-D-Op0

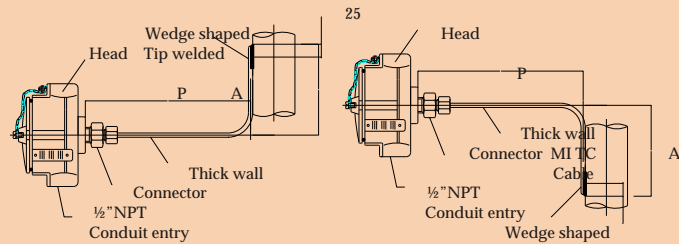
810 Series Wedge shaped Skin Thermocouples

- Almost accurate temperature measurements of :
- Fired Heater tubes
- Boiler Tubes
- Reformer tubes
- Thick wall for longer usage life.
- Grounded hot junction in a "Wedge Shaped" tip for direct welding to tube surface.
- Flameproof or weatherproof head in 316SS or Aluminum.
- Retaining Clamp furnished.
- Many Thermocouple Types and sheath materials to choose from.



INSTALLATION CODE 3

INSTALLATION CODE 4



INSTALLATION CODE 5

INSTALLATION CODE 6

Code	No of Elements
1	Simplex
2	Duplex

Code	Options
0	None
1	Head in 304SS
2	Head in 316SS
3	Extension in 304SS
4	Other Conduit entry
6	In Head Transmitter
7	Brass Cable Gland
8	SS Cable Gland
10	Special requirement
31	Spring loaded cover
32	UnGrounded junction

Code	Elements
J	Iron-Constantan
K	Chromel-Alumel
E	Chromel-Constantan
N	Nicrosil Nisil

Code	Sheath Dia	Nominal wire gauge	
		(S)	(D)
12.7	12.7mm	14AWG	16AWG
10.0	10.0mm	16AWG	18AWG

Code	Tube OD
D	Define

Code	Sheath Material
446	446SS
310	310SS
Inc 6	Inconel 600
Inc 8	Incoloy 800

Code	Tube OD
D	Define

Code	Head Type
D	Weatherproof
F	Flameproof IIA/IIB
C	Flameproof IIC
JB	Junction Box

Code	Options
Code	Tube OD
D	Define
Code	Axial Length
A	Define A
Code	Perpendicular Length
P	Define 'P'=U+T+95
Code	Expansion Loop
N	None
Code	Installation Type
3	Perpendicular to tube axis & 90°left Coaxial bend.
4	Perpendicular to tube axis & 90°right Coaxial bend.
5	Perpendicular to tube axis & 90°left 'side' bend.
6	Perpendicular to tube axis & 90°right 'side' bend.

Code	Head Type
D	Weatherproof
F	Flameproof IIA/IIB
C	Flameproof IIC
JB	Junction Box

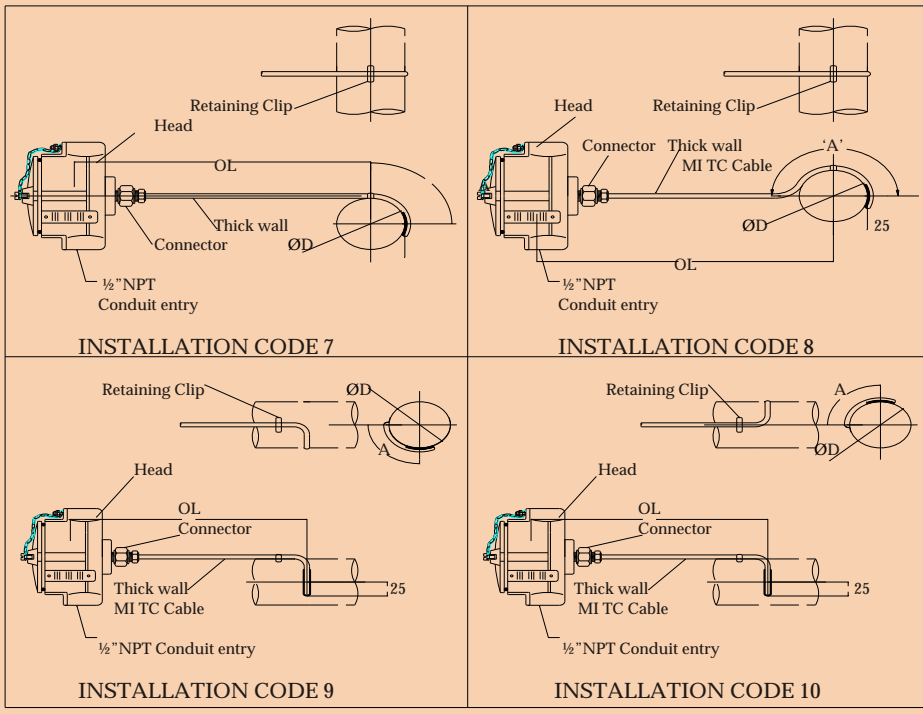
Code	No of entries
1	One entry
2	Two entries

ORDERING EXAMPLE
810 SERIES 1-K-12.7-446-D-1-1-N-P--A-D-Op0

820 Series

Wedge shaped Skin Thermocouples

- Almost accurate temperature measurements of :
 - Fired Heater tubes
 - Boiler Tubes
 - Reformer tubes
 - Thick wall for longer usage life.
- Grounded hot junction in a "Wedge Shaped" tip for direct welding to tube surface.
- Flameproof or weatherproof head in 316SS or Aluminum.
- Hot end designed tow rap round the tube.
- Many Thermocouple Types and Sheath materials to choose from.



Code	No of Elements
1	Simplex
2	Duplex

Code	Elements
J	Iron-Constantan
K	Chromel-Alumel
E	Chromel-Constantan
N	Nicrosil Nisil

Code	Sheath Dia	Nominal wire gauge	
		(S)	(D)
12.7	12.7mm	14AWG	16AWG
10.0	10.0mm	16AWG	18AWG

Code	Sheath Material
446	446SS
310	310SS
Inc 6	Inconel 600
Inc 8	Incoloy 800

Code	Head Type
D	Weatherproof
F	Flameproof IIA/IIB
C	Flameproof IIC
JB	Junction Box

Code	No of entries
1	One entry
2	Two entries

Code	Options
0	None
1	Head in 304SS
2	Head in 316SS
3	Extension in 304SS
4	Other Conduit entry
6	In Head Transmitter
7	Brass Cable Gland
8	SS Cable Gland
10	Special requirement
31	Spring loaded cover
32	UnGrounded junction

Code	Tube OD
D	Define

Code	Overall Length
OL	Define OL=U+T+95

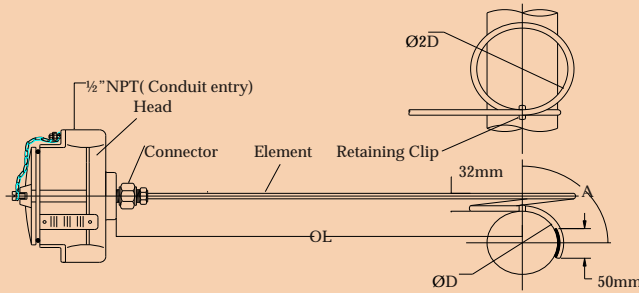
Code	Expansion Loop
N	None

Code	Installation Type
7	Perpendicular to tube axis & with wrap around angle A=90°
8	Perpendicular to tube axis & with wrap around angle A=180°
9	Axial with tube with wrap around angle A=90° on right side of tube
10	Axial with tube with wrap around angle A=90° on left side of tube

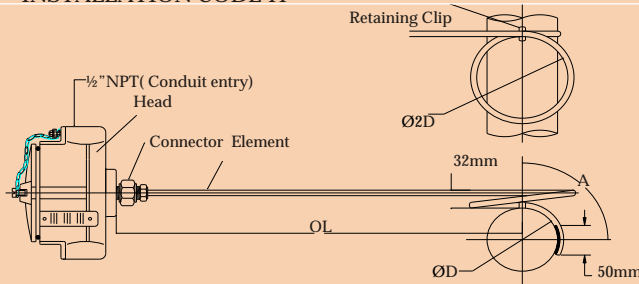
ORDERING EXAMPLE
820 SERIES 1-K-12.7-446-D-1-8-N-OL-D-Op0

830 Series

Wedge shaped Skin Thermocouples



INSTALLATION CODE 11



INSTALLATION CODE 12

- Almost accurate temperature measurements of :
- Fired Heater tubes
- Boiler Tubes
- Reformer tubes
- Thick wall for longer usage life.
- Grounded hot junction in a “Wedge Shaped” tip for direct welding to tube surface.
- Flameproof or weatherproof head in 316SS or Aluminum.
- Expansion loop furnished.
- Hot end designed to wrap round the tube
- Many Thermocouple Types and sheath materials to choose from.
- Retaining Clamp furnished.

Code	No of Elements
1	Simplex
2	Duplex

Code	Elements
J	Iron-Constantan
K	Chromel-Alumel
E	Chromel-Constantan
N	Nicrosil Nisil

Code	Sheath Dia	Nominal wire gauge	
		(S)	(D)
12.7	12.7mm	14AWG	16AWG
10.0	10.0mm	16AWG	18AWG

Code	Sheath Material
446	446SS
310	310SS
Inc 6	Inconel 600
Inc 8	Incoloy 800

Code	Head Type
D	Weatherproof
F	Flameproof IIA/IIB
C	Flameproof IIC
JB	Junction Box

Code	Options
0	None
1	Head in 304SS
2	Head in 316SS
3	Extension in 304SS
4	Other Conduit entry
6	In Head Transmitter
7	Brass Cable Gland
8	SS Cable Gland
10	Special requirement
31	Spring loaded cover
32	UnGrounded junction

Code	Tube OD
D	Define

Code	Overall Length
OL	Define OL=U+T+95

Code	Expansion Loop
Y	2 times the dia 'D'

Code	Installation Type
11	Perpendicular to tube axis with left loop and wrap around angle A=90°
12	Perpendicular to tube axis with right loop and wrap around angle A=90°

Code	No of entries
1	One entry
2	Two entries

ORDERING EXAMPLE
830 SERIES 1-K-12.7-446-D-1-12-Y-OL-D-Op0

Pyro Electric Instruments Goa Pvt Ltd.

Office : G/B, Hill Crown Apartments, College Road, Mapusa, Goa 403507; Email: pyroadmin@pyro-electric.in



**PYRO ELECTRIC
INSTRUMENTS**

**Specialists in High Technology
Temperature Measurement**

**"Wedge Shaped"
Skin Thermocouples**

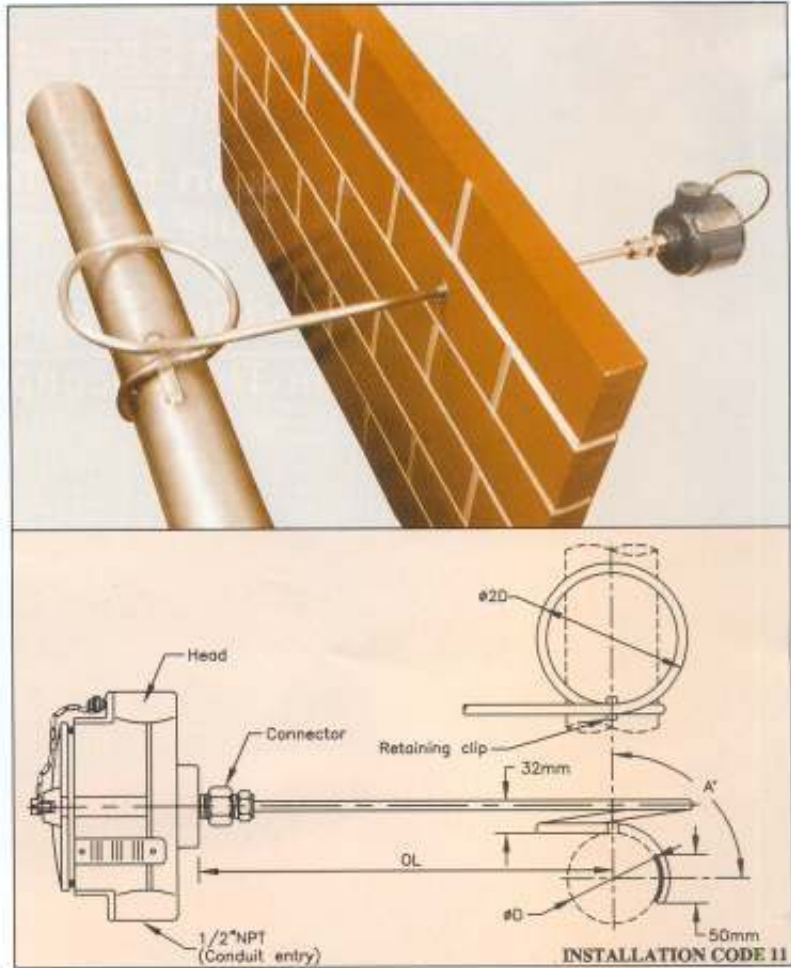
**ISO 9001
Registered**



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"Wedge shaped" Skin Thermocouples

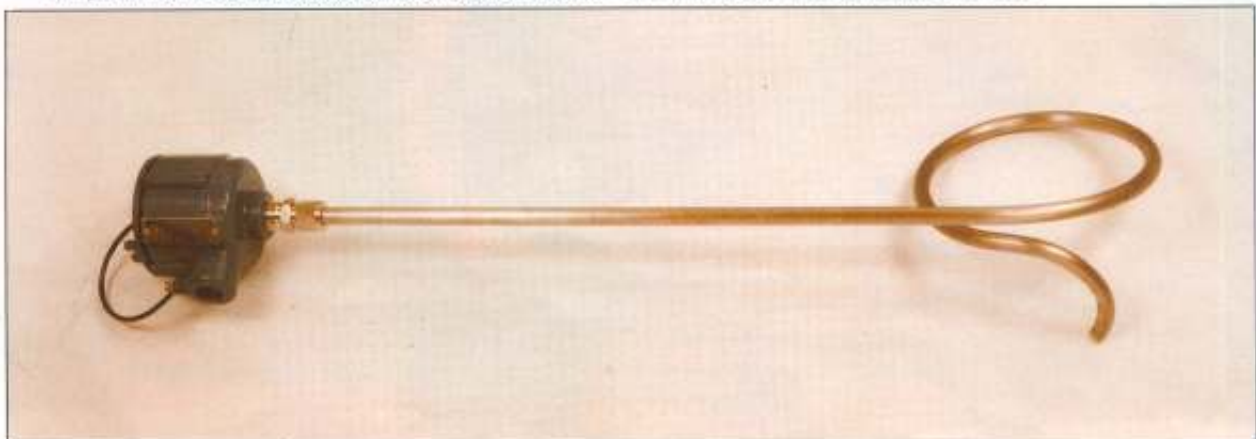
- **"Wedge shaped" Skin Thermocouples for Fired heater and industrial boiler tubes.**
- **Thick wall for longer usage life.**
- **Grounded hot junction in a "Wedge shaped" tip for direct welding to a tube surface.**
- **Available in various sheath materials and Thermocouples types.**
- **12 Factory formed designs to choose from.**
- **Self supporting due to high strength of sheath at elevated Temperatures.**
- **Thermocouples are pliable and can be easily routed within the fired heater box or furnace.**



Measurement of surface temperature of refinery fired heater tubes is difficult because of the high temperature gases and fumes which surround these tubes. These gases are 300 to 400 deg C hotter than the heater tube at the point of measurement. This aspect and the heat transfer along the length of Thermocouple sheath to its point of attachment on the heater tube tends to cause the Thermocouple to show relatively higher temperature than the desired wall temperature. This problem can get aggravated if there is direct flame impingement at the point of attachment of Thermocouple to the heater tube.

Best results can be obtained by grounding the Thermocouple hot junction in "Wedge shaped" tip and attach the same by TIG welding to the tube surface.

"Wedge shaped" Skin Thermocouples are perhaps, most ideal for the reliable monitoring of tube surface temperatures in fired heaters, for the prolonged tube life and ensuring safe and efficient operation.



PYRO ELECTRIC INSTRUMENTS GOA PVT.LTD.

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Email : sales@pyroelectricgoa.com, pyrogow@sanchinet.in

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MUMBAI OFFICE : Unit 1A, Industrial House, Dhagaji Keer Marg, Mahim, Mumbai 400 016 (India)

Tel. : (022) 24461547 Tel/Fax : (022) 24459936 Cell: 38970341 Email : pyroelectric@sify.com Visit us at www.pyroelectricgoa.com



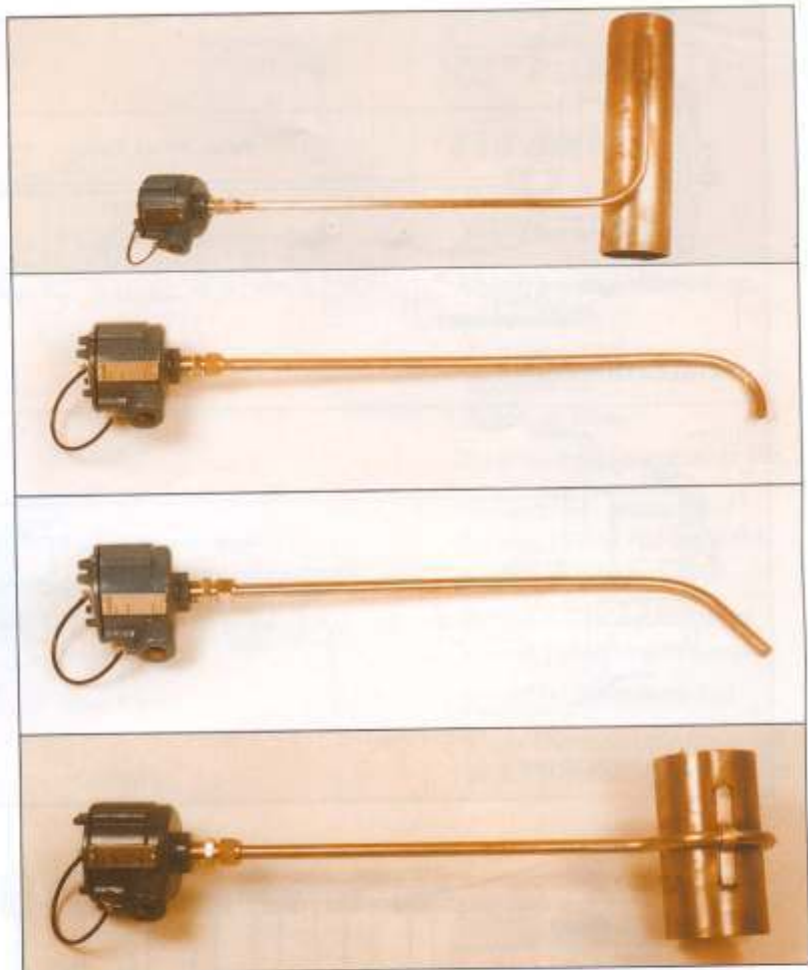
PYRO ELECTRIC INSTRUMENTS

"Wedge shaped"

**Skin Thermocouples
offer**

**many advantages for
temperature measurement**

- **Thick wall sheath and compact mass of MgO isolate the thermocouple conductors from combustible products, ensuring a long and drift free usable life.**
- **The Thermocouples are self supporting within the fired heater box or in the furnace because of the inherent high temperature strength of thick wall sheaths.**
- **Terminal heads can be mounted directly to the Thermocouple cold end with the help of a compression fitting.**
- **Thermocouple sheaths are pliable enabling easy routing and installation.**

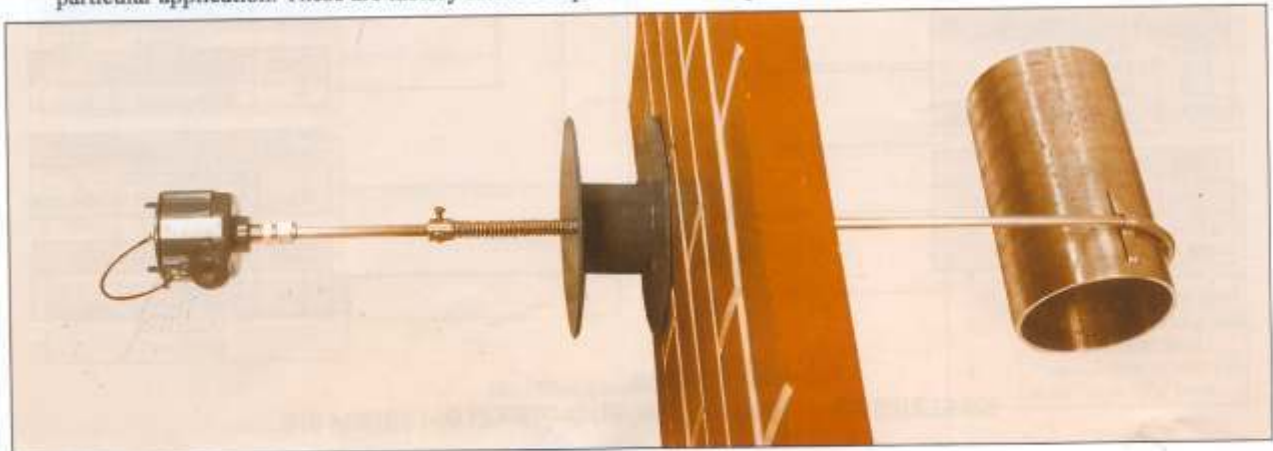


"Wedge shaped" skin Thermocouple is 10mm or 12.7mm diameter with a sheath wall thickness of nominal 3mm. The insulating material is highly compacted magnesium oxide (MgO).

The Thermocouple junction is grounded into a "Wedge shaped" tip enabling a direct and totally metallic heat transfer path from the tube wall to the hot junction of Thermocouple. Firm attachment of "Wedge shaped" tip to the heater tube by TIG weld joint, almost eliminates effect of hot combustion gases on the measurement by Thermocouple.

"Wedge shaped" skin Thermocouple offers most accurate measurements, improved longevity, better reliability and ease of installation for tube skin temperature measurement.

Twelve standard installation configurations of the "Wedge shaped" skin Thermocouples are available to fit a particular application. These are factory formed as per customers requirement.



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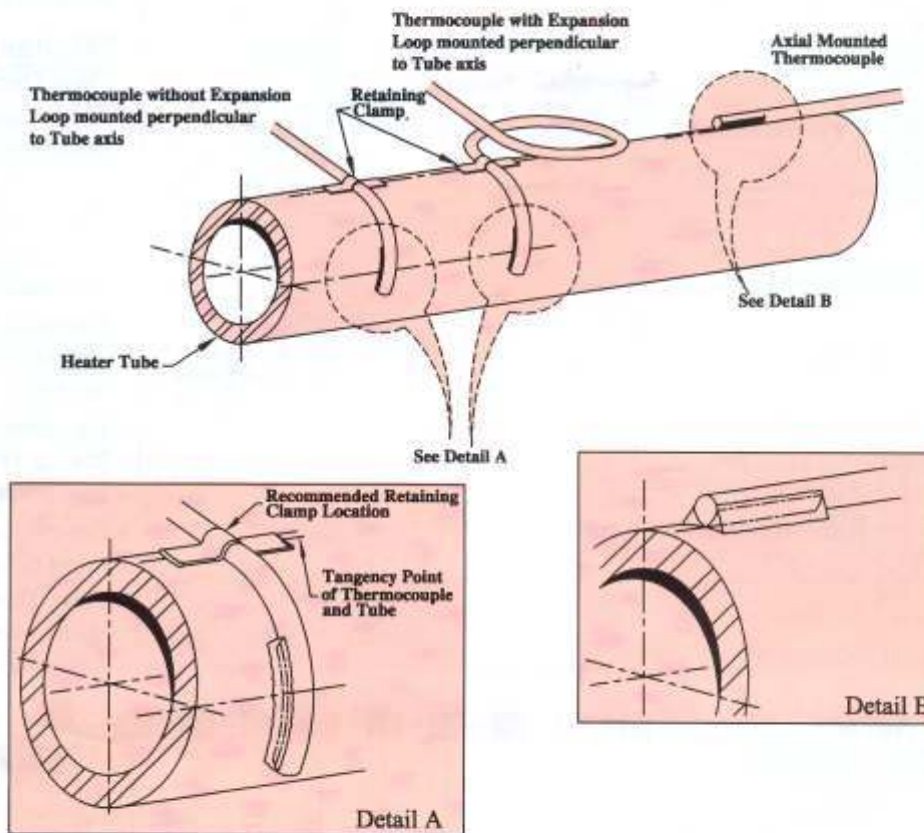
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Tel : (022) 24461547 Tel/Fax : (022) 24459936 Cell: 38970341 Email : pyroelectric@sify.com Visit us at www.pyroelectricgoa.com



"Wedge shaped" Skin Thermocouples



INSTALLATION AND WELDING PROCEDURE

- Clean tube surface area 75mm long in the direction of Thermocouple axis x 50mm wide by grinding or by scrubbing.
- Locate and clamp Thermocouple firmly in desired location. The full length of "Wedge shaped" tip must make firm contact with tube.
- Select filler wire from table.
Welding method: Tungsten Inert gas (TIG).
- Perform root weld pass on both sides of "Wedge shaped" tip using 1.6mm Ø filler wire. Welds must overlap each other at joining point of "Wedge shaped" tip and tube and run full length of "Wedge shaped" tip.
- Perform secondary weld pass on both sides of "Wedge shaped" tip using 2.5mm Ø filler wire. Welds to run full length of "Wedge shaped" tip.
- Allow the weld joint to be cooled to a temperature of 300°C between every pass.
- Perform final weld pass on both sides of "Wedge shaped" tip using 2.5mm Ø filler wire.
- Thermocouples mounted perpendicular to tube axis: Locate Retaining clip at tangency point of Thermocouple and tube and weld at both ends only using 2.5mm Ø filler rod.
- Axial mounted Thermocouples: Locate retaining clip as desired and weld same as step 8.
- Thermocouples requiring configuring or reforming at site should best be done under the supervision of our technician. This involves use of special tools and experienced hand and we will be pleased to depute our technician to solve the site problems.

Heater tube material	Filler wire
300 Series Stainless Steels	309 SS - Class ER 309 - AWS A 5.9
CS (A106Gr B), and Ferritic Steels	Inconel 82- Class ER NiCr 3 AWS A 5.14

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