



Parto Sahand Ara

# TCST

## TEMPERATURE THERMOCOUPLE

THERMOCOUPLE SKIN TUBE





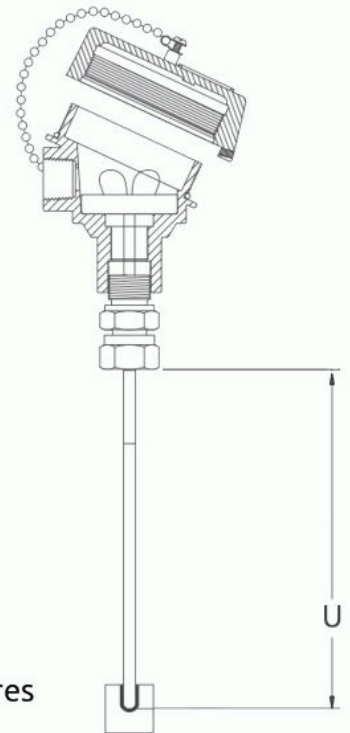
## Thermocouple model : TCST

### Description

TCST tubeskin assemblies are designed to measure surface temperature of pipes and tubes typically located within boilers, cokers, furnaces, heat exchangers, and reactors. This model of thermocouple is typically used within industrial high temperature and/or corrosive environments where fast and accurate temperature measurement is critical. Three common designs are available including the patented V-Pad, Shroud Pad and Weld Pad.

The most important considerations for effective tubeskin design are repeatability, durability and accuracy. To achieve these functions the thermocouple must incorporate within its design excellent insulation properties, material compatibility and good physical contact with the tube. It must also have the ability to withstand high radiant temperatures and stresses, and in some cases harsh combustion chemistry.

With all tubeskin designs the correct installation is of prime importance. Incorrect attachment can ultimately lead to inaccurate temperature readings.



### Applications

- Chemical and petrochemical industries
- Oil and gas industries
- Pulp and paper
- Energy and power plant technology
- Furnaces, kilns, ovens and boilers
- Power and utilities

### Tubeskin Types



SHROUD PAD



WELD PAD



V-PAD

### Connection Heads



BS



B EX-PROOF





## Thermocouple model : TCST

<b>Sensor Element:</b>	Type K (NiCr-Ni) Type T (NiCr-Ni) Type J (Fe-CuNi) Type E (NiCr-CuNi) Type N (NiCrSi-NiSi)
<b>Temperature range:</b>	-200 °C to +1260 °C (depending upon element)
<b>Number of sensors:</b>	2-wire single circuit/4-wire dual circuit

## Features:

**The patented V-Pad design includes a machined v-shaped block that is welded to the mineral insulated cable. Features of the V-Pad include:**

- Material compatibility for various service conditions.
- Compaction of the mineral insulation inside of the v-pad protects the measuring junction from radiant temperature influences.
- Thermocouple junction welded to the base of the v-pad.
- The narrow v-shaped block allows a full penetration weld between the junction and tube surface. This eliminates potential air gaps and substantial measurement inaccuracies.
- V-pad block is designed to minimize the conducted heat influence from the mi-cable.
- Fast temperature response behaviour combined with reliability.
- Designed to limit the influence of high radiant temperature at the measuring point.
- Higher accuracy can be achieved with the addition of an optimized shield.

**The Shroud Pad has a shield incorporated into its design. Features of the Shroud Pad include:**

- The shroud is filled with ceramic cement creating a large insulation factor.
- The shroud is contoured to match the tube geometry.
- The shroud is designed to minimize any air space between the ceramic surface of the shroud and tube surface.
- Thermocouple junction has an interference fit with the tube surface when the shroud is welded in place.
- Only single pass welding is required during installation.
- A clamp attachment is available when welding is not an option.

**The Weld Pad is an inexpensive design with the following features:**

- Less accurate than the Shroud and V-Pad designs while maintaining similar repeatability
- Designed for flat or curved surfaces.
- The pad is notched to match the mi-cable diameter. This allows the thermocouple junction to be in close proximity to the measuring surface.
- A shield option is available for greater accuracy.
- Compact design allows for ease of installation when there are space limitations.
- Pad can incorporate any mi-cable diameter.
- An ungrounded thermocouple junction does not create any additional inaccuracies.
- A continuous single-pass weld from the pad to the tube surface is sufficient for attachment.
- Weld pads can be mounted longitudinal or right angled to the pipe surface.



## Thermocouple model : TCST

### Order Code

TCST Configuration	
1	<b>Element</b>
	J Type J (Fe-CuNi) / 0...+760 °C
	K Type K (NiCr-Ni) / 0...+1260 °C
	N Type N (NiCrSi-NiSi) / 0...+1260 °C
	E Type E (NiCr-CuNi) / 0...+870 °C
T Type T (NiCr-CuNi) / 0...+870 °C	
2	<b>Number of sensors</b>
	D Dual
S Single	
3	<b>Wire of sensor</b>
	1 Ø 6.0 mm Flexibility
* Other - please specify	
4	<b>Connection head</b>
	BS BS
	Ex B EX-PROOF
Z Without	
5	<b>Sheath material</b>
	S Steel 316
	G Steel 310
	I Inconel 600
* Other - please specify	
6	<b>A-Dimension (U)</b>
	**** ****mm
7	<b>Terminal block / Transmitter</b>
	1 Terminal block
	2 Transmitter
Z Without	

8	<b>Type pad</b>
	G Shroud Pad
	B Weld pad
	C V-Pad
	T thread 1/2" m
Z Without	
* Other - please specify	
9	<b>Pad material</b>
	F Alumina Ceramic (99.7 % purity)
	C C610 Ceramic (approx. 60 % purity)
	K Silicon Carbide RSiC
	J C799 Ceramic (99.7 % purity)
	S Steel 316
G Steel 310	
I Inconel 600	
* Other - please specify	
10	<b>Certificates calibration</b>
	1 Yes
Z Without	

Additional order details \_\_\_\_\_

TCST-

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