

TC59 Tubeskin Thermocouple Assembly



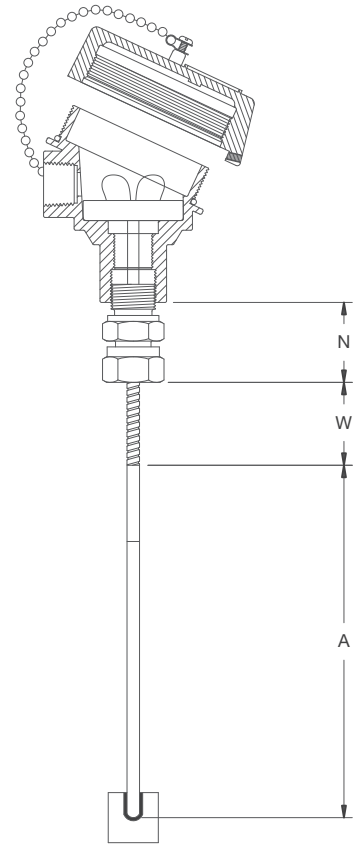
Part of your business

TC59 Tubeskin Thermocouple Assembly

TC59 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.

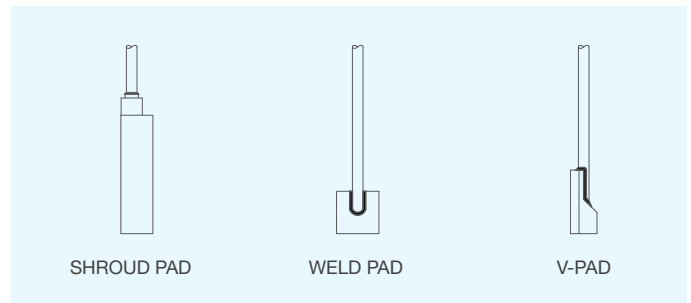


Applications:

TC59 series tubeskin assembly applications include:

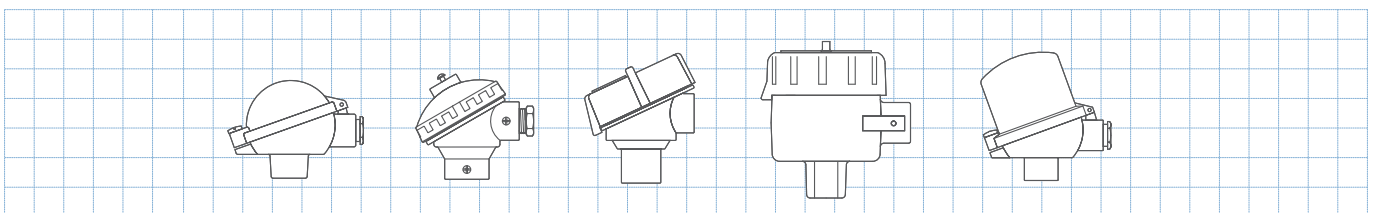
- Chemical and petrochemical industries
- Energy and power plant technology
- Furnaces, kilns, ovens and boilers
- Oil and gas industries
- Power and utilities
- Pulp and paper

Tubeskin Types:



Connection Heads

Imperial Grid 1" x 1"



BSZ

KN4-A

1000F
1000S

8000W

BSZ-H

Thermocouples

TC59 - Tubeskin Thermocouple Assembly

Tubeskin type:	V-pad, weld pad or shroud
Mounting method:	<ul style="list-style-type: none"> ■ Longitudinal ■ Longitudinal or right angle (weld pad only)
Sensor Element:	<ul style="list-style-type: none"> ■ Type K (NiCr-Ni), ■ Type J (Fe-CuNi), ■ Type E (NiCr-CuNi), ■ Type N (NiCrSi-NiSi)
Temperature range:	0 °C to +1260 °C (depending upon element)
Number of sensors:	<ul style="list-style-type: none"> ■ 2-wire single circuit ■ 4-wire dual circuit
Classification tolerance:	<ul style="list-style-type: none"> ■ Class 2 and class 1 per DIN EN 60584 ■ ISA standard and special to ANSI MC96.1-1982
Measuring point:	Grounded (Ungrounded optional)
Electrical approvals:	CSA, FM.
Options:	<ul style="list-style-type: none"> ■ Lengths and diameters to suit service conditions. ■ Transmitter mounted directly within connection head ■ Calibration - single point and multiple points ■ Traceability of the thermocouple alloys, metal sheath, pad material and mineral insulation (Mill Test Reports standard) ■ Selectable accuracy tolerance ■ Special designs and materials ■ Explosion protection: CSA, FM ■ Thermocouple transmitter matching ■ Close coupled or remote mounted ■ Shield for V-Pad or Weld Pad ■ Pipe clamp attachment ■ Mi-cable weld clamps

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.
- No special machining of the contact block is required to match the tube profile.
- 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.



Create your product part number by selecting the appropriate assembly items from each of the categories below. Enter the item code into the applicable box to generate the part number.

TC59

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1 2 3 4 5 6 7 8 9 10 11 12 13

Part Number	TC59-XXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXX
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1 Tubeskin type

Code	
V	V-Pad sensor
1	V-Pad sensor with shield [Stainless steel 316 / 316 L (1.4401 / 1.4435)]
2	V-Pad sensor with shield [Inconel® 600 (2.4816)]
3	V-Pad sensor with shield [Stainless steel 310 (1.4841)]
4	V-Pad sensor with shield [Hastelloy® X (2.4665)]
W	Weld pad sensor
5	Weld pad sensor with shield [Stainless steel 316 / 316 L (1.4401 / 1.4435)]
6	Weld pad sensor with shield [Inconel® 600 (2.4816)]
7	Weld pad sensor with shield [Stainless steel 310 (1.4841)]
8	Weld pad sensor with shield [Hastelloy® X (2.4665)]
S	Shroud sensor

2 Mounting Method

L	Longitudinal
R	Right angle (weld pad only)

3 Unit of measure

I	Imperial
M	Metric

4 Electrical approval

C	CSA Ex-proof
L	CSA Ex-proof Class 1 Division II
M	FM Ex-proof Class 1 Division II
F	FM Ex-proof
I	Ex manufacturers declaration
Z	Without

5 Flame path fitting

1	Yes
Z	Without

6 Connection head

5	1000 F (Aluminum)
6	1000 S (Stainless steel)
4	8000 W (Aluminum)
7	KN4-A (Aluminum)
B	BSZ (Aluminum)
D	BSZ-H (Aluminum)
Z	Without

7 Cable entry

S	1/2 NPT
F	3/4 NPT
T	M20 x 1.5
Z	Without

8 Head instrument connection

S	1/2 NPT
F	3/4 NPT
A	M24 x 1.5
Z	Without

9 Terminal block / Transmitter

1	Crastin terminal block
2	Ceramic terminal block
3	T12 (Programmable Digital Transmitter)
8	T19 (Analogue Transmitter)
6	T32 (HART® Transmitter)
9	T53 (Fieldbus Foundation / PROFIBUS PA Transmitter)
B	T91.10 (Analogue Transmitter, DIN form B)
X	Without / prepared for transmitter
Y	Without / flying leads

10 Neck extension

N	Nipple-Union-Gas seal
F	Nipple-Union-Nipple
2	Remote mount with electrical cord grip
3	Instrument compression fitting with stainless steel ferrule
4	Instrument compression fitting with Teflon® ferrule
Q	Neck tube male threaded, diam. 14 x 2.5 mm (DIN 43772)
Z	Without

11 Neck material

G	Galvanized steel
S	Stainless steel 316 (1.4401)
Z	Without

12 Fitting style

B	Compression fitting with stainless steel ferrule
P	Spring process cover
Z	Without

13 Fitting material

A	Stainless steel 316 (1.4401)
B	Stainless steel 316 Ti (1.4571)
Z	Without

Note: Some configurations are unavailable. Your WIKA sales person will notify you if you have made an incorrect selection

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14 N-Dimension (N)

Imperial	010	1.0 inch	
	030	3.0 inch	
	040	4.0 inch	
	045	4.5 inch	
	050	5.0 inch	
	055	5.5 inch	
	060	6.0 inch	
	080	8.0 inch	
	100	10.0 inch	
	120	12.0 inch	
	140	14.0 inch	
	Metric	025	25 mm
		075	75 mm
		100	100 mm
112		112 mm	
125		125 mm	
138		138 mm	
150		150 mm	
200		200 mm	
250		250 mm	
300		300 mm	
350	350 mm		
ZZZ	Without		

15 Furnace fitting size

1	1/2 NPT
3	3/4 NPT
4	1 NPT
5	1 1/4 NPT
6	1 1/2 NPT
8	2 NPT
F	G 1/2 B
Z	Without

16 Element

1	Type K (NiCr-Ni) / 0...+1260 °C
5	Type N (NiCrSi-NiSi) / 0...+1260 °C
7	Type E (NiCr-CuNi) / 0...+870 °C
3	Type J (Fe-CuNi) / 0...+760 °C

17 Number of sensors

1	Single
2	Dual

18 Classification tolerance

8	ISA standard to ANSI MC96.1-1982
9	ISA special to ANSI MC96.1-1982
2	Class 2 per DIN EN 60584
1	Class 1 per DIN EN 60584

19 Measuring point

2	Grounded
1	Ungrounded

20 Sensor diameter

1	1/4 inch / 0.250 inch (6.35 mm)
8	3/8 inch / 0.375 inch (9.53 mm)
4	3/16 inch / 0.188 inch (4.75 mm)
D	6.0 mm
E	8.0 mm
R	10.0 mm

21 Sheath material

P	Stainless steel 316 / 316 L (1.4401 / 1.4435)
O	Stainless steel 310 (1.4841)
J	Inconel® 600 (2.4816)
T	Stainless steel 446 (1.4762)
I	Hastelloy® X (2.4665)
U	Pyrosil® D

22 Pad material

P	Stainless steel 316 / 316 L (1.4401 / 1.4435)
O	Stainless steel 310 (1.4841)
J	Inconel® 600 (2.4816)
T	Stainless steel 446 (1.4762)
I	Hastelloy® X (2.4665)
U	Pyrosil® D

23 Lead wire insulation

B	Armoured Teflon®
A	Armoured fibreglass
G	Teflon® armour over Teflon®
D	PVC armour over Teflon®
E	Teflon® armour over fibreglass
T	Teflon® jacket
H	Fibreglass jacket
Z	Without

24 W-Dimension (W)

****	Please specify (e.g. 84 mm = 00084) (e.g. 9.5 inch = 00095)
ZZZZ	Without

25 A-Dimension (A)

****	Please specify (e.g. 84 mm = 00084) (e.g. 9.5 inch = 00950)
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26 Pipe / Tube diameter

****	Please specify (e.g. 84 mm = 0084) (e.g. 9.5 inch = 9500)
ZZZZ	Without

27 Weld clamp bracket

**	Quantity (specify 01 to 99)
ZZ	Without

28 Weld clamp bracket material

P	Stainless steel 316 / 316 L (1.4401 / 1.4435)
O	Stainless steel 310 (1.4841)
J	Inconel® 600 (2.4816)
T	Stainless steel 446 (1.4762)
I	Hastelloy® X (2.4665)
U	Pyrosil® D

29 Certificates

1	Quality certificates
Z	Without

30 Additional order details

T	Additional text
Z	Without

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