Electrical
Temperature
Measurement

TC80 High Temperature Thermocouple Assembly

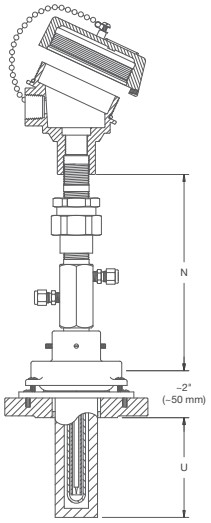
WIKA

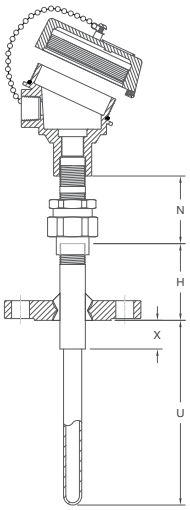
Part of your business

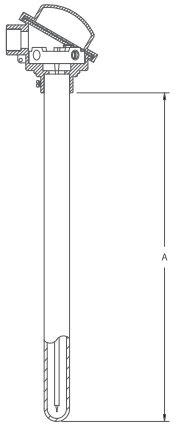
TC80 High Temperature Thermocouple Assembly

TC80 series thermocouple assemblies are designed for measuring extreme high temperatures. They are manufactured using high purity and high temperature ceramics as well as oxidation and corrosion resistant metals.

High purity and high temperature ceramics must be used when there is contact with noble metal thermocouple sensors (Types R, S, and B having platinum and platinum/rhodium elements). Oxidation and corrosion resistant metals can be used when there is contact with standard thermocouple sensors or as outer protection tubes. A wide variety of designs are available that include connection to process flanges, threaded fittings and direct mounting into a furnace refractory wall. These designs have options for air or inert gas purging, pressure seals, and rugged outer protection tubes.







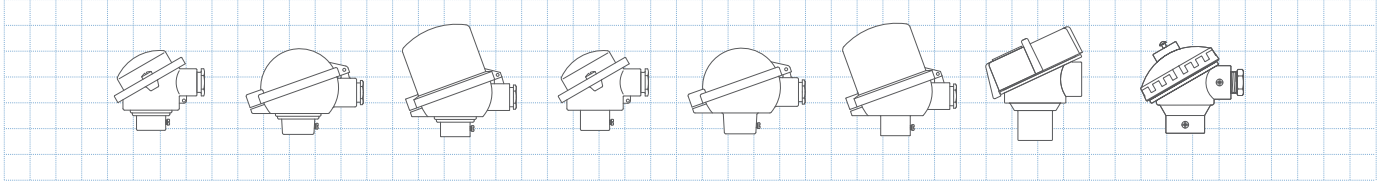
Applications:

TC80 series assemblies are suitable for measuring the radiant temperatures in most industrial and commercial high temperature applications including:

- Cement Plants
- Chemical and petrochemical industries
- Energy and power plant technology
- Furnaces, kilns, ovens and boilers
- Glass, porcelain and ceramics industries
- Incinerators
- Power and Utilities
- Reactors
- Semi-Conductor Industries
- Smelting Plants
- Sulphur Recovery Plants

Connection Heads

Imperial Grid 1” x 1”



AS | ASZ | ASZ-H | BS | BSZ | BSZ-H | 1000F 1000S | KN4-A

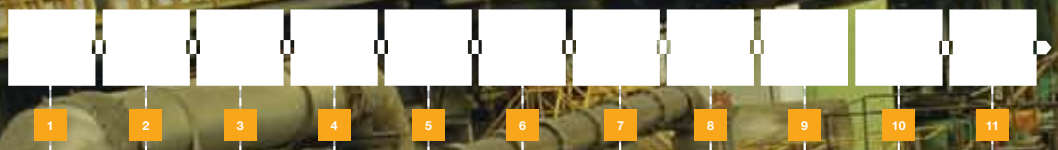
TC80 - High Temperature Thermocouple Assembly	
Sensor Element:	■ Type R (Pt-13%Rh/Pt), ■ Type S (Pt-10%Rh/Pt), ■ Type B (Pt/30%Rh-Pt/6%Rh), ■ Type K (NiCr-Ni), ■ Type J (Fe-CuNi), ■ Type E (NiCr-CuNi), ■ Type N (NiCrSi-NiSi)
Temperature range:	0 °C to +1700 °C (depending upon element and tube material)
Number of sensors:	■ 2-wire single circuit ■ 4-wire dual circuit
Classification tolerance:	■ Class 3, class 2 and class 1 per DIN EN 60584 ■ ISA standard and special to ANSI MC96.1-1982
Options:	■ Lengths and diameters standard or customer specific ■ Transmitter mounted directly within connection head or on measuring insert DIN plate ■ Calibration - single point and multiple points ■ Material traceability of the thermocouple alloys and inner/outer tube material ■ Selectable accuracy tolerance ■ Exchangeable measuring insert ■ Special designs and materials ■ Thermocouple transmitter matching ■ Air or inert gas purge system / pressure test connection ■ Pressure seal ■ Protective outer tube ■ Flanged or threaded connections ■ Metal support sleeve ■ Various thermocouple wire sizes

Features:

- The assembly can be supplied with or without a transmitter. Transmitters convert the millivolt input from the thermocouple to a linear analogue or digital output (commonly 4-20 mA). This signal reduces potential inaccuracies in the circuit and negates the requirement for thermocouple extension wire.
- Thermocouple temperature ranges are dependent on element calibration and inner/outer tube material.
- A variety of neck extensions are possible providing a fixture from the enclosure (connection head) to the assembly.
- Manufactured from the finest high purity, high temperature ceramics and materials.
- Pure ceramic insulators and tubes are used in conjunction with noble metal thermocouples. These provide greater resistance against contamination and premature degradation.
- A purge assembly option is available to remove any contaminant gasses that may pass from the process to the inside of the assembly tubes.
- An optional pressure seal is available to prevent the potential migration of contaminant gasses from entering the electrical enclosure.
- A variety of process connections to suit the desired application.
- Secondary sealing can be included as an extra safeguard in the event of thermal or mechanical fatigue of the protective tube.
- The tubes available provide good thermal and mechanical shock resistance.
- A metal support tube can be attached over the ceramic tube when there is the possibility of any movement of the refractory lining. The length of the metal support tube should be comparable to the thickness of the refractory wall.
- A variety of wire sizes are available.

TC80

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.



Part Number	TC80-XXXXXXXXX-XXXX-XX-XXXX-XXXXXXXXXXXXXXXXX-XX

1 Thermocouple assembly description

Code	
Y	PTA ceramic protection tube (North American standard)
X	PTA silicon carbide protection tube (North American standard)
V	PTA metal/ceramic protection tube (North American standard)
P	AM per DIN 43733 (metal protection tube, head form A)
Q	AMK per DIN 43733 (metal protection tube with ceramic inner tube, head form A)
O	AK per DIN 43733 (ceramic protection tube, head form A)
R	AKK per DIN 43733 (ceramic protection tube with ceramic inner tube, head form A)
S	BM per DIN 43733 (metal protection tube, head form B)
T	BMK per DIN 43733 (metal protection tube with ceramic inner tube, head form B)
U	BK per DIN 43733 (ceramic protection tube, head form B)

2 Unit of measure

I	Imperial
M	Metric

3 Connection head

5	1000 F (Aluminum)
6	1000 S (Stainless steel)
7	KN4-A (Aluminum)
T	AS (Aluminum) with set screws
U	ASZ (Aluminum) with set screws
V	ASZ-H (Aluminum) with set screws
W	BS (Aluminum) with set screws
C	BSZ (Aluminum) with set screws
X	BSZ-H (Aluminum) with set screws
Z	Without

4 Cable entry

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

5 Head instrument connection

S	1/2 NPT
F	3/4 NPT
E	Straight, fixed with two set screws
Z	Without

6 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

7 Neck extension

E	Nipple
A	Nipple-Union
P	Threaded pipe sleeve
B	Metallic support tube
Z	Without

8 Neck material

S	Stainless steel 316 (1.4401)
E	Carbon steel
Z	Without

9 Assembly option

1	Standard
2	With air purge
3	With pressure test connection
4	With ceramic seal
5	With ceramic seal and pressure test connection

10 Outer tube material

A	Alumina Ceramic (99.7 % purity)
I	C610 Ceramic (approx. 60 % purity)
M	Mullite (approx. 60 % purity)
B	Metal Ceramic
C	Hexaloy
K	Silicon Carbide RSiC
J	C799 Ceramic (99.7 % purity)
H	C530 Ceramic (approx. 73 - 75 % purity)
D	Carbon steel (1.0305)
E	Carbon steel (1.0305), enamelled
F	Steel (1.4762)
G	Steel (1.4841)

11 Outer tube diameter (See Notes *)

1	3/8 inch x 1/4 inch *1
2	11/16 inch x 7/16 inch *1
3	3/4 inch x 9/16 inch *1
4	7/8 inch x 5/8 inch *2
6	5/8 inch x 3/8 inch *3
7	3/4 inch x 1/2 inch *3
8	1 inch x 1/2 inch *3
9	1 1/4 inch x 3/4 inch *3
5	1 3/4 inch x 1 inch *4
F	26 mm x 18 mm *5
G	24 mm x 19 mm *6
D	16 mm x 12 mm *6
I	15 mm x 11 mm *7
K	10 mm x 7 mm *6
A	24 mm x 18 mm *8
C	15 mm x 10 mm *9
E	10 mm x 6 mm *9
B	22 mm x 18 mm *10

12 Inner tube material

A	Alumina Ceramic (99.7 % purity)
I	C610 Ceramic (approx. 60 % purity)
J	C799 Ceramic (99.7 % purity)
M	Mullite (approx. 60 % purity)
Z	Without

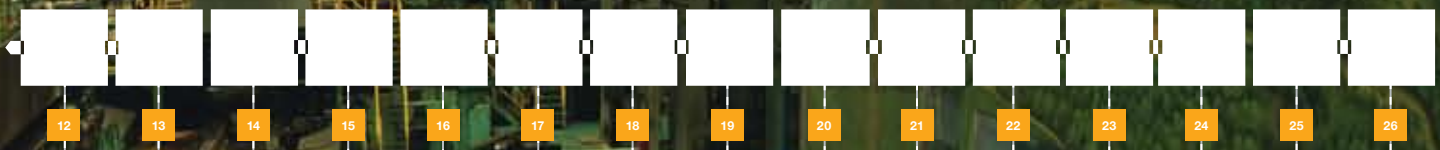
13 Inner tube diameter (See Notes *)

1	3/8 inch x 1/4 inch *11
2	11/16 inch x 7/16 inch *11
3	3/4 inch x 9/16 inch *11
D	16 mm x 12 mm *12
I	15 mm x 11 mm *12
K	10 mm x 7 mm *12
C	15 mm x 10 mm *13
E	10 mm x 6 mm *13
Z	Without

14 Process connection design

6	Double threaded hex bushing
7	Flange (full penetration welded)
8	Flange (partial penetration welded, 6 mm fillet)
9	Flange (cemented)
4	Threaded bushing (adjustable)
5	Stop flange DIN 43734 (adjustable)
Z	Without

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



15 Process connection (See Notes *)

7	1/2 NPT, stainless steel *14
8	3/4 NPT, stainless steel *14
A	1 1/2 inch, 150 lbs, RF, 316 SS *15
B	1 1/2 inch, 150 lbs, RF, A105 C/S *15
C	1 1/2 inch, 300 lbs, RF, 316 SS *15
D	1 1/2 inch, 300 lbs, RF, A105 C/S *15
E	2 inch, 150 lbs, RF, 316 SS *15
F	2 inch, 150 lbs, RF, A105 C/S *15
G	2 inch, 300 lbs, RF, 316 SS *15
H	2 inch, 300 lbs, RF, A105 C/S *15
I	3 inch, 150 lbs, RF, 316 SS *15
J	3 inch, 150 lbs, RF, A105 C/S *15
K	3 inch, 300 lbs, RF, 316 SS *15
L	3 inch, 300 lbs, RF, A105 C/S *15
M	4 inch, 150 lbs, RF, 316 SS *15
N	4 inch, 150 lbs, RF, A105 C/S *15
O	4 inch, 300 lbs, RF, 316 SS *15
P	4 inch, 300 lbs, RF, A105 C/S *15
1	G 1/2, carbon steel *16
2	G 3/4, carbon steel *16
3	G 1, carbon steel *16
4	G 1 1/4, carbon steel *16
5	Dimensions adapted to thermowell, malleable cast iron *17
6	With mating flange, dimensions adapted to thermowell, malleable cast iron *17
Z	Without

16 Element

R	Type R (Pt-13%Rh/Pt) 0...+1480 °C (ANSI), 0...+1600 °C (DIN)
S	Type S (Pt-10%Rh/Pt) 0...+1480 °C (ANSI), 0...+1600 °C (DIN)
B	Type B (Pt/30%Rh-Pt/6%Rh) +870...1700 °C (ANSI), +600...+1700 °C (DIN)
1	Type K (NiCr-Ni) / 0...+1260 °C
3	Type J (Fe-CuNi) / 0...+760 °C
5	Type N (NiCrSi-NiSi) / 0...+1260 °C
7	Type E (NiCr-CuNi) / 0...+870 °C

17 Number of sensors

2	Dual
1	Single

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
3	Class 3 per DIN EN 60584

19 Wire gauge of sensor

O	24 AWG
P	26 AWG
G	8 AWG
J	14 AWG
M	20 AWG
1	Ø 0.35 mm
2	Ø 0.50 mm
3	Ø 0.20 mm
4	Ø 1.00 mm
5	Ø 3.00 mm

20 H-Dimension (H)

Imperial	A	2.0 inch
	B	3.0 inch
	C	4.0 inch
	D	5.0 inch
	E	6.0 inch
Metric	F	50 mm
	G	75 mm
	H	100 mm
	I	125 mm
	J	150 mm
	Z	Without

21 X-Dimension (X)

****	Please specify (e.g. 84 mm = 0084) (e.g. 9.5 inch = 0950)
ZZZZ	Without

22 U-Dimension (U)

*****	Please specify (e.g. 84 mm = 00084) (e.g. 9.5 inch = 00950)
ZZZZZ	Without

23 N-Dimension (N)

010	1.0 inch
042	4.2 inch
075	7.5 inch (Air Purge only)
080	80 mm
150	150 mm
200	200 mm
300	300 mm
350	350 mm
ZZZ	Without

24 A-Dimension (A)

*****	Please specify (e.g. 844 mm = 00844) (e.g. 9.5 inch = 00950)
00355	355 mm
00500	500 mm
00710	710 mm
01000	1000 mm
01400	1400 mm
02000	2000 mm
ZZZZZ	Without

25 Certificates

1	Quality certificates
Z	Without

26 Additional order details

T	Additional Text
Z	Without

Notes*

1	Use only with codes A, I or M for Outer tube material (Field 10)
2	Use only with code B for Outer tube material (Field 10)
3	Use only with code C for Outer tube material (Field 10)
4	Use only with code K for Outer tube material (Field 10)
5	Use only with codes H or K for Outer tube material (Field 10)
6	Use only with code I for Outer tube material (Field 10)
7	Use only with codes D, E, F, G or I for Outer tube material (Field 10)
8	Use only with codes D, E, F, G or J for Outer tube material (Field 10)
9	Use only with code J for Outer tube material (Field 10)
10	Use only with codes D, E, F or G for Outer tube material (Field 10)
11	Use only with codes A or M for Inner tube material (Field 12)
12	Use only with code I for Inner tube material (Field 12)
13	Use only with code J for Inner tube material (Field 12)
14	Use only with code 6 for Process connection design (Field 14)
15	Use only with codes 7, 8 or 9 for Process connection design (Field 14)
16	Use only with code 4 for Process connection design (Field 14)
17	Use only with code 5 for Process connection design (Field 14)

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