

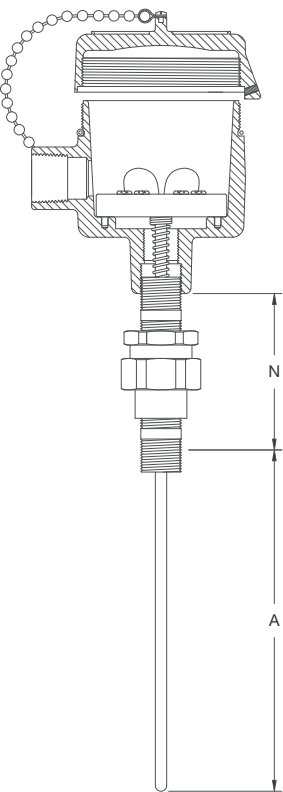
# TC10 Industrial Thermocouple Assembly



# TC10 Industrial Thermocouple Assembly

TC10 series thermocouples are industrial assemblies supplied with or without a temperature transmitter. An extensive range of elements, connection heads, insertion lengths, neck lengths, and process connections can be individually selected for the appropriate application. Replacement sensors can also be configured for this model.

Thermocouples in this series can be inserted directly into a process or combined with a variety of thermowell designs.



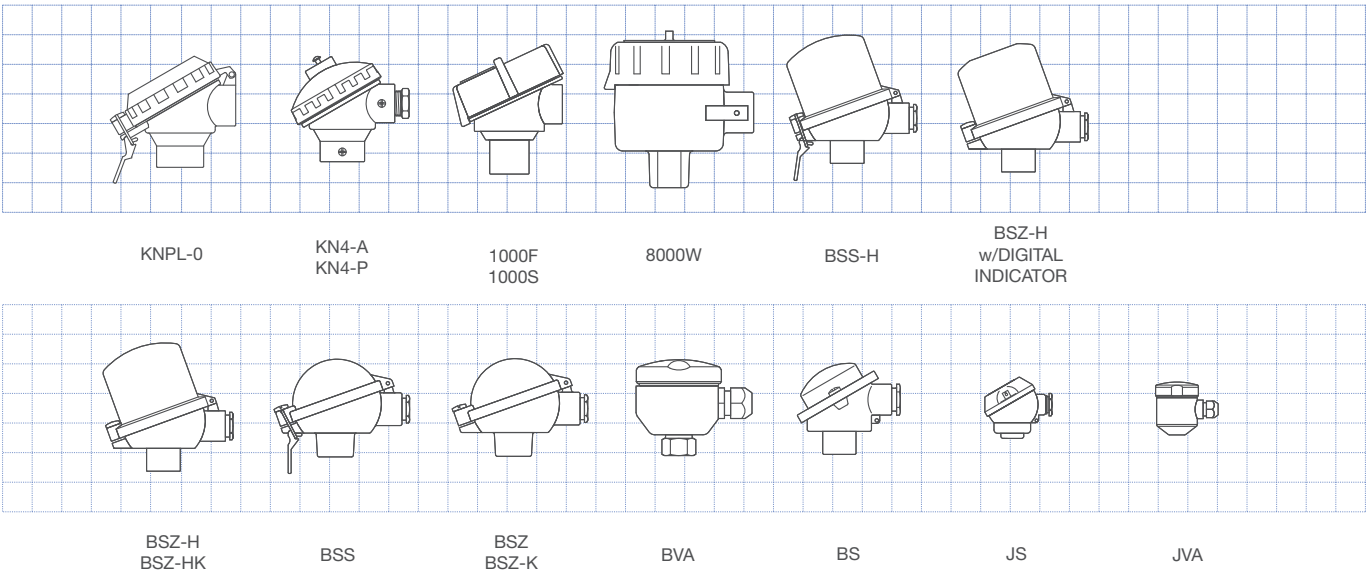
## Applications:

TC10 series assemblies are suitable for most industrial and commercial applications including:

- Chemical and petrochemical industries
- Energy and power plant technology
- Furnaces, kilns, ovens and boilers
- Incinerators
- Machinery, plant and tank measurement
- Oil and gas industries
- Offshore exploration and drilling
- Pipeline control
- Power and utilities
- Pulp and paper
- Water and wastewater treatment

## Connection Heads

Imperial Grid 1" x 1"



# Thermocouples

## TC10 - Industrial Thermocouple Assembly

Sensor Element:	<ul style="list-style-type: none"> <li>■ Type K (NiCr-Ni),</li> <li>■ Type J (Fe-CuNi),</li> <li>■ Type E (NiCr-CuNi),</li> <li>■ Type N (NiCrSi-NiSi),</li> <li>■ Type T (Cu-CuNi)</li> </ul>
Temperature range:	-200 °C to +1260 °C (depending upon element)
Number of sensors:	<ul style="list-style-type: none"> <li>■ 2-wire single circuit</li> <li>■ 4-wire dual circuit</li> </ul>
Classification tolerance:	<ul style="list-style-type: none"> <li>■ Class 2 and class 1 per DIN EN 60584</li> <li>■ ISA standard and special to ANSI MC96.1-1982</li> </ul>
Measuring point:	Ungrounded or grounded
Electrical approvals:	CSA, FM, ATEX/IEC, NAMUR
Options:	<ul style="list-style-type: none"> <li>■ Lengths and diameters standard or customer specific</li> <li>■ Transmitter mounted directly within connection head or on measuring insert DIN plate</li> <li>■ Calibration - single point and multiple points</li> <li>■ Material traceability of the thermocouple alloys, metal sheath and mineral insulation</li> <li>■ Selectable accuracy tolerance</li> <li>■ Exchangeable measuring insert</li> <li>■ Special designs and materials</li> <li>■ Explosion protection: CSA, FM, ATEX (EEx-d)</li> <li>■ Intrinsically safe version: ATEX (EEx-i)</li> <li>■ Non-sparking version: ATEX (EEx-n)</li> <li>■ Thermocouple transmitter matching</li> </ul>

## Features:

- The sensor can be mounted into a thermowell or directly into a process with the use of a fixed, spring loaded or compression process fitting.
- 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.
- The assembly has electrical approvals for explosion proof hazardous locations, intrinsic safety, ingress protection and general purpose areas.
- Electrical authorities that have registered these approvals include CSA, FM, ATEX/IEC, and NAMUR. The approvals can be with or without an attached thermowell. A specially designed and patented integral flame path fitting makes it possible when supplied without a thermowell.
- The thermocouple sensors available for this assembly are provided with a variety of sheath materials including austenitic 300 series and ferritic 400 series stainless steels, corrosion resistant and high temperature oxidation resistant alloys.
- Thermocouple diameters range from 0.125 inch to 0.250 inch and 2 mm to 8 mm. Standard diameters are 0.125 inch & 0.250 inch also 3 mm & 6 mm.
- The thermocouple sensor can be spring-loaded ensuring a positive contact to the base of a thermowell bore.
- Thermocouple temperature ranges are dependent on the sheath & conductor diameter, element calibration, and sheath material.
- A variety of neck extensions are possible. They provide a fixture from the enclosure (connection head) to the process or thermowell. The standard neck extensions are the nipple-union-nipple or the male threaded neck tube. These extensions allow for directional rotation of the head for field wiring as well as a positive quick disconnection of the assembly from the process or thermowell.



# TC10

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.

1	2	3	4	5	6	7	8	9

Part Number TC10-X-X-XXXXXX-X-XXXX-XXX-XXXX-X-X-XXXX-XX

## 1 Assembly description

Code	
0	Industrial assembly configured
1	Industrial sensor configured
A	Measuring insert [TC002]
B	Thermocouple assembly with neck tube [TC200]
C	DIN Thermocouple assembly with threaded protection tube [TC201]
D	Thermocouple assembly with protection tube [TC211 / TC212]
F	DIN Thermocouple assembly with flanged protection tube [TC401]
H	Thermocouple assembly without protection tube [TC750 / TC760]
K	Measuring insert EEx-d [TCD02] (Replacement insert, for use in TCD20 only)
L	Thermocouple assembly EEx-d [TCD20]

## 2 Unit of measure

I	Imperial
M	Metric

## 3 Insert design

S	Self gripping spring
N	Fixed to the fitting
D	Spring loaded plate (removable insert)
T	Spring loaded miniature terminal plate (removable)
M	Fixed miniature terminal plate (not removable)

## 4 Electrical approval

C	CSA Ex-proof
F	FM Ex-proof
A	EEx-i (ATEX) gas, acc. to directive 94/9/EC
B	EEx-i (ATEX) gas/dust, acc. to directive 94/9/EC
J	EEx-d (ATEX) acc. to directive 94/9/EC
H	EEx-n (ATEX) acc. to directive 94/9/EC
D	EEx-i, confirmation NAMUR NE24
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)
8	KN4-P (Polypropylene)
9	KNPL-0 (Aluminum)
A	BS (Aluminum)
B	BSZ (Aluminum)
D	BSZ-H (Aluminum)
J	BSZ-K (anti static Polyamide)
K	BSZ-HK (anti static Polyamide)
N	BSZ-H with digital temperature indicator DIH10 (set to transmitter range)
E	BSS (Aluminum)
F	BSS-H (Aluminum)
I	BVA (Stainless steel)
R	JS (Aluminum)
S	JVA (Stainless steel)
Z	Without

## 7 Cable entry

S	1/2 NPT
F	3/4 NPT
T	M20 x 1.5
P	M16 x 1.5
L	M12 x 1.5
Z	Without

## 8 Head instrument connection

S	1/2 NPT
F	3/4 NPT
B	G 1/2 B (BSP 1/2 inch)
T	M20 x 1.5
A	M24 x 1.5
J	M10 x 1.0
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)
C	T91.20 (Analogue Transmitter, form J)
X	Without / prepared for transmitter
Y	Without / flying leads

## 10 Neck extension

F	Nipple-Union-Nipple
E	Nipple
D	Fixed double threaded hex bushing
R	Spring loaded Bushing-Union-Nipple
G	Fixed single threaded hex bushing
K	Spring loaded bushing without oil seal
H	Spring loaded bushing with oil seal
5	Bushing with oil seal
U	Nipple-Union (Protection tube only)
L	Adjustable lock nut
C	Fixed single threaded hex bushing with additional fitting
X	Neck tube unthreaded, diam. 12 x 1.5 mm
V	Neck tube unthreaded, diam. 12 x 2.5 mm
S	Neck tube male threaded, diam. 12 x 1.5 mm (DIN 43772)
T	Neck tube male threaded, diam. 12 x 2.5 mm (DIN 43772)
Q	Neck tube male threaded, diam. 14 x 2.5 mm (DIN 43772)
Z	Without



G	Galvanized steel
S	Stainless steel 316 (1.4401)
F	Stainless steel 316 Ti (1.4571)
Z	Without

A	Fixed fitting, threaded hex bushing
B	Compression fitting with stainless steel ferrule
D	Compression fitting, spring loaded, with stainless steel ferrule
Z	Without

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

K	1/2 NPT
J	3/4 NPT
N	1/4 NPT
M	M20 x 1.5
F	G 1/2 B
C	G 3/4 B
R	G 1/4 B
D	G 1/8 B
V	G 3/8 B
B	G 1 B
A	M8 x 1.0
T	M10 x 1.0
S	M12 x 1.5
P	M14 x 1.5
O	M18 x 1.5
Z	Without

Imperial	005	0.5 inch	
	010	1.0 inch	
	015	1.5 inch	
	020	2.0 inch	
	025	2.5 inch	
	030	3.0 inch	
	035	3.5 inch	
	040	4.0 inch	
	045	4.5 inch	
	050	5.0 inch	
	055	5.5 inch	
	060	6.0 inch	
	065	6.5 inch	
	080	8.0 inch	
	Metric	012	12 mm
		025	25 mm
030		30 mm	
037		37 mm	
050		50 mm	
062		62 mm	
065		65 mm	
075		75 mm	
087		87 mm	
100		100 mm	
112		112 mm	
125		125 mm	
130		130 mm	
138		138 mm	
140		140 mm	
150		150 mm	
163		163 mm	
200		200 mm	
210		210 mm	
***		N-Dimension in mm (e.g. 84 mm = 084)	
ZZZ	Without		

1	Type K (NiCr-Ni) / 0...+1260 °C
2	Type K (NiCr-Ni) / 0...+600 °C
3	Type J (Fe-CuNi) / 0...+760 °C
4	Type J (Fe-CuNi) / 0...+300 °C
5	Type N (NiCrSi-NiSi) / 0...+1260 °C
6	Type N (NiCrSi-NiSi) / 0...+600 °C
7	Type E (NiCr-CuNi) / 0...+870 °C
8	Type E (NiCr-CuNi) / 0...+400 °C
9	Type T (Cu-CuNi) / -200...+370 °C

1	Single
2	Dual

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

1	Ungrounded
2	Grounded

1	1/4 inch / 0.250 inch (6.35 mm)
4	3/16 inch / 0.188 inch (4.75 mm)
2	1/8 inch / 0.125 inch (3.17 mm)
J	1/4 inch / 0.250 inch (6.35 mm) reduced to 1/8 inch / 0.125 inch (3.17 mm)
3	0.215 inch (5.46 mm)
A	2.0 mm
B	3.0 mm
G	4.0 mm
D	6.0 mm
H	6.0 mm reduced to 3.0 mm
F	6.0 mm with 8.0 mm tip
E	8.0 mm

P	Stainless steel 316 / 316 L (1.4401 / 1.4435)
O	Stainless steel 310 (1.4841)
J	Inconel® 600 (2.4816)
I	Hastelloy® X (2.4665)
T	Stainless steel 446 (1.4762)
H	Hastelloy® C276 (2.4819)
Q	Stainless steel 316 Ti (1.4571)

\*\*\*\*\* Please specify (e.g. 84 mm = 00084)  
(e.g. 9.5 inch = 00950)

1	Quality certificates
Z	Without

T	Additional text
Z	Without