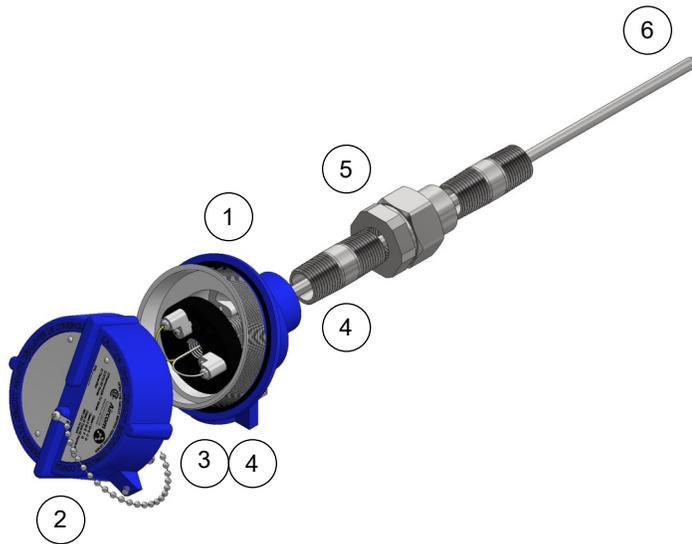


TC10 Thermocouple Assembly

TC10

Overview



1. Connection Head or Junction box is the electrical enclosure that holds the terminal block for connecting the appropriate signal wires.

2. Tags on the connection head will identify the hazardous location approval rating of the enclosure as well the assembly if applicable.

3. Terminal Block is where the lead wires are terminated. Standard material is Bakelite. Other terminal block options such as ceramics available.

4. Spring Loading can be achieved by a spring attached to the terminal block or a spring loaded fitting in the extension (5) between the connection head and the thermowell.

5. Extension is what attaches the connection head to the thermowell or directly to the process depending on the required construction. It can be made up of an array of fittings, most common being an electrical conduit nipple-union-nipple.

6. Thermocouple Sensor Probe extends into the thermowell or direction into the process depending on configuration. The thermocouple sensing junction(s) are located in the tip of the probe.

Temperature Limiting Factors of thermocouple assemblies will depend on the material temperature rating of each component used in the sensors construction, in addition to the thermocouple type. Continuous temperature ratings of the components are listed in the model number selection. Generally, the sensor probe and thermowell will have a higher temperature rating than the extension and junction box.

The TC10 Thermocouple assembly is a temperature sensor assembly consisting of a thermocouple sensor probe, various fitting options, and optional connection head and terminal block.

Features:

- Simple design that is used and accepted across multiple process industries.
- Direct mount process temperature transmitter using the TXUN fitting option.
- TC10 configuration options allow for many different patterns to be configured for almost any temperature measurement application.

Application:

Thermocouple assemblies are used widely across almost any and every industrial process control environment

Configuration Considerations

When configuring the TC10 model to suit your application it is important to consider the following:

- Hazardous location approval rating
- Connection head type
- Extension length
- Thermocouple type (tolerance)
- Junction style and quantity
- Minimum and maximum temperature of the process
- Maximum pressure
- Process conditions and effect on the assembly
- Thermocouple sensor probe length (to align with what it is going into)

If using a TC10 with a thermowell, consider:

- Thermowell length alignment with TC10 sensor probe
- Spring loaded TC10 "L" length = Thermowell stem
- Fixed fitting TC10 "L" length = Thermowell stem - 0.5"

TC10 Thermocouple Assembly Model Code

TC10 - T1 - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9

TC10 Thermocouple Assembly

T1 Connection Head

2AL	Aluminum, 3/4" conduit, Bakelite terminal block
2ALT	Aluminum epoxy, 3/4" conduit, Bakelite terminal block
2SS	Stainless steel, 3/4" conduit, Bakelite terminal block
X	Not required
Other	Refer to page B-19 for details, styles and options

T2 Connection Extension

N	N = Nipple ⁴ 1/2" NPT (galvanized)
NUN	NUN = Nipple-Union-Nipple⁴ 1/2" NPT (galvanized)
SNUN	Nipple-union-nipple ⁴ 1/2" NPT (stainless steel)
FS	Fixed bushing 1/2"x1/2" NPT
FX	Fixed hex instrument fitting 1/2" NPT
OS	Spring loaded bushing with oil seal 1/2"x1/2" NPT
AF	Fixed hex instrument fitting - flex armor over fiberglass
AT	Fixed hex instrument fitting - flex armor over Teflon
PT	Fixed hex fitting - Poly jacketed flex armor over Teflon
TX	Spring loaded fitting (transmitter bushing) 1/2"x1/2" NPT
TXUN	Spring loaded fitting-union-nipple (galvanized)
STXUN	Spring loaded fitting-union-nipple (stainless)

T3 Connection Extension "A" (inches)⁵

3.5	3.5" (3" installed)
4.5	4.5" (4" installed)
"inches"	Specify AF, AT, PT length in inches
Other	Specify (inches)

T4 Thermocouple Type

K	Type K	N	Type N
J	Type J	R	Type R
T	Type T	S	Type S
E	Type E	B	Type B

T5 Sensor Sheath Diameter

18	1/8" OD
36	3/16" OD
14	1/4" OD
38	3/8" OD

T6 Thermocouple Junction

G	Grounded
U	Underground

T7 Thermocouple Junction Quantity

S	Single
D	Dual
T	Triple
Q	Quad

T8 Sensor Sheath Material

304	304/304L stainless steel
316	316/316L stainless steel
310	310 stainless steel
600	Inconel 600
HAC	Hastelloy C-276
CI	Ceramic Insulators
Other	Consult factory

T9 Sensor "L" Length (inches)⁵

"inches"	Specify length in inches
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Assembly Hazardous Location Approval	Connection Head Series	NOTE
Class I Groups A,B,C,D Class II Groups E,F,G Class III	CCI	2
Class I Groups B,C,D Class II Groups E,F,G Class III; Enclosure Type 4	AL, CAL	2
Class I Groups B,C,D Class II Groups E,F,G Class III; Enclosure Type 4X	ALT, SS	2
Class I Division 2 Groups A,B,C,D Class II Groups E,F,G Class III; Enclosure Type 4	AL, CAL	3
Class I Division 2 Groups A,B,C,D Class II Groups E,F,G Class III; Enclosure Type 4X	ALT, SS	3
General Purpose	0AL, 4AL, 1CI, 2CI, 3CI, 0PY	

NOTES:

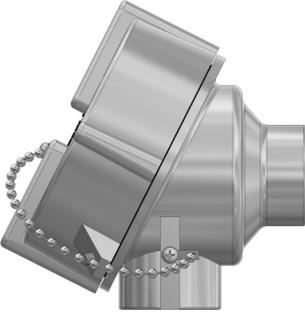
1. Part number example: TC10-2ALT-3.5-K-14-U-S-316-12
2. For hazardous location approval rating must come complete with or installed into approved thermowell in the field
3. Only Class I Division 2 with connection head extension (T2) options; FS, FX, AF, AT, and PT, with or without optional thermowell
4. Connection head extension (T2) options N and _NUN requires a connection head - terminal block for spring loading
5. Reference page B-22 for part overview and page B-23 for dimensions
6. Bold text indicates most common part selections



TC10 Thermocouple Assembly Outline

Connection Head

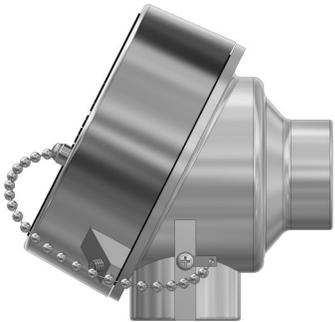
2AL



2ALT



2SS



Refer to page B-24 for further connection head styles, options, and details

Connection Extension

N



NUN & SNUN



FS



FX



OS



TX



TXUN & STXUN



AF - AT



PT



Sensor Probe (OD)

18
(0.125")



36
(0.188")



14
(0.250")



38
(0.375")

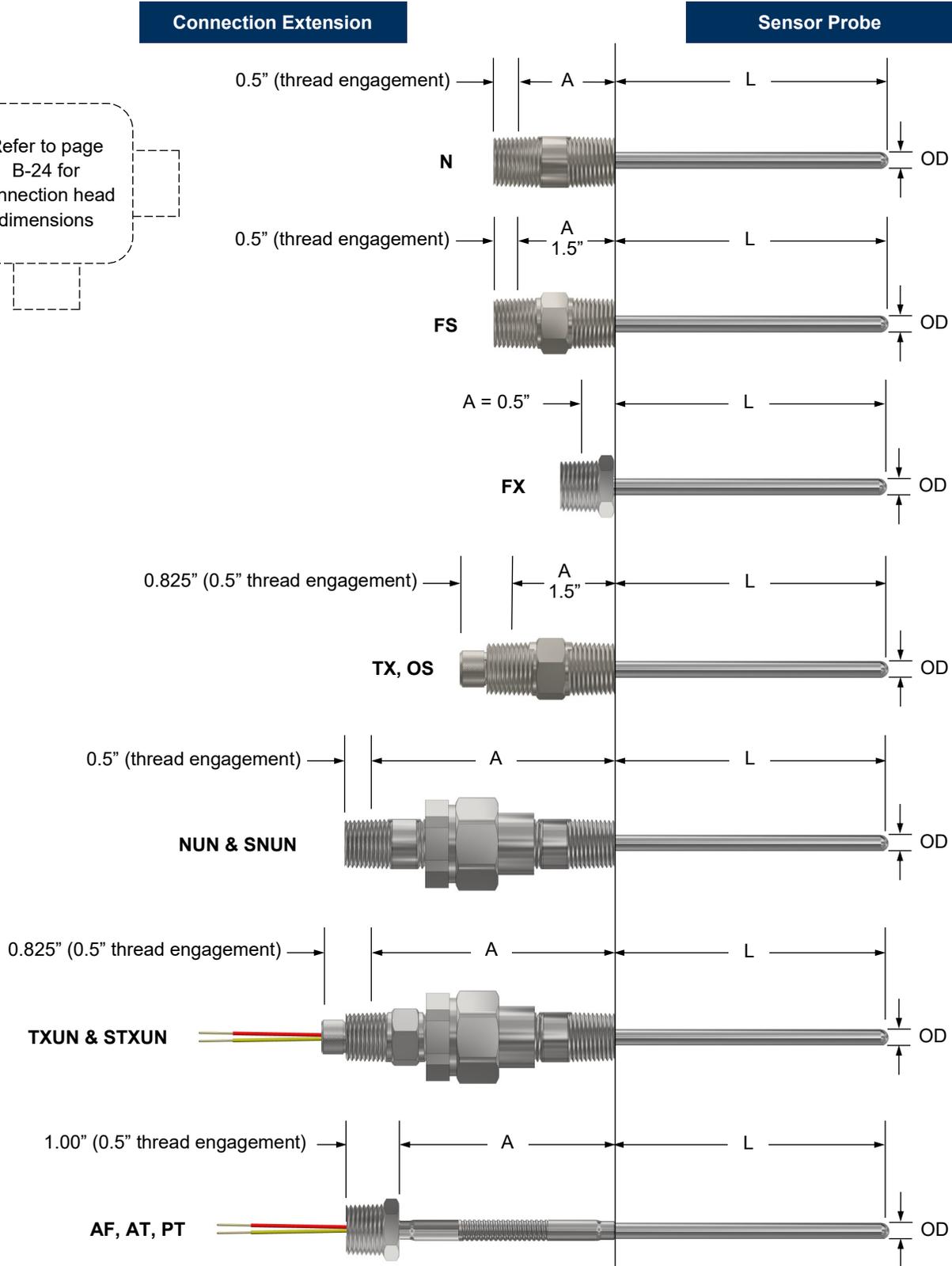


CI
(0.250 or 0.375")



TC10 Thermocouple Assembly Dimensions

Refer to page B-24 for connection head dimensions



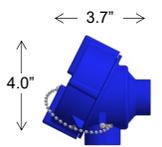
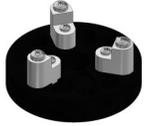
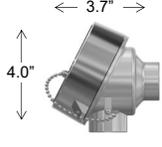
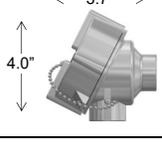
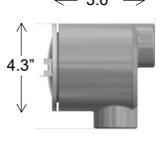
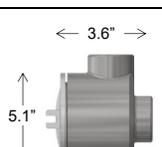
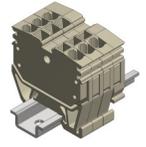
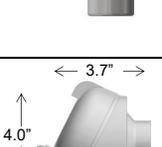
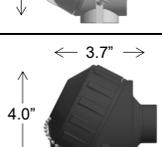
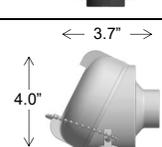
NOTE:

1. Assemblies are supplied with 6" to 8" of lead wire



TC10 Connection Heads

Model, Outline, and Dimensions

Outline & Dimensions	Model	Connection (NPT)		Terminal Block Options	Material
		Instrument	Conduit		
	1ALT	1/2"	1/2" ²	 Bakelite - <u>standard</u> Screw terminals to suit sensor configuration	Cast aluminum epoxy coated Buna O-ring
	2ALT	1/2"	3/4"		
	3ALT	3/4"	3/4"		
	1SS	1/2"	1/2" ²	Ceramic - optional Screw terminals to suit sensor configuration Add: "C" to connection head model number Example: 2ALTC	316 stainless steel Buna O-ring
	2SS	1/2"	3/4"		
	3SS	3/4"	3/4"		
	1AL	1/2"	1/2" ²	 Ceramic - optional Screw terminals to suit sensor configuration Add: "C" to connection head model number Example: 2ALTC	Cast aluminum Buna O-ring
	2AL	1/2"	3/4"		
	3AL	3/4"	3/4"		
	1CAL ³	1/2" ²	1/2" ²	Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add: "D" to connection head model number. Example: 2ALTD	Iron alloy Buna O-ring
	2CAL ³	3/4"	3/4"		
	1CCI ³	1/2" ²	1/2" ²		
	2CCI ³	3/4"	3/4"		
	4CAL ³	1/2"	2x 1/2"	 Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add: "D" to connection head model number. Example: 2ALTD	Cast aluminum Buna O-ring
	3CAL ³	3/4"	2x 3/4"		
	4CCI ³	1/2" ²	2x 1/2" ²		
	3CCI ³	3/4"	2x 3/4"		
	4AL	1/2"	1/2" ²	Ceramic - oval terminal block Screw terminals to suit sensor configuration	Cast aluminum Buna O-ring
	0AL	1/2"	3/4"		
	1CI	1/2"	1/2" ²	Ceramic - oval terminal block Screw terminals to suit sensor configuration	Iron alloy Buna O-ring
	2CI	1/2"	3/4"		
	3CI	3/4"	3/4"		
	0PY	1/2"	3/4"	Terminal block integral to connection head Screw terminals to suit sensor configuration	Polypropylene

NOTES:

1. Electrical approval is noted on page B-21
2. May be supplied with an approved reducer bushing
3. Requires model configuration (T2) connection extension options: FS, FX, OS, AF, AT, PT, TX, TXUN, STXUN