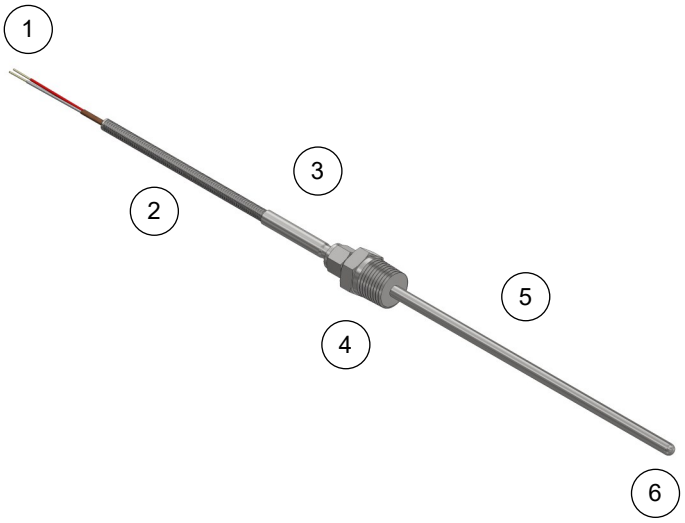
Thermocouple Sensor Probes

TC Series Sensor Probes



1. Lead Wire Termination is how the sensor will connect and terminate to the instrument or electrical interface.

2. Lead Wire Insulation Type and length are selected to suit each application. The temperature rating varies depending on the material of lead wire used.

3. Transition is where the sensing probe is transitioned to lead wires. This piece is crimped or brazed onto the probe and potted with an epoxy rated to 150°C. For high temperature, and low moisture applications, a ceramic cement potting material is available on special request.

4. Fitting options are available to fasten the sensor into the process or optional thermowell.

5. Sensor length, outer diameter, and material are very important variables when designing a thermocouple sensor probe. The sheath is commonly constructed from mineral insulated cable (MI cable). Various alloys are available to suit applications. Material compatibility is always the end users responsibility.

6. Thermocouple Junction is located in the tip of the sensor. This is where the temperature sensing takes place.

Temperature Limiting Factors of thermocouple sensor probes 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 sheath will have a higher temperature rating than the transition and lead wires.

Overview

The TC series Thermocouple sensor probes come in various styles unique to different applications. Each style consists of a thermocouple sensing junction protected by a sheath with a termination option.

Features:

- Styles are customizable to almost any application.
- Manufactured from high quality raw materials that meet industry recognized standards.
- Fast lead time on styles that utilize standard Aircom materials.

Application:

Thermocouple sensor probes are used widely across almost any and every commercial and industrial temperature process control application.

Configuration Considerations

When configuring the TC series thermocouple sensor probe models to suit your application it is important to consider the following:

- Hazardous location approval rating
- Thermocouple type
- Number of junctions
- Sheath OD
- Sheath material
- Sensor probe length
- Lead wire length
- Lead wire type
- Lead wire termination
- Process fitting options
- Process fitting size
- Minimum and maximum temperature of the process
- Process conditions and effect on the sensor probe
- Maximum pressure (if applicable)

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TC4 Thermocouple Sensor Probe Model Code

TC4 - T1 - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9 - T10 - T11

TC4	Thermocouple Sensor Probe

T1	Thermocouple Type
K	**Type K**
J	Type J
T	Type T
E	Type E
N	Type N
Other	Consult factory

T2	Thermocouple Junction
G	Grounded
U	**Ungrounded**
2G	Dual grounded
2U	Dual ungrounded
()G	(Qty up to 4) grounded[2]
()U	(Qty up to 4) ungrounded[2]
E	Exposed

T3	Sensor Probe Diameter
04	0.040” (1/25”)
16	0.063” (1/16”)
18	0.125” (1/8”)
36	0.188” (3/16”)
14	**0.250” (1/4”)**
38	0.375” (3/8”)

T4	Sensor Sheath Material
304	304/304L stainless steel
316	**316/316L stainless steel**
310	310 stainless steel
446	446 stainless steel
600	Inconel 600
Other	Consult factory

T5	Sensor Probe “L” Length (inches)[3]
“inches”	Specify length in inches for straight probe length
“LA”N“LB”	LA = Length above / N = Bend / LB = Length below

T6	Lead wire “A” Length (inches)[3]
“inches”	Specify length in inches

T7	Lead Wire Type[4]
FB	Fiberglass (+482°C)
SF	Fiberglass with SS over braid (+482°C)
AF	**Flex armor over fiberglass (+482°C)**
TE	Teflon (+260°C)
ST	Teflon with SS over braid (+260°C)
AT	**Flex armor over Teflon (+260°C)**
PT	Poly jacketed flex armor over Teflon (+102°C)
TT	Teflon jacketed flex armor over Teflon (+260°C)
PV	Polyvinylchloride (PVC) (+102°C)
BC	2” Stripped bare conductor
Other	Consult factory

T8	Lead Wire Termination[4] (multiple allowed)
BE	**Bare ended lead wire**
SC	**Standard male connector (+205°C)**
MC	Miniature male connector (+205°C)
HC	High temp standard male connector (+425°C)
MH	High temp miniature male connector (+425°C)
SL	Spade lugs (thermocouple alloy if available)
CG	1/2” NPT cord grip electrical fitting[5]
Other	Consult factory

T9	Flying Leads “W” Length (inches)[3]
8	**Standard 8” flying leads**
“inches”	Specify length in inches
X	Not applicable (Default for TE, ST, FB, SF options)

T10	Fitting Options
X	**No fitting required**
CF	Compression fitting - SS ferrule
CT	Compression fitting - Teflon ferrule
FX	Fixed hex instrument plug[6] 1/2" NPT
FS	Fixed bushing 1/2”x1/2” NPT
TX	Spring loaded bushing 1/2”x1/2” NPT
OS	Oil seal spring loaded 1/2”x1/2” NPT
SG	Self gripping spring
Other	Consult factory

T11	Fitting Size
X	**No fitting**
18	1/8” NPT
14	1/4” NPT
38	3/8” NPT
12	**1/2” NPT**
Other	Consult factory

NOTES:

1. Model example: TC4-J-2U-14-316-4N6-72-AT-SC-X-CF-12.
2. Consult factory for more than 2 thermocouple junctions with probe OD (T3) values less than option 36 (0.188”).
3. Reference page 3 for part outline and page 4 for part dimensions.
4. Temperature values given are for maximum continuous rating for the specific component of the configuration.
5. CG fitting option (T8) only for lead wire options AT, AF & PT.
6. Consult factory for FX fixed hex plug option (T9) for probe OD options smaller than option 36 (0.188”).
7. Bold text indicates most common part selections .

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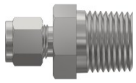
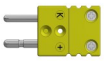
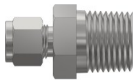
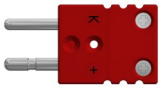
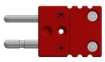
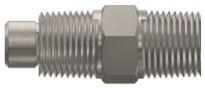
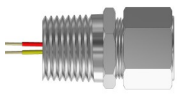
TC4 Thermocouple Sensor Probe Outline

Termination	Lead Wire Type	Transition	Fittings	Sensor Sheath (OD)
BE 	FB 	Transition with Spring 	X (None)	04 (0.040”)
SC 	SF 		CF 	16 (0.0625”)
MC 	AF 		CT 	18 (0.125”)
HC 	TE 	Standard Transition 	FX 	36 
MH 	ST 		FS 	14 (0.250”) 
SL 	AT 	Small Transition 	OS/TX 	38 
CG 	PT 		SG 	
	PV 			
	BC			
	TT 			

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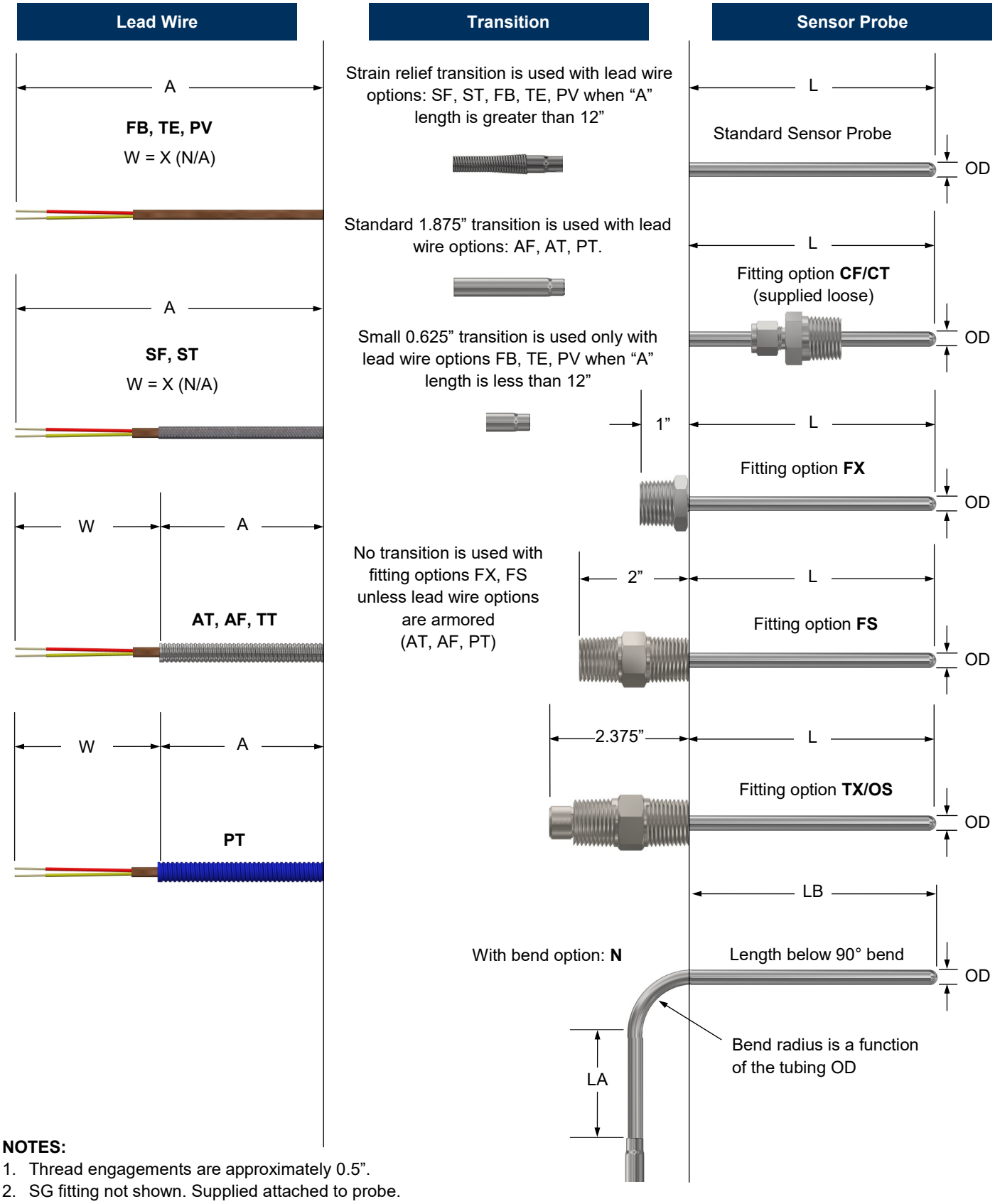
TC4 Thermocouple Sensor Probe Dimensions



NOTES:

1. Thread engagements are approximately 0.5".
2. SG fitting not shown. Supplied attached to probe.

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