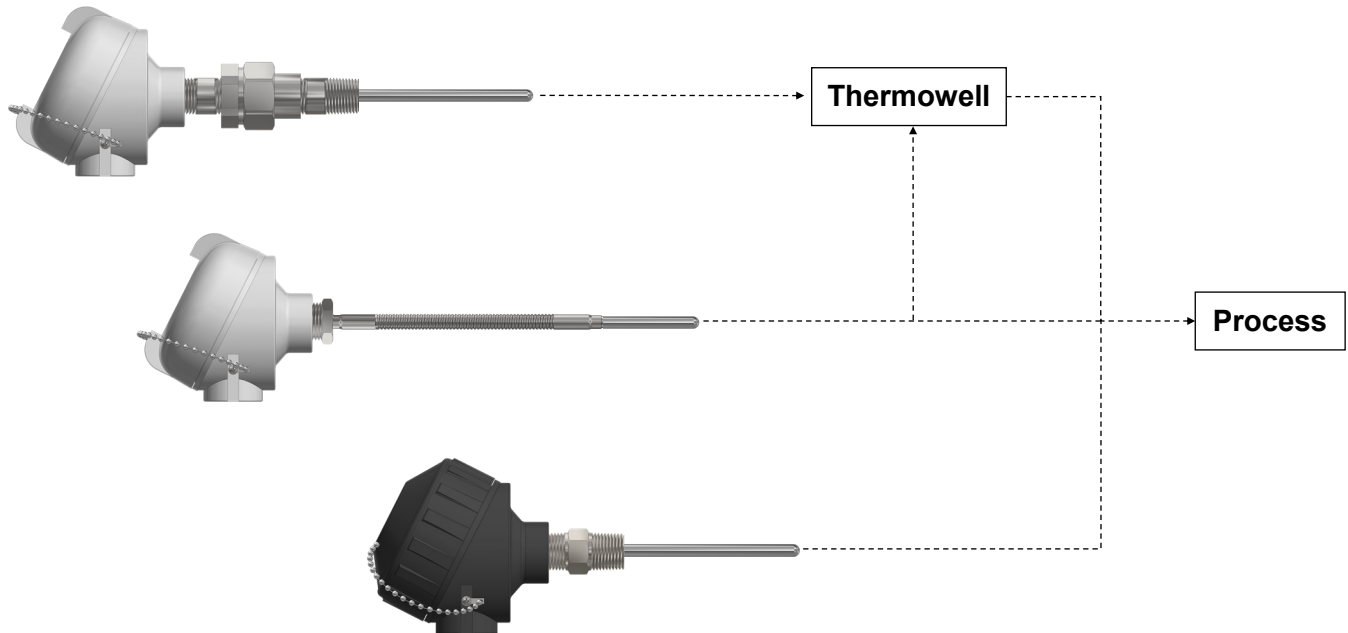


TC1 Thermocouple Assembly

General Purpose / Ordinary Location Thermocouple Assembly



Overview

Description:

The TC1 thermocouple assembly is a thermocouple sensor designed for use general purpose non-hazardous locations. The TC1 is a customizable product that is model number configured and made to order.

The TC1 consists of a thermocouple sensor, complete with a connection head (enclosure) that may or may not contain an internal temperature transmitter module. Connection extension fittings will spring load the sensor into a thermowell or a fixed fitting can be used without a thermowell.

Features:

- Simple design that is used and accepted across multiple process industries.
- TC1 configuration options allow for many different patterns to be configured for almost any temperature measurement application.

Application:

- Industrial temperature measurement
- Process control
- Outdoor or indoor use (as per connection head & thermowell ratings)

Configuration Considerations

When configuring the TC1 model to suit your application it is important to consider the following:

- Site specific standards
- Connection head type
- Extension length
- Thermocouple type (tolerance)
- Junction style and quantity
- Minimum and maximum temperature of the process
- Maximum pressure
- Process conditions and their effects on the assembly
- Sensor probe length (to align with what it is going into)

If using a TC1 with a thermowell, consider:

- Thermowell length alignment with TC1 sensor probe
- Spring loaded TC1 "L" length = Thermowell stem
- Fixed fitting TC1 "L" length = Thermowell stem - 0.5"

TC1 Thermocouple Assembly Model Code

TC1 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9 - T10 - T11

TC1 General Purpose / Ordinary Location RTD Assembly

T1	Connection Head / Termination	T1	Continued
0AL	Aluminum, 1/2" instrument x 3/4" conduit	8	Without termination (standard 8" flying leads (W))
2CI	Cast iron, 1/2" instrument x 3/4" conduit	75G	Head transmitter with display (PR 7501A3A2A12GY)
0PY	Polypropylene, 1/2" instrument x 3/4" conduit	CST	Customer supplied transmitter (Check with Aircom)
2ALT	Aluminum, 1/2" instrument x 3/4" conduit	Other	Refer to page 7-8 for details, styles and options

T1A	Terminal Block / Transmitter	T1A	Continued
'Blank'	Bakelite terminal block	31D	5331D PR puck transmitter
C	Ceramic terminal block	35D	5335D PR puck transmitter (with HART)
D	DIN mount technology	Other	Consult Factory
S	Splicing connectors		

T2	Flex-Armor/Connection Extension	T2	Continued
N	Nipple 1/2" NPT (galvanized) ¹	SN	Nipple 1/2" NPT (stainless steel) ¹
NUN	Nipple-union-nipple 1/2" NPT (galvanized) ¹	SNUN	Nipple-union-nipple 1/2" NPT (stainless steel) ¹
TXUN	Spring loaded fitting-union-nipple (galvanized)	STXUN	Spring loaded fitting-union-nipple (stainless)
FS	Fixed bushing 1/2"x1/2" NPT	FX	Fixed hex instrument fitting 1/2" NPT
TX	Spring loaded fitting (transmitter bushing) 1/2"x1/2" NPT	OS	Spring loaded bushing with oil seal 1/2"x1/2" NPT
AT	Fixed hex instrument fitting - flex armor over Teflon	AF	Fixed hex instrument fitting - flex armor over fiberglass
PT	Fixed hex fitting - Poly jacketed flex armor over Teflon	Other	Consult factory

T3	Connection Extension Length (CEL)
X	Fixed extension. FS/TX/OS: 1" installed length (A); FX: 0.5" installed length (A)
3.5	3.5" Connection Extension Length (CEL), 3" Installed Length (A)
8.5	8.5" Connection Extension Length (CEL), 8" Installed length (A)
"inches"	Specify other Flex Connection Extension Length (CEL) if AF, AT, PT, TT, Note ² : CEL = A
"inches"	Specify other Union Connection Extension Length (CEL). Note ² : CEL = A + t _p ; A = CEL - t _p

T4	Thermocouple Type	T4	Continued
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

Continued on page 3

NOTES:

1. N, SN, NUN, SNUN require connection heads and terminal block to enable spring-loaded functionality.
2. CEL = Connection Extension Length; A = Installed Length; t_h = Head thread engagement; t_p = Process thread engagement.
3. Bold text indicates choices most common part selections.



Section: Thermocouple Sensor Probes & Assemblies
File: Thermocouple-Assembly-TC1-4

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TC1 Thermocouple Assembly Model Code

TC1 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9 - T10 - T11

Continued from page 2

T6	Thermocouple Junction
G	Grounded
U	Ungrounded
E	Exposed

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 C276
CI	Ceramic Insulators
Other	Consult Aircom Specialist

T9	Sensor "L" Length (inches)
"inches"	Specify length in inches
"LA"N"LB"	Length(s) with bend; LA = above bend (leave blank for standard supply); N = 90° Bend; LB = below bend; e.g. N12 or 4N8

T10	Fitting Options
X	No fitting required
CF	Compression Fitting
SL0	Spring loaded fitting (1/2"NPT Only)
Other	Consult factory

T11	Fitting Size
X	No fitting required (size not applicable)
18	1/8" NPT
14	1/4" NPT
12	1/2" NPT
34	3/4" NPT
Other	Consult factory

NOTES:

1. Part number example: TC1-0AL32D-TXUN-3.5-K-14-U-S-316-12-CF-12.
2. Reference page 4-6 for part outline and dimensions.

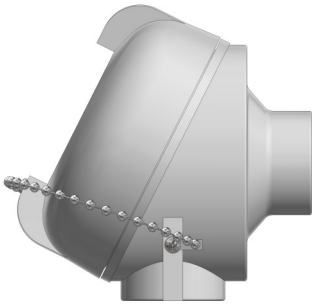


Section: Thermocouple Sensor Probes & Assemblies
File: Thermocouple-Assembly-TC1-4

TC1 Thermocouple Assembly Outline

Connection Head

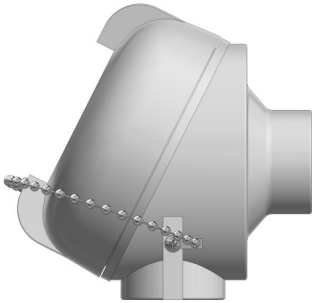
OAL



2CI



OPY



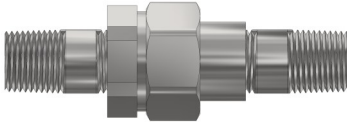
Refer to page 7-8 for additional connection head styles, options, and details

Flex-Armor/Connection Extension

N & SN



NUN & SNUN



FS



FX



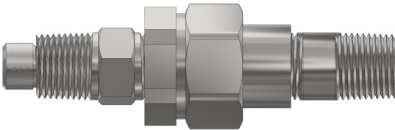
OS



TX



TXUN & STXUN



AF - AT



PT



Sensor Probe (OD)

18
(0.125")



36
(0.188")



14
(0.250")



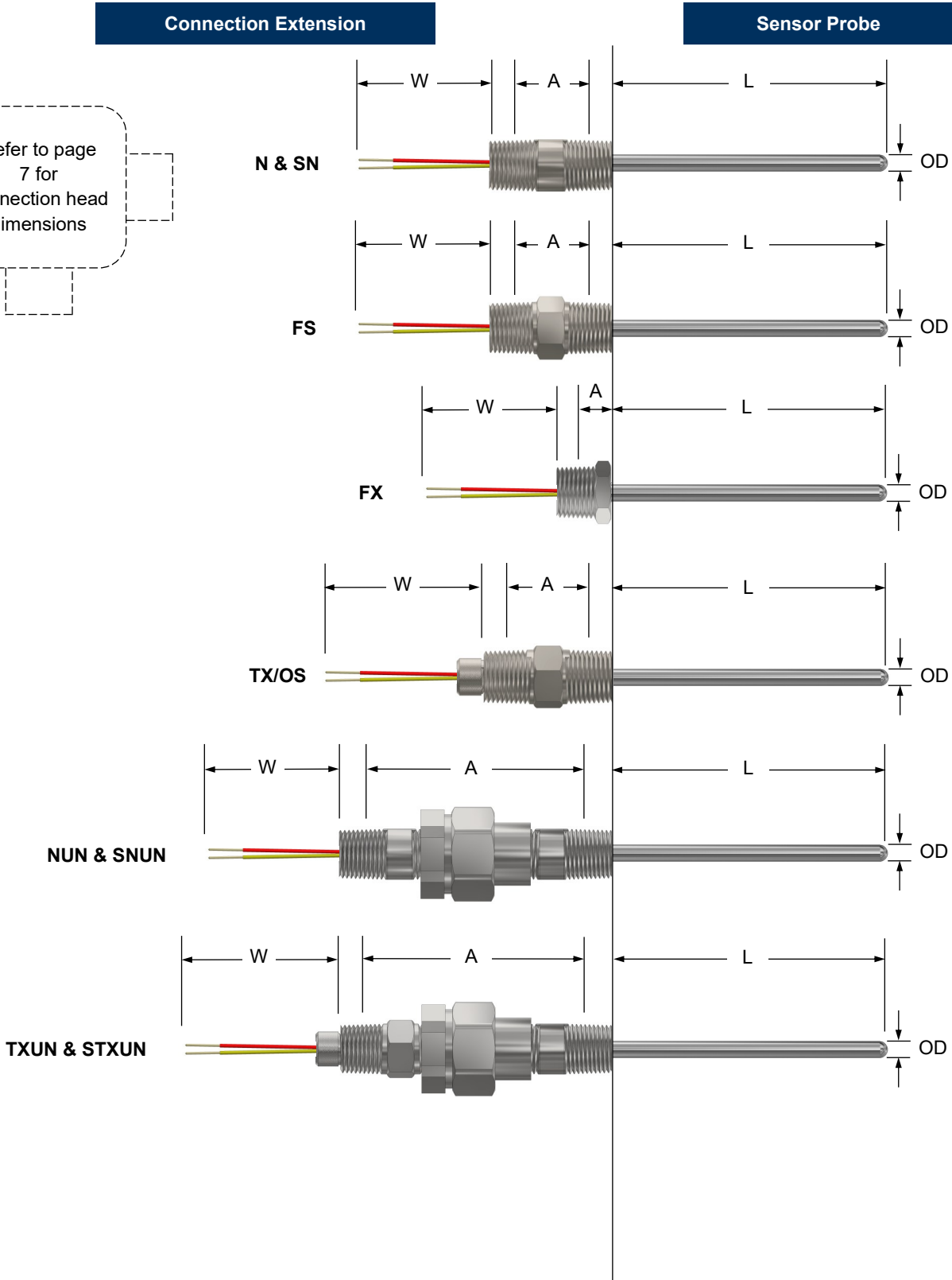
38
(0.375")



CI
(0.250 or 0.375")



TC1 Thermocouple Assembly Dimensions

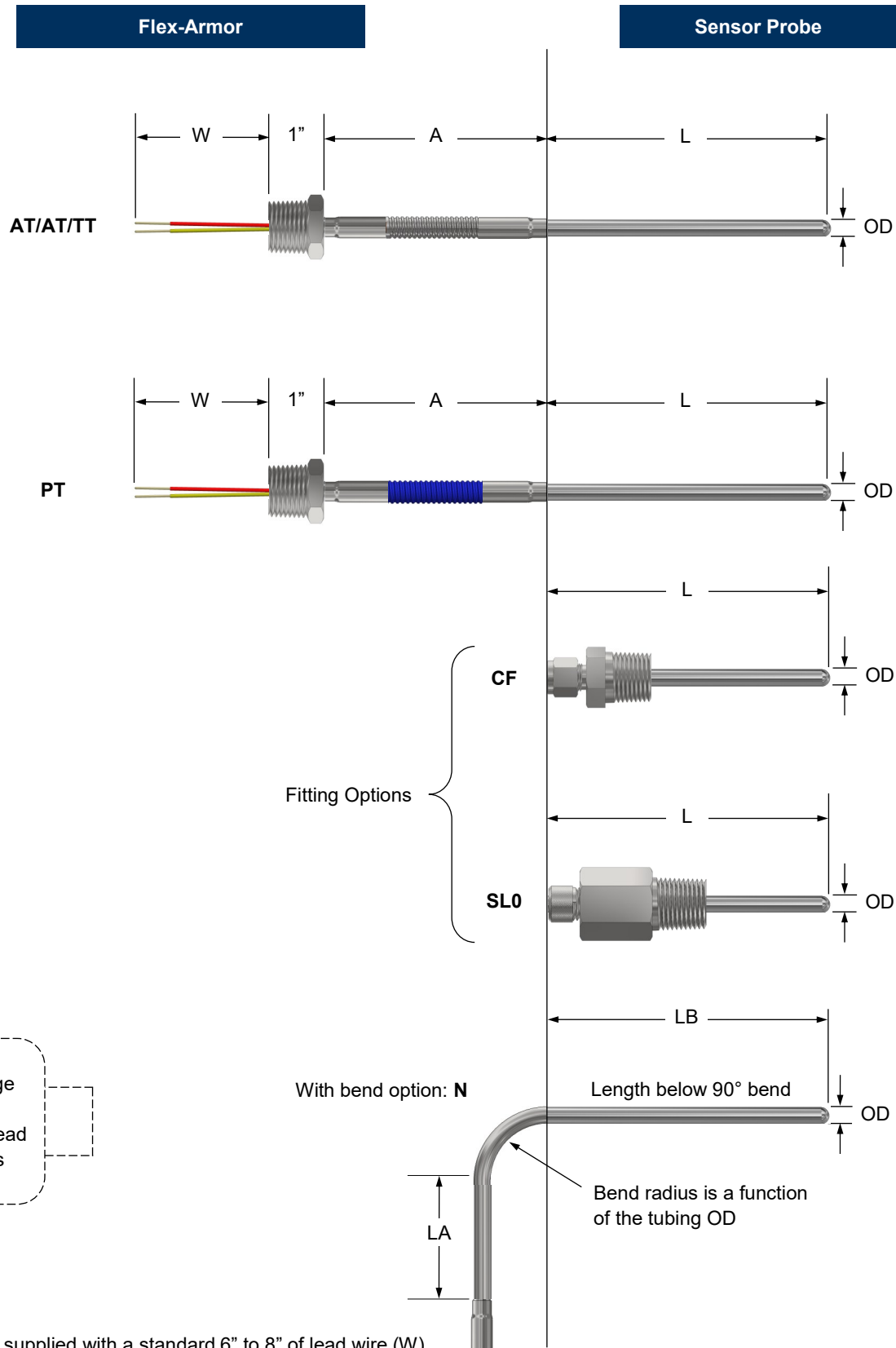


NOTES:

1. Thread engagements are approximately 0.5".



TC1 Thermocouple Assembly Dimensions



Refer to page 7 for connection head dimensions

NOTES:

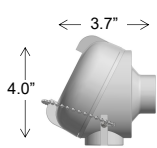
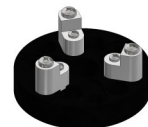
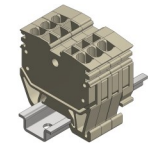
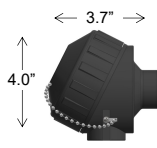
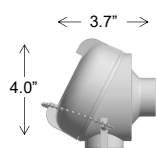
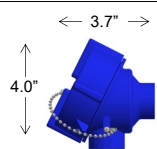
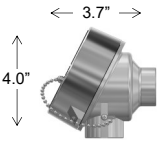
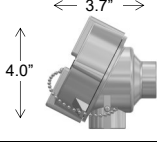
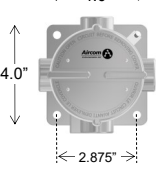
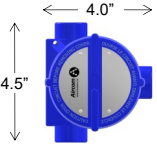
1. Assemblies are supplied with a standard 6" to 8" of lead wire (W).
2. Thread engagements are approximately 0.5".



Section: Thermocouple Sensor Probes & Assemblies
File: Thermocouple-Assembly-TC1-4

TC1 Connection Heads

Model, Outline, and Dimensions for T1/T1A

Outline & Dimensions	Model	Connection (NPT)		Material & Type	Max. Temperature Rating	Terminal Block Options (T1A)
		Instrument	Conduit			
	4AL	1/2"	1x 1/2" ²	Cast aluminum Buna O-ring General Purpose	+440°C (+825°F)	 Bakelite - <u>standard</u> Screw terminals to suit sensor configuration  Ceramic - optional Screw terminals to suit sensor configuration Add suffix "C" to connection head model number  Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add suffix "D" to connection head model number.  Splice technology - optional Wire splicing connectors contained loosely within connection head. Add suffix "S" to connection head model number.
	0AL	1/2"	1x 3/4"			
	1CI	1/2"	1x 1/2" ²	Iron alloy General Purpose	+440°C (+825°F)	
	2CI	1/2"	1x 3/4"			
	3CI	3/4"	1x 3/4"			
	0PY	1/2"	1x 3/4"	Polypropylene General Purpose	+121°C (+250°F)	
	1ALT	1/2"	1x 1/2" ²	Cast aluminum epoxy coated Buna O-ring Hazardous ¹ Type 4X	-50°C to +85°C (-58°F to +185°F) (+125°C (+257°F) Canada only)	
	2ALT	1/2"	1x 3/4"			
	3ALT	3/4"	1x 3/4"			
	1SS	1/2"	1x 1/2" ²	316 stainless Hazardous ¹ Type 4X		
	2SS	1/2"	1x 3/4"			
	3SS	3/4"	1x 3/4"			
	1AL	1/2"	1x 1/2" ²	Cast aluminum Buna O-ring Hazardous ¹ Type 4X		
	2AL	1/2"	1x 3/4"			
	3AL	3/4"	1x 3/4"			
	1ALW	1/2" ²	1x 1/2" ²	Cast aluminum epoxy coated Buna O-ring Hazardous ¹ Type 4X	-40°C to +85°C (-40°F to +185°F)	
	2ALW	1/2" ²	1x 3/4"			
	3ALW	3/4"	1x 3/4"			
	4ALW	3/4"	2x 3/4"			
	1ALM	1/2"	2x 1/2"			
	2ALM	1/2"	2x 3/4"			
	3ALM	3/4"	2x 3/4"			

NOTES:

1. Hazardous location rating is for connection head ONLY and not the complete temperature sensor assembly.
2. May be supplied with an approved reducer bushing.
3. Ambient temperature rating -50°C to +85°C (-58°F to +185°F); maximum temperature rating +125°C (+257°F) Canada only.
4. Ambient temperature rating -40°C to +85°C (-40°F to +185°F).



Section: Thermocouple Sensor Probes & Assemblies
File: Thermocouple-Assembly-TC1-4

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Transmitter Options for T1/T1A

Image	Code	Model	Specifications
	31D	5331D PR Order PN RTD, TC, Ohm, or mV input Extremely high accuracy 1.5 kVAC galvanic isolation Programmable sensor error value For DIN form B sensor head mounting	Operating Temperature: -40°C to +85°C Protection Degree: IP68 (enclosure) / IP00 (terminal) Dimensions: Ø 44 x 20.2 mm Weight: Approx. 50 g Supply Voltage: 7.2...30 VDC Isolation Voltage: 1.5 kVAC (test) / 50 VAC (working) Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1...60 s Signal Range (Output): 4...20 mA Approvals: ATEX, IECEx, FM, CSA, INMETRO Refer to PR Electronics for full details
	35D	5335D PR Order PN RTD, TC, Ohm, or mV input Extremely high accuracy HART 5 protocol Galvanic isolation For DIN form B sensor head mounting	Zone 0,1,2,21,22, M1 / DIV.1, DIV.2 Operating Temperature: -40°C to +85°C Protection Degree: IP68 (enclosure) / IP00 (terminal) Dimensions: Ø 44 x 20.2 mm Weight: Approx. 50 g Supply Voltage: 8.0...30 VDC Isolation Voltage: 1.5 kVAC (test) / 50 VAC (working) Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1...60 s Signal Range (Output): 4...20 mA Approvals: ATEX, IECEx, FM, CSA, INMETRO, SIL Refer to PR Electronics for full details
	75G	7501A3A2A12GY PR Order PN RTD, TC, Ohm, and bipolar mV input and analog output High definition local operator interface (LOI) 3 optical buttons Selectable red or white backlight Ex d explosion proof / flame proof HART 7 functionality with HART 5 compatibility	Operating Temperature: -40°C to +85°C (with silicone O-ring) Storage Temperature: -40°C to +85°C Protection Degree: IP54 / IP66 / IP68 / Type 4X Dimensions: Ø 110 mm Dimensions (HxWxD): 109.3 x 145 x 126 mm Weight: 1.3 kg Display Resolution: 96 x 64 pixels Backlight: Selectable ON/OFF, Color: White or Red Supply Voltage: 10 (12 with backlight)...30 VDC (Ex ia) / 10...35 VDC (Other) Isolation Voltage: 1.5 kVAC (test) / 50 VAC (working) Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1...60 s Long-Term Stability: ±0.1% of span per year Programming: HART Approvals: ATEX, IECEx, FM, CSA, INMETRO, SIL Refer to PR Electronics for full details
Image Not Applicable	31A	5331A PR Order PN	Refer to PR Electronics for full details
Image Not Applicable	47D1	5437D1 PR Order PN	Refer to PR Electronics for full details
Image Not Applicable	47D2	5437D2 PR Order PN	Refer to PR Electronics for full details
Image Not Applicable	Other	Consult Aircom for other available options	

NOTES:

1. Models shown represent the most commonly selected configurations.