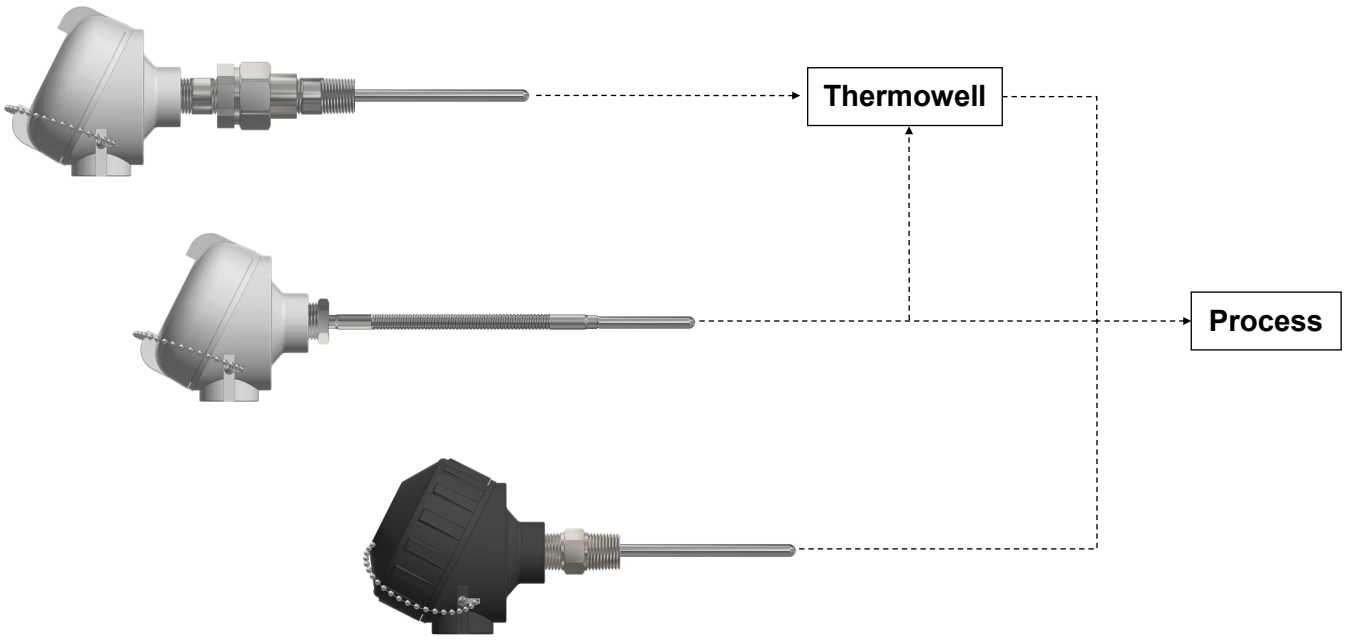
RT1 RTD Assembly

General Purpose / Ordinary Location RTD Assembly



Overview

Description:

The RT1 RTD assembly is a resistance temperature detector designed for use general purpose non-hazardous locations. The RT1 is a customizable product that is model number configured and made to order.

The RT1 consists of a stainless steel RTD 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.
- RT1 configuration options allow for many different patterns to be configured for almost any temperature measurement application.

Application:

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

Configuration Considerations

When configuring the RT1 model to suit your application it is important to consider the following:

- Site specific standards
- Connection head type
- Extension length
- RTD element (tolerance)
- RTD construction style
- Number of RTD elements
- 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 RT1 with a thermowell, consider:

- Thermowell length alignment with RT1 sensor probe
- Spring loaded RT1 “L” length = Thermowell stem
- Fixed fitting RT1 “L” length = Thermowell stem - 0.5”

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RT1 RTD Assembly Model Code

RT1 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9 - T10 - T11

RT1	General Purpose / Ordinary Location RTD Assembly

T1	Connection Head / Termination	T1	Continued
0AL	**Aluminum, 1/2" instrument x 3/4" conduit**	**X**	**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**	**32D**	**5332D PR puck transmitter**
C	**Ceramic terminal block**	31D	5331D PR puck transmitter
D	DIN mount technology	35D	5335D PR puck transmitter (with HART)
S	Splicing connectors	Other	Consult Factory

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	Element Type
A	**100Ω Pt. 385 Class A (Class A tolerance ≤ +300°C (+572°F), Class B tolerance typically applies >+300°C (+572°F))**
B	100Ω Pt. 385 1/10 Class B (1/10 DIN; tolerance typically applies ≤ +150°C (+302°F))
C	100Ω Platinum 392
D	120Ω Nickel 627 0.806Ω/ºC
E	10Ω Copper 427 0.039Ω/ºC
F	1000Ω Pt. 385 Class A (Class A tolerance ≤ +300°C (+572°F), Class B tolerance typically applies >+300°C (+572°F))

T5	Number of Elements
S	**Single element**
D	Dual element

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 most common part selections.

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RT1 RTD Assembly Model Code

RT1	-	T1	T1A	-	T2	-	T3	-	T4	-	T5	-	T6	-	T7	-	T8	-	T9	-	T10	-	T11

Continued from page 2

T6	Lead Wire Configuration
2	2 Wire
3	**3 Wire**
4	**4 Wire**

T7	Sensor Probe Construction
LT	**Low temperature (-50 to +260ºC) (-58°F to +500°F)**
HT	High temperature (-50 to +482ºC) (-58°F to +899°F)
ET	Extreme temperature (-50 to +850°C) (-58°F to +1562°F)
VL	Vibration construction low temp (-50 to +260ºC) (-58°F to +500°F)
VH	Vibration construction high temp (-50 to +482ºC) (-58°F to +899°F)
CT	Cryogenic temperature (-200 to +260°C) (-328°F to +500°F)

T8	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*

T9	Sensor Sheath Diameter
18	1/8” (0.125”)[3]
36	3/16” (0.188”)[3]
21	0.215”[3]
14	**1/4” (0.250”)**
38	3/8” (0.375”)

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: RT1-2ALT32D-AT-72-A-S-3-LT-N6-14-CF-12.
2. Reference page 4-6 for part outline and dimensions.
3. OD Not available for element type E, dual elements, or HT, ET, VH construction.
4. Standard sheath material supply is 316/316L stainless steel.

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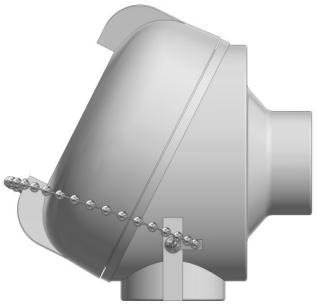
RT1 RTD Assembly Outline

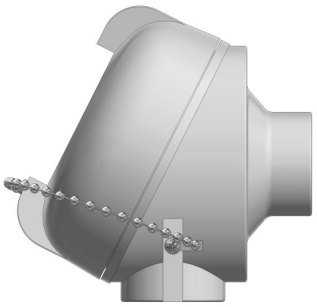
Connection Head

0AL



2CI

0PY

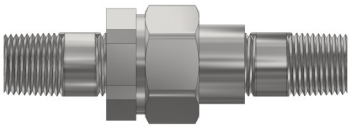


Refer to page 7-8 for additional connection head styles, options, and details

Flex-Armor/Connection Extension

N & SN

NUN & SNUN

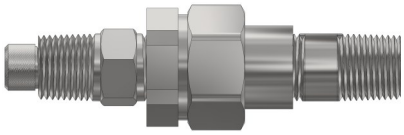


FS

FX

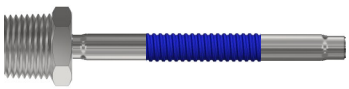
OS/TX

TXUN/STXUN



AF/AT/TT

PT



Sensor Probe (OD)

18
(0.125”)

36
(0.188”)

14
(0.250”)

38
(0.375”)

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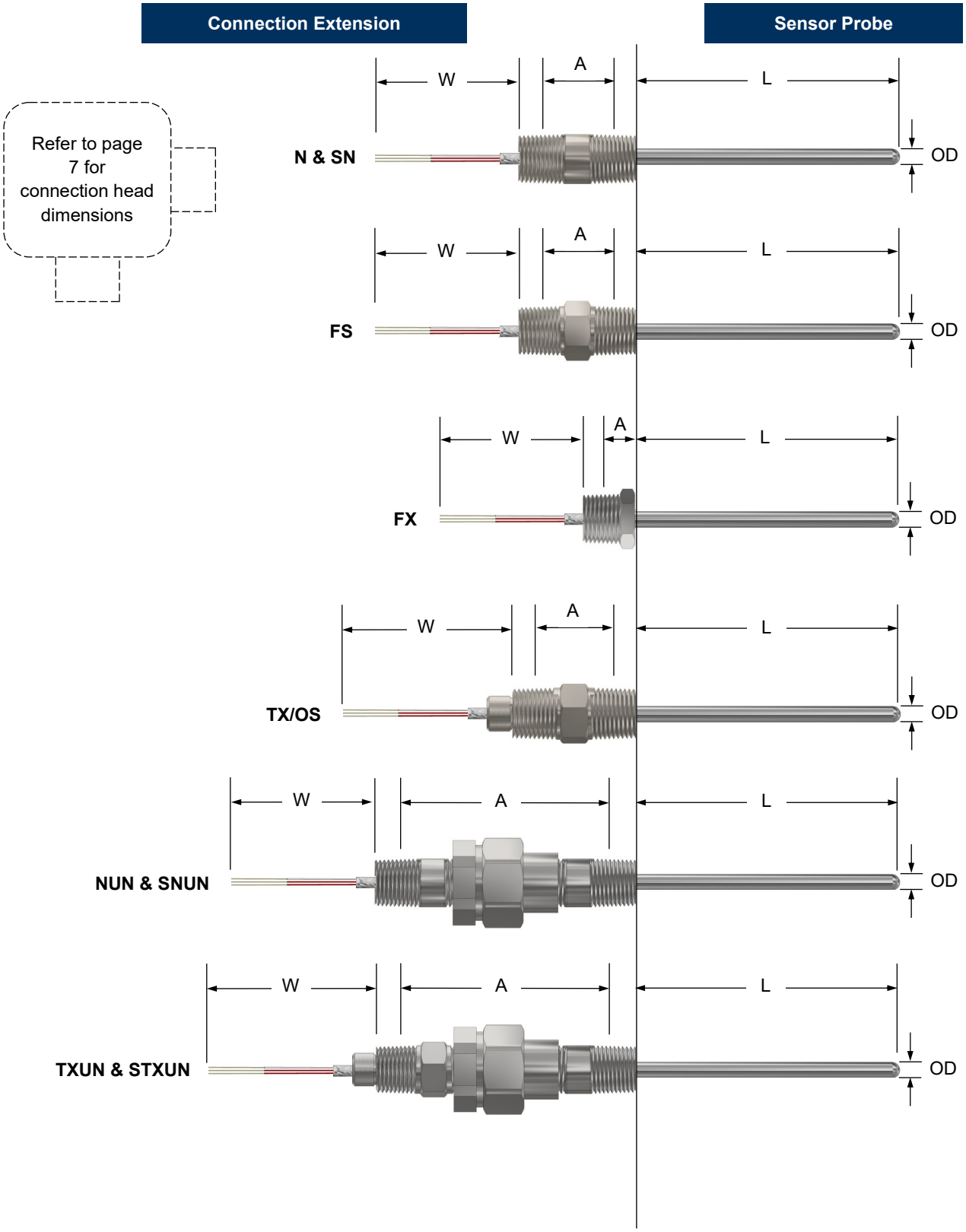
RT1 RTD Assembly Dimensions



NOTES:

1. Thread engagements are approximately 0.5”.

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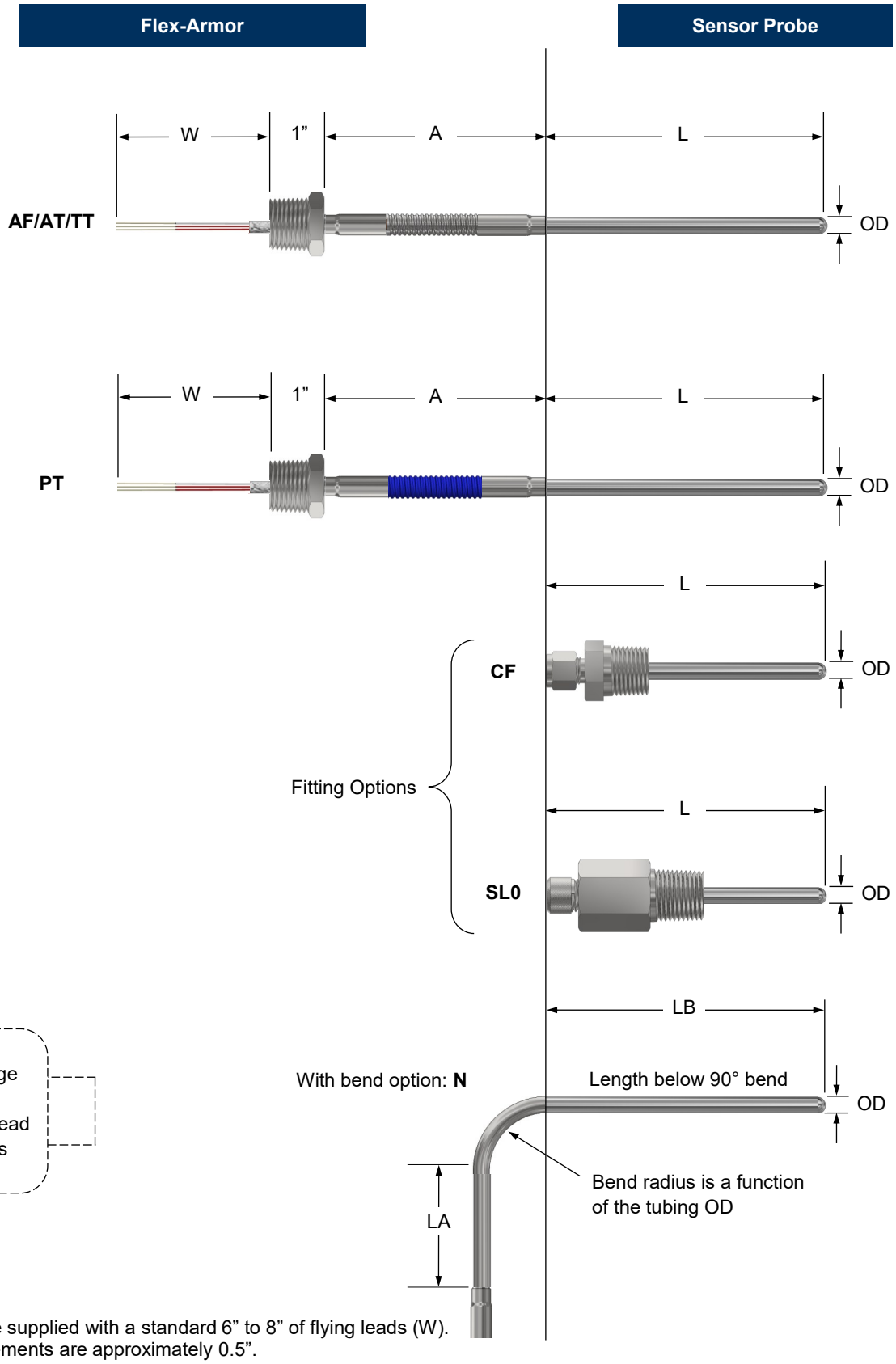
RT1 RTD Assembly Dimensions



NOTES:

1. Assemblies are supplied with a standard 6” to 8” of flying leads (W).
2. Thread engagements are approximately 0.5”.

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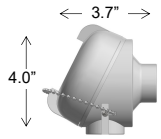
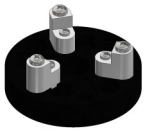
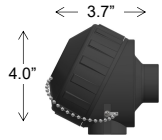
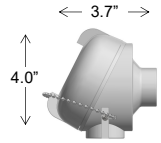
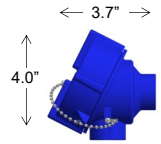
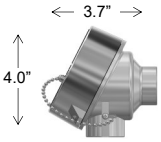
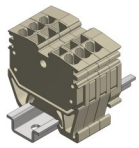
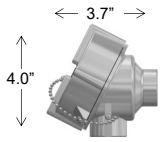
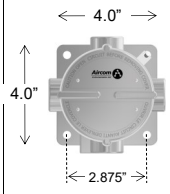
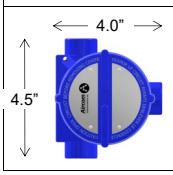
Model, Outline, and Dimensions for T1/T1A

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

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Transmitter Options for T1/T1A

Image	Code	Model	Specifications
	32D	5332D PR Order PN RTD or Ohm input Extremely high accuracy Programmable sensor error value For DIN form B sensor head mounting	Hazardous area, Zone 0 / Div. 0 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 Signal Range (Output): 4…20 mA Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1…60 s Signal Dynamics: Input 20 bit / Output 16 bit Approvals: ATEX, IECEx, FM, CSA Refer to PR Electronics for full details
	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.

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