



Sanitary RTDs and Temperature Transmitters

Form No. AIC5001 © 3/99
Revised: 11/04
Supercedes: 4/02

- **Modular components provide maximum configuration flexibility**
- **Unique element-to-housing design eliminates exposed threads, lowers profile**
- **All stainless steel construction with O-ring seals for maximum corrosion and moisture protection**
- **NIST traceable with certifications**

Anderson Instrument's electronic temperature sensors combine our industry proven, all stainless steel construction with modular components. Interchangeable RTD elements, wiring heads, transmitter modules and digital displays can be individually selected. Components can be factory or field assembled in the optimum configuration for any application. To further facilitate adaptability, our RTD's are

offered with the widest selection of sanitary clamp, thermowell and flush-mount fittings available. Our temperature transmitters are available in analog and HART "SMART" versions. These modules can be factory or field installed in any standard (CT-1) wiring head or panel mounted remotely from the RTD element allowing for greater flexibility. Ordering information, technical specifications and dimensional drawings are included herein.



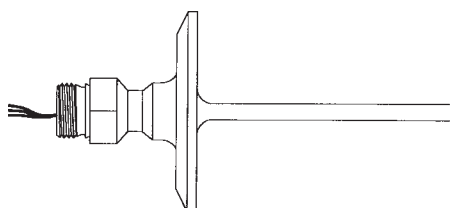
Sanitary RTD's

Anderson RTD sensors are 100 ohm, 3-wire, DIN standard elements designed for direct immersion in sanitary applications or in any of a wide variety of thermowells. Sensors are available in single or dual element configurations. Single element styles may be specified with factory sealed, shielded cables up to 200 feet in length, or in our unique modular design. The modular elements can be mated with either the "mini" head for stand-alone RTD applications or our transmitter head for analog or "smart" transmitter applications. All dual element sensors are supplied in the modular configuration.

All sensors feature completely sealed internals for maximum moisture and vibration resistance. They provide the fastest possible response characteristics due to our unique method of internal element attachment which eliminates all air and non-metallic materials between the element and the process material being monitored.

These sensors are constructed entirely of 316L grade stainless steel and all product contact surfaces are electropolished to an R_a max. of 8 micro-inches (0.2 microns). All elements are provided with a permanently engraved stainless steel tag and a certificate of calibration.

- All stainless steel with no exposed threads
- Compact, low in profile
- Field serviceable - replaceable elements



Specifications

RTD Elements

General:	100 ohm, 3-wire sensors which conform to DIN standards. Single element standard; dual element optional	Response:	2.5 to 3 seconds for 63% step change
Coefficient:	.00385 ohms/ohm/Deg. C	Span:	400°F (221°C) maximum
Accuracy:	.1% at 0°C (Band 1) Standard	Low End:	-50°F (-45°C) minimum
Probe Diameters:	1/4" standard for sanitary clamp styles (1"-4") single or dual element. 5/32" standard for direct mount, clamp styles (1/2" - 3/4") clamp and "mini wells" <u>single element only</u> Other diameters available for thermowell installation	High End:	350°F (176°C) maximum
		Material:	316 "L" Stainless Steel wettable parts
		Surface Finish:	8 micro-inch R_a electropolished 32 micro-inch R_a (thermowell fittings)
		Fitting Styles:	All standard sanitary clamp styles, including fractional clamps and mini thermowell styles; Refer to ordering matrix for details

Wiring Heads

General:	The wiring heads are designed to accept any type of RTD element, but offers the cleanest package when coupled with Anderson "no exposed thread" RTD's, which provide an O-ring seal against the housing.	Surface Finish:	32 micro-inch R_a max.
Material:	304 Stainless Steel	Dimensions:	Transmitter: 3.15" O.D. X 2.75" L Mini RTD: 2.0" O.D. X 2.3 L
		Penetrations:	(2) at 1/2" - 14 NPT female; (1) centered in bottom plate; (1) in side beneath cap rim.
		Cable "Grip":	Optional NEMA 4X "Hubbel" style connector, supplied when pre-wired cable is specified.
		Ratings:	NEMA 4X; IP-65

Temperature Transmitters

Any single element RTD can be used with our 4-20 mA transmitters. Our standard 4-20mA transmitter module can be mounted in our transmitter wiring head or in a remote panel. The module not only provides an accurate signal (0.1% of calibrated span) but is also completely sealed in urethane for protection against vibration and moisture. An optional digital display can be mounted in the cap providing local indication of temperature, signal level, or percent output. This option can be factory installed or added in the field. The housing can be oriented vertically or horizontally to simplify wiring and optimize viewing angle. The result is a competitively priced transmitter which is:

- Modular - field replaceable/upgradeable components.
- All stainless steel with no exposed threads
- Compact, low in profile

All prewired element/transmitter assemblies are factory calibrated and shipped with NIST traceable certifications.

Specifications

Analog Transmitter Module

Input:	3-wire, 100 ohm, DIN standard curve (385 coefficient)
Output:	2-wire, 4-20 mA analog
Power Supply:	12 to 40 Volts d.c. loop power required.
Accuracy:	0.1% of calibrated span, linearized.
Minimum Span:	50°F or C
Maximum Span:	300°F, 180°C
Minimum Low End:	0°F or C
Maximum Low End:	100°F or C
Minimum High End:	50°F or C
Maximum High End:	350°F, 180°C

Wiring Connections:	Screw terminals with #3 screws.
Isolation:	Non-isolated.
Burn-Out:	Upscale (factory standard) downscale (consult factory)
Zero Adjustment:	"Pot" adjustable to $\pm 25^\circ\text{F}$ ($\pm 15^\circ\text{C}$) typical
Span Adjustment:	"Pot" adjustable over a 25°F (15°C) range minimum

AGENCY APPROVALS

Electromagnetic Compatibility (EMC):
CE Compliant (Accuracy de-rated up to 4% in
200 - 300 MHz 3V/M RF Field).

SMART Transmitter Module

Input:	3-wire, 100 ohm, DIN standard (.00385 ohms/ohm/°C)
Output:	4-20 mA, linear with temperature; Digital output signal superimposed on 4-20mA signal; "HART" compliant
Isolation:	Input/Output isolated to 500V rms (707V p-p)
Accuracy:	$\pm 0.1\%$ of upper range limit (URL); includes non-linearity, and hysteresis
Stability:	0.1°C per 6 months
Minimum Span:	10:1 turndown (23°C)
Maximum Span:	230°C
Maximum Range:	-50 to 180°C
Power Required:	14-40 VDC external loop power (unregu- lated)
Power Supply Effect:	Less than 0.005% of span per Volt
Max. Loop Resistance:	(Supply Voltage - 14) X 40 = Ohms

AGENCY APPROVALS

Electromagnetic Compatibility (EMC):	CE Compliant (for optional LCD only, display accuracy de-rated up to 2% in 150 - 180 MHz and 230 - 350MHz, 10V/M RF Field).
Hazardous Locations:	Meets UL requirements for Class 1, Div. 1&2; Groups A-D for intrinsically safe apparatus when installed with barrier as required in control drawing provided
Ambient Limits:	-18 to 50°C
Ambient Effects:	$\pm 0.13^\circ\text{C}$ per 28°C temperature change
Storage Temperature:	-40 to 65°C
Humidity:	0-100% RH
Vibration Effects:	Withstands 2g at 10-60 Hz
Failure Mode:	Field selectable, High or Low
Warranty:	Two Years

Display Module

General: The display module provides a local display of temperature (°F or °C) or output value (milliamps or percent). It mounts in the cap and is powered by the loop power supply. It is designed to be easily added to any unit in the field or can be specified initially with any unit or transmitter.

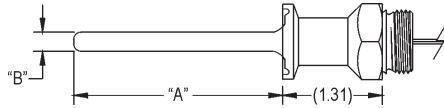
Digits:	3-1/2 digits
Digit Size:	.5" High
Type:	LCD
Mounting:	Integral to cap; field replaceable/upgradeable
Units of Display:	4-20mA; 0-100%; Degrees C; Degrees F (0- 199.9°F max) factory set, or 0-300° F.
Accuracy:	$\pm 0.2\%$ of scale
Loop Resistance:	Adds less than 250 ohms.

Dimensional Drawings

RTD Fitting Styles and Sizes

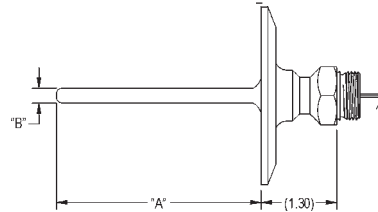
1/2" & 3/4" TRI-CLAMP STYLE

DESCRIPTION	"A" DIM.	"B" DIM.
1/2" TRI-CLAMP	1-1/4"	5/32" DIA.
3/4" TRI-CLAMP	2-3/4"	5/32" DIA.
3/4" TRI-CLAMP	2-3/4"	1/4" DIA.



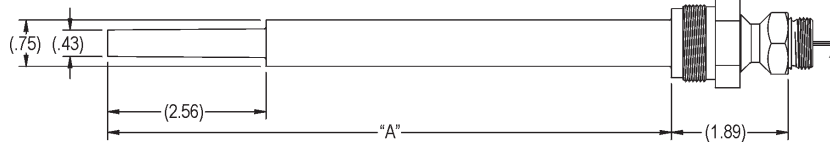
1-1/2" - 4" TRI-CLAMP STYLES

DESCRIPTION	"A" DIM.	"B" DIM.
1-1/2" TRI-CLAMP	2-3/4"	1/4" DIA.
2" TRI-CLAMP	3-1/2"	1/4" DIA.
2-1/2" TRI-CLAMP	3-1/2"	1/4" DIA.
3" TRI-CLAMP	3-3/4"	1/4" DIA.
4" TRI-CLAMP	4-1/2"	1/4" DIA.



WELL STYLES

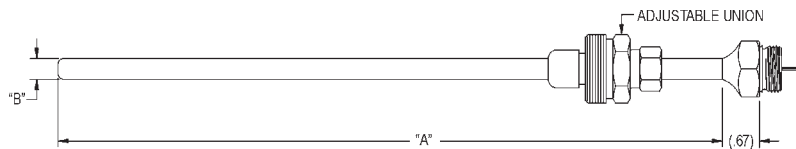
DESCRIPTION	"A" DIM.
41247 WELL	9-1/8"
41279 WELL	12-1/8"



E-1 & E-3 STYLES

DESCRIPTION	"A" DIM.	"B" DIM.
E-1 *	12"	1/4" DIA.
E-1 *	18"	3/8" DIA.
E-3	12"	1/4" DIA.
E-3	18"	3/8" DIA.

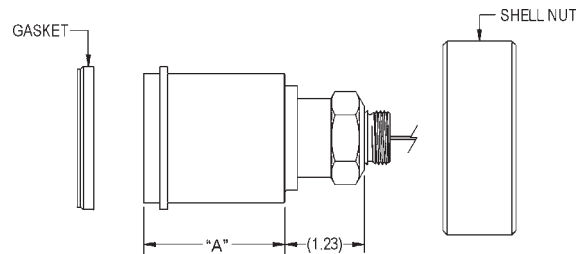
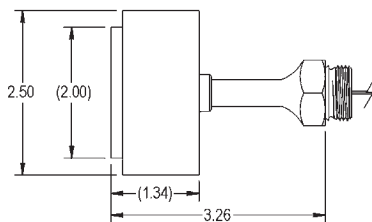
*NO UNION



AIC FLUSH MOUNT

DESCRIPTION	"A" DIM.
LONG	6.50
SHORT	2.19

TAYLOR FLUSH MOUNT

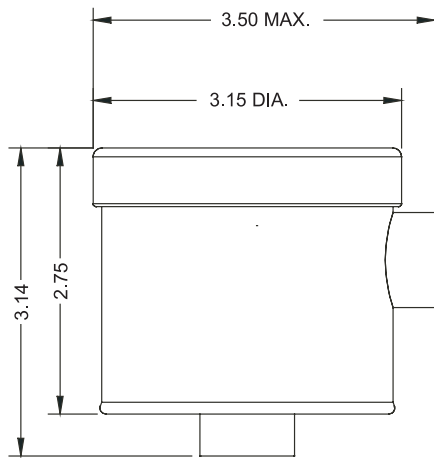


Special "A" diameter available upon request.

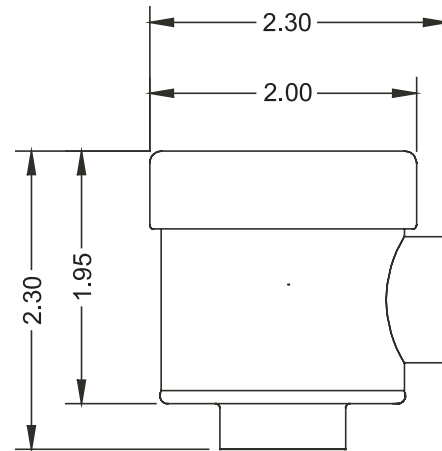
Note: "A" dimensions of less than 1.5" de-rates accuracies by 0.1%/50°C at temperatures exceeding 212°F (100°C)

Dimensional Drawings

Modular Wiring Heads

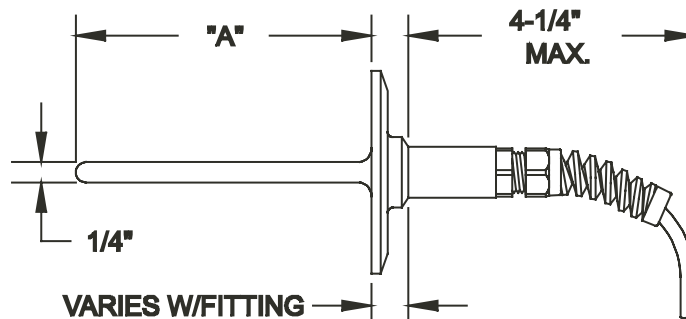


TRANSMITTER HEAD



"MINI" RTD HEAD

Sealed Cable RTD



Ordering Examples

1. Pharmaceutical Series RTD, single element, 50' sealed cable with strain relief, 1.5" tri-clamp fitting.
Model #: SA110040370110
2. Pharmaceutical Series RTD, dual element, with wiring head, 2" tri-clamp fitting.
Model #'s: SA520050490000 (RTD)
CT320000001100 (wiring head)
3. Analog (4-20mA) temperature transmitter, 0-150°C range, 0-100% display, with pre-wired RTD, Pharmaceutical Series with thermowell fitting for 6" insertion, 1/4" diameter, 1/2" NPT. Horizontal mount wiring head.
Model #'s: SA510840890000 (RTD)
CT13073C022100 (wiring head with transmitter)
4. Smart (4-20mA with HART) temperature transmitter, field programmable range, no display, with pre-wired RTD, Pharmaceutical Series with 1.5" tri-clamp fitting. Vertical mount wiring head with 25' pre-wired cable.
Model #'s: SA510040370000 (RTD)
CT14999P001105 (wiring head with transmitter)

Ordering Information

RTD's



WIRING STYLE

- 1 Sealed Cable w/Strain Relief
- 2 Sealed Cable w/male 1/2" NPT & Strain Relief
- 5 6" leads for use with wiring head (see CT matrix)

ELEMENT TYPE

- 1 100 ohm Single (DIN std.)
- 2 100 ohm Dual (DIN std.)
(available w/wiring style #5 only)

CABLE LENGTH

- 00 No Cable (wiring style #5)
- 01 5' (Standard w/wiring style #2)
- 05 25' (Standard w/wiring style #1)
- 10 50'
- 15 75'
- 20 100'
- 21 125'
- 22 150'
- 23 175'
- 24 200'

CABLE TYPE

- 0 No Cable Required (Wiring style #5)
- 1 4 conductor PVC w/Strain Relief (Standard w/wiring style #1 or #2)
- 2 6 conductor PVC (for element type #2)

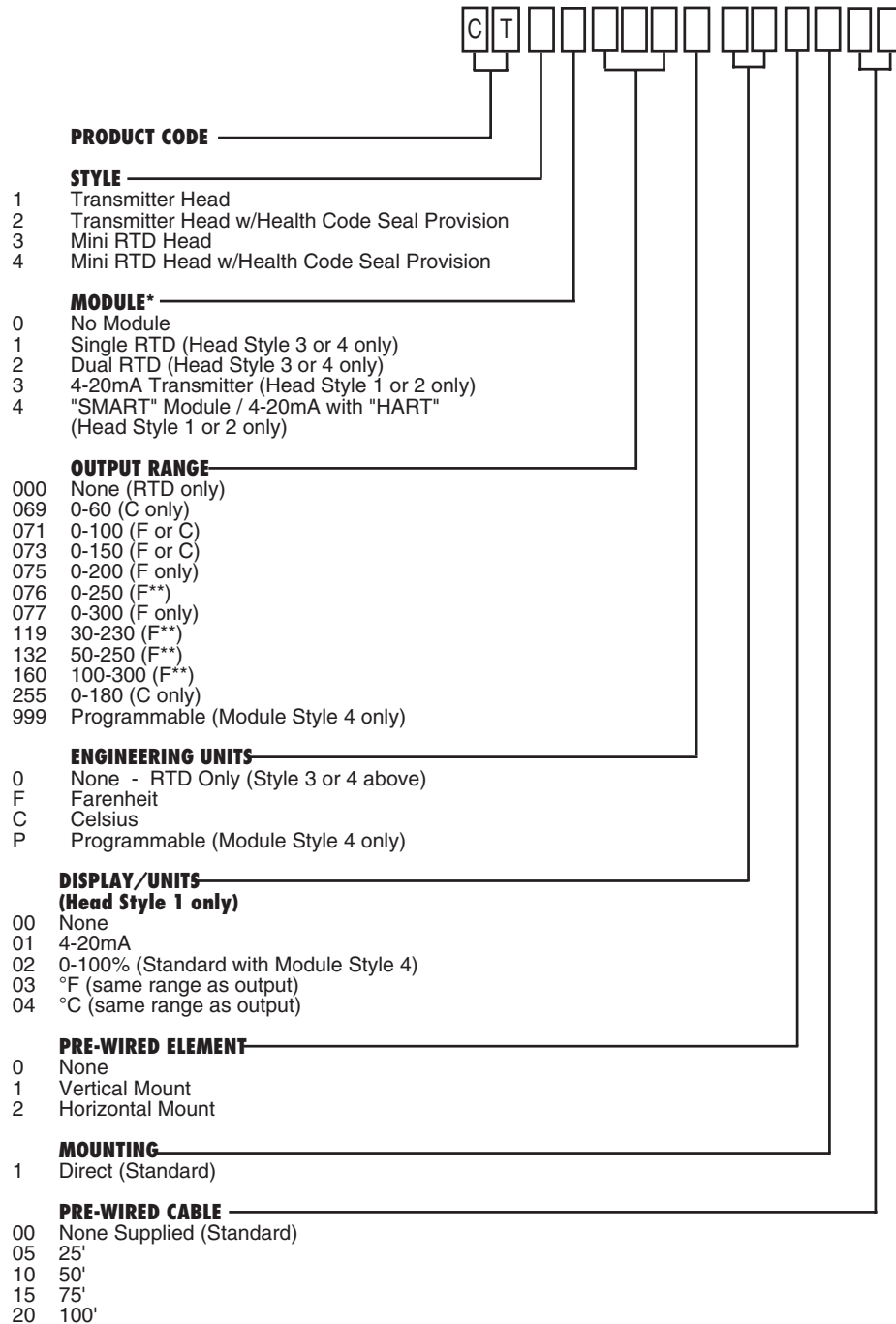
FIXED CHARACTER

FITTING

	FITTING	INSERTION LENGTH
004-037	1-1/2" Tri-Clamp	2-3/4"
005-049	2" Tri-Clamp	3-1/2"
006-049	2-1/2" Tri-Clamp	3-1/2"
007-053	3" Tri-Clamp	3-3/4"
008-065	4" Tri-Clamp	4-1/2"
010-031	1-1/2" APC "K"	2-3/8"
011-730	2" APC "K"	2-25/32"
012-044	2-1/2" APC "K"	3-3/16"
013-049	3" APC "K"	3-1/2"
016-031	1-1/2" Cherry-Burrell "I"	2-3/8"
017-730	2" Cherry-Burrell "I"	2-25/32"
018-044	2-1/2" Cherry-Burrell "I"	3-3/16"
019-049	3" Cherry-Burrell "I"	3-1/2"
027-044	1-1/2" G&H "H" Line (male)	3-3/16"
028-056	2" G&H "H" Line (male)	3-15/16"
029-056	2-1/2" G&H "H" Line (male)	3-15/16"
030-060	3" G&H "H" Line (male)	4-3/16"
032-033	1-1/2" Cherry "Q"	2-1/2"
033-049	2" Cherry "Q"	3-1/2"
034-028	1-1/2" #14 APC-PV (w/nut)	2-3/16"
035-729	2" #14 APC-PV (w/ nut)	2-17/32"
036-040	2-1/2" #14 APC-PV (w/ nut)	2-15/16"
037-045	3" #14 APC-PV (w/ nut)	3-1/4"
038-028	1-1/2" #14 APC-PV (w/o nut)	2-3/16"
039-729	2" #14 APC-PV (w/o nut)	2-17/32"
040-040	2-1/2" #14 APC-PV (w/o nut)	2-15/16"
041-045	3" #14 APC-PV (w/o nut)	3-1/4"
044-731	1-1/2" #14 Bevel seat (w/nut)	2-15/64"
045-035	2" #14 Bevel Seat (w/nut)	2-5/8"
046-731	1-1/2" #14 Bevel St. (w/o nut)	2-15/64"
047-035	2" #14 Bevel Seat (w/o nut)	2-5/8"
051-029	1-1/2" APC K15W XF (female) self aligning	2-1/4"
052-036	2" APC K15W XF (female) self aligning	2-11/16"
060-221	Umbrella	14-1/4"
060-360	Umbrella	22-15/16"
060-435	Umbrella	27-5/8"
060-532	Umbrella	33-11/16"
060-680	Umbrella	42-15/16"
061-077	Split Ferrule (button)	5-1/4"
062-139	Projectile Well (41247)	9-1/8"
063-161	Projectile Well (41280)	10-1/2"
064-187	Projectile Well (41279)	12-1/8"
074-185	E1 Style - 1/4" dia. (plain)	12"
075-185	E1 Style - 3/8" Dia. (plain)	12"
079-185	E3 Style - 1/4" Dia (with adjustable union)	12"
080-185	E3 Style - 3/8" Dia. (w/adjustable union)	12"
083-137	Bi-Metal Well - 1/4" NPT	9"
084-089	Bi-Metal Well - 1/2" NPT	6"
088-000	Anderson Flush Mt. (short)	
089-000	Anderson Flush Mt. (long)	
098-000	Taylor Flush Mount	

Ordering Information

Modular Wiring Heads for RTD's and Transmitters



* To order only the output module, consult our Customer Service Department.

"SMART" Module Part Number: 5610100003

** This range available with display options 00, 01, 02 only.



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