

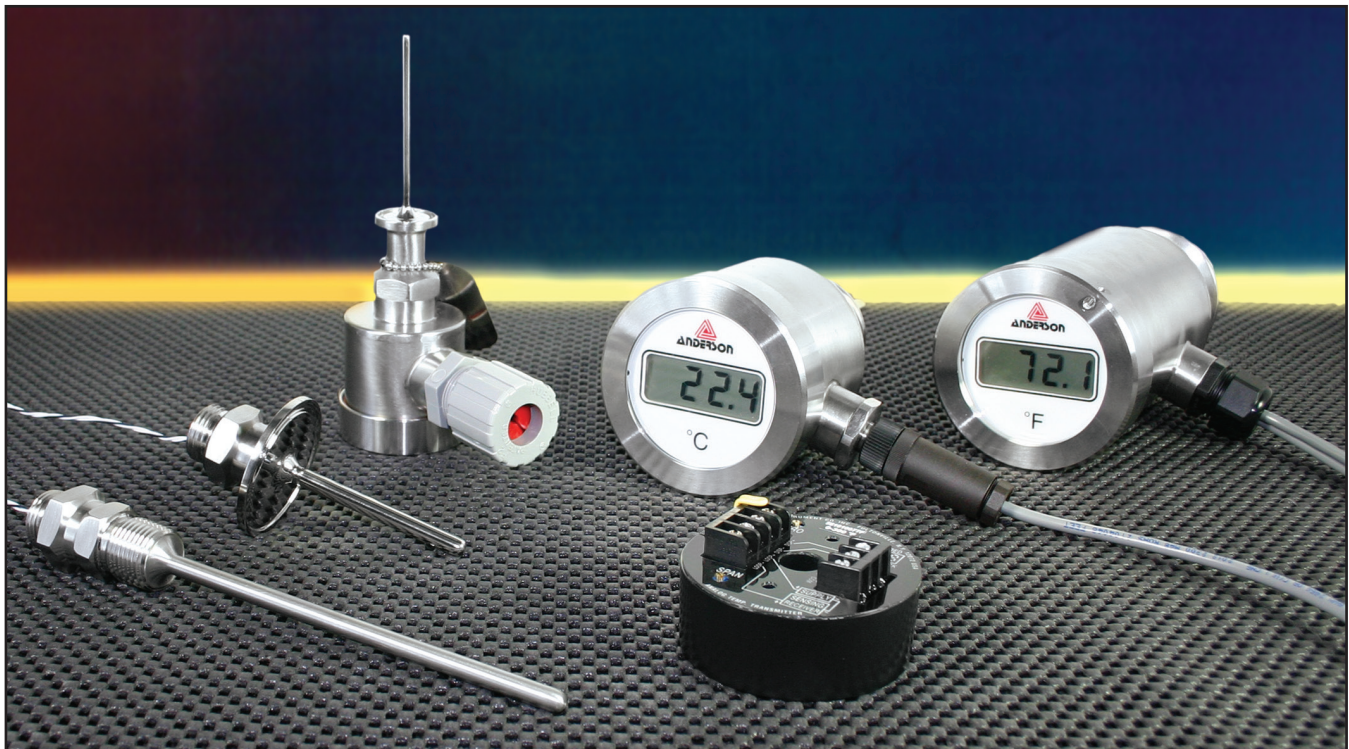


# Sanitary RTDs and Temperature Transmitters

- *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*
- *Custom lengths (up to 6") available at no extra charge*
- *Dual Output Options*
- *Quick Disconnect Options*

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; and with sealed cable, quick disconnect, or wiring heads options.

Our temperature transmitters are available in analog and HART "SMART" versions. These modules can be factory or field installed in any standard (CT) wiring head or panel mounted remotely from the RTD element allowing for greater flexibility. New Dual Output options provide two signals in virtually any combinations. Ordering information, technical specifications and dimensional drawings are included herein, or for more information please visit our Web Site at [www.andinst.com](http://www.andinst.com), or contact your local Authorized Anderson Distributor.

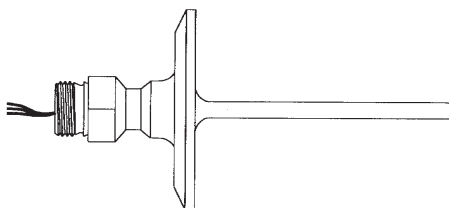


# Sanitary RTD's

Anderson SA-Series 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 or with our new water-tight quick disconnect. 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, now available with dual output wiring heads as well.

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.

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



## 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. Other diameters available for thermowell installation	High End:	350°F (176°C) maximum
		Material:	316 "L" Stainless Steel wettable parts
		Surface Finish:	25 micro-inch $R_a$ 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
		* RTD's with quick disconnect are configured for 4-wire connection to minimize output errors from connection resistance.	

### 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.
		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.
Material:	304 Stainless Steel	Cable Connections:	Standard NEMA4X "Hubbell" style cable "grip", or Optional Quick Disconnect with Field Wireable Connector
		Ratings:	NEMA 4X; IP66

# 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. Any of the above may be specified in single (standard) or dual (any combination) outputs. 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

## 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 $25^{\circ}\text{F}$ ( $15^{\circ}\text{C}$ ) 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 (unregulated)
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 $28^{\circ}\text{C}$ 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

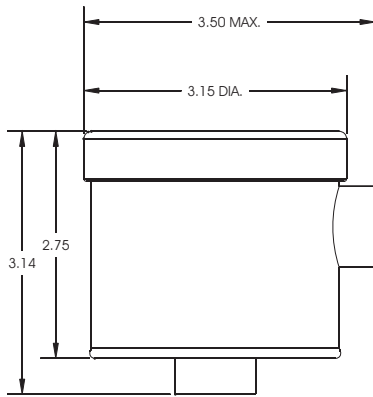
### Display Module

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.

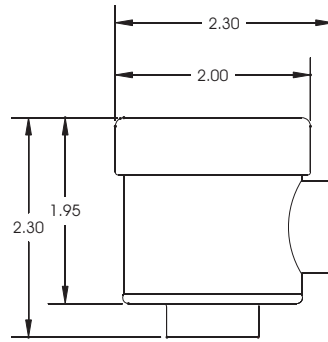
Digits:	3-1/2 digits
Digit Size:	.5" High
Type:	LCD
Mounting:	Integral to cap; field replaceable/upgradeable
Units of Display:	4-20mA; 0-100%; Degrees C; Degrees F (0-199.9°F max) factory set, or 0-300° F.
Accuracy:	$\pm 0.2\%$ of scale
Loop Resistance:	Adds less than 250 ohms

# Dimensional Drawings

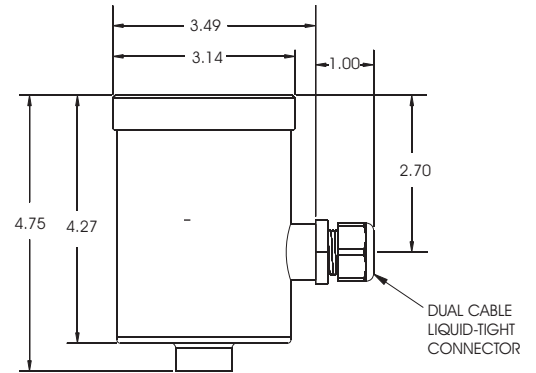
## Modular Wiring Heads



TRANSMITTER HEAD



"MINI" RTD HEAD

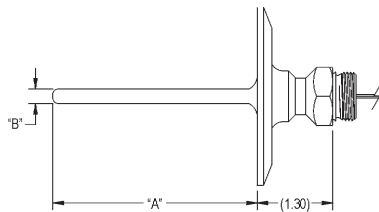


DUAL OUTPUT WIRING HEAD

## RTD Fitting Styles and Sizes

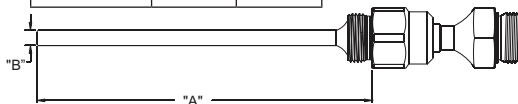
1-1/2" - 4" TRI-CLAMP® STYLE

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.



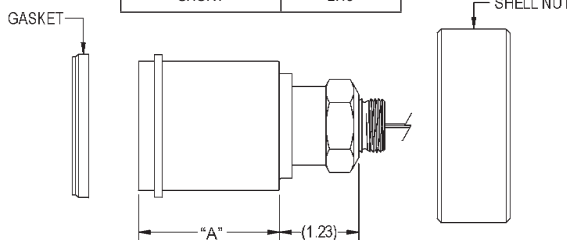
SPRING LOADED STYLES

DESCRIPTION	"A" DIM.	"B" DIM.
1/2" NPT	6"	1/4" DIA.
1/2" NPT	9"	1/4" DIA.



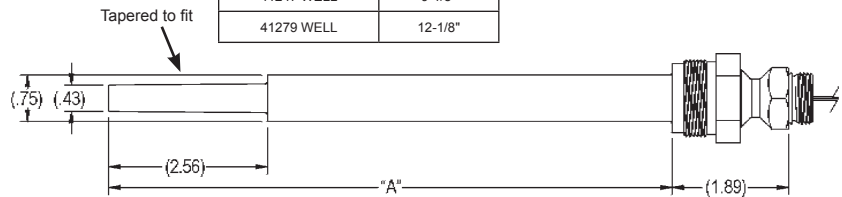
AIC FLUSH MOUNT

DESCRIPTION	"A" DIM.
LONG	6.50
SHORT	2.19



WELL STYLES

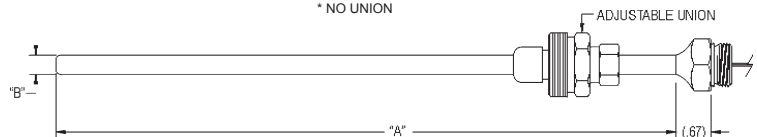
DESCRIPTION	"A" DIM.
41247 WELL	9-1/8"
41279 WELL	12-1/8"



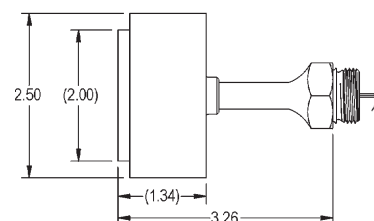
E-1 & E-3 STYLES

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



TAYLOR FLUSH MOUNT



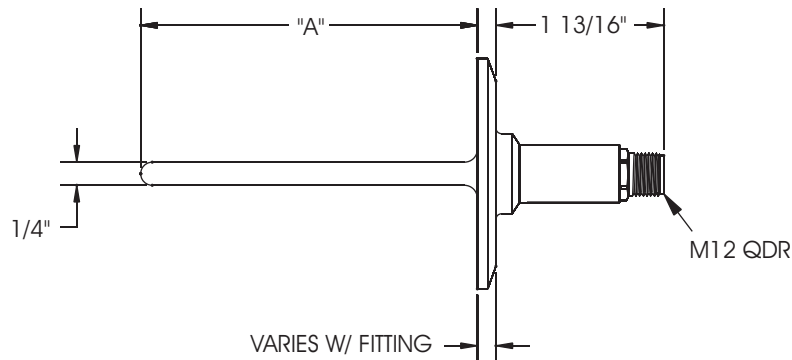
Special "A" diameter available upon request.

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

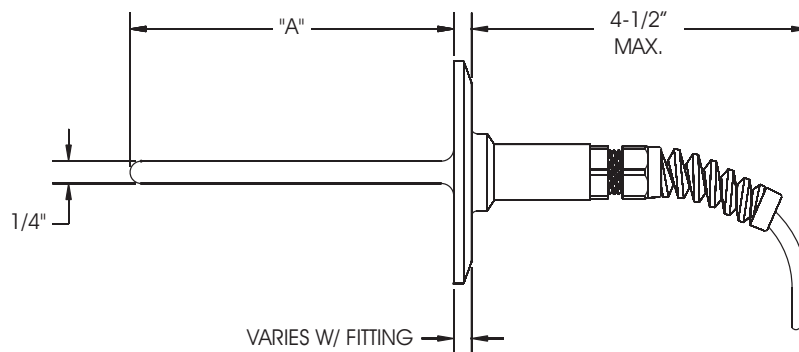
# Dimensional Drawings

## RTD Styles

### QDR RTD



### Sealed Cable RTD



## Ordering Examples

1. Sanitary Series RTD, single element, 50' sealed cable with strain relief, 1.5" Tri-Clamp® fitting.  
Model #: SA110040370110
2. Sanitary 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, 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, 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)

7 Quick Disconnect (see Quick Disconnect Connection/Cable)

**ELEMENT TYPE**

1 100 ohm Single (DIN std.)

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

**FITTING**

004-037 1-1/2" Tri-Clamp®

005-049 2" Tri-Clamp®

006-049 2-1/2" Tri-Clamp®

007-053 3" Tri-Clamp®

008-065 4" Tri-Clamp®

010-031 1-1/2" APC "K"†

011-730 2" APC "K"†

016-031 1-1/2" Cherry-Burrell "I"

017-730 2" Cherry-Burrell "I"

027-044 1-1/2" G&H "H" Line (male)

028-056 2" G&H "H" Line (male)

032-033 1-1/2" Cherry "Q"

033-049 2" Cherry "Q"

034-028 1-1/2" #14 APC-PV (w/nut)†

035-729 2" #14 APC-PV (w/ nut)†

038-028 1-1/2" #14 APC-PV (w/o nut)†

039-729 2" #14 APC-PV (w/o nut)†

044-731 1-1/2" #14 Bevel seat (w/nut)†

045-035 2" #14 Bevel Seat (w/nut)†

046-731 1-1/2" #14 Bevel St. (w/o nut)†

047-035 2" #14 Bevel Seat (w/o nut)†

051-029 1-1/2" APC K15WXF (female)†  
self aligning

052-036 2" APC K15WXF (female)†  
self aligning

060-221 Umbrella

060-360 Umbrella

060-435 Umbrella

060-532 Umbrella

060-680 Umbrella

061-077 Split Ferrule (button)

062-139 Projectile Well (41247)

063-161 Projectile Well (41280)†

064-187 Projectile Well (41279)†

074-185 E1 Style - 1/4" Dia. (plain)

075-185 E1 Style - 3/8" Dia. (plain)

079-185 E3 Style - 1/4" Dia.  
(with adjustable union)

080-185 E3 Style - 3/8" Dia.  
(w/adjustable union)

083-137 Bi-Metal Well - 1/4" NPT

084-089 Bi-Metal Well - 1/2" NPT

084-137 Bi-Metal Well - 1/2" NPT

088-000 Anderson Flush Mt. (short)†

089-000 Anderson Flush Mt. (long)†

098-000 Taylor Flush Mount†

174-089 Spring Loaded 1/4" Dia. - 1/2" NPT

174-137 Spring Loaded 1/4" Dia. - 1/2" NPT

**INSERTION LENGTH \*\***

2-3/4"

3-1/2"

3-1/2"

3-3/4"

4-1/2"

2-3/8"

2-25/32"

2-3/8"

2-25/32"

3-3/16"

3-15/16"

2-1/2"

3-1/2"

2-3/16"

2-17/32"

2-3/16"

2-17/32"

2-15/64"

2-5/8"

2-15/64"

2-5/8"

2-1/4"

2-11/16"

14-1/4"

22-15/16"

27-5/8"

33-11/16"

42-15/16"

5-1/4"

9-1/8"

10-1/2"

12-1/8"

12"

12"

12"

12"

12"

12"

12"

9"

6"

9"

6"

9"

**CONNECTION/CABLE**

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'

**QUICK DISCONNECT OPTIONS**

A0 Quick Disconnect Receptacle(QDR)  
w/no cable

A1 QDR & Field Wireable  
Connector(FWC) w/ no cable

A2 QDR & FWC w/ 25' cable

A3 QDR & FWC w/ 50' cable

A4 QDR & FWC w/ 75' cable

A5 QDR & FWC w/ 100' cable

**CABLE TYPE**

0 No Cable Required (Std. w/wiring  
style #5, available for wiring style #7)

1 Multiple conductor PVC (Std. w/wiring  
style #1 or #2, available for wiring style  
#7)

**PROBE**

0 Standard probe  
(choose for well fittings)

1 Heavy duty probe\*  
(recommended for lengths over 6")

\* Heavy Duty Probes with 3/4"Dia., insertion lengths from 3-1/2" to 43-1/2" available for standard fittings, Tri-Clamp®, Cherry "I", Bevel Seat and Umbrella. Consult factory for other fittings.

\*\* Custom lengths (up to 6") available at no extra charge, but are non-cancellable/non-returnable for credit.

† Sensors with these fittings are non-cancellable/non-returnable for credit.

**ACCESSORIES**

Anderson Weld-In Shells for Flush Mount Fittings

71060A0003 Insulated Vessel (089 fitting)  
Standard Flange - 316L

71060A0004 Uninsulated Vessel (088 fitting)  
Standard Flange - 316L

# Ordering Information

## Modular Wiring Heads for RTD's and Transmitters

		<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">C</div> <div style="border: 1px solid black; padding: 2px;">T</div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;">1</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>									
<b>PRODUCT CODE</b>											
<b>STYLE</b>											
1	Standard										
2	Standard (with health authority seal provision)										
3	Mini (for RTD and analog transmitter)										
4	Mini (with health authority seal provision)										
7	Standard, Dual Output										
8	Standard, Dual Output (with health authority seal provision)										
<b>MODULE*</b>											
<b>Single Output Options</b>											
0	No Module										
1	Single RTD										
2	Dual RTD										
3	4-20mA Analog transmitter (head style 1 or 2 only)										
4	"SMART" Module with 4-20 mA and HART (head style 1 or 2 only)										
5	4-20mA Mini transmitter (head style 3 or 4 only)										
6	4-20mA Mini transmitter (head style 3 or 4 only) (for use with probe lengths of 1.25" or less)										
<b>Dual Output Options</b>											
A	Dual 4-20mA Temperature Transmitter										
B	Dual Smart with 4-20mA with "HART"										
C	4-20mA Temperature Transmitter & RTD										
D	Smart 4-20mA with "HART" & RTD										
E	4-20mA Temp. Transmitter & Smart 4-20mA with "HART" Transmitter										
<b>OUTPUT RANGE</b>											
000	None (RTD only)										
069	0-60 (C only)										
071	0-100 (F or C)										
073	0-150 (F or C)										
075	0-200 (F only)										
076	0-250 (F only)										
077	0-300 (F only)										
119	30-230 (F only)**										
132	50-250 (F only)**										
160	100-300 (F only)										
255	0-180 (C only)										
999	Programmable (Module Style 4, B, and D only)										
<b>ENGINEERING UNITS</b>											
0	None - RTD Only (Module 1 & 2 above)										
F	Fahrenheit										
C	Celsius										
P	Programmable (Module Style 4, B, and D only)										
<b>DISPLAY/UNITS</b>											
<b>(Not available w/ Mini styles or RTD modules)</b>											
00	None										
01	4-20mA										
02	0-100%										
03	°F (same range as output)										
04	°C (same range as output)										

**CONNECTION / CABLE**  
(Includes water tight cord grip)

00 No cable (Std.)

05 25ft

10 50ft

15 75ft

20 100ft

(Quick Disconnect Options)\*\*\*†

A0 QDR only

A1 QDR & Field Wireable Connector (FWC)

A2 QDR / FWC w/ 25ft

A3 QDR / FWC w/ 50ft

A4 QDR / FWC w/ 75 ft

A5 QDR / FWC w/ 100ft

**1 FIXED CHARACTER**

**PRE-WIRED ELEMENT**  
(refer to picture below for orientation)

0 None

1 Vertical Orientation (option "A")

2 Horizontal Orientation (option "B")

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

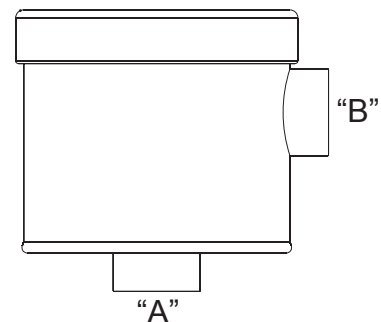
"SMART" Module Part Number: 5610100003

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

\*\*\* Not available with output range 000.

† Not available with Dual Output

Figure 1 - Probe Orientation





Form No. AIC5001 © 3/99  
Revised: 1/11  
Supersedes: 5/09