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, or contact your local Authorized Anderson Distributor.

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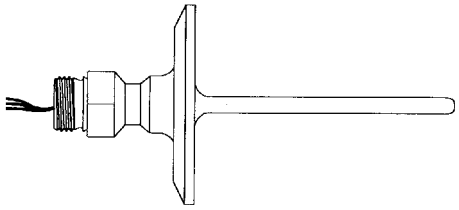
NEGELE MESSTECHNIK GmbH • RAIFFEISENWEG 7 • D-87743 EGG A. D. GÜNZ • GERMANY • +49 (0) 8333/9204-0 • FAX +49 (0) 8333/9204-49

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
Coefficient:	.00385 ohms/ohm/Deg. C
Accuracy:	.1% at 0°C (Band 1) Standard
Probe Diameters:	1/4" standard for sanitary clamp styles (1"-4") single or dual element. Other diameters available for thermowell installation

Response:	2.5 to 3 seconds for 63% step change
Span:	400°F (221°C) maximum
Low End:	-50°F (-45°C) minimum
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.
Material:	304 Stainless Steel

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.
Cable Connections:	Standard NEMA 4X "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 ±25°F (±15°C) typical
Span Adjustment:	"Pot" adjustable over a 25°F (15°C) range minimum

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:	± 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:	±0.13°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

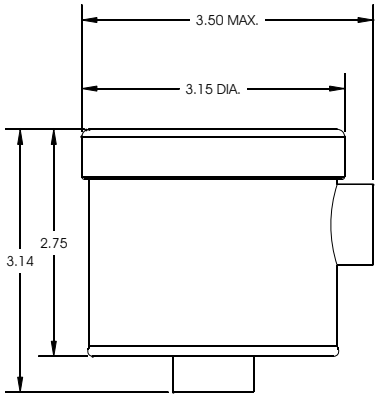
Display Module

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.

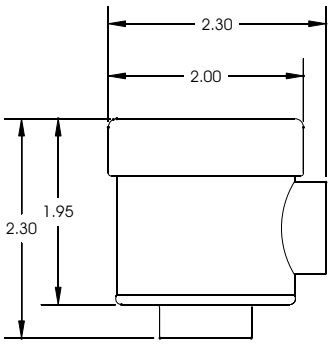
Digits:	3-1/2 digits
Digit Size:	.5" High
Type:	LCD
Mounting:	Integral to cap; field replaceable/upgradeable
Units of Display:	4-20mA; 0-100%; Degrees C; Degrees F (0-199.9°F max) factory set, or 0-300° F.
Accuracy:	±0.2% of scale
Loop Resistance:	Adds less than 250 ohms

Dimensional Drawings

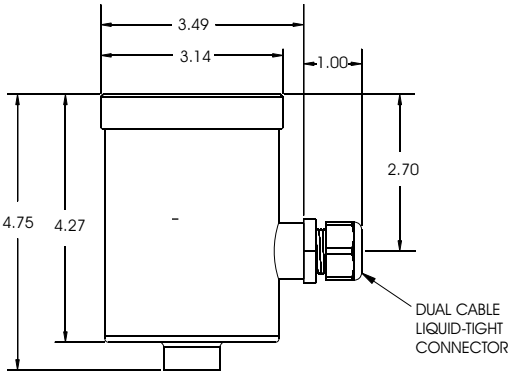
Modular Wiring Heads



TRANSMITTER HEAD



"MINI" RTD HEAD

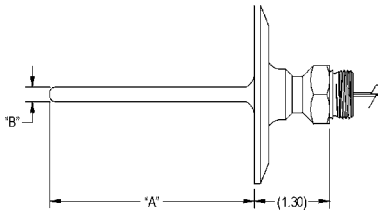


DUAL OUTPUT WIRING HEAD

RTD Fitting Styles and Sizes

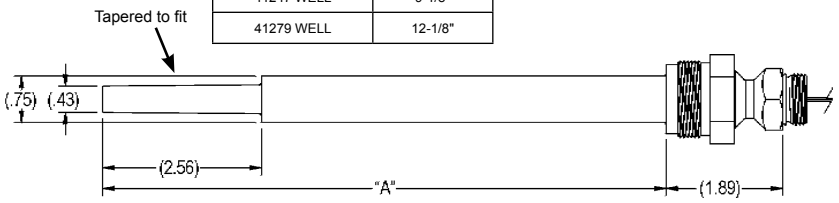
1-1/2" - 4" TRI-CLAMP® STYLE

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.



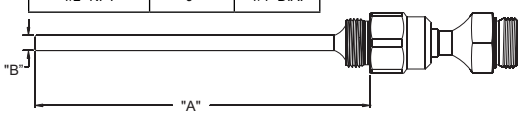
WELL STYLES

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



SPRING LOADED STYLES

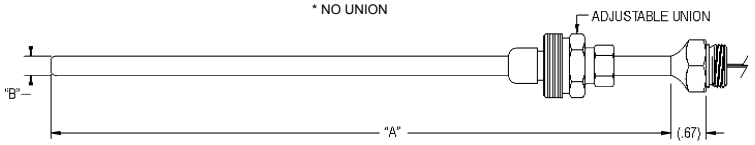
DESCRIPTION	"A" DIM.	"B" DIM.
1/2" NPT	6"	1/4" DIA.
1/2" NPT	9"	1/4" DIA.



E-1 & E-3 STYLES

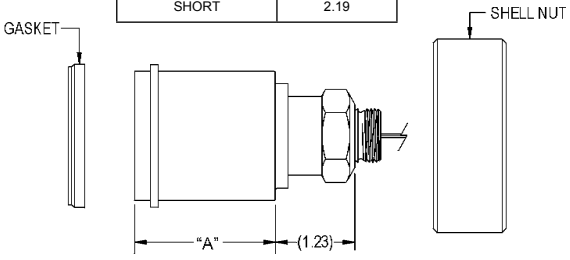
DESCRIPTION	"A" DIM.	"B" DIM.
E-1*	12"	1/4 DIA.
E-1*	18"	3/8 DIA.
E-3	12"	1/4 DIA.
E-3	18"	3/8" DIA.

* NO UNION

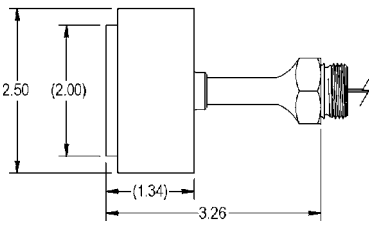


AIC FLUSH MOUNT

DESCRIPTION	"A" DIM.
LONG	6.50
SHORT	2.19



TAYLOR FLUSH MOUNT

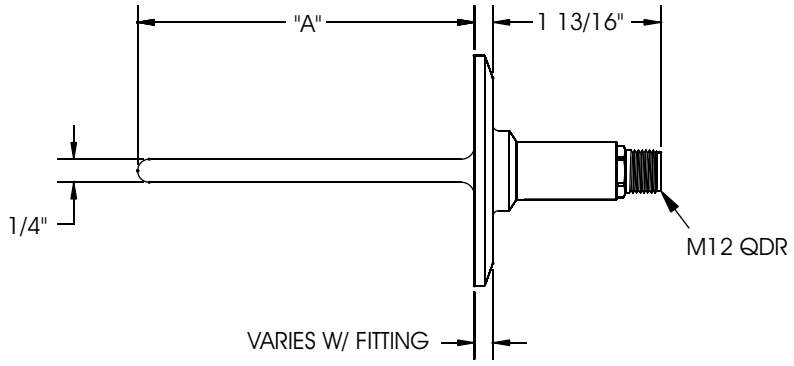


Special "A" diameter available upon request.
Note: "A" dimensions of less than 1.5" de-rates accuracies by 0.1%/50°C at temperatures exceeding 212°F (100°C)

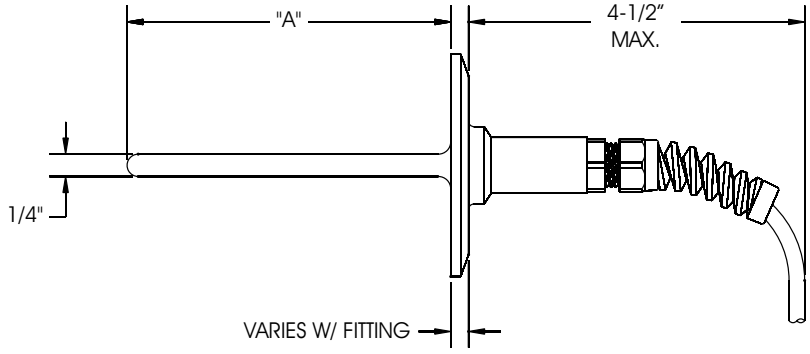
Dimensional Drawings

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

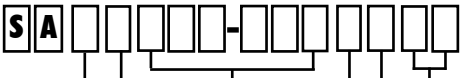
2. Sanitary Series RTD, dual element, with wiring head, 2" Tri-Clamp® fitting.
   Model #'s: SA520050490000 (RTD)
   CT320000001100 (wiring head)

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

	FITTING	INSERTION LENGTH [2]
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" [3]	2-3/8"
011-730	2" APC "K" [3]	2-25/32"
016-031	1-1/2" Cherry-Burrell "I"	2-3/8"
017-730	2" Cherry-Burrell "I"	2-25/32"
027-044	1-1/2" G&H "H" Line (male)	3-3/16"
028-056	2" G&H "H" Line (male)	3-15/16"
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) [3]	2-3/16"
035-729	2" #14 APC-PV (w/ nut) [3]	2-17/32"
038-028	1-1/2" #14 APC-PV (w/o nut) [3]	2-3/16"
039-729	2" #14 APC-PV (w/o nut) [3]	2-17/32"
044-731	1-1/2" #14 Bevel seat (w/nut) [3]	2-15/64"
045-035	2" #14 Bevel Seat (w/nut) [3]	2-5/8"
046-731	1-1/2" #14 Bevel St. (w/o nut) [3]	2-15/64"
047-035	2" #14 Bevel Seat (w/o nut) [3]	2-5/8"
051-029	1-1/2" APC K15WXF (female) [3] self aligning	2-1/4"
052-036	2" APC K15WXF (female) [3] 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) [5]	9-1/8"
063-161	Projectile Well (41280) [3, 5]	10-1/2"
064-187	Projectile Well (41279) [3, 5]	12-1/8"
074-185	E1 Style - 1/4" Dia. (plain) [5]	12"
075-185	E1 Style - 3/8" Dia. (plain) [5]	12"
079-185	E3 Style - 1/4" Dia (with adjustable union) [4, 5]	12"
080-185	E3 Style - 3/8" Dia. (w/adjustable union) [4, 5]	12"
083-137	Bi-Metal Well - 1/4" NPT [5]	9"
084-089	Bi-Metal Well - 1/2" NPT [5]	6"
084-137	Bi-Metal Well - 1/2" NPT [5]	9"
088-000	Anderson Flush Mt. (short) [3]	
089-000	Anderson Flush Mt. (long) [3]	
098-000	Taylor Flush Mount [3, 6]	
100-049	Industrial well(41070) [6]	3-1/2"
101-091	Industrial well(41074) [6]	6-1/8"
174-089	Spring Loaded 1/4" Dia. - 1/2" NPT [5]	6"
174-137	Spring Loaded 1/4" Dia. - 1/2" NPT [5]	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 w/25 ft Standard Molded Cordset
A3	QDR w/50 ft Standard Molded Cordset
A5	QDR w/100 ft Standard Molded Cordset

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 [1] (recommended for lengths over 6")

[1] 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.

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

[3] Sensors with these fittings are non-cancellable/non-returnable for credit.

[4] Requires bushing: 29057A0001 1/2" 14NPT; 29057A0002 3/4" 14NPT

[5] Meets 3-A when used with a 3-A compliant well

[6] Not 3-A compliant

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

C T _ _ _ _ _ _ _ _ _ 1 _ _

PRODUCT CODE

STYLE

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)

MODULE*

Single Output Options

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*)

Dual Output Options

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

OUTPUT RANGE

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)

ENGINEERING UNITS

0 None - RTD Only (Module 1 & 2 above)
F Fahrenheit
C Celsius
P Programmable (Module Style 4, B, and D only)

DISPLAY/UNITS
(Not available w/ Mini styles or RTD modules)

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.

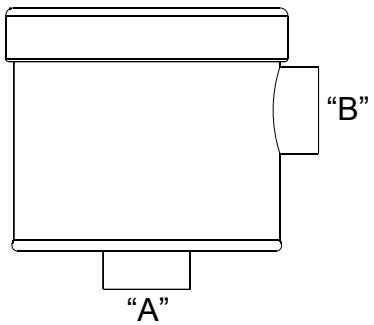
"SMART" Module Part Number: 5610100003

** 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



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