



**Weed Instrument**

*Leader In Temperature Sensing*



**Application Driven Designs  
for Tank Temperature Measurement**

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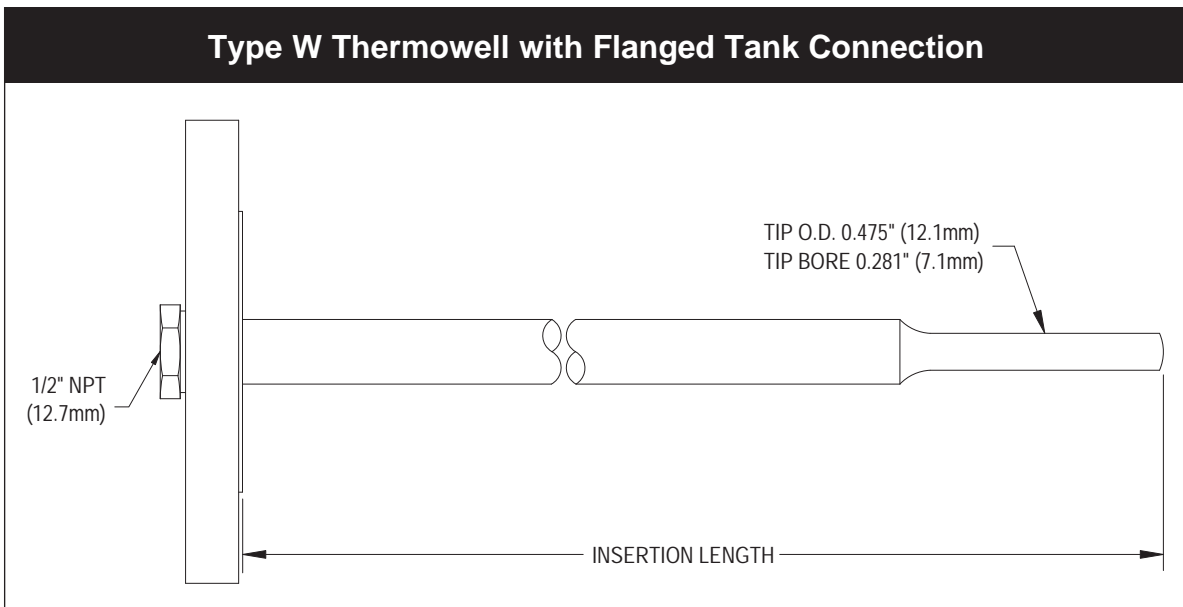
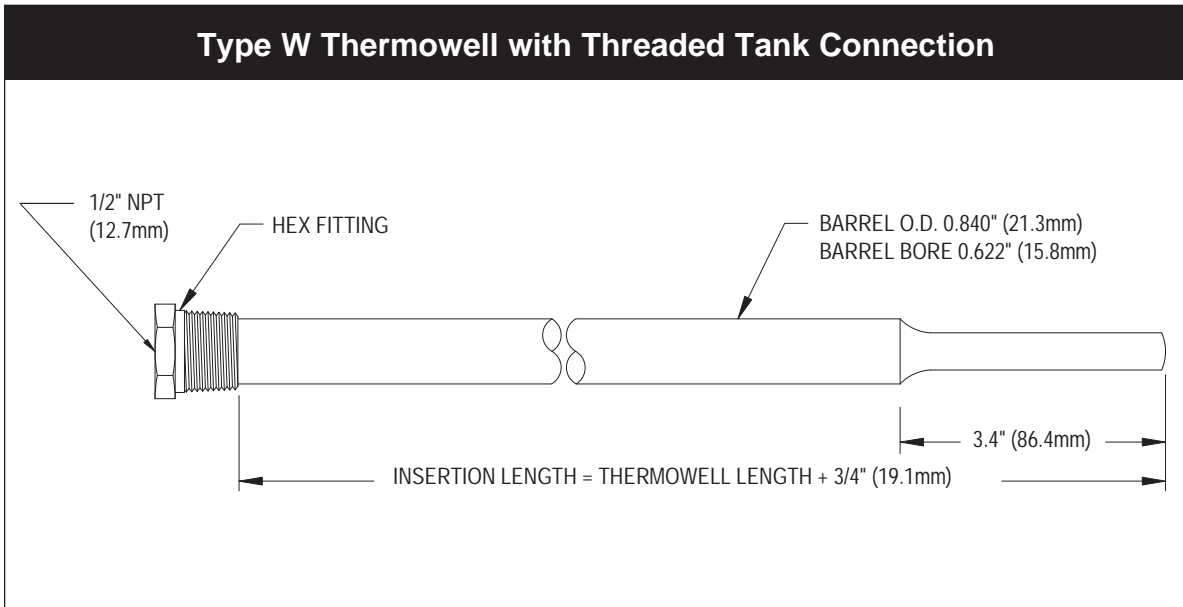
Reference: API Manual of Petroleum Measurement Standards, Chapter 7, "Temperature Determination".

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## Thermowell - Type W

Type W thermowells offer an economical alternative to more costly single piece bar stock wells. These thermowells are of the built-up, three-piece construction type, and are available with tip, shank and hex fitting made of 316SS, and if required, 304SS flanges. The thermowells are manufactured to meet the high quality and long life required by the

Inventory Tank Gauging industry. Various installation configurations can be provided, such as 3/4" NPT or 2" 150# flange. (See ordering matrix for all selections) Standard length is 36", consult factory for lengths shorter or longer. The Type W thermowells are expressly designed to be used with the Type G RTD.



## Ordering Information

<b>1. Model</b>	
<b>W</b>	Type W Thermowell
<b>2. Material</b>	
<b>1</b>	316SS (Standard) (Tip, shank, and hex fitting)
<b>2</b>	Other (specify)
<b>3. Connection</b>	
<b>0</b>	3/4" NPT (316 SS)
<b>1</b>	1" NPT (316 SS)
<b>2</b>	1 1/2" NPT (316 SS)
<b>3</b>	1 1/2" 150# Flange (304 SS)
<b>4</b>	1 1/2" 300# Flange (304 SS)
<b>5</b>	2" 150# Flange (304 SS)
<b>6</b>	2" 300# Flange (304 SS)
<b>7</b>	3" 150# Flange (304 SS)
<b>8</b>	3" 300# Flange (304 SS)
<b>9</b>	Other (specify)
<b>4. Immersion Length - Inches/Tenths</b>	
<b>xx</b>	Standard length 36" (Consult factory for other lengths)

<b>W</b>	<b>1</b>	<b>0</b>	<b>-36.0"</b>
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Sample Model Number

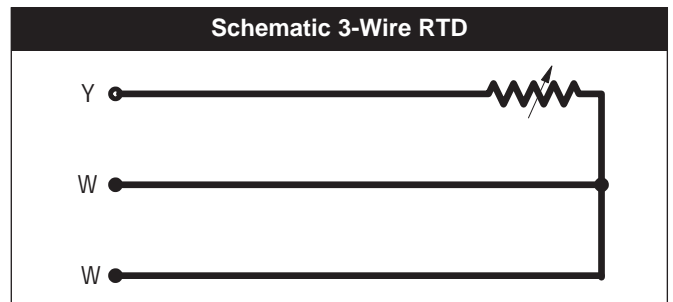
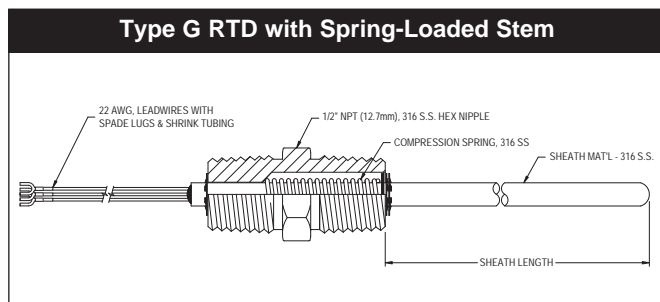
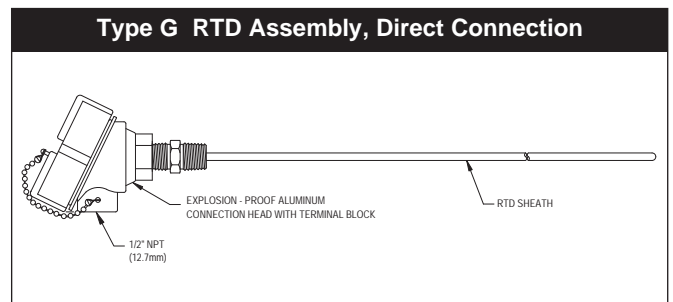
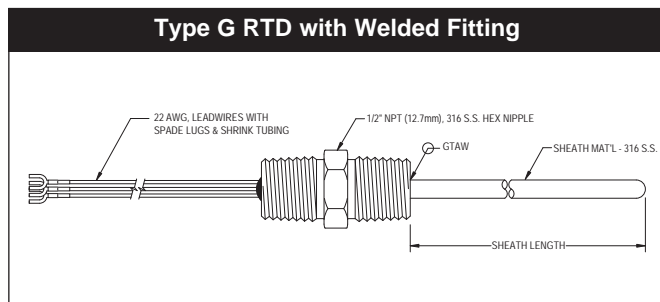
## Single Point RTD - Type G

Type G RTD's are designed for direct installation into the Type W thermowell and feature high accuracy and excellent insulation resistance strength. The sensor element is encapsulated in a fill material calculated to provide ruggedness and fast response time. The sensors are manufactured with 3 or 4 lead wires to provide full lead-wire compensation. The RTD's are designed to meet the high quality and long-life required by the Inventory Tank Gauging industry.

Industry-standard sensor length of 36" can be supplied; consult factory for longer or shorter lengths.

The sensing elements can be either 100 ohm copper or 100 ohm DIN platinum, configured for standard temperature rating of 212°F max. (100°C) or high temperature rating of 392°F max. (200°C).

The sheath and hex nipple are manufactured from 316 SS and can be supplied as either a fixed or spring-loaded stem. Connection to an explosion-proof or ATEX-approved head is made in by direct connection. Additionally, a microprocessor-based, 4 to 20 mA or HART output transmitter can be supplied.



## Ordering Information

<b>1. Model</b>	
<b>G</b>	<b>Type G Single Point RTD</b>
<b>2. Stem Diameter</b>	
<b>1</b>	0.250" (6 mm nominal)
<b>2</b>	Other (specify)
<b>3. Calibration</b>	
<b>1</b>	100 ohm Copper, Std. Range to 212°F (100°C)
<b>2</b>	100 ohm DIN Platinum, Std. Range to 212°F (100°C)
<b>3</b>	100 ohm Copper, High Temp to 392°F (200°C)
<b>4</b>	100 ohm DIN Platinum, High Temp to 392°F (200°C)
<b>5</b>	Other (specify)
<b>4. Stem Configuration</b>	
<b>0</b>	Fixed
<b>1</b>	Spring Loaded
<b>5. Leadwires</b>	
<b>1</b>	3 Wire
<b>2</b>	4 Wire
<b>6. Connection Head</b>	
<b>0</b>	No Connection Head
<b>1</b>	Explosion-proof Connection Head
<b>2</b>	ATEX-approved Connection Head
<b>7. Stem Length - Inches/Tenths</b>	
<b>x.x</b>	Standard Length 36" (Consult Factory for other lengths)

<b>G</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>36.0"</b>	Sample Model Number
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**Optional Output Transmitter: (100 ohm Platinum RTD or 100 ohm Copper)**

<b>1. Model</b>	
<b>4500H</b>	Head Mount PC Programmable RTD Temperature Transmitter
<b>2. Range Code</b>	
<b>(x-xx °F or °C)</b>	

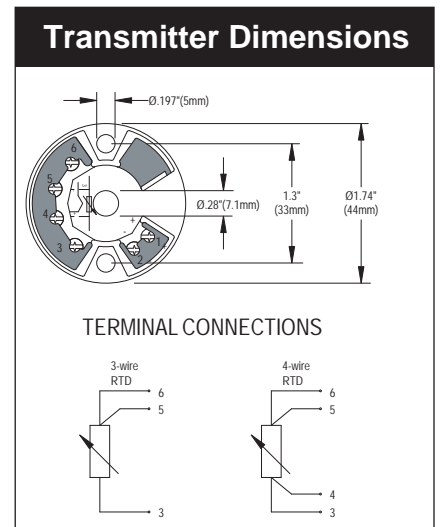
  

<b>4500H</b>	<b>(0-100°F)</b>	Sample Model Number
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<b>1. Model</b>	
<b>7600H</b>	Head Mount HART RTD Temperature Transmitter
<b>2. Range Code</b>	
<b>(x-xx °F or °C)</b>	

<b>7600H</b>	<b>(0-100°F)</b>	Sample Model Number
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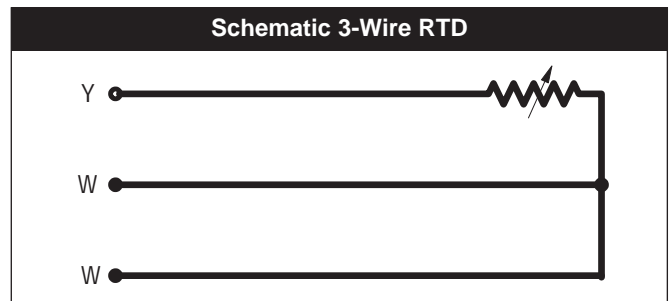
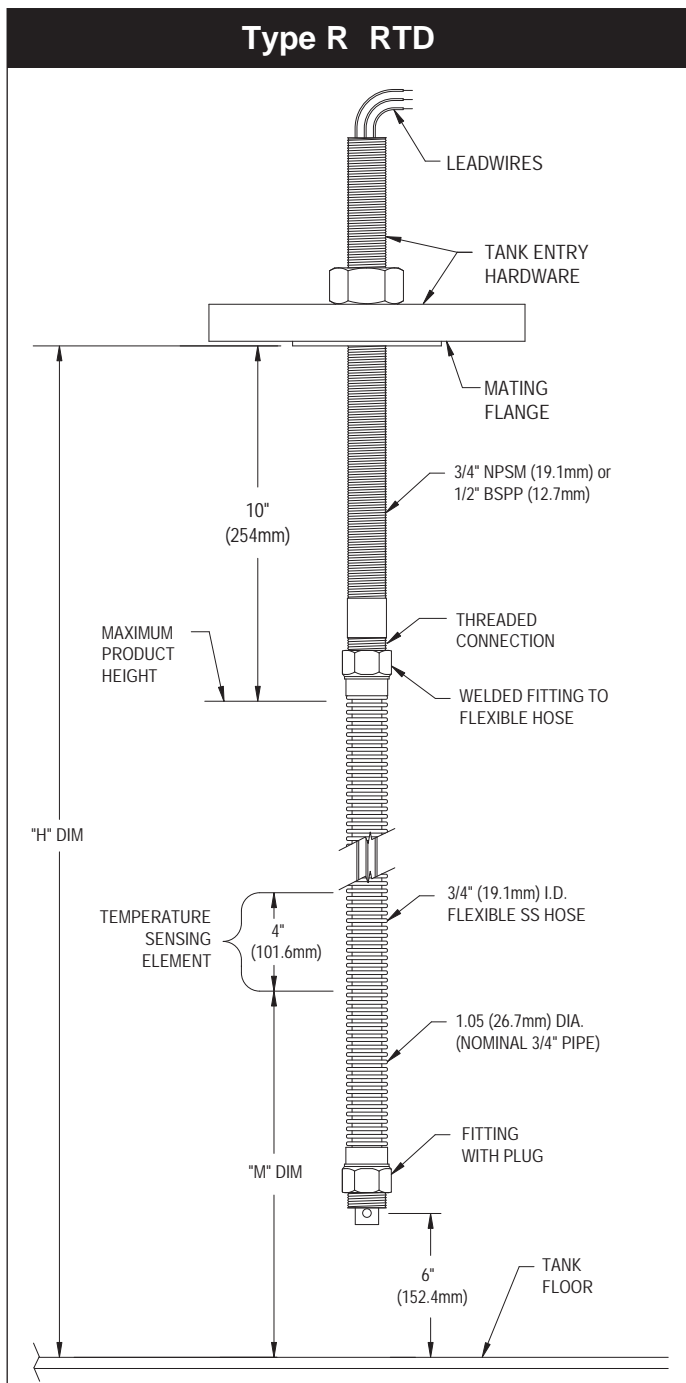


## Single Point RTD - Type R

Type R Single Point RTD's provide a convenient and economical means of installing a temperature sensor in a tank in service without hot-tapping the tank shell to accommodate a thermowell. The Type R RTD is designed for direct immersion in the product and is available with 316 stainless steel or Monel housing material to meet the rugged requirements of the Inventory Tank Gauging Industry.

Type R RTD's, with three-wire configuration, are available with 100 ohm copper or 100 ohm DIN platinum calibration. Standard temperature service to 212°F (100°C) and high temperature service to 392°F (200°C) is available.

Various types of tank entry hardware and styles of anchor weights are available; consult matrix on following page. For ordering information on the optional microprocessor-based temperature transmitters, refer to Page 5. An explosion-proof or ATEX-approved head can be supplied to hold either the transmitter or terminal block.



# Ordering Information

<b>1. Model</b>	
R	Type R Single Point RTD
<b>2. Flexible Hose Material</b>	
1	316 SS
2	Monel
<b>3. Service</b>	
1	Standard, to 212°F (100°C) (PVC insulated lead wire)
2	High Temperature, to 392°F (200°C) (Teflon insulated lead wire)
<b>4. Calibration</b>	
1	100 ohm Copper, Std. Range to 212°F (100°C)
2	100 ohm DIN Platinum, Std. Range to 212°F (100°C)
3	100 ohm Copper, High Temp to 392°F (200°C)
4	100 ohm DIN Platinum, High Temp to to 392°F (200°C)
5	Other (specify)
<b>5. Tank Entry Hardware (refer to pages 18-19)</b>	
0	Type 0, Mating Flange, (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304 SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304 SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushings; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount With 3/4" MSS 304 SS Flanges and Gaskets
8	Type 8, Welded Flange (Specify flange size, material, class)
9	Other (specify)
<b>6. Anchor Weight (refer to page 19)</b>	
0	No Anchor Weight
1	Standard Anchor Weight, CS (fits 3" flange and larger)
2	Reduced Size Anchor Weight, CS (fits 2" flange)
3	Standard Anchor Weight, 316 SS (fits 3" flange and larger)
4	Reduced Size Anchor Weight, 316 SS (fits 2" flange)
5	Other (specify)
<b>7. Leadwire Length</b>	
1	5 ft. (1.5m)
2	15 ft. (4.5m)
3	Other (specify)
<b>8. Connection Head</b>	
1	Explosion-proof head with terminal block
2	ATEX-approved head
3	Other (specify)
<b>9. "H" Dimension - Tank Height - Feet/Inches (m/mm)</b>	
xx	
<b>10. "M" Dimension - Element Location - Feet/Inches (m/mm)</b>	
xx	

R 1 1 1 0 0 1 1 40" 6" 18" ————— Sample Model Number



## Averaging Temperature and Multiple Spot RTD, Type MA & MS

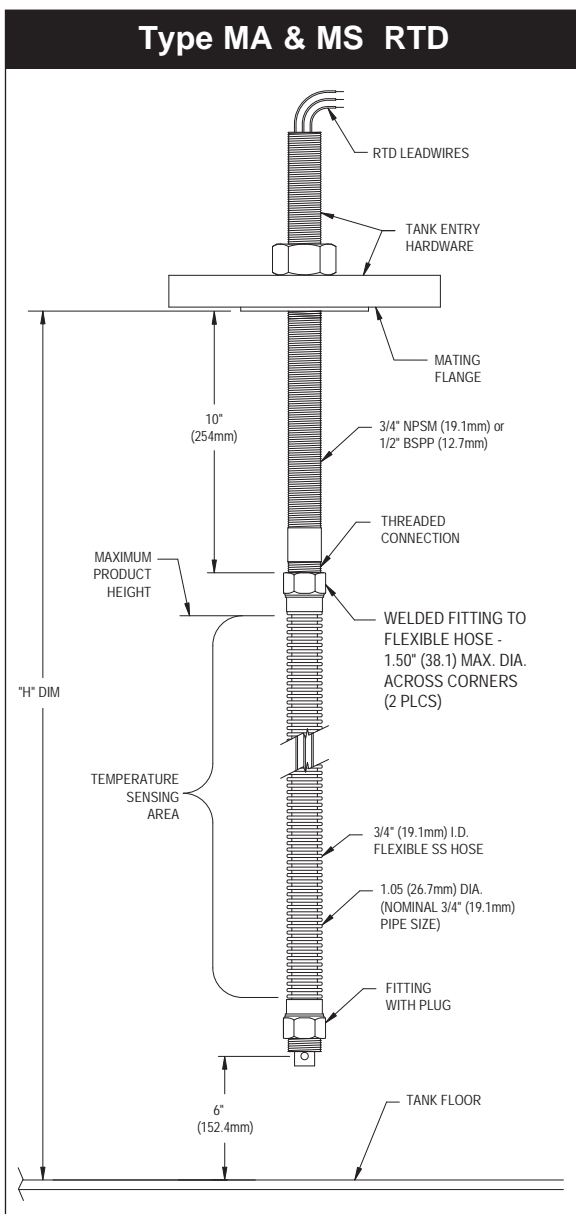
The **ACCU-TEMP Tank Temperature RTD's** provide a convenient, accurate, permanently-installed primary sensor for the determination of the average or spot temperature in liquid bulk storage tanks.

When dealing with large volumes of high-value, liquid products, the determination of the temperature of the product is essential so that measured volumes may be corrected to a standard temperature for purposes of inventory control or custody transfer.

The **Type MA Averaging Temperature RTD** and **Type MS Multiple-Spot RTD** are designed for direct immersion in the product. The annular-ring, convoluted housing material can be supplied in either stainless-steel or Monel. A comprehensive selection of tank entry hardware is available to suit the type of tank in which the RTD is to be installed. Anchor weights can be supplied to keep the assembly from floating up in the tank.

The **Averaging Temperature RTD (MA)** measures the temperature with a number of sensing elements of varying lengths, that are temperature-sensitive over the entire length and which extend upwards from the bottom of the tank. Only the elements that are fully submerged in the product are used to determine the temperature. Up to 10 elements can be installed and may be either 100 ohm copper or 100 ohm DIN platinum-characterized copper.

The **Multiple-Spot Temperature RTD (MS)** measures the temperature with a number of individual spot elements, placed at different heights in the assembly, to provide either a temperature profile or an average temperature of the product. Only the elements that are fully submerged in the product are used to determine the temperature. The spot elements can be either 100 ohm copper or 100 ohm DIN platinum. Consult factory if more than six elements are required.

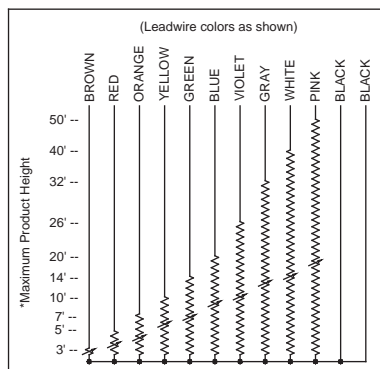


# Ordering Information

<b>1. Model</b>	
MA Type MA Variable Length Averaging RTD	
<b>2. Flexible Hose Material</b>	
1	316 SS
2	Monel
<b>3. Service</b>	
1	Standard, to 212°F (100°C) (PVC insulated lead wire)
2	High Temperature, to 392°F (200°C) (Teflon insulated lead wire)
3	Low Temperature -170°C (PFA Teflon)
<b>4. Calibration</b>	
1	100 ohm Copper Variable Length Elements, Std Configuration
2	100 ohm DIN Platinum Characterized Copper Variable Length Elements, Std Configuration
3	Other (specify)
<b>5. Tank Entry Hardware (refer to pages 18-19)</b>	
0	Type 0, Mating Flange (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushings; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount with 3/4" MSS 304 SS Flanges With Gaskets
8	Type 8, Welded Flange (specify flange size, material, class)
9	Other (specify)
<b>6. Anchor Weight (refer to page 19)</b>	
0	NoAnchor Weight
1	Standard Anchor Weight, CS (fits 3" flange & larger)
2	Reduced Size Anchor Weight, CS (fits 2" flange)
3	Standard Anchor Weight, 316 SS (fits 3" flange and larger)
4	Reduced Size Anchor Weight, 316 SS (fits 2" flange)
5	Other (specify)
<b>7. Leadwire Length</b>	
1	5 ft. (1.5m)
2	15 ft. (4.5m)
3	Other (specify)
<b>8. Connection Head</b>	
1	Explosion-proof head with terminal block
2	ATEX-approved head
3	Other (specify)
<b>9. "H" Dimension - Tank Height - Feet/Inches (m/mm)</b>	
xx	

MA 1 1 1 0 1 1 1 40'6" Sample Model Number

## Schematic - Averaging Element



Averaging RTD with multiple elements all starting at tank bottom and terminating at levels shown. Note: Delete longest element(s) for tanks with maximum product height less than 50' high (15m).

## Normal Lengths of a Typical Variable Length RTD Temperature Element System

3 feet (0.9 meters)	20 feet (6.1 meters)
5 feet (1.5 meters)	26 feet (7.9 meters)
7 feet (2.1 meters)	32 feet (9.8 meters)
10 feet (3.0 meters)	40 feet (12.2 meters)
14 feet (4.3 meters)	50 feet (15.2 meters)

Note: In practice, the sensitive portion of the element is 0.15 meters (6 inches) less than shown above so that the lowest 0.15 meters (6 inches) in the tank are not measured.

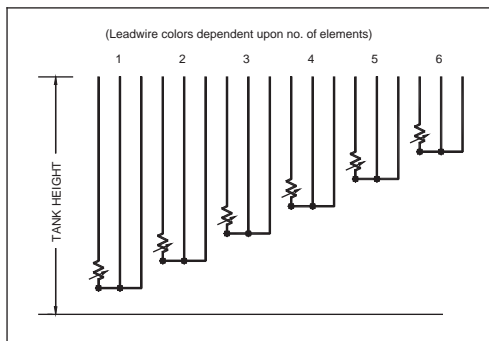
Note: Number of elements is based on the maximum product height. Maximum product height for tank entry hardware Options 0, 1, 2, 3, 4, and 8 is "H" dimension minus 12 inches. Options 5, 6, and 7 is "H" dimension minus 16 inches.

## Ordering Information

<b>1. Model</b>	
<b>MS Type MS Multiple Spot Averaging RTD</b>	
<b>2. Flexible Hose Material</b>	
1	316 SS
2	Monel
<b>3. Service</b>	
1	Standard, to 212°F (100°C) (PVC insulated lead wire)
2	High Temperature, to 392°F (200°C) (Teflon insulated lead wire)
3	Low Temperature -170°C (PFA Teflon)
<b>4. Calibration</b>	
1	100 ohm Copper, Multiple Spot Elements (specify number and mounting height of elements)
2	100 ohm DIN Platinum, Multiple Spot Elements (specify number and mounting height of elements)
3	Other (specify)
<b>5. Tank Entry Hardware (refer to pages 18-19)</b>	
0	Type 0, Mating Flange (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushings; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount with 3/4" MSS 304 SS Flanges With Gaskets
8	Type 8, Welded Flange (specify flange size, material, class)
9	Other (specify)
<b>6. Anchor Weight (refer to page 19)</b>	
0	NoAnchor Weight
1	Standard Anchor Weight, CS (fits 3" flange & larger)
2	Reduced Size Anchor Weight, CS (fits 2" flange & larger)
3	Standard Anchor Weight, 316 SS (fits 3" flange and larger)
4	Reduced Size Anchor Weight, 316 SS (fits 2" flange)
5	Other (specify)
<b>7. Leadwire Length</b>	
1	5 ft. (1.5m)
2	15 ft. (4.5m)
3	Other (specify)
<b>8. Connection Head</b>	
1	Explosion-proof head with terminal block
2	ATEX-approved head
3	Other (specify)
<b>9. "H" Dimension - Tank Height - Feet/Inches (m/mm)</b>	
	xx

MS 1 1 1 0 1 1 1 40'6"

Sample Model Number



### Schematic - Multiple Spot Elements

Averaging RTD with multiple spot elements at levels determined by the number of elements and the height of the tank. (Consult factory for more than 6 elements.)

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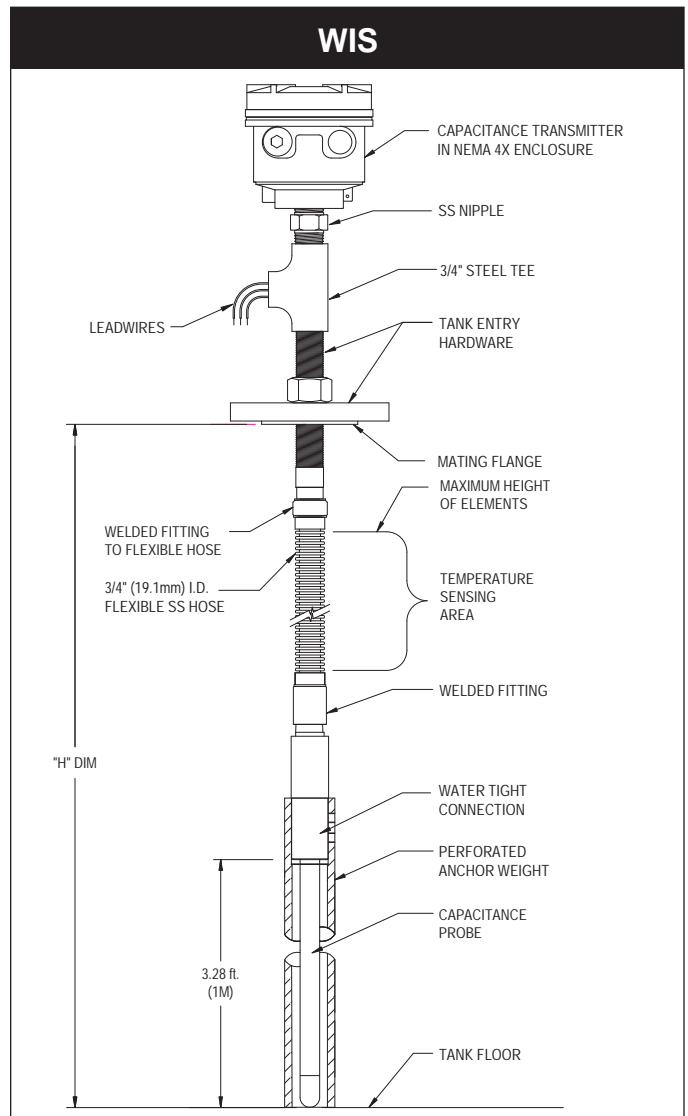
## Water Interface Sensor with Averaging or Multiple Spot RTD's

In addition to providing a highly accurate and dependable average temperature of tank contents, the ACCU-TEMP MWA & MWS Water Interface Sensor (WIS) with Averaging or Multiple Spot RTD's will provide a continuous indication of water interface level. This information can then be factored into the net barrel calculation along with the temperature correction. Additionally, the information can be utilized to schedule water draw-off activities.

The water interface portion of the Type MWA or MWS sensor utilizes a capacitance probe with intrinsically-safe circuitry to determine the interface level between the water and the product in the tank.

The capacitance probe is of a reduced-size, allowing entry through a 2" flange opening. A perforated anchor weight, held in place with set-screws, is included as part of the assembly. The transmitter is available in either 4 to 20 mA analog version or HART protocol version and is powered by 24 VDC. For most applications, the sensor will provide an accuracy of 0.24" (6mm) analog or 0.16" (4mm) digital over 3.28 ft. (1000mm). The XW, a version of the MWA & MWS, utilizes capacitance only; no temperature measurement is possible. The capacitance sensor transmitter is contained in a NEMA 4X enclosure mounted at the top of the tank entry pipe.

Technical Data for WIS	
Active Measuring Range:	40" (1000mm)
Output analog:	2-wire, 4 to 20 mA transmitter
Output digital:	HART-protocol transmitter
Accuracy	
Analog:	+/- 0.24" (6mm)
Digital:	+/- 0.16" (4mm)
Ambient Temperature Transmitter:	-40 to 185° F (-40 to 85° C) ATEX Ex protection: -40 to 158° F (-40 to 70° C) for T6, -40 to 185° F (-40 to 85° C) for T5 to T1
Process Temperature Probe:	-328 to +392° F (-200 to 200° C)
Mechanical Dimensions:	Process connection 3/4" NPT
Outer diameter of WIS:	0.750" (19.05mm)
Immersed Materials:	AISI 316L, PFA, enamel PEEK
Max. pressure:	511 psig (35 bar)
Approvals:	CE, FM, CSA, ATEX
Use HART communication for highest resolution	

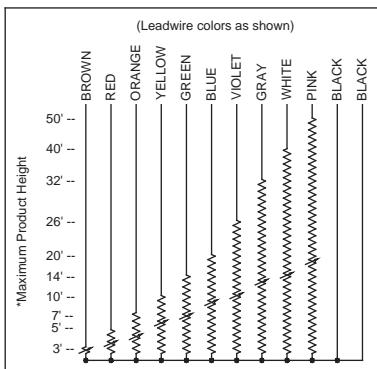


## Ordering Information

1. Model	
MWA	Water Interface Sensor, Averaging Elements
2. Flexible Hose Material	
1	316 SS
2	Monel
3. Service	
1	Standard, to 200°F (100°C) (PVC insulated lead wire)
2	High temperature, to 392°F (200°C) (Teflon insulated lead wire)
4. Calibration	
1	100 ohm Copper Variable Length Elements, Std Configuration
2	100 ohm DIN Platinum Characterized Copper Variable Length Elements
3	Other (specify)
5. Tank Entry Hardware (refer to pages 18-19)	
0	Type 0, Mating Flange (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushing; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount with 3/4" MSS 304 SS Flanges with Gaskets
8	Type 8, Welded Flange (specify flange size, material, class)
9	Other (specify)
6. Leadwire Length	
1	5 ft. (1.5m)
2	15 ft. (4.5m)
3	Other (specify)
7. Transmitter & Connection Head	
1	Microprocessor-based 4-20 mA Transmitter, NEMA 4X Enclosure, 5 ft. (1.5m) RTD Leads
2	HART Transmitter, NEMA 4X Enclosure, 5 ft. (1.5m) RTD Leads
8. "H" Dimension - Feet/Inches (m/mm)	
xx	

MWA 1 1 1 0 1 1 40'6" Sample Model Number

### Schematic - Averaging Element



Averaging RTD with multiple elements all starting at tank bottom and terminating at levels shown. Note: Delete longest element(s) for tanks with maximum product height less than 50' high (15m).

### Normal Lengths of a Typical Variable Length RTD Temperature Element System

3 feet (0.9 meters)	20 feet (6.1 meters)
5 feet (1.5 meters)	26 feet (7.9 meters)
7 feet (2.1 meters)	32 feet (9.8 meters)
10 feet (3.0 meters)	40 feet (12.2 meters)
14 feet (4.3 meters)	50 feet (15.2 meters)

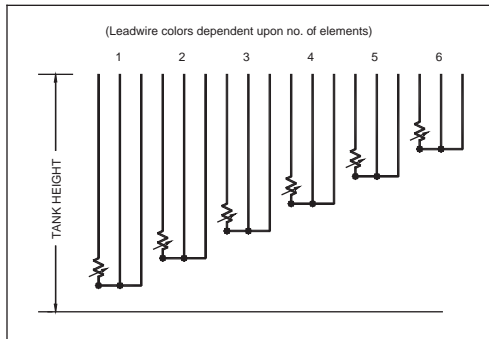
Note: In practice, the sensitive portion of the element is 0.15 meters (6 inches) less than shown above so that the lowest 0.15 meters (6 inches) in the tank are not measured.

Note: Number of elements is based on the maximum product height. Maximum product height for tank entry hardware Options 0, 1, 2, 3, 4, and 8 is "H" dimension minus 12 inches. Options 5, 6, and 7 is "H" dimension minus 16 inches.

## Ordering Information

1. Model	
MWS	Water Interface Sensor, Multiple Spot Elements
2. Flexible Hose Material	
1	316 SS
2	Monel
3. Service	
1	Standard, to 200°F (100°C) (PVC insulated lead wire)
2	High temperature, to 392°F (200°C) (Teflon insulated lead wire)
4. Calibration	
1	100 ohm Copper, Multiple Spot Elements (specify number and mounting height of elements)
2	100 ohm DIN Platinum, Multiple Spot Elements (specify number and mounting height of elements)
3	Other (specify)
5. Tank Entry Hardware (refer to pages 18-19)	
0	Type 0, Mating Flange (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushing; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount with 3/4" MSS 304 SS Flanges with Gaskets
8	Type 8, Welded Flange (specify flange size, material, class)
9	Other (specify)
6. Leadwire Length	
1	5 ft. (1.5m)
2	15 ft. (4.5m)
3	Other (specify)
7. Transmitter & Connection Head	
1	Microprocessor-based 4-20 mA Transmitter, NEMA 4X Enclosure, 5 ft. (1.5m) RTD Leads
2	HART Transmitter, NEMA 4X Enclosure, 5 ft. (1.5m) RTD Leads
8. "H" Dimension - Feet/Inches (m/mm)	
xx	

MWS 1 1 1 0 1 1 40'6" Sample Model Number



### Schematic - Multiple Spot Elements

Averaging RTD with multiple spot elements at levels determined by the number of elements and the height of the tank. (Consult factory for more than 6 elements.)

## Ordering Information

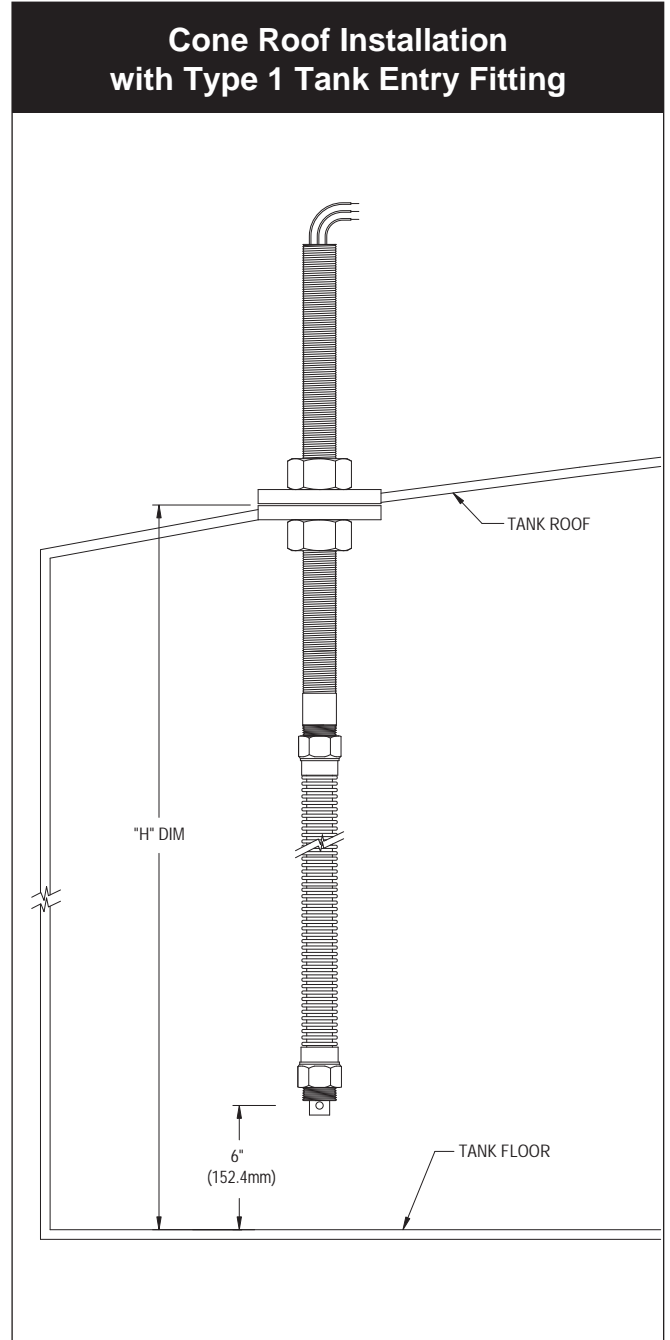
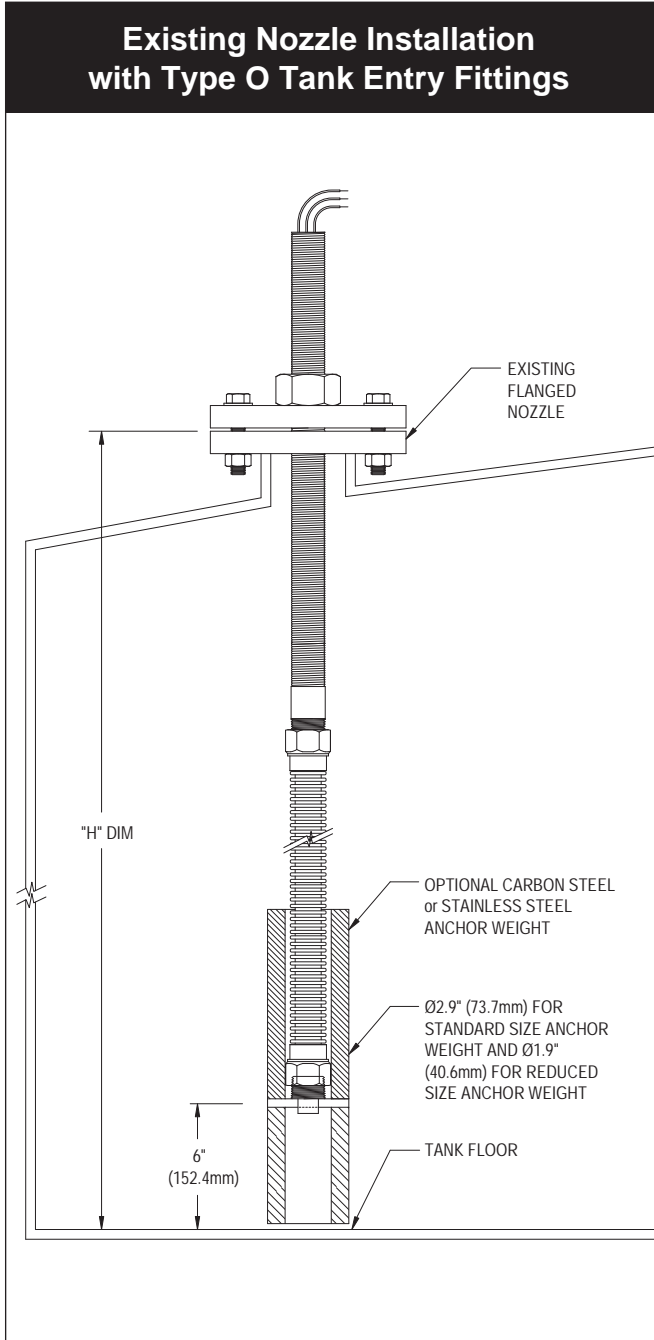
<b>1. Model</b>	
<b>XW</b>	<b>Water Interface Sensor (No temperature elements)</b>
<b>2. Flexible Hose Material</b>	
1	316 SS
2	Monel
<b>3. Service</b>	
1	Standard, to 200°F (100°C)
2	High temperature, to 392°F (200°C)
<b>4. Tank Entry Hardware (refer to pages 18-19)</b>	
0	Type 0, Mating Flange (specify flange size, material, & class)
1	Type 1, 3/4" NPS SS Hex Nuts & Washers
2	Type 2, 3/4" MSS 304 SS Flanges With Full Gaskets
3	Type 3, Bushing & Coupling, 304SS (specify 1-1/2" or 2")
4	Type 4, Bushing, 304SS (specify 1-1/2" or 2")
5	Type 5, Vapor Boot With Angle Mount (specify size of PVC wear bushing; ex. 2" NPT)
6	Type 6, Angle Mount With 3/4" NPS SS Hex Nuts & Washers
7	Type 7, Angle Mount with 3/4" MSS 304 SS Flanges with Gaskets
8	Type 8, Welded 304 SS Flange (specify flange size, material, class)
9	Other (specify)
<b>5. Transmitter &amp; Connection Head</b>	
1	Microprocessor-based 4-20 mA Transmitter, NEMA 4X Enclosure
2	HART Transmitter, NEMA 4X Enclosure
<b>6. "H" Dimension - Feet/Inches (m/mm)</b>	
xx	

XW	1	1	0	1	40'6"
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Sample Model Number

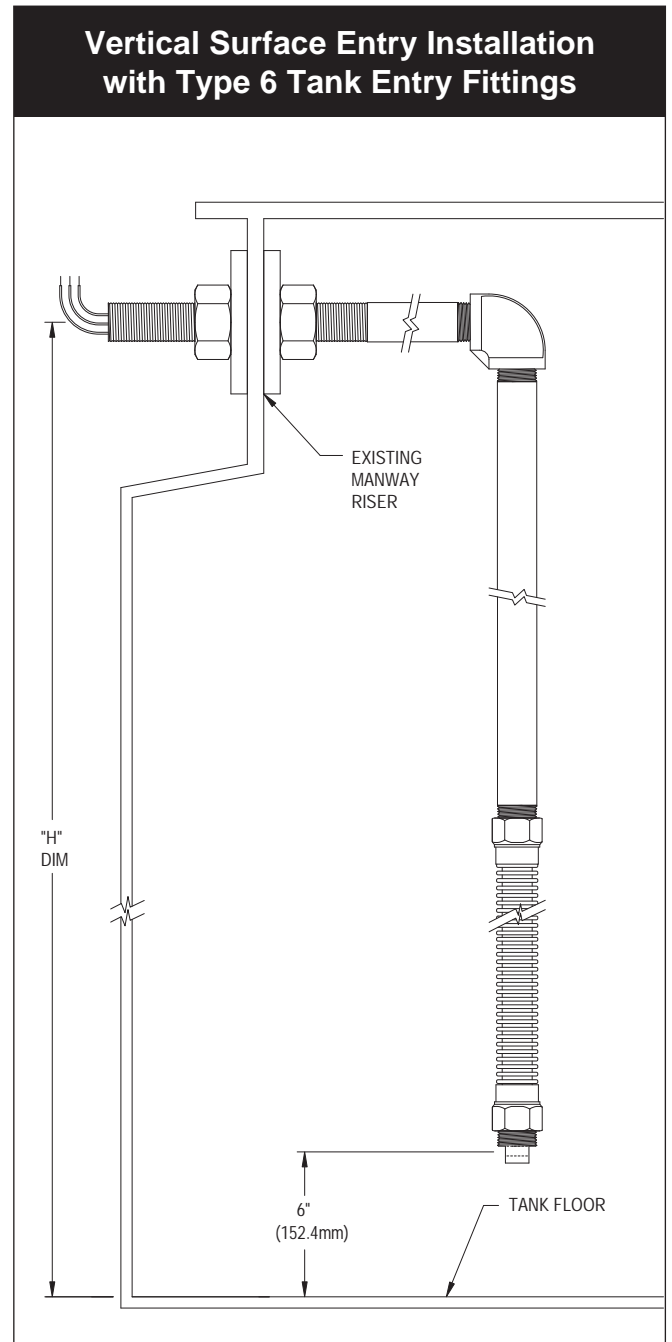
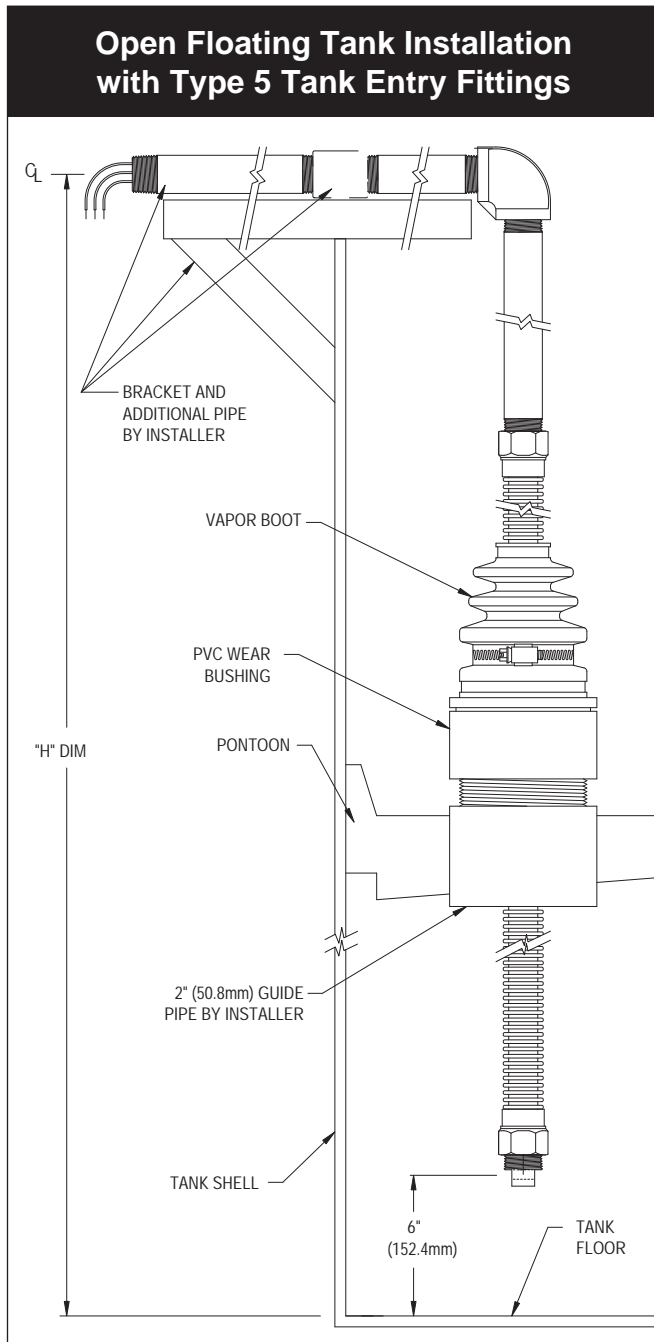


# Typical Installations



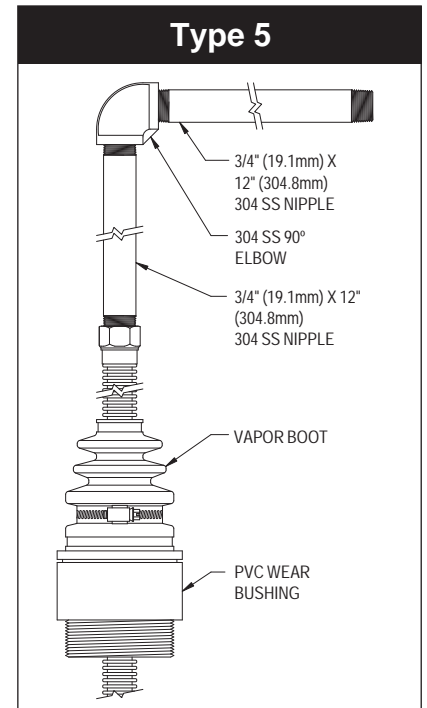
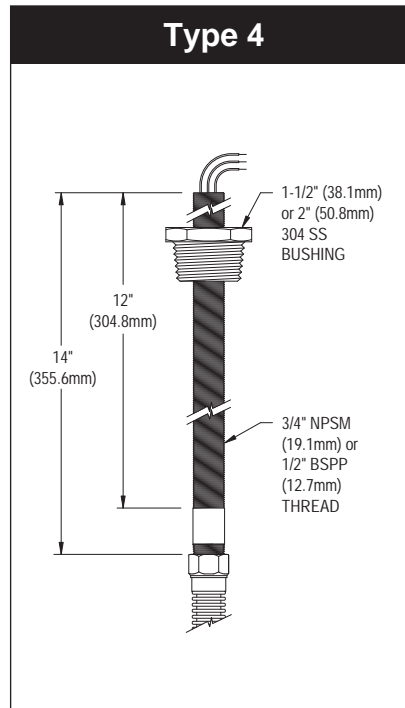
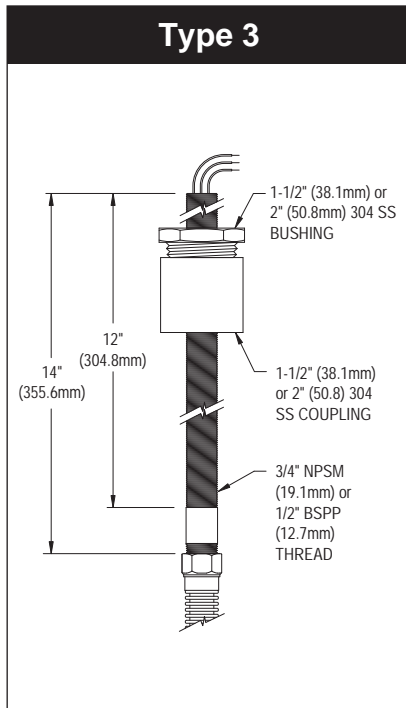
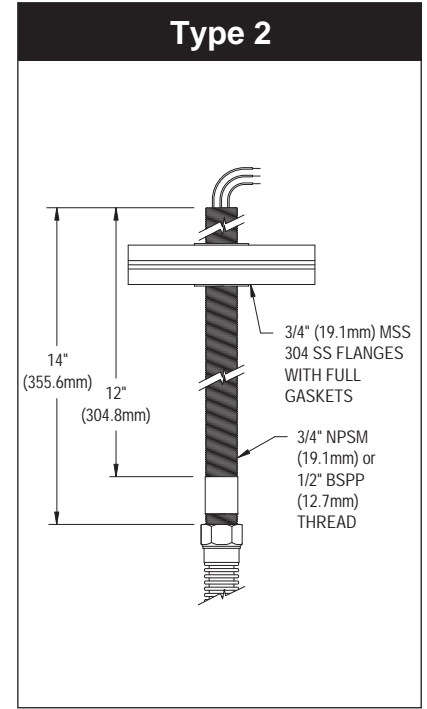
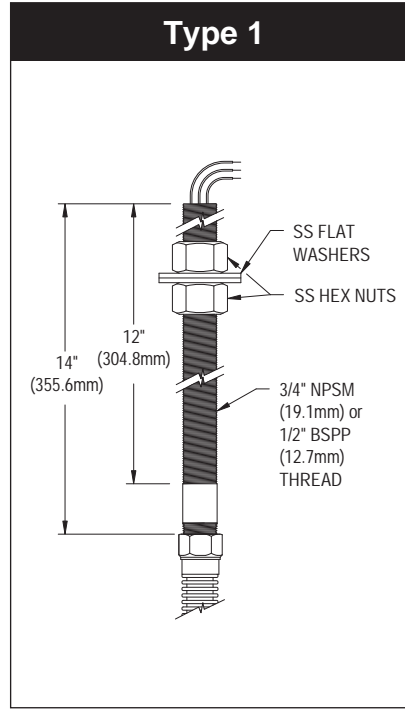
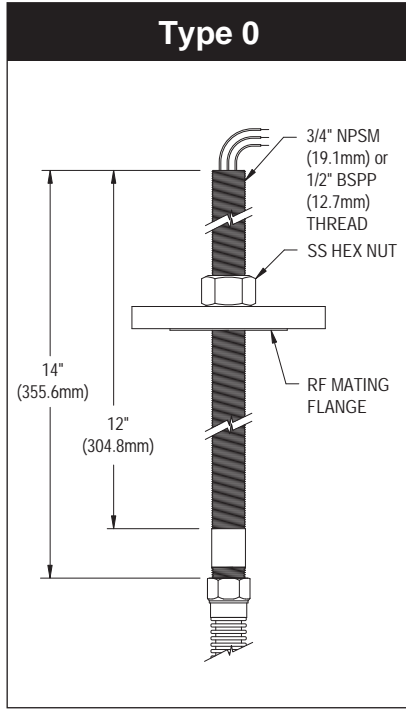
**H = length of sensor from the tank floor to the top of existing flange or roof connection.**

# Typical Installations

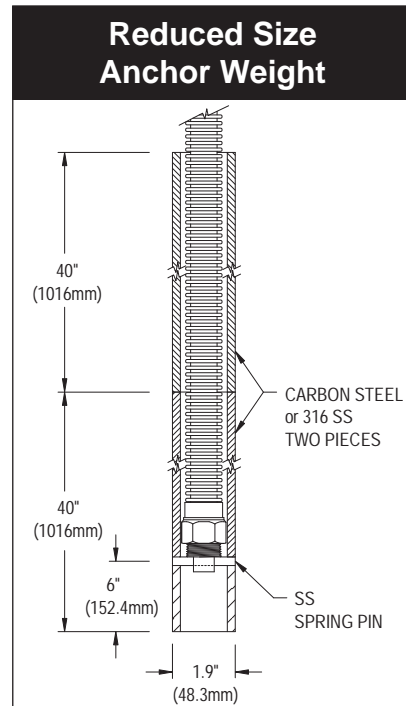
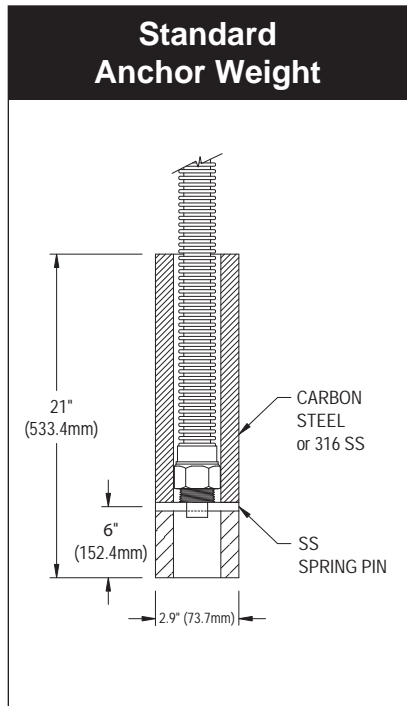
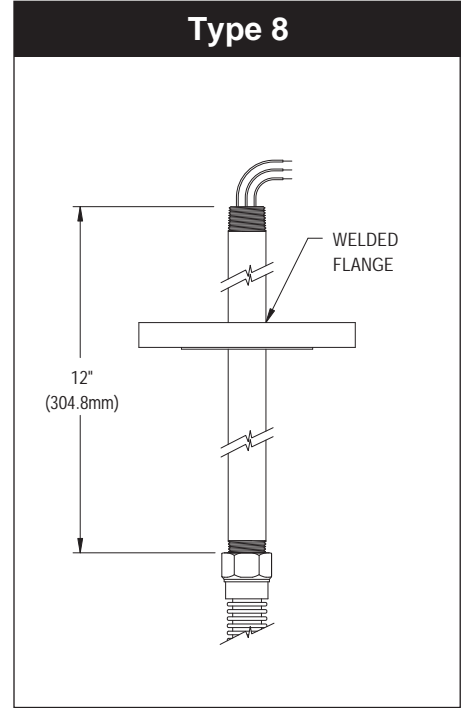
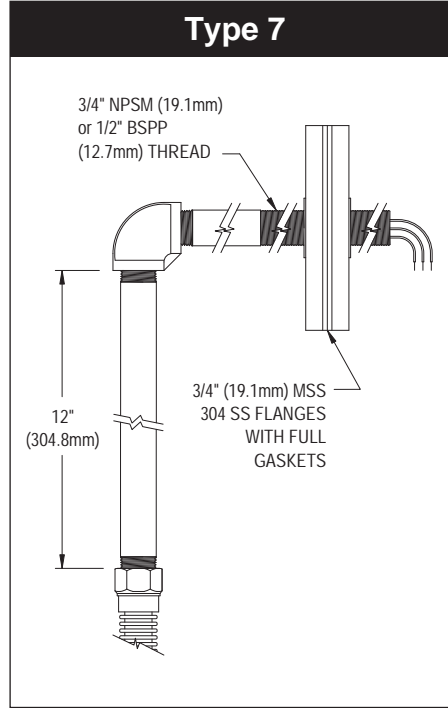
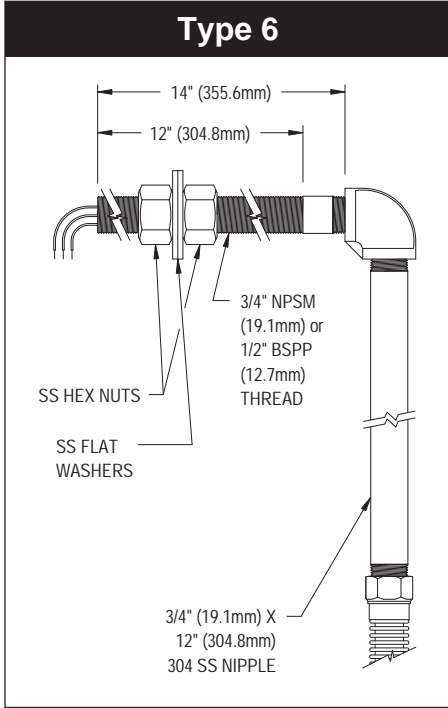


**H = length of sensor from the tank floor to the top of existing bracket or manway riser.**

# Tank Entry Hardware



# Tank Entry Hardware Anchor Weights



<b>Temperature/Resistance Relationships</b>				
<b>TEMPERATURE</b>		<b>RESISTANCE</b>		
<b>°F</b>	<b>°C</b>	<b>100 OHM COPPER</b>	<b>100 OHM DIN PLATINUM CHARACTERIZED COPPER</b>	<b>100 OHM DIN PLATINUM</b>
5	-15	84.48	94.41	94.12
14	-10	86.42	96.33	96.09
23	-5	88.36	98.25	98.04
32	0	90.30	100.17	100.00
41	5	92.24	102.05	101.95
50	10	94.18	103.98	103.90
59	15	96.12	105.90	105.85
68	20	98.06	107.83	107.79
77	25	100.00	109.75	109.73
86	30	101.94	121.68	111.67
95	35	103.88	113.60	113.61
104	40	105.82	115.53	115.54
113	45	107.76	117.45	117.47
122	50	109.70	119.38	119.40
131	55	111.64	121.30	121.32
140	60	113.58	123.23	123.24
149	65	115.52	125.15	125.16
158	70	117.45	127.08	127.07
167	75	119.39	129.00	128.98
176	80	121.33	130.93	130.89
185	85	123.27	132.85	132.80
194	90	125.21	134.78	134.70
203	95	127.15	136.58	136.60
212	100	129.09	138.50	138.50

General Specifications - All RTD's					
ACCURACY	TEMPERATURE		MAXIMUM DEVIATION		
	°F	°C	°F	°C	OHMS
<b>100 OHM COPPER</b>	-4	-20	0.27	0.15	0.06
	104	40	0.18	0.10	0.04
	212	100	0.27	0.15	0.06
<b>100 OHM DIN PLATINUM CHARACTERIZED COPPER</b>	41	5	0.65	0.36	0.14
	86	30	0.23	0.13	0.05
	131	55	0.28	0.15	0.06
	194	90	0.56	0.31	0.12
<b>100 OHM DIN PLATINUM (1/10 DIN)</b>	-4	-20	0.07	0.04	0.016
	104	40	0.09	0.05	0.019
	212	100	0.14	0.08	0.030

**TEMPERATURE COEFFICIENT OF RESISTANCE**

100 ohm Copper 0.004279 ohms/ohm/° C  
 100 ohm DIN Platinum Characterized Copper - 0.00383 ohms/ohm/° C  
 100 ohm DIN Platinum - 0.00385055 ohms/ohm/° C

**REPEATABILITY (0 TO 100° C)**

100 ohm Copper 0.05° F (0.03° C)  
 100 ohm DIN Platinum Characterized Copper - 0.05° F (0.03° C)  
 100 ohm DIN Platinum - 0.24° F (0.14° C)

**TEMPERATURE LIMITS**

*TYPE G*  
 Copper, Standard Range - to 212° F (100° C)  
 DIN Platinum, Standard Range - to 212° F (100° C)  
 Copper, High Temp Range - to 392° F (200° C)  
 DIN Platinum, High Temp Range - to 392° F (200° C)

*Type MA, MS, MWA and MWS*  
 Standard Unit - to 212° F (100° C)  
 High Temperature Version - to 392° F (200° C)

## Fiber Optic Networking for Tank Gauging

Fiber optic data transmission in the process industries has rapidly gained in importance in recent years. Specifically, in applications where the data is of high value, such as inventory tank gauging, fiber optics is becoming the standard. Compared to copper systems, fiber optic data transmission offers many advantages:

- Excellent electrical isolation between stations
- Very high resistance to interference, even when exposed to extreme EMI and RFI
- Transmission distances of up to 15 miles (24 kilometers), with high data rates
- The number of stations is not limited by the electrical properties of the communication interface utilized

This all adds up to a significant gain in immunity to interference and performance improvement for the data transmission infrastructure. No allowance is necessary for equipotential bonding concepts, complex surge protection or shielding.

The Weed Instrument EOTec 2000 family of fiber optic converters has been designed to provide the highest levels of transmission reliability and system availability. A broad range of protocols and analog signals are supported:

- Ethernet, Profibus, Modbus, Modbus Plus, ControlNet, DeviceNet, Data Highway Plus, DH-485, Genius, Remote I/O, RS232/485, Reliance R-Net
- 4-20mA, 0-10VDC

### Profibus Model



### Multiplexer



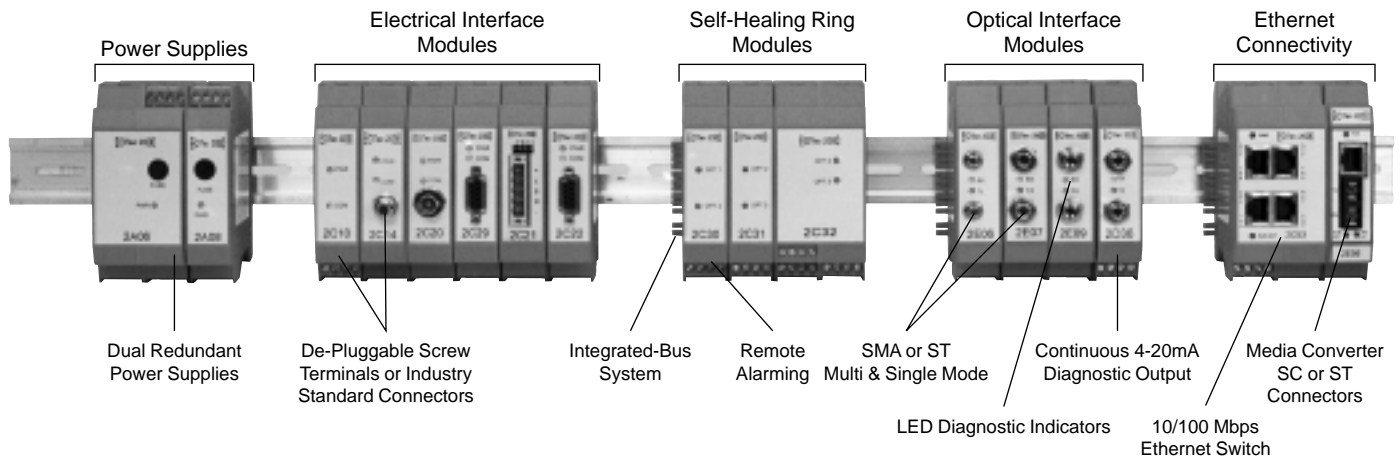
### Analog Data Link



### Multi-Channel Contact Closer



## EOTec 2000 Fiber Optic Converters







**Notes:**

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Weed Instrument is a leading manufacturer of temperature & pressure measurement instrumentation and fiber optic data networking equipment for OEM, industrial, aerospace and nuclear applications. Our products include RTDs, thermocouples, temperature & pressure transmitters, and fiber optic modems. We are ISO 9001-2000 registered and operate from a purpose-built 50,000 square foot (4,600 square meter) facility located on the outskirts of Austin, Texas.

We are recognized as an innovator in the instrumentation market, having received multiple customer and industry awards during our 35 year history. Our products are used by virtually every global leader engaged in the Oil and Gas, Process, Power Generation, and Aerospace industries. Our strength lies in our ability to custom design products to customer specifications, as well as provide proven designs for "off the shelf" applications.

Weed Instrument is totally committed to providing quality products, timely deliveries and personalized service. Worldwide sales support and flexible engineering, together with state-of-the-art manufacturing operations, allow us to consistently meet our customers sensing needs with reliable, practical and economical solutions.



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Petroleum Institute

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