

## IMPULSE® Series

### Guided Wave Radar (TDR)

### for Total Level and Volumetric Measurements



#### The New Impulse™ Guided Wave Radar

employs field proven TDR (Time Domain Reflectometry) technology to provide accurate measurement of Total Level, Distance or Volumetric outputs on all liquids and slurries. TDR Technology has been widely used for its inherent ability to remain unaffected by variations in the process materials electrical characteristics. AMETEK Drexelbrook has harnessed the technology with easy to use configuration menus in plain language. You will have the level measurement you need, configured within minutes.

#### Easy to install, Easy to use

- Easy navigation
- 2-wire, HART or Modbus Output for Class I, Div. 1 and Class I, Zone 0 installations
- Push-Button configuration or HART communications. Local Display (2-line, 7 digit LCD) or PC configuration software
- No calibration or Level changes needed
- System configuration asks only those basic questions that pertain to your selected level measurement type, and in plain language. You will be expertly measuring the process level within minutes
- Dual Compartment housing separates customer wiring terminals from the Intrinsically Safe electronic circuits, display and keypad

#### Dependable performance

- Reliable performance with accuracies to +/- 3mm and resolution to 1 mm
- 50 ft. (15 m) measurement range
- Sensor designs for -40°F to 392°F (-40°C to 200°C) to 580 psig (40 bar)
- Suitable for Liquids and Slurries
- Despite disturbances such as agitated, or irregular surfaces, foam or coating of the probe, the Impulse Guided Wave TDR will continue to provide reliable and accurate measurements.
- Unaffected by changes in density and dielectric properties, dusts, vapor, and turbulence
- Low dielectric measurements – down to a dielectric constant of 1.4, suitable for LPG/LNG service.
- Hazardous approvals – Intrinsically Safe, Explosion Proof and Non-Incendive approvals

#### Application versatility

- Probe Type and Material selections for all applications.
- Ideal for level measurement of Liquids and Slurries.
- Ideal for replacement of costly mechanical displacer systems.

Continuous Level Measurement

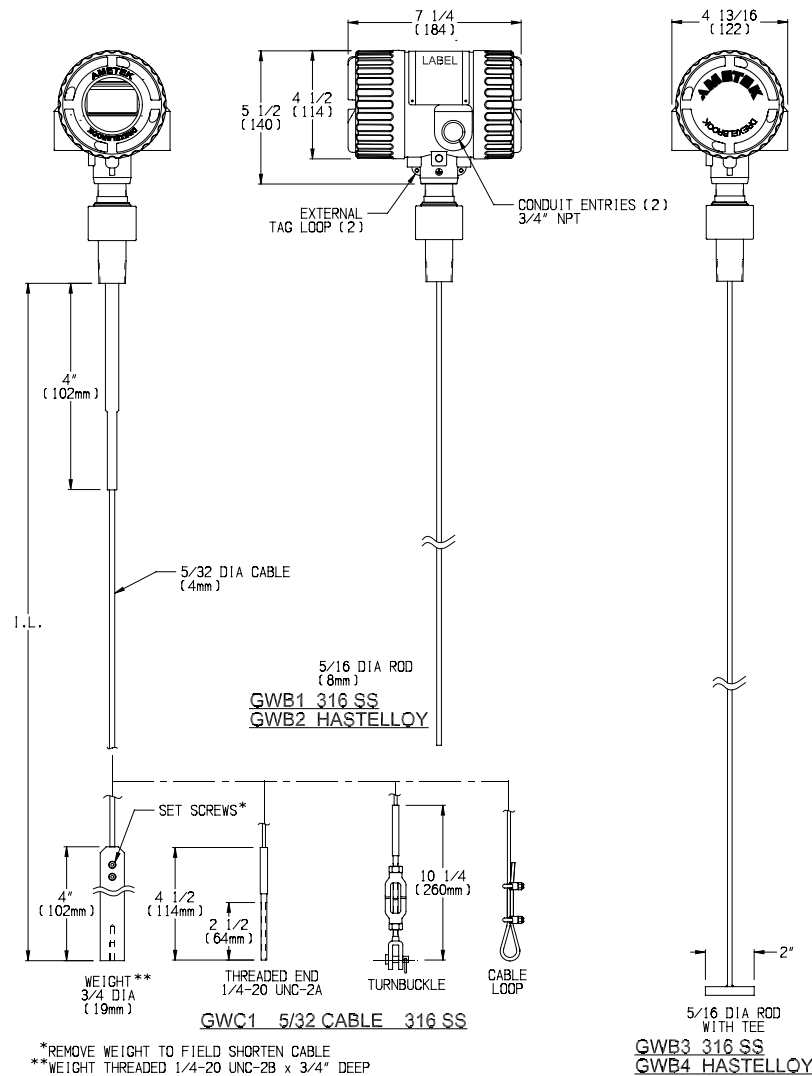


# Continuous Level Measurement

## IMPULSE™ Series

### Single Element Sensors

Single rod (12 ft. maximum length) and Single cable (maximum 50 ft. length) sensors provide the best performance with the lowest price point on applications that do not have any obstructions within the electromagnetic pulse area (12" from sensor). Single element sensors also provide the least resistance to process and process material forces, due to agitation or material loading on the sensor. Single sensor can be secured to the vessel bottom or internal elements in the instances of strong agitation, lateral forces, etc., without affecting system performance. Single element sensors will require either direct entry to the vessel or a nozzle that has a diameter to length ration of 1:1. Single Element Sensors have a minimum dielectric constant (K) limitation of process material  $K > 1.9^*$ . Single Element sensors have the best ability to withstand process material buildup on the element. Severe buildup, however, can affect system performance.



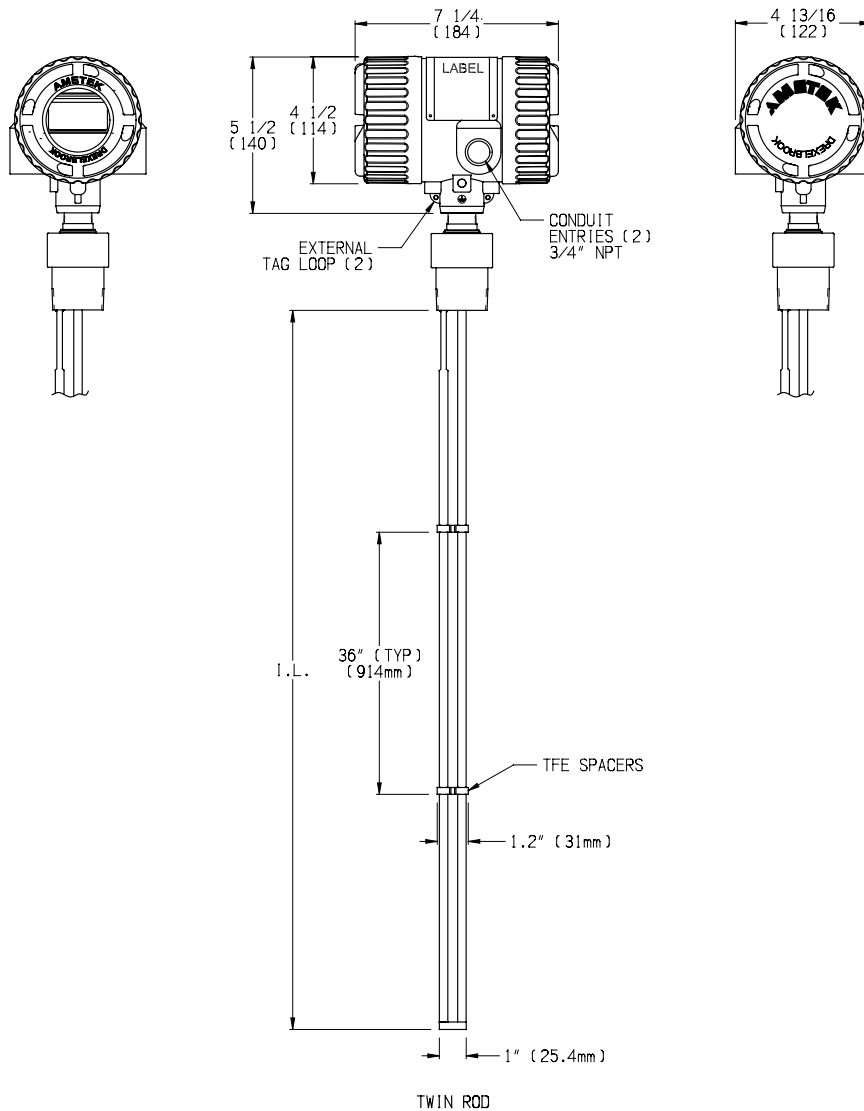
\* Single sensing element sensors must be mounted within 3"-6" (75-150mm) of a ground reference such as a tank wall. For dielectrics of 1.9 to 10.  $K > 10$ , no mounting restrictions,

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### Double Element Sensors

Double Rod (12 ft. , 3.6m Max. Length) and Double Cable (50 ft. , 15m Max. Length) sensors provide the best performance on applications that may have smaller process mountings or on vessels that may have internal obstructions that are closer to the sensor (6" from the sensor). The double element design causes a more focused electromagnetic pulse that travels closer to the double element. This is also an advantage on applications with lower process material dielectric constants, as it permits a greater amount of reflected signal to be reliably detected and processed at the electronics. As with the single element designs, the double element can also be secured to the vessel to help with mechanical strength. Caution must be taken with double element sensors so that the process material does not bridge between the double elements, as this will result in a level detection at the bridge point. Suitable for process materials with dielectrics > 1.9.



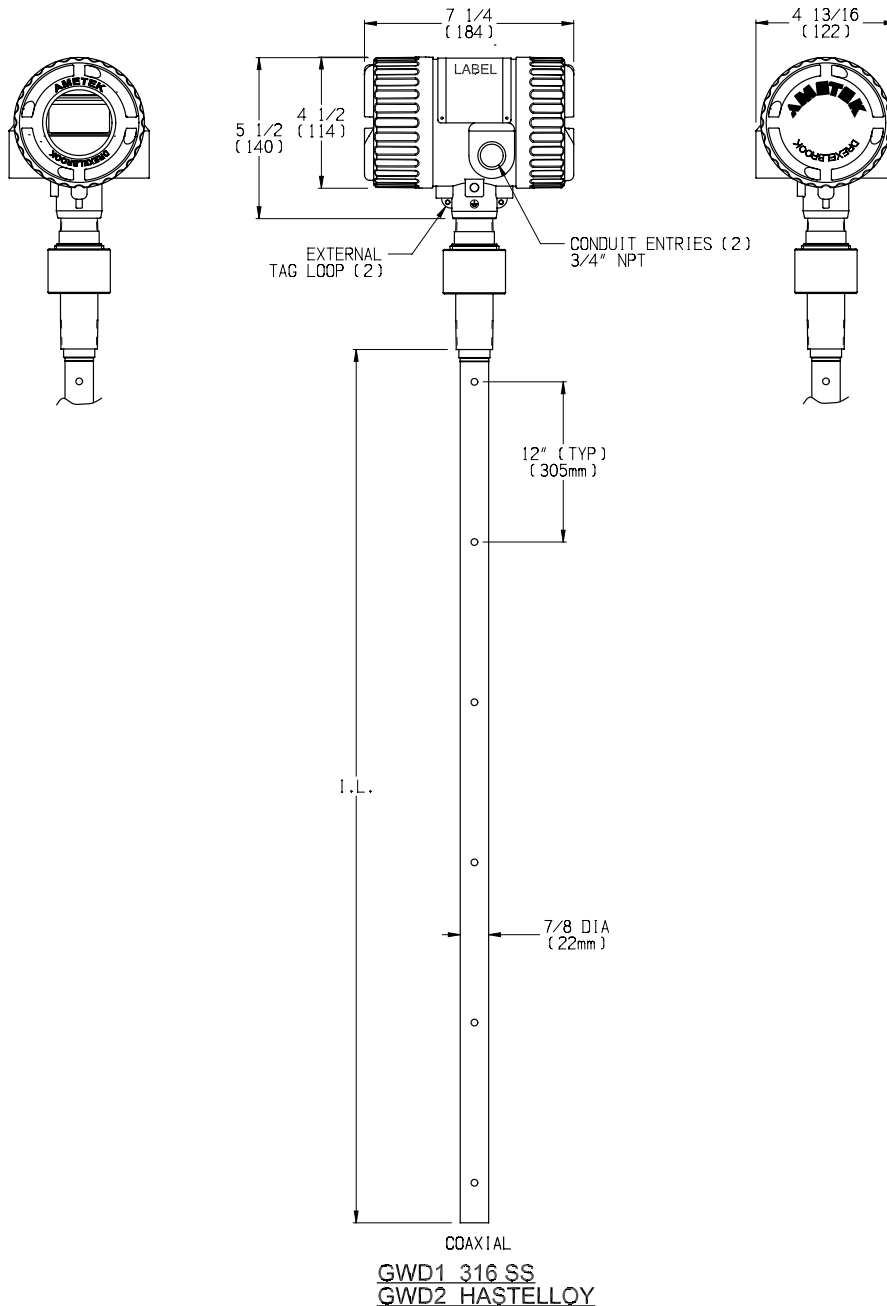
GWF1 316 SS  
GWF2 HASTELLOY

# Continuous Level Measurement

## IMPULSE™ Series

### Coaxial Sensors

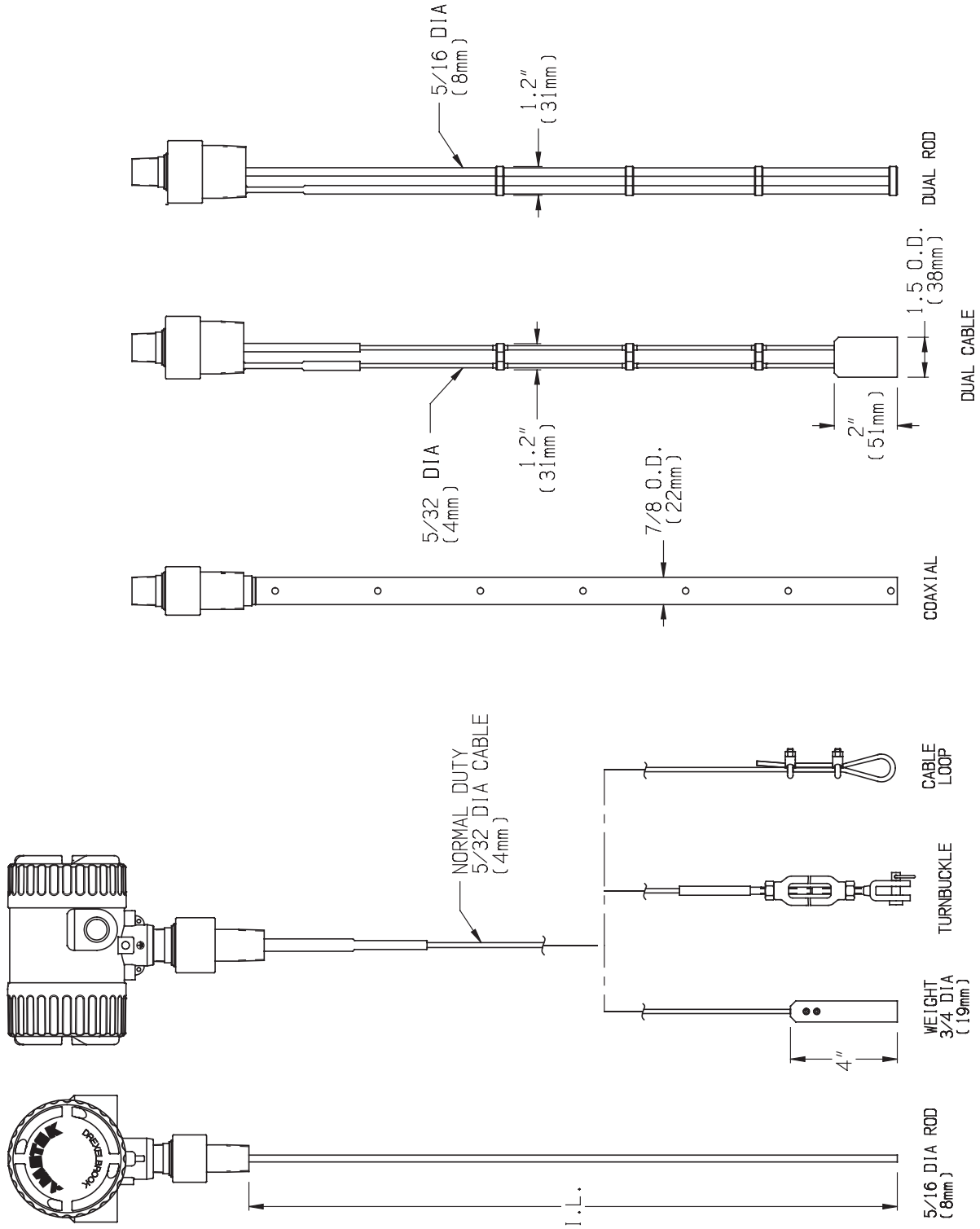
Coaxial Sensors (20 ft. , 6m Max. Length) provide the best performance with free flowing low viscosity liquids and in vessels that have limited process mountings. Coaxial sensors will completely ignore long mounting nozzles and internal vessel obstructions as the electromagnetic pulse is completely contained within the coaxial shield. Because the signal is contained, the coaxial design provides the strongest reflection from the process material. Coaxial sensors can be used on process liquids that have dielectric constants  $K > 1.4$ . Process vessels that may have strong agitation or other violent forces can have the coaxial sensor firmly secured or even welded in place.



# Continuous Level Measurement

## IMPULSE™ Series

### Dimensions



# Continuous Level Measurement

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### Specifications

#### Input Power:

- 13 – 30 VDC, I.S. HART Version
- 14 - 30 VDC, X.P. HART Version
- 11-30 VDC, X.P. Modbus Version  
(400mw max at 12VDC)

#### Output Signals:

- 2-wire, 4-20 mA, HART (isolated)
- Error Signals – 3.7 / 22 mA
- User selectable or Digital Modbus

#### Modbus Communication

- RTU or ASCII Mode
- Baud rate up to 57,600
- Multi Modbus data formats are available:  
Integer, Long Integer, Floating Point, Enron, 16-bit, 32-bit, and more.

#### Maximum Loop Resistance:

- Supply Voltage - 13 (I.S version) or - 14 (XP version) / 0.022 = max. loop resistance

#### Output Mode:

- 1 Output: Total Level, Distance or Volume

#### Measurement Range:

- Flexible Cable sensors: 1 to 50 ft. (15 m)
- Rod sensors: 1 to 12 ft. (3.6 m)
- Coaxial sensor: 1 to 20 ft. (6 m)

#### Upper / Lower Dead Zones:

- Sensor dependant

#### Sensor Types:

- Single Rod, 5/16" (8 mm) OD
- Single Cable, 5/32" (4 mm) OD
- Single Cable, 5/16" (8 mm) OD
- Double Rod, 1.2" (31 mm) OD assembly
- Double cable, 1.2" (31 mm) OD assembly
- Coaxial, 7/8" (22 mm) OD

#### Response Time:

- Less than 1 second

#### Warm-up time:

- Less than 60 seconds

#### Surge Protection:

- 1000 V power/signal to ground

#### Process Temperature (measured at the mounting):

- 40 to +392°F (-40 to 200°C)

#### Process Pressure:

- Vacuum to 580 psig (-1 to 40 bar)

#### Gasket Sealing Materials (options):

- PEEK & Viton, Kalrez 6375, EPDM

#### Display:

- 2-line, 7 digit, LCD Character height: 0.25" top line, 0.36" bottom line

#### UV Rated:

- No Sunshield required

#### Accuracy:

- K > 10: +/- 3 mm or 0.03% of measured distance, whichever is greater
- K < 10: +/- 5 mm or 0.05% of measured distance, whichever is greater

#### Repeatability / Resolution:

- 2 mm

#### Operational Temperature Limits:

- Transmitter: -40 to + 158°F (-40 to + 70°C)
- Sensor: -40 to + 392°F (-40 to + 200°C)

#### Configuration:

- Local Display with Keypad is Standard
- HRTWin PC Software is available for HART Versions only

#### Signal Damping:

- 0 – 90 seconds

#### Electrical Enclosure:

- Dual Compartment, Powder Coated
- Aluminum to NEMA 4X, IP66

#### Electrical Connection:

- ¾" NPT, M20 X 1.5

#### Process Connections:

- Thread: ¾" NPT, 1" NPT, 1-1/2" NPT, sensor dependant.
- Flange: 1" ANSI through 8" ANSI, 150#, 300# ratings, others on request.

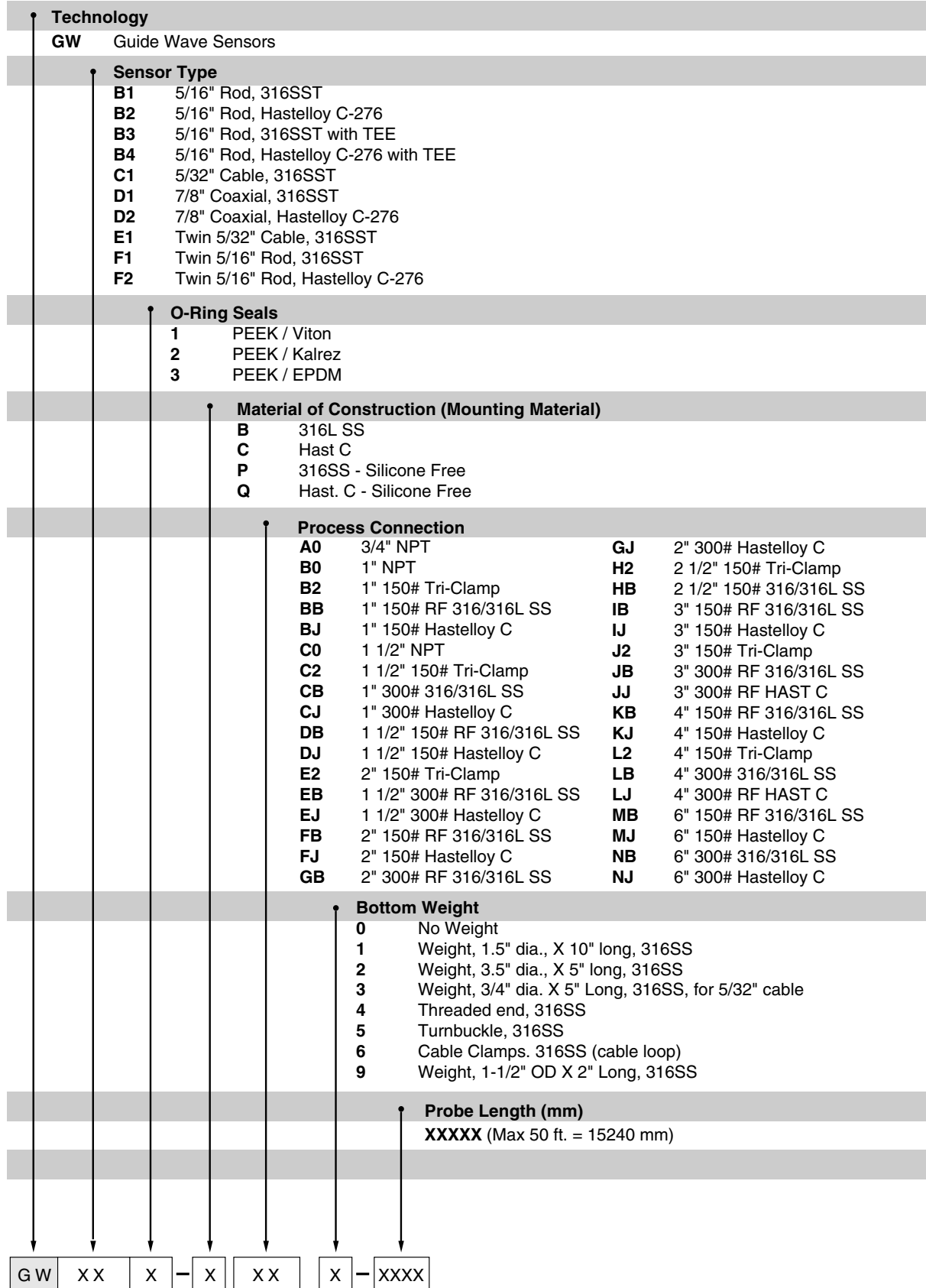
#### Approvals:

- Intrinsically Safe or Explosion Proof (with Intrinsically Safe Sensor) for Class I, Div.1, and Class I, Zone 0, and Class I, Div. 2 hazardous locations. FM/FMc for Canada Approved. ATEX, CRN, and CE Mark.

# Continuous Level Measurement

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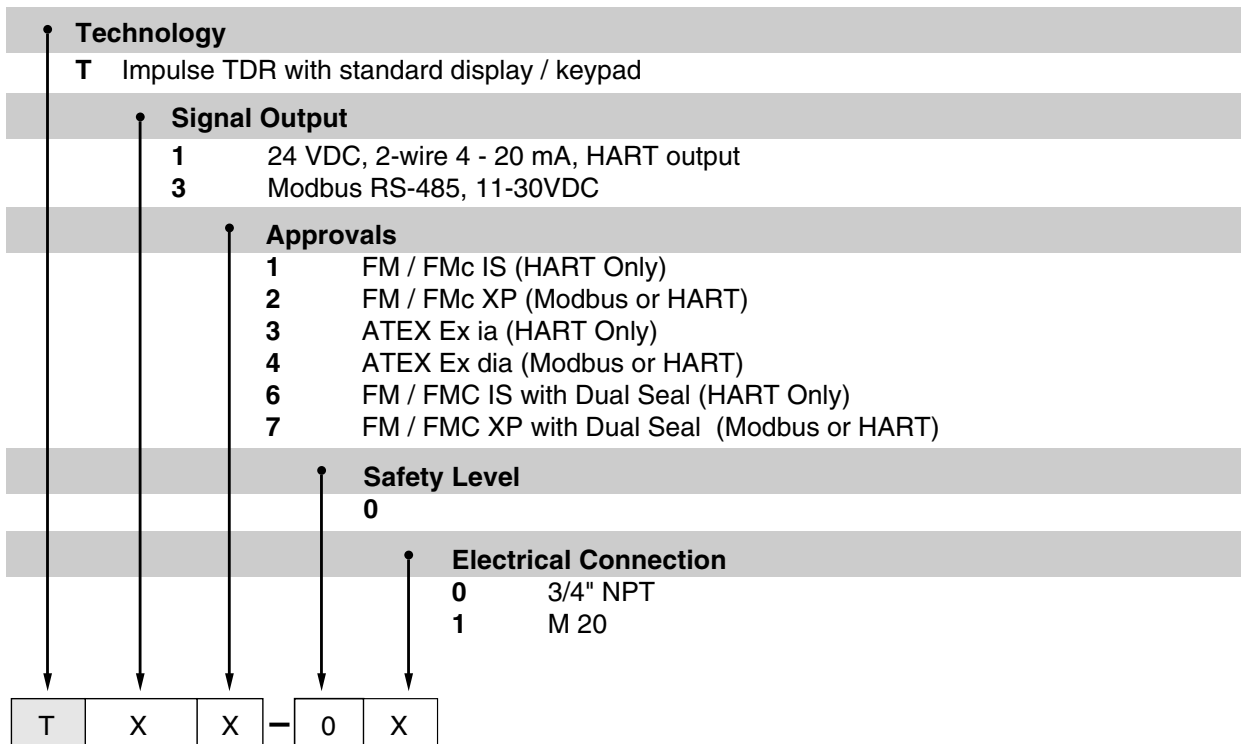
### Model Numbering - Sensing Element



# Continuous Level Measurement

## IMPULSE™ Series

### Model Numbering - Transmitter



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