AMETEK®

DREXELBROOK®

DATA SHEET

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
- Wave Guide Mounting Tube eliminates the signal interference normally caused by tank nozzles
- 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

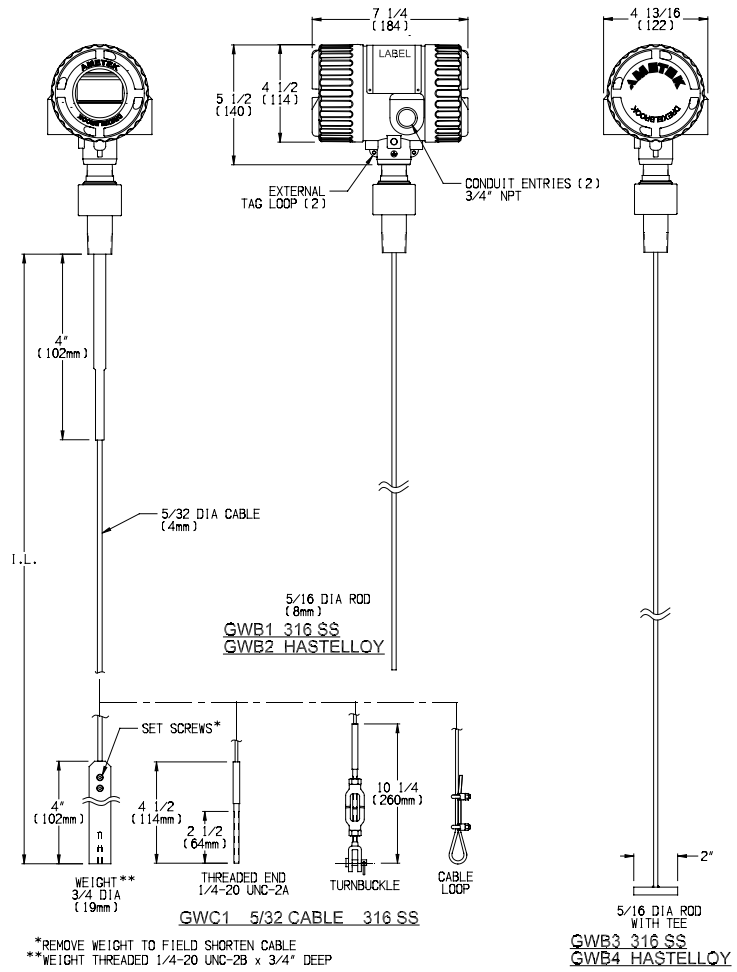
Application versatility

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

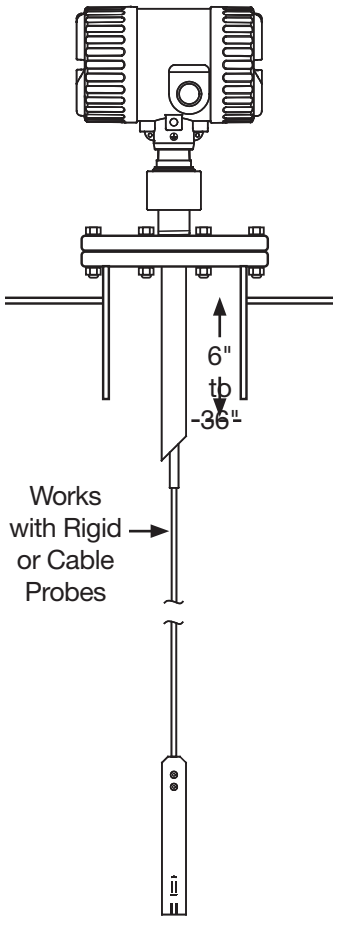
IMPULSE™ Series

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 (4" 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



GW HX, JX, KX, QX, Options

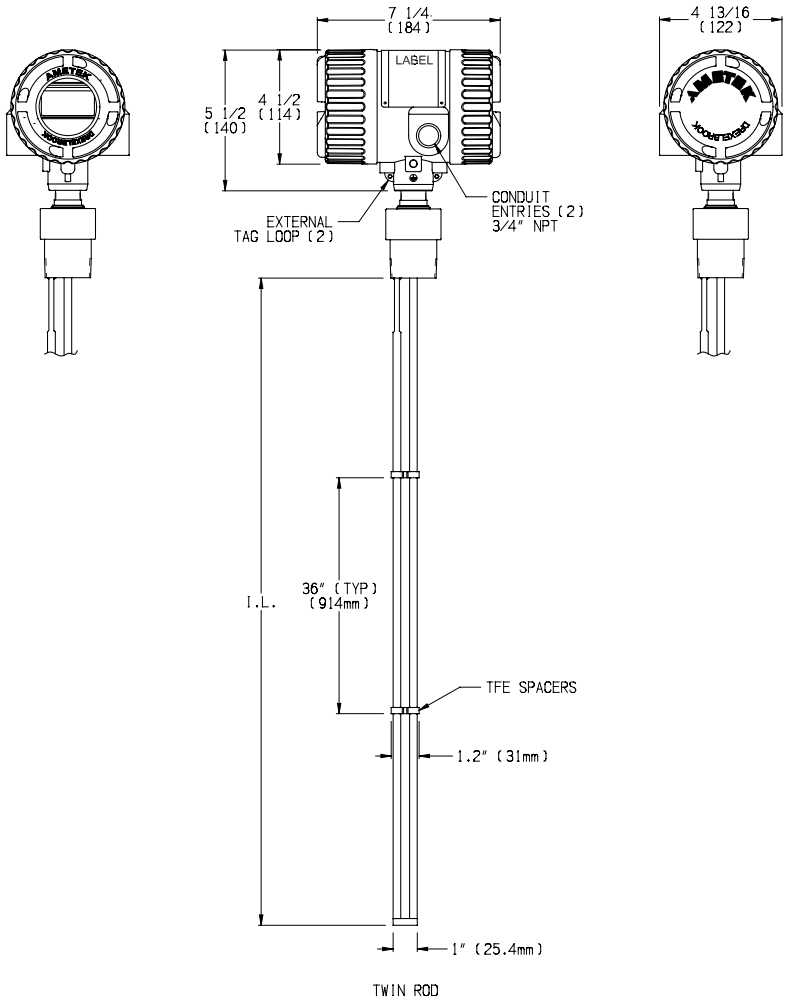
The Wave Guide Mounting Tube eliminates the signal interference normally caused by tank nozzles

Phone: +1 215-674-1234 • Fax: +1 215-674-2731
E-mail: drexelbrook.info@ametek.com
205 Keith Valley Road | Horsham PA 19044 U.S.A.
AMETEK® DREXELBROOK
www.Drexelbrook.com

IMPULSE™ Series

Double Element Sensors

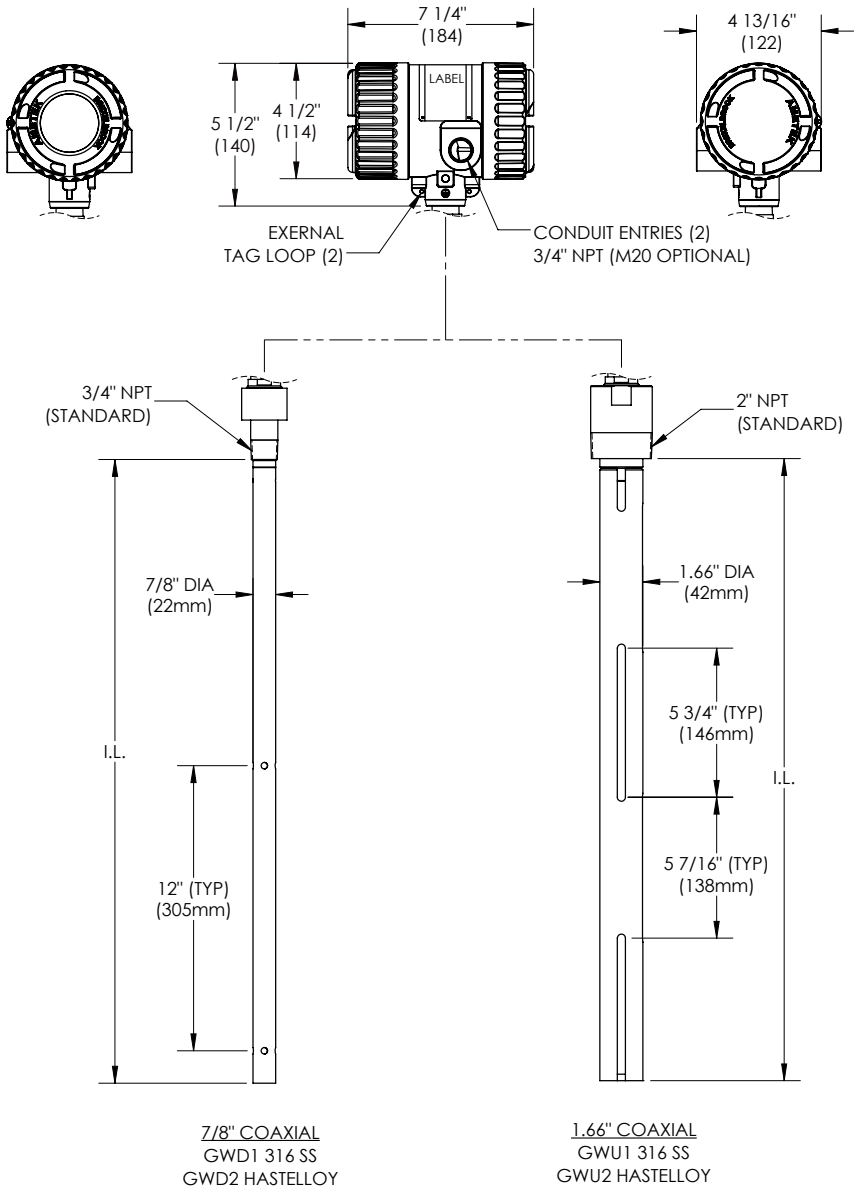
Double Rod (12 ft. , 3.6m Max. Length) and Double Cable (50 ft. , 15m Max. Length) sensors provide the best performance on applications that may have smaller process mountings or on vessels that may have internal obstructions that are closer to the sensor (4" from the sensor). The double element design 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.



IMPULSE™ Series

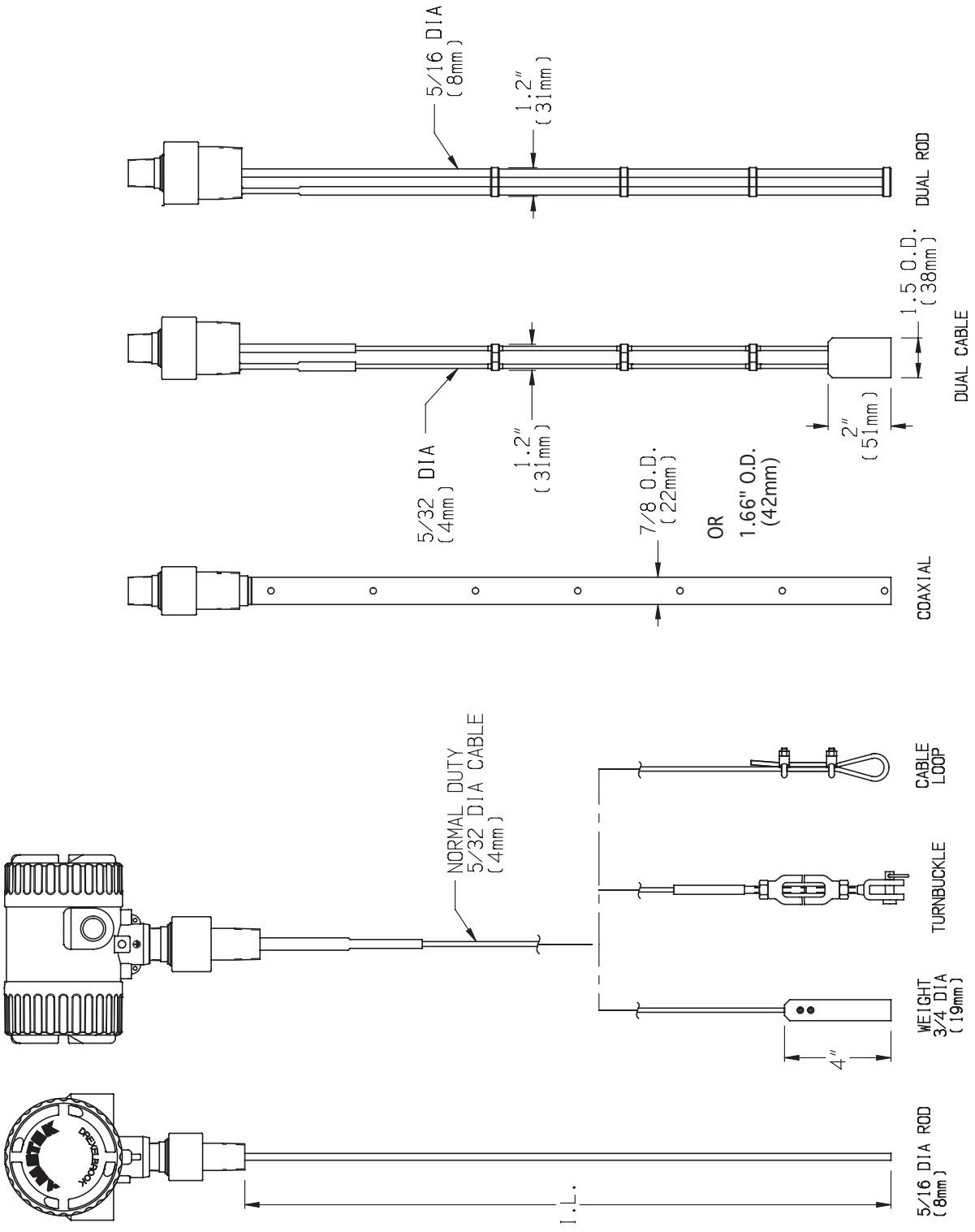
Coaxial Sensors

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.



IMPULSE™ Series

Dimensions



IMPULSE™ Series

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 or 1.66" (42mm) 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, or 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.

IMPULSE™ Series

Model Numbering - Sensing Element

Technology

GW Guide Wave Sensors

Sensor Type

B1	5/16" Rod, 316SST
B2	5/16" Rod, Hastelloy C-276
B3	5/16" Rod, 316SST with TEE
B4	5/16" Rod, Hastelloy C-276 with TEE
C1	5/32" Cable, 316SST
D1	7/8" Coaxial, 316SST
D2	7/8" Coaxial, Hastelloy C-276
E1	Twin 5/32" Cable, 316SST
F1	Twin 5/16" Rod, 316SST
F2	Twin 5/16" Rod, Hastelloy C-276
HX	Wave Guide Nozzle Eliminator, 5/32" Cable
JX	Adjustable Length, Wave Guide Nozzle Eliminator, 5/32" Cable
KX	Wave Guide Nozzle Eliminator, 5/16" Rod
QX	Adjustable Length, Wave Guide Nozzle Eliminator, 5/16" Rod (Consult Factory)
U1	1.66" Coaxial, 316SST
U2	1.66" Coaxial, Hastelloy C-276

O-Ring Seals

1	PEEK / Viton
2	PEEK / Kalrez
3	PEEK / EPDM

Material of Construction (Mounting Material)

B	316L SS
C	Hast C
P	316SS - Silicone Free
Q	Hast. C - Silicone Free

Process Connection

A0	3/4" NPT 316SS	**GJ**	2" 300# Hastelloy C
B0	1" NPT 316SS	**H2**	2 1/2" 150# Tri-Clamp
B2	1" 150# Tri-Clamp	**HB**	2 1/2" 150# 316/316L SS
BB	1" 150# RF 316/316L SS	**IB**	3" 150# RF 316/316L SS
BJ	1" 150# Hastelloy C	**IJ**	3" 150# Hastelloy C
C0	1 1/2" NPT 316SS	**J2**	3" 150# Tri-Clamp
C2	1 1/2" 150# Tri-Clamp	**JB**	3" 300# RF 316/316L SS
CB	1" 300# 316/316L SS	**JJ**	3" 300# RF HAST C
CJ	1" 300# Hastelloy C	**KB**	4" 150# RF 316/316L SS
DB	1 1/2" 150# RF 316/316L SS	**KJ**	4" 150# Hastelloy C
DJ	1 1/2" 150# Hastelloy C	**L2**	4" 150# Tri-Clamp
E0	2" NPT 316SS	**LB**	4" 300# 316/316L SS
E2	2" 150# Tri-Clamp	**LJ**	4" 300# RF HAST C
EB	1 1/2" 300# RF 316/316L SS	**MB**	6" 150# RF 316/316L SS
EJ	1 1/2" 300# Hastelloy C	**MJ**	6" 150# Hastelloy C
FB	2" 150# RF 316/316L SS	**NB**	6" 300# 316/316L SS
FJ	2" 150# Hastelloy C	**NJ**	6" 300# Hastelloy C
GB	2" 300# RF 316/316L SS		

Bottom Weight

0	No Weight
1	Weight, 1.5" dia., X 10" long, 316SS
2	Weight, 3.5" dia., X 5" long, 316SS
3	Weight, 3/4" dia. X 5" Long, 316SS, for 5/32" cable
4	Threaded end, 316SS
5	Turnbuckle, 316SS
6	Cable Clamps. 316SS (cable loop)
9	Weight, 1-1/2" OD X 2" Long, 316SS

Probe Length (mm)

XXXXX (Max 50 ft. = 15240 mm)

GW	XX	X	–	X	XX	X	–	XXXX

IMPULSE™ Series

Model Numbering - Transmitter

Technology

T Impulse TDR with standard display / keypad

Signal Output

1 24 VDC, 2-wire 4 - 20 mA, HART output
3 Modbus RS-485, 11-30VDC

Approvals

1 FM / FMc IS (HART Only)
2 FM / FMc XP (Modbus or HART)
3 ATEX Ex ia (HART Only)
4 ATEX Ex dia (Modbus or HART)
6 FM / FMC IS with Dual Seal (HART Only)
7 FM / FMC XP with Dual Seal (Modbus or HART)

Safety Level

0

Electrical Connection

0 3/4" NPT
1 M 20

T	X	X	–	0	X

Phone: +1 215-674-1234 • Fax: +1 215-674-2731
E-mail: drexelbrook.info@ametek.com
205 Keith Valley Road | Horsham PA 19044 U.S.A.
AMETEK® DREXELBROOK
www.Drexelbrook.com