



RADAR LEVEL TRANSMITTER

Pulse burst radar operating at 25 GHz K-band microwave frequency

HIGHLY ACCURATE NON-CONTACT MEASUREMENT:

EDGE Precision's tank radar is an ideal solution for the high precision level measurement transmitting of liquids, in a wide range of applications area including the food, energy, pharmaceutical, chemical, and even in marine applications with an outstanding accuracy range and measurement stability. EDGE Precision's tank radar provides an excellent non-contact measurement solution for liquids with a gas layer.

HOW IT WORKS:

This non-contact microwave level transmitter operates based on the measurement of the time of flight of transmitted and reflected signals. The measured distance is not affected by the physical parameters of medium to be measured because the propagation speed of electromagnetic energy is practically the same in air, gases, and in a vacuum.



1 1/2" HORN ANTENNA

2" HORN ANTENNA

3" HORN ANTENNA

6" PARABOLIC ANTENNA

			
Material of wetted parts Process connection Beam angle (-3dB)	316Ti (1.4571), PTFE 1 1/2" BSP, 1 1/2" NPT 19°	316Ti (1.4571), PTFE 2" BSP, 2" NPT 16°	316Ti (1.4571), PTFE ANSI 150# RF Flange 11°

The 25 GHz EDGE radar's most noticeable advantage over the lower frequency (5-12 GHz) radars are the smaller antenna size, ease of installation, and weight.



**FM Approved Class 1
Division 1, Groups C&D**

SELECT OPTIONS BELOW FOR FAST & EASY ORDERING:

EDGE PRECISION 9 -

TYPE	CODE
2-Wire Transmitter	1
2-Wire Transmitter + Display	2
High Temperature Transmitter	3
High Temperature Transmitter + Display	4

ANTENNA / FLANGE CONNECTION	CODE
1 1/2" Antenna w/ 1 1/2" Thread	1
2" Antenna w/ 2" Thread	2
3" Antenna w/ ANSI 150# RF 3" Flange	3
Parabolic Antenna w/ 6" Flange	4

PROCESS CONNECTION	CODE
NPT Thread 1 1/2" and 2" Antennas only	N
BSP Thread	B
Not Applicable: (See flange size under field 2)	0

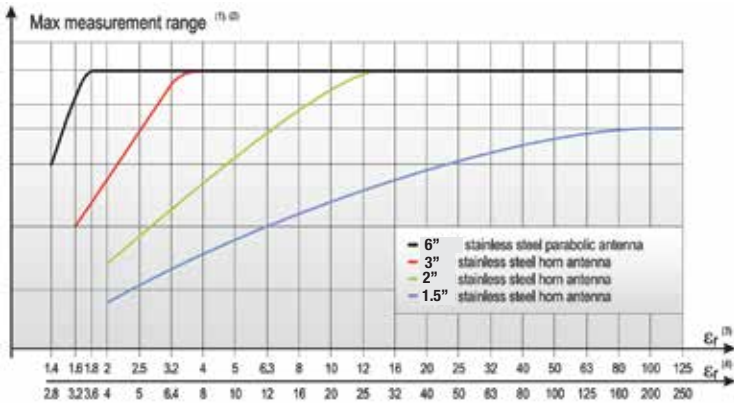
OUTPUT & HAZARDOUS RATING	CODE
4...20 mA + HART / XP-IS Class I Div 1	A
4...20 mA + HART / NI Class I Div 2	B

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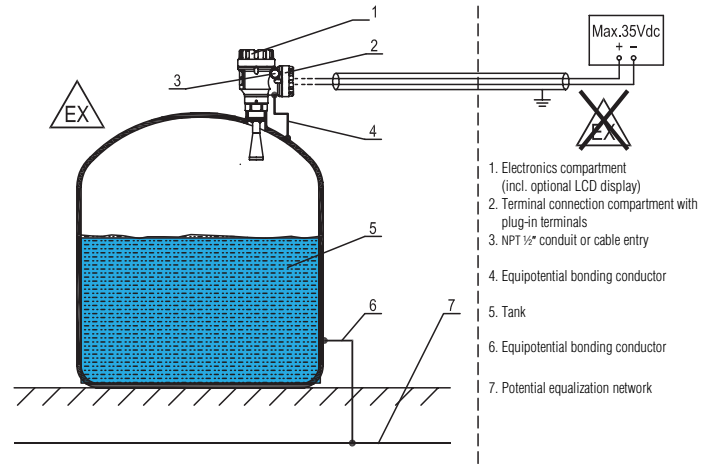
EDGE PRECISION RADAR LEVEL TRANSMITTER TECHNICAL DATA

TECHNICAL DATA	EDGE PRECISION STANDARD	HIGH TEMPERATURE VERSION
Measured and calculated values	Level, distance, volume, mass	
Measured media	Liquids or slurries	
Frequency of the measuring signal	~25 GHz (K-band) 1 mm	
Minimal and maximal measuring range *	0.6-75 ft (depending on antenna type & size)	
Material of wetted parts	1.4571, PTFE	
Process connection	NPT or BSP Thread, or 316 titanium stainless steel flange (see ordering codes)	
Beam angle	Varies based on model options, see users and programming manual	
Minimal ϵ_r of the medium*	Horn can measure starting at 1.9 & the parabolic antenna is capable of measuring from 1.4 under optimal circumstances. See the max measuring range diagram and the reduction factor diagrams below	
Maximal medium pressure (depending on the antenna)	25 bar (at 248°F... 120 °C)	
Medium temperature	-22°F ... 212°F (-30 ... + 100 °C) (up to max. 2 min.: 248°F..120 °C)	-22°F...-356°F (-30°C...=180°C)
Ambient temperature	-4 °F ...+140 °F (-20 ... +60 °C)	
Resolution	1 mm	
Typical linearity error (as per EN 61298-2)*	< 0.5 m: ±25 mm, 0.5 - 1m: ±15 mm, 1 – 1.5 m: ±10 mm, 1.5 – 8 m: ±3 mm, > 8 m: ±0.04% of the measured distance	
Temperature error (as per EN 61298-3)	0,05% FSK / 50°F (10 °C) -4 °F...+140 °F (-20 ... +60 °C)	
Output	Analogue	4-20 mA (3.9 – 20.5 mA)
	Digital communication	HART (minimal terminal resistor: 250 Ohm)
	Display	Graphical display unit
Damping time	Selectable: 0 ... 99 sec	
Measuring frequency	10 ... 60 sec as per the application settings	
Error indication	Output = 22 mA or 3.8 mA	
Output load	$R_i = (U_i - 20V) / 0.022 A$, U_i = power supply voltage	
Power supply voltage	XP-IS: 24...35Vd.c , NI: 20...35Vd.c	
Electrical protection	Class III.	
Ingress protection	IP 67	
Electrical connection	Internal thread for 2x 1/2" NPT cable protective pipe, cable outer diameter: 7...13 mm, cross section: max.1.5 mm ²	
Housing material	Paint coated aluminium	
Sealing	Viton, EPDM	

* Examined in case of proper application settings at 95% sample rate level. The environment should be free of EMC noises and power supply voltage fluctuations in accordance to the standard, under constant temperature. The reflector should be a plane plate reflector with ideal material, surface and dimensions (min. 3m x 3m). The largest false echo should be 20 dB smaller than the useful echo.



- (1) Under reference conditions of reflection (as per EN 61298 -3), moreover in case of interference-free environment, from min. 10 m² target surface) and stabilized temperature.
- (2) In some instances (e.g. disturbing reflections, steam or gas condensation, EMC noises) the maximal measurement range might decrease by 50 %!
- (3) Dielectric constant (ϵ_r) of liquids used in storage tanks with flat liquid surface
- (4) Dielectric constant (ϵ_r) of liquids used in process tanks or where liquid surface is waving



Depending on the process conditions, the following typical reducing factors are recommended to be considered in order to calculate the maximal measuring range. When more than one reducing factors occur at the same time then all the factors should be considered for the calculation:

Process Condition	Reflection reduction in amplitude	Max. measuring distance decrease by:	Reduction Factor
Slow mixing or slightly waving	2...6 dB	20-50%	0.8...0.5
Foaming	2...6 dB	20-50%	0.8...0.5
Fast mixing, vortex	8...10 dB	60-70% (the measurement might be completely terminated)	0.4...0.3
Steaming, condensation	3...10 dB	30-70% (the measurement might be completely terminated)	0.7...0.3

EDGE Precision's Pulse Radar is the best technology for non-contact liquid level measurement of tanks, based on reliability, lack of regular maintenance, and measurement repeatability.

- ▶ Continuously measures the levels in tanks from the lowest possible point in the tank to the highest safe operating level
- ▶ 24-7 liquid level monitoring to avoid overflow spills in production and water storage tanks when integrated with a control system & SCADA platform
- ▶ Process connections offered in multiple options for various installations: tank connections vary to suit existing or new tanks with coupling or flanges

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