2290 Non-contact Radar Level Transmitter

PP

The 25 GHz (K-band) 2290 Pulse Radars are the most progressive non-contact level transmitter technology for industrial processes. With an excellent accuracy, compact antennas and a user-friendly set-up the 2290 is an effective, simple, low cost choice for demanding level applications. GF's new K-band radar featuring ±3 mm (±0.1inch) accuracy and short dead band excels with its full plastic housing. Its antenna range incorporates a stainless steel horn and enclosed plastic tube choices.

The enclosed antenna versions can be replaced without removing the antenna enclosure from the process. Local programming of type 2290 is aided by a plug-in display module. The signal processing algorithm of the 2290 is based on years of experience with non-contact level measurement making it an excellent choice for applications simple and challenging alike.

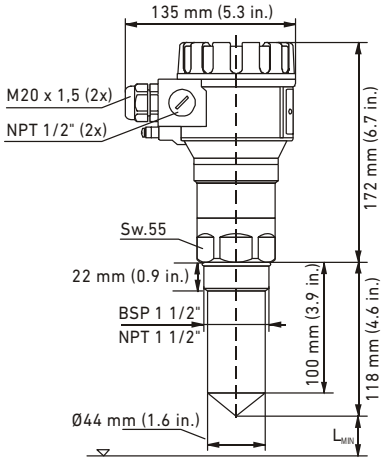
Features

- **19° beam angle**
- **Tank mapping function**
- **Large dot matrix LCD display**
- **Predefinded tank shapes**
- **Works with fumes, condensation, and light foam layers**

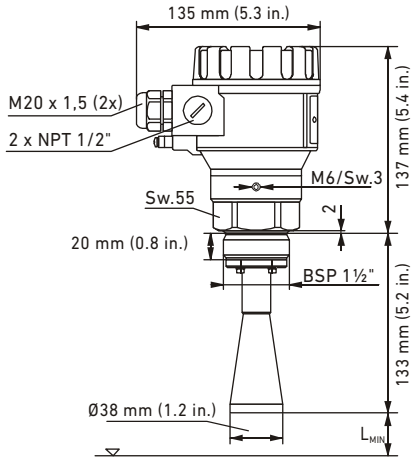
Applications

- **Bulk Storage Tanks**
- **Day Tanks**
- **Process vessels for Mixing and Batching**
  - **Buffer Tanks**
  - **Conditioning vessels**
  - **Metal or Plastic**

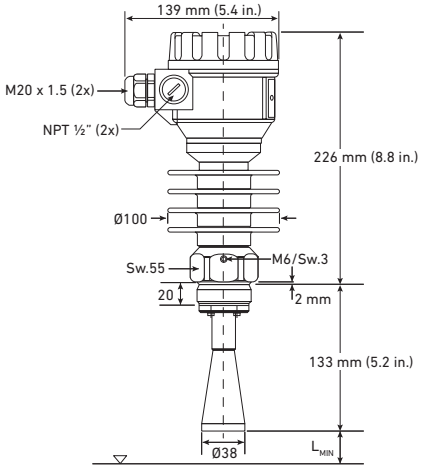
Dimensions



PP horn antenna
Lmin: 200 mm (7.9 inch)



Stainless Steel 316 Ti horn antenna
Lmin: 200 mm (7.9 inch)

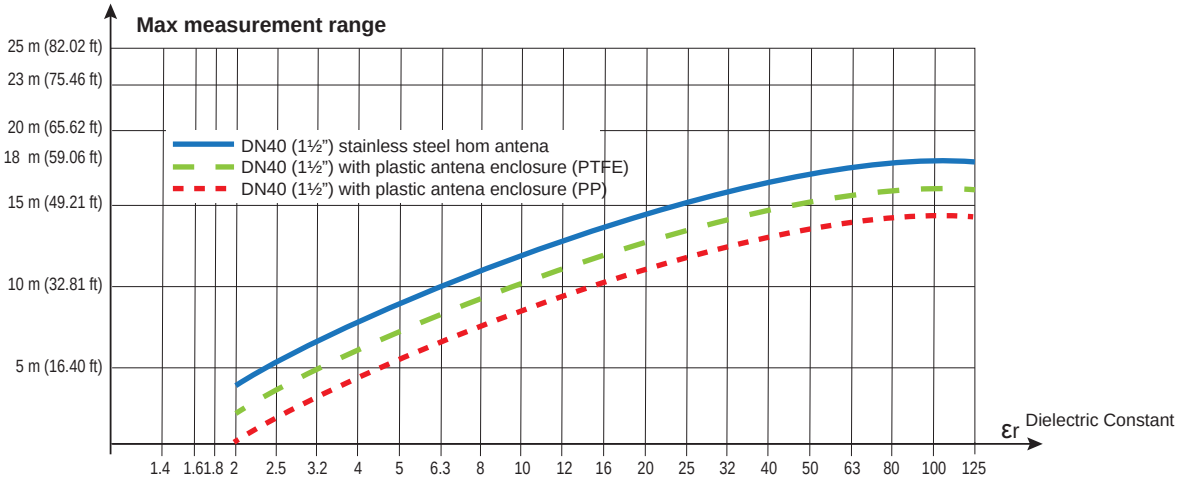


Stainless Steel 316 Ti horn antenna & temperature isolater
Lmin: 200 mm (7.9 inch)

Specifications

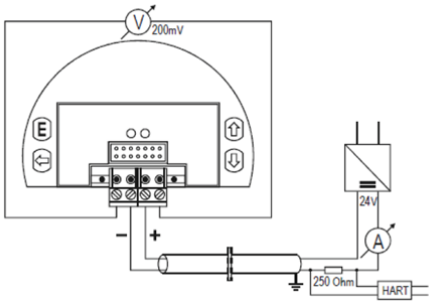
General		
Measured Values		Level, Distance; Calculated values: Volume, Mass
Wetted Parts	Horn Anntenna	Stainless Steel 316 Ti
	Antenna enclosure	PTFE, PP
Frequency of the Measuring Signal		~25 GHz (K-band)
Measuring Range		0.2 m – 18 m (0.65 – 59 ft) (depending on εr of the process liquid)
Accuracy		±3 mm (0.1 inch)
Linearity Error (as per EN 61298-2)		< 0.5 m: ±25 mm (< 1.6 ft: ±0.9 inch); 0.5 – 1 m: ±15 mm (1.6 – 3.2 ft: ±0.6 inch); 1 – 1.5 m: ±10 mm (3.2 – 4.9 ft: ±0.4 inch); 1.5 – 8 m: ±3 mm (4.9 – 26.3 ft: ±0.1 inch); > 8 m: ±0.04% (> 26.3 ft: ±0.04%) of the measured distance
Beam Angle		Minimum 19°
Minimum dielectric constant ε_r of the Medium		1.9 (refer to range diagram below)
Resolution		1 mm (0.04 in.)
Temperature Error (as per EN 61298-3)		0.05% FSK / 10 °C (50 °F) -20 °C... +60 °C (-68 °F... +140 °F)
Power Supply Voltage		20 V ...36 V DC
Output Digital Communication		4 – 20 mA + HART
Output Display		64 x 128 Dot Matrix LCD Graphical display unit
Measuring Frequency		10...60 sec as per the application settings
Antenna Diameter		38 mm (1 ½")
Antenna Material		Horn: Stainless Steel; enclosure: PP, PTFE
Medium Process Temperature		-30 °C... +100 °C (-22 °F - 212 °F), (up to 120 °C (248 °F) for max. 2 min); with PP antenna enclosure: max.: 80 °C (176 °F)
		2290 HT (high-temperature, SS316 horn antenna): -30°C ... +180°C (-22°F ... + 356°F)
Maximal Medium Pressure		25 bar at 120 °C (248 °F); with plastic antenna enclosure: 3 bar at 25 °C (77 °F)
Ambient Temperature		-20 °C... +60 °C (-4 °F - 140 °F)
Process Connection		DN 40 / 1 ½" BSP, 1 ½" NPT" thread
Ingress Protection		IP 67
Electrical Connection		2x M 20 x 1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø 7 ... Ø 13 mm (0.3 ... 0.5 inch), wire cross section: max. 1.5 mm² (AWG 15), wire cross section: max. 1.5 mm²
Electrical Protection		Class III
Housing Material		Plastic (/PBT)
Sealing		FKM
Communication Certifications		R&TTE, FCC
EX-Approvals		ATEX (ia): II 1/2 G Ex ia IIB T6...T5 Ga/Gb ICEX (ia): EX ia IIB T6...T5 Ga/Gb CE, FCC

Measurement range diagram*

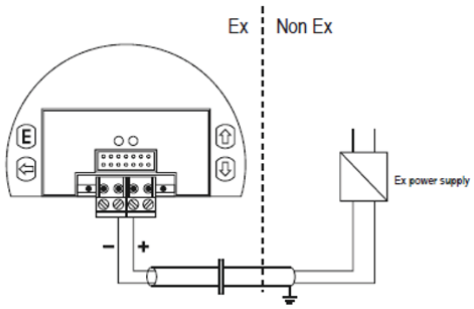


Under reference conditions of reflection (as per EN 61298-3, moreover in case of interface-free environment, from min. 10 m² target surface) and stabilized termperature.

Connections / Wiring

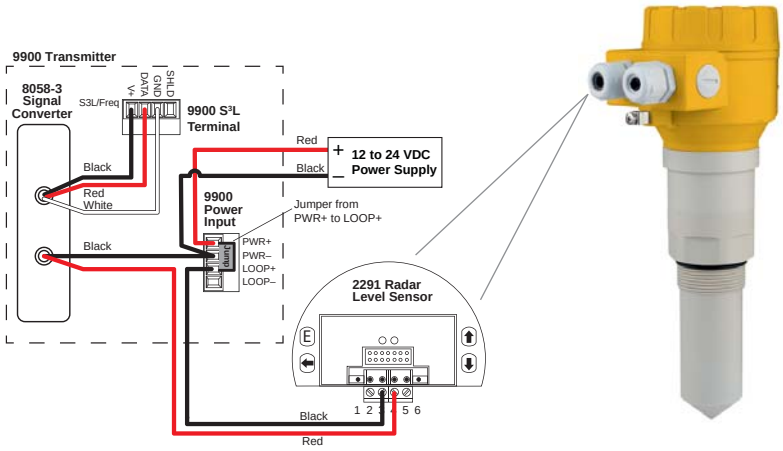


Standard wiring & conecction of HART-Modem



Wiring in an EX-enviroment

To iGo Converter – (S³L) / 4 to 20 mA



Pin No.	Assignment
1	Not Assigned
2	(+) Voltage measuring connector (200 mV)
3	(-) 4-20 mA loop current + supply (HART)
4	(+) 4-20 mA loop current + supply (HART)
5	(-) Voltage measuring connector (200 mV)
6	Not Assigned

Ordering Information

Mfr. Part No	Code	Description
2290-P-1DB2-18	**159 300 184**	2290 Radar Level Transmitter, LCD, PP/PBT housing, 1 ½" BSP
2290-P-1DN2-18	**159 300 185**	2290 Radar Level Transmitter, LCD, PP/ PBT housing, 1 ½" NPT
2290-S-DB2-18	**159 300 186**	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 ½" BSP
2290-S-DN2-18	**159 300 187**	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 ½" NPT
2290-F-DB2-18	**159 300 206**	2290 Radar Level Transmitter, LCD, PBT housing / PTFE antenna, 1 ½" BSP
2290-F-DN2-18	**159 300 207**	2290 Radar Level Transmitter, LCD, PBT housing/ PTFE antenna, 1 ½" NPT
2290-P-1DB2X-18	**159 300 194**	2290 EX Radar Level Transmitter, LCD, PP/PBT housing, 1 ½" BSP
2290-P-1DN2X-18	**159 300 195**	2290 EX Radar Level Transmitter, LCD, PP/ PBT housing, 1 ½" NPT
2290-S-DB2X-18	**159 300 196**	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½" BSP
2290-S-DN2X-18	**159 300 197**	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½" NPT
2290-F-DB2-18	**159 300 188**	PTFE antenna enclosure, 1 1/2" BSP
2290-F-ENC-N2	**159 300 189**	PTFE antenna enclosure, 1 1/2" NPT
On Request	**2290-S-DB2-18-HT**	2290 High Temperature Radar Level Transmitter, LCD, Aluminium housing/ SS316 Ti antenna, 1 ½" BSP
On Request	**2290-S-DN2-18-HT**	2290 High Temperature Radar Level Transmitter, LCD, Aluminium housing/ SS316 Ti antenna, 1 ½" NPT

Accessories

Mfr. Part No	Code	Description
	159 300 181	HART - USB Modem
3-8058-3	**Special Order**	Wire-mount Signet i-Go signal (4 to 20 mA /S^{3}L) converter to connect 2290 to 9900 Transmitter, 8900 Multi-Parameter Controller. Single input
3-8058-2	**159 000 967**	DIN rail mount Signet i-Go (4to 20 mA /S^{3}L) converter to connect 2290 to 9900 Transmitter, 8900 Multi-Parameter Controller. Two inputs
3-9900-1P	**159 001 695**	9900 Transmitter - Panel Mount
3-9900-1	**159 001 696**	9900 Transmitter - Field Mount
3-9950-1	**159 001 841**	9950 Base Unit – Two Channel Multi-Parameter Inputs, Two 4 to 20 mA Outputs, Panel Mount, DC Power
3-9950-2	**159 001 842**	9950 Base Unit – Two Channel Multi-Parameter Inputs, Two 4 to 20 mA Outputs, Panel Mount, AC or DC Power