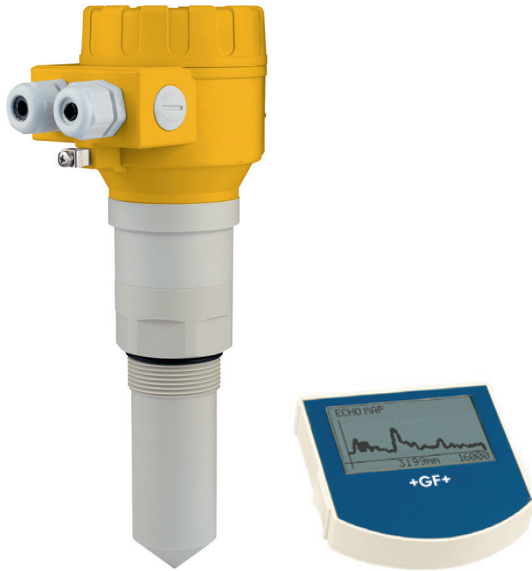


# 2290 Non-contact Radar Level Transmitter



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  $\pm 3$  mm ( $\pm 0.1$  in.) 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

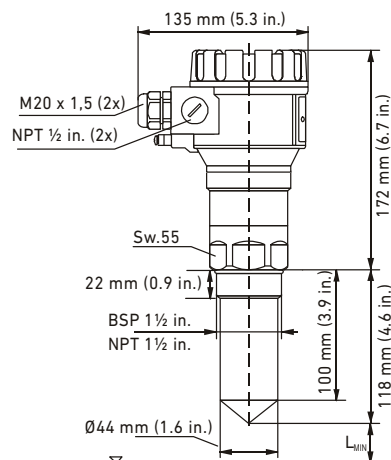
- 19° beam angle
- Tank mapping function
- Large dot matrix LCD display
- Predefined tank shapes
- Works with fumes, condensation, and light foam layers



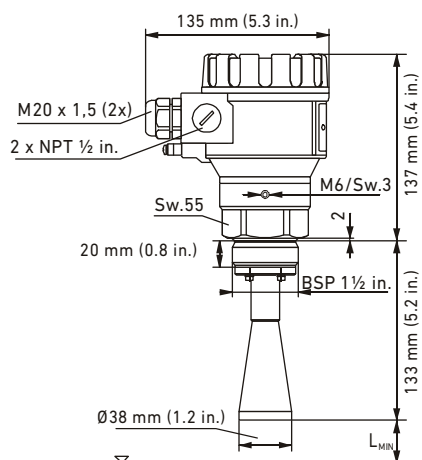
## Applications

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

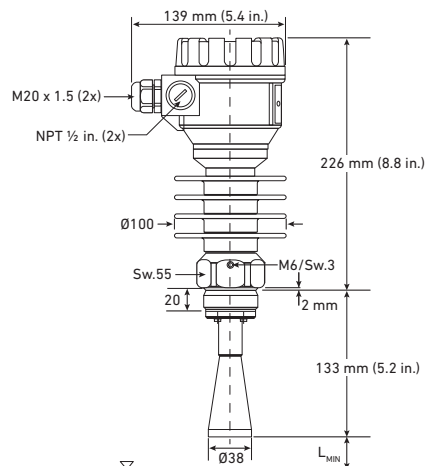
## Dimensions



PP horn antenna  
Lmin: 200 mm (7.9 in.)



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

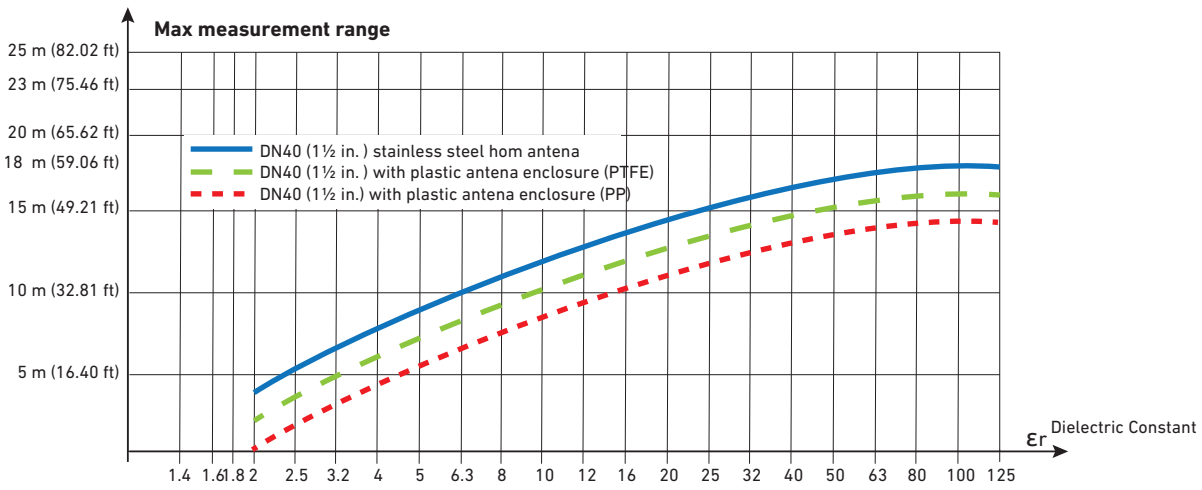


Stainless Steel 316 Ti horn antenna &  
temperature isolater  
Lmin: 200 mm (7.9 in.)

## Specifications

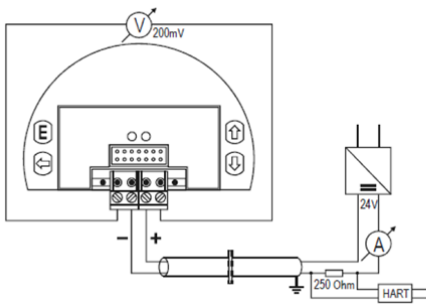
General		
Measured Values		Level, Distance; Calculated values: Volume, Mass
Wetted Parts	Horn Antenna	Stainless Steel 316 Ti
	Antenna Enclosure	PTFE, PP
Frequency of the Measuring Signal	~25 GHz (K-band)	
Measuring Range	0.2 m – 18 m (0.65 – 59 ft) (depending on $\epsilon_r$ of the process liquid)	
Accuracy	$\pm 3$ mm (0.1 inch)	
Linearity Error (as per EN 61298-2)	< 0.5 m: $\pm 25$ mm (< 1.6 ft: $\pm 0.9$ in.); 0.5 – 1 m: $\pm 15$ mm (1.6 – 3.2 ft: $\pm 0.6$ in.); 1 – 1.5 m: $\pm 10$ mm (3.2 – 4.9 ft: $\pm 0.4$ in.); 1.5 – 8 m: $\pm 3$ mm (4.9 – 26.3 ft: $\pm 0.1$ in.); > 8 m: $\pm 0.04\%$ (> 26.3 ft: $\pm 0.04\%$ ) of the measured distance	
Beam Angle	Minimum $19^\circ$	
Minimum dielectric constant $\epsilon_r$ 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 / $10^\circ\text{C}$ ( $50^\circ\text{F}$ ) $-20^\circ\text{C} \dots +60^\circ\text{C}$ ( $-68^\circ\text{F} \dots +140^\circ\text{F}$ )	
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 1/2 in.)	
Antenna Material	Horn: Stainless Steel; enclosure: PP, PTFE	
Medium Process Temperature	$-30^\circ\text{C} \dots +100^\circ\text{C}$ ( $-22^\circ\text{F} - 212^\circ\text{F}$ ), (up to $120^\circ\text{C}$ ( $248^\circ\text{F}$ ) for max. 2 min); with PP antenna enclosure: max.: $80^\circ\text{C}$ ( $176^\circ\text{F}$ ) 2290 HT (high-temperature, SS316 horn antenna): $-30^\circ\text{C} \dots +180^\circ\text{C}$ ( $-22^\circ\text{F} \dots +356^\circ\text{F}$ )	
Maximal Medium Pressure	25 bar at $120^\circ\text{C}$ ( $248^\circ\text{F}$ ); with plastic antenna enclosure: 3 bar at $25^\circ\text{C}$ ( $77^\circ\text{F}$ )	
Ambient Temperature	$-20^\circ\text{C} \dots +60^\circ\text{C}$ ( $-4^\circ\text{F} - 140^\circ\text{F}$ )	
Process Connection	DN 40 / 1 1/2 in. BSP, 1 1/2 in. NPT thread	
Ingress Protection	IP 67	
Electrical Connection	2x M 20 x 1.5 cable glands + internal thread for 2x 1/2 in. NPT cable protective pipe, cable outer diameter: $\varnothing 7 \dots \varnothing 13$ mm (0.3 ... 0.5 inch), wire cross section: max. $1.5 \text{ mm}^2$ (AWG 15), wire cross section: max. $1.5 \text{ mm}^2$	
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\*

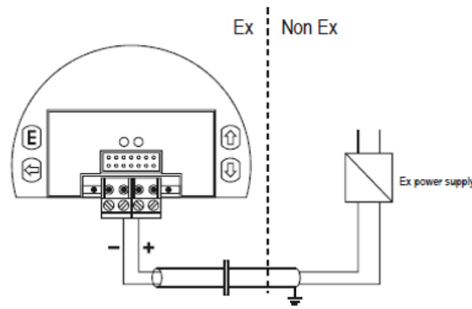


Under reference conditions of reflection (as per EN 61298-3, moreover in case of interface-free environment, from min. 10 m<sup>2</sup> target surface) and stabilized temperature.

## Connections / Wiring

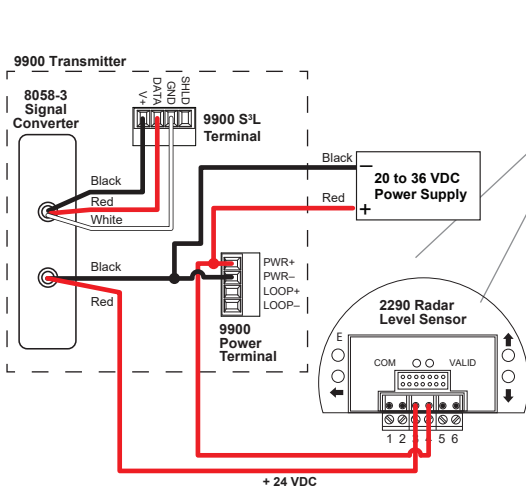


Standard wiring & connection of HART-Modem



Wiring in an EX-environment

## To iGo Converter – (S<sup>3</sup>L) / 4 to 20 mA

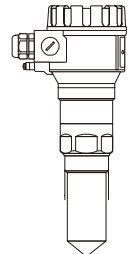
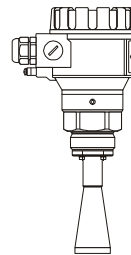


2290 Housing must be grounded, use screw terminal on housing (EP) to earth ground.



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	<b>159 300 184</b>	2290 Radar Level Transmitter, LCD, PP/PBT housing, 1½ in. BSP
	2290-P-1DN2-18	<b>159 300 185</b>	2290 Radar Level Transmitter, LCD, PP/ PBT housing, 1½ in. NPT
	2290-S-DB2-18	<b>159 300 186</b>	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½ in. BSP
	2290-S-DN2-18	<b>159 300 187</b>	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½ in. NPT
	2290-F-DB2-18	<b>159 300 206</b>	2290 Radar Level Transmitter, LCD, PBT housing / PTFE antenna, 1½ in. BSP
	2290-F-DN2-18	<b>159 300 207</b>	2290 Radar Level Transmitter, LCD, PBT housing/ PTFE antenna, 1½ in. NPT
	2290-P-1DB2X-18	<b>159 300 194</b>	2290 EX Radar Level Transmitter, LCD, PP/PBT housing, 1½ in. BSP
	2290-P-1DN2X-18	<b>159 300 195</b>	2290 EX Radar Level Transmitter, LCD, PP/ PBT housing, 1½ in. NPT
	2290-S-DB2X-18	<b>159 300 196</b>	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½ in. BSP
	2290-S-DN2X-18	<b>159 300 197</b>	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1½ in. NPT
	2290-F-DB2-18	<b>159 300 188</b>	PTFE Antenna Enclosure, 1½ in. BSP
	2290-F-ENC-N2	<b>159 300 189</b>	PTFE Antenna Enclosure, 1½ in. NPT
	On Request	<b>2290-S-DB2-18-HT</b>	2290 High Temperature Radar Level Transmitter, LCD, Aluminium housing/ SS316 Ti antenna, 1½ in. " BSP
	On Request	<b>2290-S-DN2-18-HT</b>	2290 High Temperature Radar Level Transmitter, LCD, Aluminium housing/ SS316 Ti antenna, 1½ in. NPT

## Accessories

Mfr. Part No.	Code	Description
	<b>159 300 181</b>	HART - USB Modem
3-8058-3	<b>Special Order</b>	Wire-mount Signet i-Go Signal (4 to 20 mA /S <sup>3</sup> L) Converter to connect 2290 to 9900 Transmitter, 8900 Multi-Parameter Controller. Single input
3-8058-2	<b>159 000 967</b>	DIN Rail Mount Signet i-Go Signal (4 to 20 mA /S <sup>3</sup> L) Converter to connect 2290 to 9900 Transmitter, 8900 Multi-Parameter Controller. Two inputs
3-9900-1P	<b>159 001 695</b>	9900 Transmitter - Panel Mount
3-9900-1	<b>159 001 696</b>	9900 Transmitter - Field Mount
3-9950-1	<b>159 001 841</b>	9950 Base Unit – Two Channel Multi-Parameter inputs, two 4 to 20 mA outputs, panel mount, DC Power
3-9950-2	<b>159 001 842</b>	9950 Base Unit – Two Channel Multi-Parameter inputs, two 4 to 20 mA outputs, panel mount, AC or DC Power