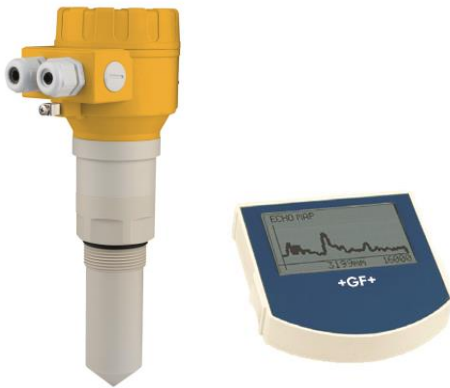


2290 Non-contact Radar Level Transmitter



Product description

The 25 GHz (K-band) 2290 Pulse Radars are the most progressive non-contact level transmitters 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 (± 0.1 inch) accuracy and short dead band excels with its robust 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 / Benefits

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

Approvals



Function

The operation of the non-contact microwave level transmitters is based on the measurement of the time of flight of the microwave burst. The propagation speed of microwave impulses is virtually the same in air, gases, or a vacuum and is independent of the process temperature and pressure, so the measured distance is not affected by the physical parameters of the medium to be measured. The level transmitter produces billions of microwave pulses per second, emitting from the antenna with a 19° focus the energy is reflected by the process media. The time of flight of the reflected signal is measured and processed by the electronics, and then this is converted to distance, level or volume proportional data. The measurability of a particular medium is dependent upon strength of the reflected signal which varies considerably based upon such factors as distance, dielectric constant, and surface turbulence. The relative dielectric constant (ϵ_r) of the medium should be greater than 1.9.

Applications

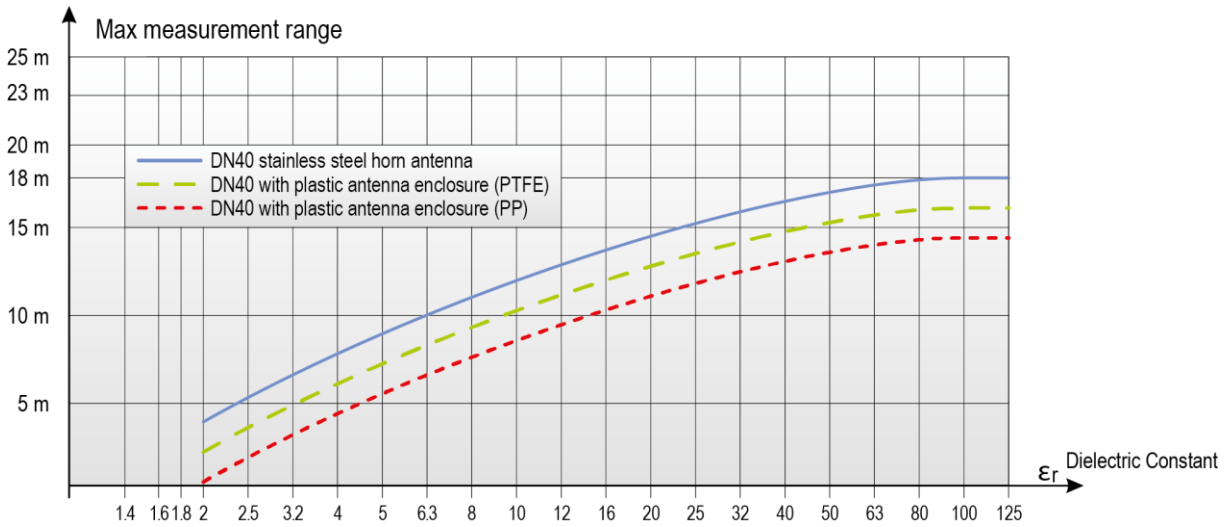
- Bulk storage tanks
- Day tanks
- Process vessels for mixing & batching
 - Buffer tanks
 - Conditioning vessels
 - Metal or plastic

Technical Data

Specifications

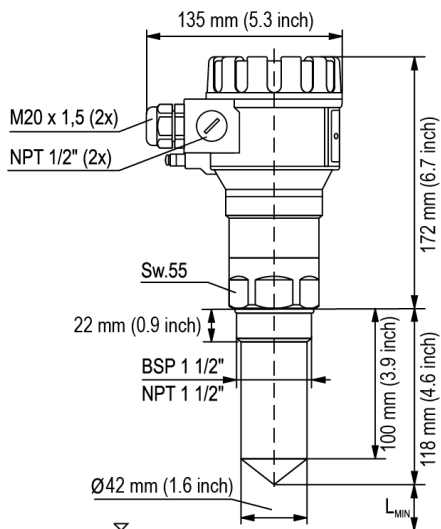
Measured values	Level, Distance; Calculated values: Volume, Mass
Wetted components	PP / PTFE /Stainless Steel 316 Ti
Frequency of the measuring signal	~25 GHz (K-band)
Measuring range	0.2 m – 18 m (0.65 ft – 59 ft) (depending on ϵ_r of the process liquid)
Accuracy	+/- 3 mm (0.1 inch)
Linearity error (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: $\pm 0.04\%$ (> 26.3 ft: $\pm 0.04\%$) 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 inch)
Temperature error (as per EN 61298-3)	0.05% FSK / 10 °C (50 °F); -20 °C... +60 °C (-4 °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 1/2")
Antenna material	Horn: Stainless Steel; enclosure: PP or PTFE
Medium process temperature	-30 °C... +100°C (-22 °C... +212°C), (up to 120 °C (248 °F) for max. 2 min); with PP antenna enclosure: max.: 80 °C (176 °F)
Maximum 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	DN40 / 1 1/2" BSP, 1 1/2" NPT" thread
Ingress protection	IP 67
Electrical connection	2x M 20 x 1.5 cable glands + internal thread for 2x 1/2" NPT cable protective pipe, cable outer diameter: $\varnothing 7$... $\varnothing 13$ mm (0.3 ... 0.5 inch), wire cross section: max. 1.5 mm ² (AWG 15), wire cross section: max. 1.5 mm ²
Electrical protection	Class III
Housing material	Plastic (/PBT)
Sealing	FPM
Communication certifications	R&TTE, FCC
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*

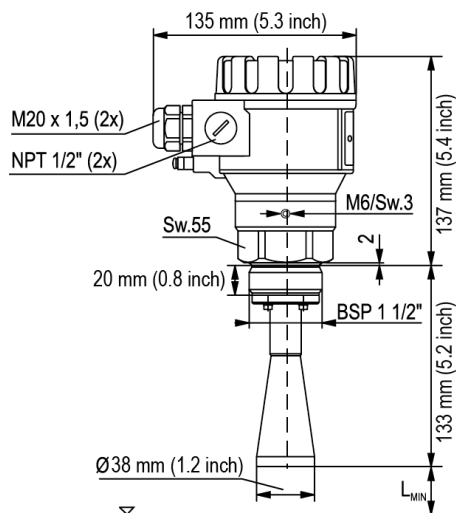


* Under reference conditions of reflection (as per EN 61298-3, moreover in case of interface-free environment, from min. 10 m² target surface) and stabilized temperature.

Dimensions

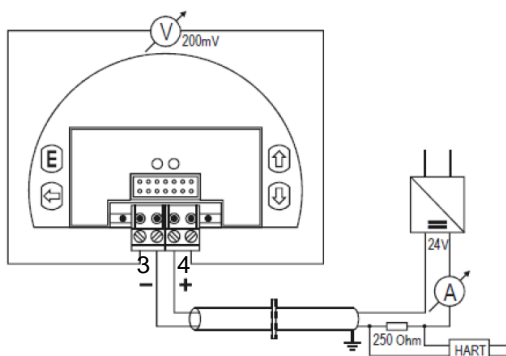


PP horn antenna
L_{min}: 200 mm (7.9 inch)

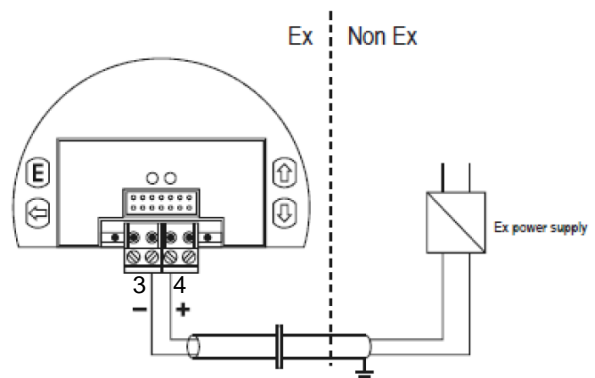


Stainless Steel 316 Ti horn antenna
L_{min}: 200 mm (7.9 inch)

Connections / Wiring

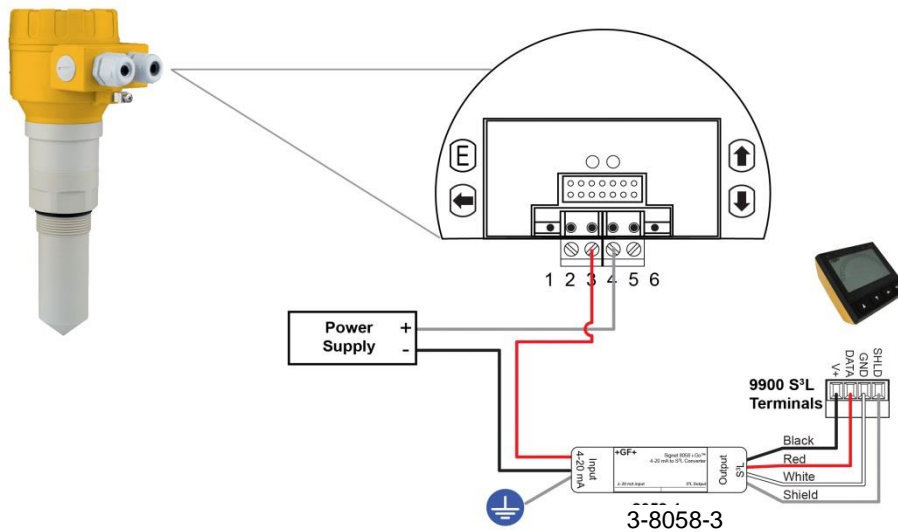


Standard wiring & connection of HART-Modem



Wiring in an EX-environment

To iGo Converter – S³L/4-20mA



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

Article overview type 2290

Order Code No.	Type Key	Article description
159300184	2290-P-1DB2-18	2290 Radar Level Transmitter, LCD, PP/PBT housing, 1 1/2" BSP
159300185	2290-P-1DN2-18	2290 Radar Level Transmitter, LCD, PP/ PBT housing, 1 1/2" NPT
159300186	2290-S-DB2-18	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 1/2" BSP
159300187	2290-S-DN2-18	2290 Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 1/2" NPT
159300206	2290-F-DB2-18	2290 Radar Level Transmitter, LCD, PBT housing / PTFE antenna, 1 1/2" BSP
159300207	2290-F-DN2-18	2290 Radar Level Transmitter, LCD, PBT housing/ PTFE antenna, 1 1/2" NPT
159300194	2290-P-1DB2X-18	2290 EX Radar Level Transmitter, LCD, PP/PBT housing, 1 1/2" BSP
159300195	2290-P-1DN2X-18	2290 EX Radar Level Transmitter, LCD, PP/ PBT housing, 1 1/2" NPT
159300196	2290-S-DB2X-18	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 1/2" BSP
159300197	2290-S-DN2X-18	2290 EX Radar Level Transmitter, LCD, PBT housing/SS316 Ti antenna, 1 1/2" NPT
159300188	2290-F-DB2-18	PTFE antenna enclosure, 1 1/2" BSP
159300189	2290-F-DN2-18	PTFE antenna enclosure, 1 1/2" NPT

Additional accessories

Order Code No.	Type Key	Article description
159300181	HART - USB Modem	HART - USB Modem
159000966	3-8058-3	Wire-mount Signet i-Go signal (4-20mA /S ³ L) converter to connect 2290 to 9900 Smart Pro, 8900 transmitter. Single input.
159300967	3-8058-2	DIN rail mount Signet i-Go (4-20mA/S ³ L) converter to connect 2290 to 9900 SmartPro, 8900 transmitter. Two inputs.
159001695	3-9900-1P	9900 Panel Mount Transmitter
159001696	3-9900-1	9900 Field Mount Transmitter