

## Type 2298 80 GHz Radar Level Sensor



PP

### Product description

The type 2298 is a rugged, high performance radar level measurement sensor, having transducer and processing electronics incorporated in one single housing.

For single and multiple tank applications 2-wire sensors are recommended using either HART protocol or 4 to 20 mA for the direct communication with a panel mount controller or a PLC.

Either for liquid level measurement in sumps or tanks, for tank volume measurement, or open channel flow measurement, the 2298 Level Sensors provide the answer. Sensing ranges up to 20 m (66 ft) are available. PP and PVDF sensor bodies provide best chemical resistance in applications where concentrated chemical shall be detected.

#### Features

- 2 wire compact sensor
- Compatible with 9900 Sensor (optional signal converter)
- Non-contact level measuring
- Narrow 7° beam angle
- Level, volume and open channel flow
- Compact housing
- Fully temperature compensated electronics
- Outstanding signal processing software providing highly accurate measuring results
- PP or PVDF sensor body provides best chemical resistance
- Secondary lightning protection
- 4 to 20 mA / HART interface

#### Applications

- Water Treatment
- Corrosive Industrial Waste Treatment
- Filling
- Batching
- Bulk Transfer
- Dirty Liquids



## Specifications

Antenna type		Encapsulated Antenna	
Antenna size		ø1" *	ø1½"
Dead zone <sup>(1)</sup>		0 m (0 ft)	
Max. measuring distance <sup>(2)</sup>		10 m (33 ft)	10 m (33 ft)    20 m (66 ft)
Antenna insertion length <sup>(3)</sup>		56 mm (2.2")	70 mm (2.76")
Accuracy <sup>(4)</sup>		±5 mm (±0.2")	±5 mm (±0.2")    ±2 mm (±0.079")
Process pressure		-1...3 bar (-14.5...43.5 psi)	
Beam angle (-3 dB)		12°	7°
Process connection		1" BSP / NPT	1½" BSP / NPT
Materials	Housing	PP, PVDF, PTFE*	
	Seal	EPDM	
	Cable	Cable sealing: EPDM, cable isolation: PVC	
Measured Values		Level, Distance; Calculated values: Volume, Mass	
Frequency of the Measuring Signal		~80 GHz (W-band)	
Linearity Error (as per EN 61298-2)		See diagram	
Minimum dielectric constant $\epsilon_r$ of the Medium		1.9 (refer to diagram)	
Resolution		0.1 mm (0.0039")	
Power Supply Voltage		12...36 V DC	
Output Digital Communication		4...20 mA; (3.9...20.5 mA); RLmax = (US - 12 V) / 0.02 A + HART	
Measuring Frequency		~1/s	
Antenna Diameter		1" (25.4 mm); 1½" (38.1 mm)	
Antenna Material		Horn: Stainless Steel; enclosure: PP / PVDF / PTFE	
Medium Process Temperature		PVDF: -40...+80 °C (-40...+176 °F) PP: -30...+80 °C (-34.4...+176 °F)	
Ambient Temperature		PVDF: -40...+80 °C (-40...+176 °F) PP: -30...+80 °C (-34.4...+176 °F)	
Upper process connection		1" BSP	
Protection class		IP66 / IP68	
Electrical Connection <sup>(5)</sup>		4 × 0.5 mm <sup>2</sup> shielded Ø6 mm cable × 5 m (up to 30 m); (4 × 22 AWG shielded Ø0.24" cable × 16.4 ft [up to 98.5 ft]); For the relay option: 7 × 0.5 mm <sup>2</sup> (22 AWG) shielded cable	
Electrical Protection		Class I overvoltage protection; (Class III [SELV])	
Communication Certifications		R&TTE, FCC	
Weight		~600 g (1.3 lb)	
Standards and Approvals		Directive 2014/35/EU (LVD), Directive 2014/30/EU (EMC), Directive 2014/53/EU (RED), Directive 2015/863/EU (RoHS 3)	

\* Available on request.

(1) From the tip of the antenna, if dielectric constant ( $\epsilon_r$ ) < 80.

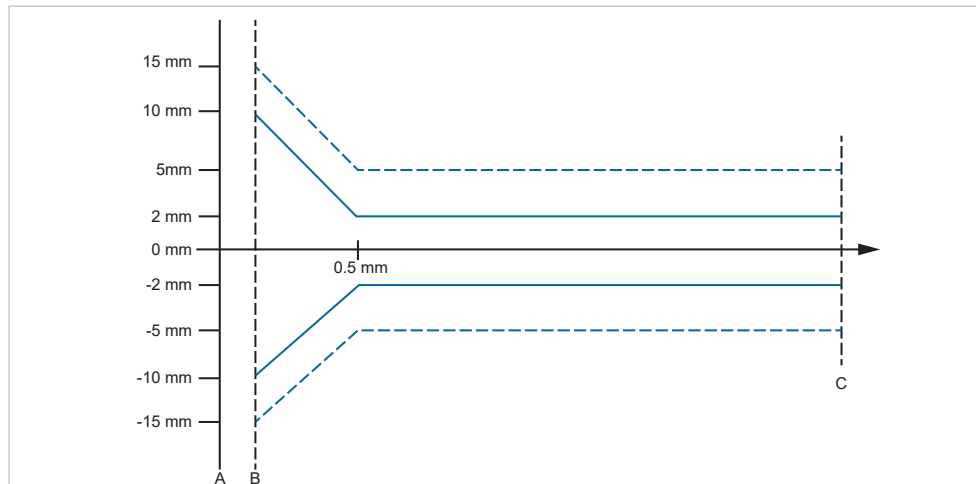
(2) May be limited for media with low dielectric constants or non-vertical or non-planar surfaces.

(3) From process connection.

(4) With an ideal reflecting surface, according to IEC 62828-1, an accuracy of ±2 mm (±0.079") is not guaranteed for Region 3 and Region 4 settings.

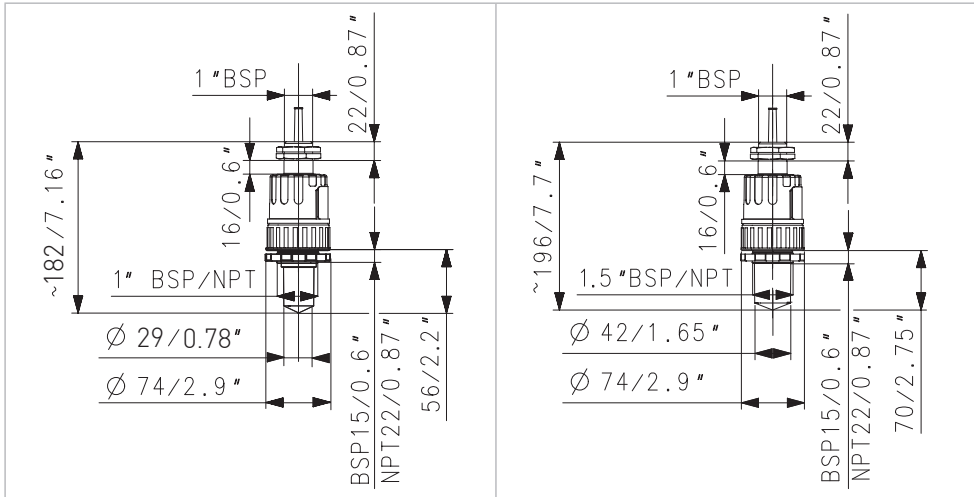
(5) Operate only with galvanically isolated power supply!

### Linearity error



- Transmitters up to 10 m measuring range
- Transmitters up to 20 m measuring range
- A** Process connection plane of the device
- B** The minimum measurement distance below which the radar cannot measure, due to the insertion length of the antenna ( $X_m$ )
- C** Maximum measurement distance ( $X_M$ )

## Dimensions



Encapsulated Antenna  $\phi 1''$

Encapsulated Antenna  $\phi 1\frac{1}{2}''$

## Ordering Information

Mfr. Part No	Description
159300464	2298 Radar Level Sensor, 0-10m, PP housing, 1½", 70 mm, BSP
159300465	2298 Radar Level Sensor, 0-10m, PVDF housing, 1½", 70 mm, BSP
159300467	2298 Radar Level Sensor, 0-10m, PP housing, 1½", 70 mm, NPT
159300468	2298 Radar Level Sensor, 0-10m, PVDF housing, 1½", 70 mm, NPT
159300440	2298 Radar Level Sensor, 0-20m, PP housing, 1½", 70 mm, BSP
159300441	2298 Radar Level Sensor, 0-20m, PVDF housing, 1½", 70 mm, BSP
159300443	2298 Radar Level Sensor, 0-20m, PP housing, 1½", 70 mm, NPT
159300444	2298 Radar Level Sensor, 0-20m, PVDF housing, 1½", 70 mm, NPT
*on request	2298 Radar Level Sensor, 0-10m, PP housing, 1", 56 mm, BSP
*on request	2298 Radar Level Sensor, 0-10m, PVDF housing, 1", 56 mm, BSP
*on request	2298 Radar Level Sensor, 0-10m, PTFE housing, 1", 56 mm, BSP
*on request	2298 Radar Level Sensor, 0-10m, PP housing, 1", 56 mm, NPT
*on request	2298 Radar Level Sensor, 0-10m, PVDF housing, 1", 56 mm, NPT
*on request	2298 Radar Level Sensor, 0-10m, PTFE housing, 1", 56 mm, NPT
*on request	2298 Radar Level Sensor, 0-10m, PTFE housing, 1½", 70 mm, BSP
*on request	2298 Radar Level Sensor, 0-10m, PTFE housing, 1½", 70 mm, NPT
*on request	2298 Radar Level Sensor, 0-20m, PTFE housing, 1½", 70 mm, BSP
*on request	2298 Radar Level Sensor, 0-20m, PTFE housing, 1½", 70 mm, NPT

## Accessories

Mfr. Part No	Code	Description
	159 300 208	HART - USB Modem
	159 300 182	HART - USB Modem, DIN Rail
3-8050	159 000 184	Universal Mount Kit
2-9900.396	159 001 701	Angle Adaptor

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