

# Radar level measurement PILOTREK



- Measuring range: 0.2 to 23 m
- Without contact with the fluid
- 4-20 mA loop power supply
- IP 67 compact housing
- Option: Display/ programming module

## APPLICATIONS

PILOTREK is an accurate level transmitter of liquids, slurries, emulsions and other chemicals in many fields of application such as: food, energy, pharmaceutical, chemical industries and even in shipbuilding.

PILOTREK provides a contact-free measurement for those substances which create vapors and is convenient as well as for vacuum applications.

## DESCRIPTION

The Pilotrek is a radar level transmitter without contact with the liquid, with protected electronic module integrated in the housing. Compact, this device powered by the 4-20 mA loop is distinguished by its reliability and accuracy.

Located above the liquid surface, it provides an analogue signal proportional to the level of the liquid. The measurement is not affected by changes of operating temperature and pressure.

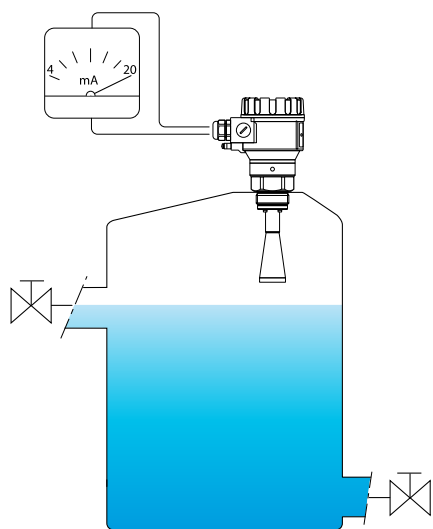
Easy settings through only 4 keys. For complete programming, the display module SAP 300 provides access to all parameters.

The radar operates at a frequency of 25 GHz (K band). Compared to radars operating at low frequency (5-12 GHz), the antenna size, the dead zone and the measurement angle are reduced.

### Relative dielectric constant ( $\epsilon_r$ ):

The essential condition to operate a radar level measurement is the relative dielectric constant ( $\epsilon_r$ ) of the medium which must be greater than 1.9 .

Petroleum	2.1	Ethyl alcohol	24
Diesel	2.1	Ethanol	25.1
Benzene	2.2	Methyl alcohol	33.1
Gasoline	2.3	Methanol	33.7
Bitumen	2.6	Glycol	37
Ethers	4.4	Nitrobenzene	40
Acetic acid	6.2	Glycerol	41.1
Ammonia	17...26	Water	80
Acetone	21	Sulphuric acid at 20 °C	84



Operating mode

**BAMO** INTERNATIONAL

22, Rue de la Voie des Bans · Z.I. de la gare · 95100 ARGENTEUIL

Tel +33 (0)1 30 25 83 20 Web [www.bamo.eu](http://www.bamo.eu)

Fax +33 (0)1 34 10 16 05 E-mail [export@bamo.fr](mailto:export@bamo.fr)

Radar level measurement  
**PILOTREK**

07-03-2020

D-596.01-EN-AC

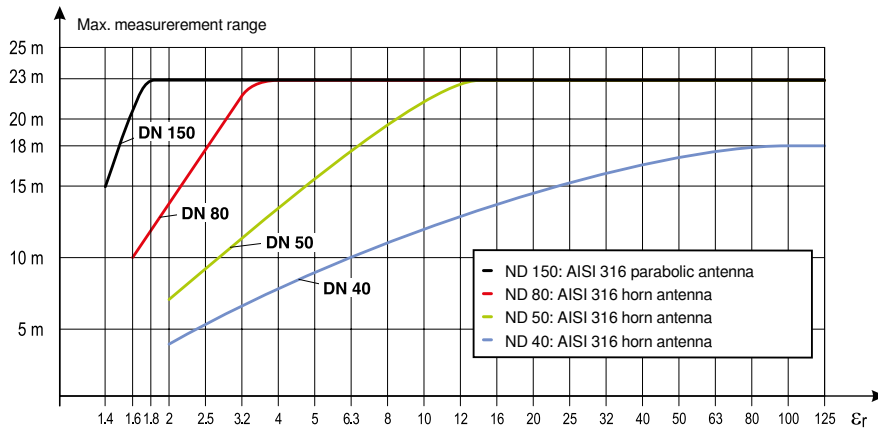
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### Maximum measurement distance:

The maximum measurement distance of PILOTREK radars depends on the environment and on the selected device (with or without plastic protection). According to the relative dielectric constant of the liquid and the operating conditions, the maximal measurement distance may decrease.

The measuring distance is illustrated in the diagram below. The diagram is valid for a horn type antenna without plastic enclosure, for liquids not foaming, neither vapouring.



The plastic protection (in PP) or the presence of foam and vapours lead to reduce the maximum measurement distance:

Operating conditions	Reduction in amplitude:	Maximum distance decreasing by:	Reducing coefficient:
Slow agitator	2 ... 6 dB	20 ... 50 %	0.8 ... 0.5
Foaming			
Fast agitator	8 ... 10 dB	60 ... 70 %	0.4 ... 0.3
Condensation	3 ... 10 dB	30 ... 70 %	0.7 ... 0.3
PP enclosure	2 dB	20 %	0.8

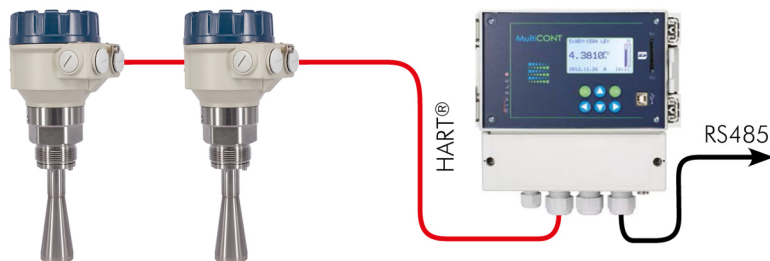
### Display unit SAP-300:

For easy settings, the SAP-300 display module provides access to all parameters of measurement and output signals. The LCD screen displays the measured values numerically as well as in a bar graph.

The function "Echo Map" helps to detect false reflections and to optimize the measurement settings.



### Display unit MULTICONT:



The MultiCONT manages digital data from several compatible transmitters (up to 15 transmitters).



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## TECHNICAL FEATURES

Measurement	Level, Distance; Volume
Signal frequency	About 25 GHz (K-band)
Measuring range	From 0.2 m to 23 m according antenna type → See "Maximum measurement distance"
Linearity error	< 0.5 m: ±25 mm 1 m to 1.5 m: ±10 mm 0.5 to 1 m: ±15 mm 1.5 to 8 m: ±3 mm > 8 m: ± 0.04 % of measured distance
Measuring angle	Maximum 19° (Antenna DN 40)
Resolution	1 mm
Temperature incidence	0.05 % F.S. / 10 °C
Power supply	20 V ... 36 V DC
Output signal	4-20 mA + HART®
Display module (option)	SAP-300, graphical display unit
Signal damping	From 0 to 99 s
Measuring frequency	10 ... 60 s (as per the application)
Head housing material	PBT
Antenna material	AISI 316 Ti (1.4571) (316Ti) or PP
Temperature limits	Liquid: -30 °C ... +100 °C; With PP protection: up to 80 °C max. Ambient: -20 ... 60 °C
Operating pressures	25 bar; With PP protection: 3 bar
Fitting	BSP
Protection	IP 67
Connections	2 x M20x1.5 (cable O.D.: 7 to 13 mm) 2x ½" NPT cable glands Wire section: 1.5 mm² max.
Electrical protection	Class III
Sealing	FPM, EPDM
Mass	Max. 1.6 kg

**EC Conformity:** The instrument meets the legal requirements of the current European Directives.

*OPTIONS: ATEX cert., flange fittings, hygienic or food fittings, other types of antennas on request.*

## CODE NUMBERS AND REFERENCES

Code	Reference	Antenna Ø	Material:	Measuring angle	Min. measuring distance
596 010	WEM 140 4	ND 40	AISI 316 Ti (1.4571)	19°	200 mm
596 011	WEM 150 4	ND 50	AISI 316 Ti (1.4571)	16°	200 mm
596 020	WEP 140 4	ND 40	PP protection	19°	300 mm
596 021	WEP 150 4	ND 50	PP protection	16°	300 mm

### Accessory

Code	Reference	Description
596 003	SAP 300 0	Digital and graphic display module

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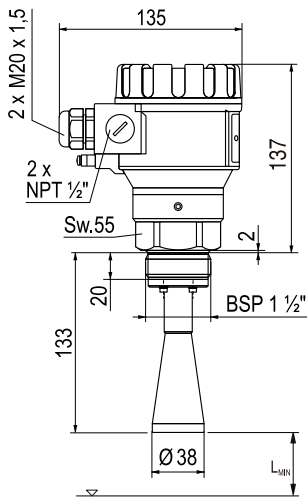
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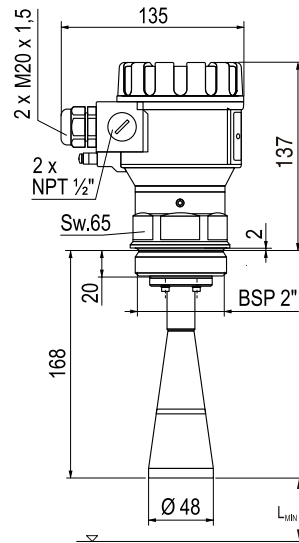
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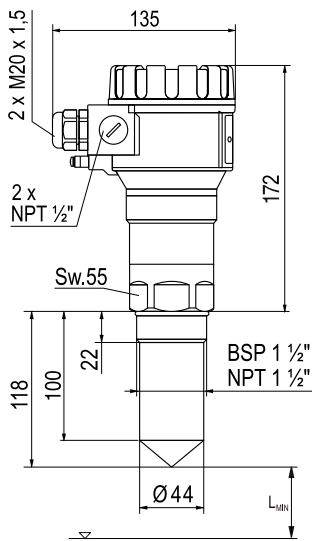
**DIMENSIONS [mm]**



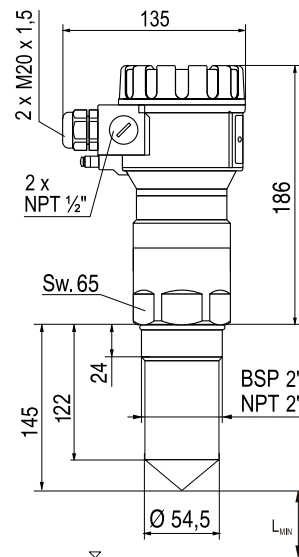
**WEM-140**



**WEM-150**



**WEP-140**



**WEP-150**