

## Overview

### Features

- Continuous level measurement of solids and liquids in standard applications in nearly all industries with 80 GHz FMCW radar
- Suitable for measurement of solids in silos, segmented containers, open containers, open heaps and crushers
- Suitable for measurement of liquids in storage tanks and for water treatment
- Measurement through the wall of a plastic tank is possible as well

#### Measurement range

Up to 30 m (98.4 ft)

#### Mechanic

- Housing and antenna made of PVDF for high chemical resistance
- No aiming of the antenna is required
- Simple mounting due to threaded process connection
- Accessories for further mounting options

#### Service

- Plug and play system, simple installation and commissioning
- Programming / communication wireless with standard mobile device

#### Approvals

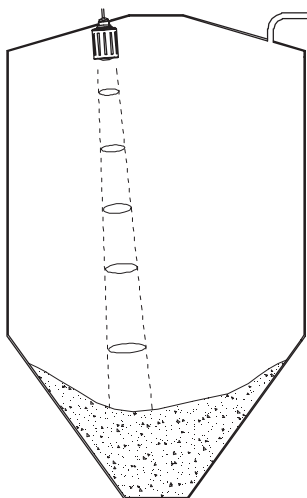
- Approval for use in Hazardous Locations (Dust and Gas)
- 2011/65/EU RoHS conform



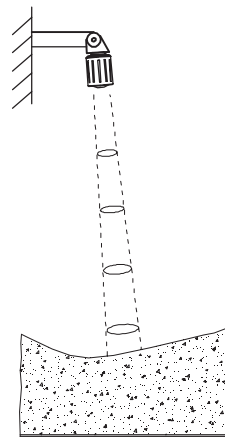
## Application

### Solids measurement

Closed bins



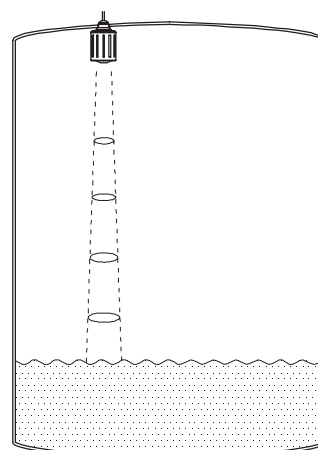
Open arrangements



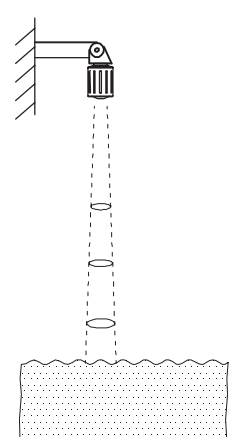
Aiming of the antenna to the center of the silo allows measurement down to the bottom

### Liquids measurement

Closed bins



Open arrangements



Vertical installation without aiming of the antenna

## Specification

### Specification

<b>Process</b>	Measurement range	Up to 30m (98.4 ft)
	Ambient temperature	-40 .. +80°C (-40 .. 176°F)
	Process temperature	-40 .. +80°C (-40 .. 176°F)
	Process overpressure	-1 .. +3,0 bar (-14.5 .. +43.5 psi)
<b>Process</b>	Frequency	80 GHz FMCW
	Beam angle	4°
	Accuracy of measurement	Solids: depending on application Liquids: ≤ 2 mm (0.08") at distance >0,25m (0.82ft)
	Response time	Max. 3 seconds (with sudden distance change)
	Dielectric constant of material measured	≥ 1,1 (under ideal conditions)
<b>Mechanics</b>	Ingress protection	Type 6P, IP66/68
	Antenna and process connection	Material: PVDF, FDA certification (for foodstuff and pharmaceutical)
	Connection cable	Fix mounted, colour black, with intrinsic safety:blue Material: PUR, sealing of cable inlet: Silicone
<b>Electronics</b>	Power supply	4-20 mA 2-wire loop according to NE43 12 .. 35 V DC
	Programming / communication	Wireless: effective range typ. 25m (82ft) HART, version 7.0 (not programmable via PACTware/DTM)
<b>Approvals</b>	General purpose	CE / cFMus / UKCA
	Protection by enclosure	Zone 20, 20/21: ATEX / IEC-Ex/ cFMus / UKEX / INMETRO / KCs Cl. II Div.1, Cl. III: cFMus
	Encapsulation	Zone 1, 1/2: ATEX / IEC-Ex/ cFMus / UKEX / INMETRO / KCs Cl. I Div.2: cFMus
	Non-incendive	Cl. I Div.2: cFMus
	Intrinsically safe	Zone 0, 0/1, 20, 20/21: ATEX / IEC-Ex/ cFMus / UKEX / INMETRO / KCs Cl. I Div.1, Cl. II Div.1, Cl. III: cFMus
	Radio approvals	According to country-specific standards for radar devices and wireless communication

### Wireless programming / communication

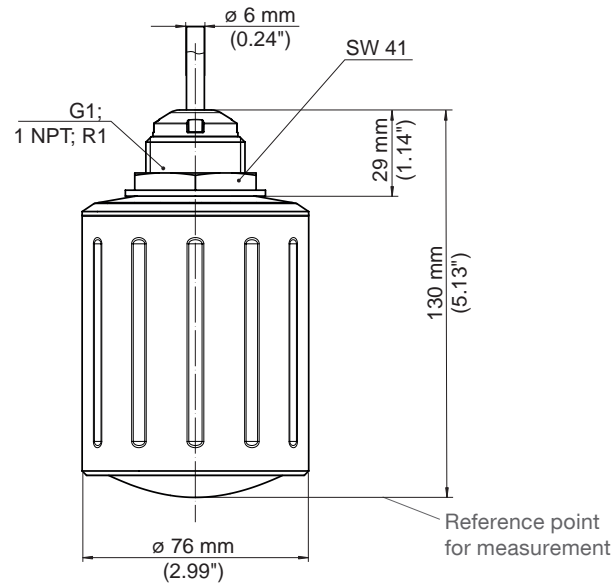
with standard mobile device via UWT LevelApp:

- Tablet or Smartphone (iOS- or Android-operating system)



## Dimensions

NR 4100



## Detailed Ex-markings

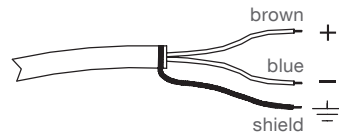
pos.2 **Certificate**

T	ATEX	II 2G, Ex ib mb IIC T4 Gb II 1D, 1/2D Ex ta, ta/tb IIIC T <sub>200</sub> 121°C Da, Da/Db II 2D Ex tb IIIC T <sub>200</sub> 134°C Db
	IEC-Ex	Ex ib mb IIC T4 Gb Ex ta, ta/tb IIIC T <sub>200</sub> 121°C Da, Da/Db Ex tb IIIC T <sub>200</sub> 134°C Db
	UKEX	II 2G, Ex ib mb IIC T4 Gb II 1D, 1/2D Ex ta, ta/tb IIIC T <sub>200</sub> 121°C Da, Da/Db II 2D Ex tb IIIC T <sub>200</sub> 134°C Db
S	ATEX	II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb II 1D, 1/2D Ex ia IIIC T134 °C Da, Da/Db
	IEC-Ex	Ex ia IIC T4 Ga, Ga/Gb Ex ia IIIC T134 °C Da, Da/Db
	UKEX	II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb II 1D, 1/2D Ex ia IIIC T134 °C Da, Da/Db
	cFMus	IS Class I, Div.1, Gp.A-D, IS Class II Div.1 Gp. EFG, Cl. III T4 Class I, Zn 0, 0/1 Ex ia IIC T4 Ga, Ga/Gb Zn 20, 20/21 Ex ia IIIC T134 °C Da, Da/Db
U	cFMus	CI I Div 2 Gp ABCD T4 Ta = -20°C...+80°C AEx ib mb IIC T4 Gb Ta = -20°C to +80°C DIP Class II, Div. 1, Gp EFG, T4, Class III AEx ta IIIC (T121°C or T142°C) Da Ta = -20°C to +67°C AEx tb IIIC (T134°C or T155°C) Db Ta = -20°C to +80°C
H	cFMus	NI Class I, Div 2, Gp. A-D T4 Ta = -20°C...+80°C DIP Class II, Div 1, Gp. EFG, Cl III T4 Ta = -20°C...+80°C
F	INMETRO	Ex ia IIC T4 Ga, Ga/Gb Ex ia IIIC T134 °C Da, Da/Db
E	INMETRO	Ex ib mb IIC T4 Gb Ex ta, ta/tb IIIC T <sub>200</sub> 121°C Da, Da/Db Ex tb IIIC T <sub>200</sub> 134°C Db
B	KCs	Ex ia IIC T4 Ga, Ga/Gb Ex ia IIIC T134 °C Da, Da/Db
D	KCs	Ex ib mb IIC T4 Gb Ex ta, ta/tb IIIC T <sub>200</sub> 121°C Da, Da/Db Ex tb IIIC T <sub>200</sub> 134°C Db

## Electrical installation

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### 4-20 mA



4-20 mA 2-wire loop  
12 .. 35 V DC  
Connecting cable 0,5 mm<sup>2</sup> (AWG 20)

With version "Intrinsically safe" (pos.2 S, X, F, B) connection is done to an approved intrinsically safe circuit (barrier):

$U_i=30\text{ V}$   $I_i=131\text{ mA}$   $P_i=983\text{mW}$

The effective internal capacitance  $C_i$  and inductance  $L_i$  depend on the length of the connection cable:

$L_i = 0,65\ \mu\text{H/m} \cdot \text{cable length in meter}$

$C_i = 180\ \text{pF/m} \cdot \text{cable length in meter}$

Extension of the cable:

Use of standard 2-wire cables. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, shielded cable should be used. Connect the cable screening to ground potential at one end on the supply side.