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Subject to change.

All dimensions in mm (inches).

All prices in Euro (€) or USD (\$),  
excluding VAT.

All EURO prices are EXW Betzigau,  
all USD prices are EXW Memphis,  
excluding packaging costs.

Valid: From 01.04.2020 until 31.03.2021, unless otherwise agreed.

By publishing this selection list all other lists become invalid.

We assume no liability for typing errors.

Different variations to those specified are possible.  
Please contact our technical consultants.

## Overview

### Features

Continuous level measurement of solids and liquids applications with 78 GHz FMCW radar

#### Measurement range

- Up to 100 m (329 ft)

#### Mechanic

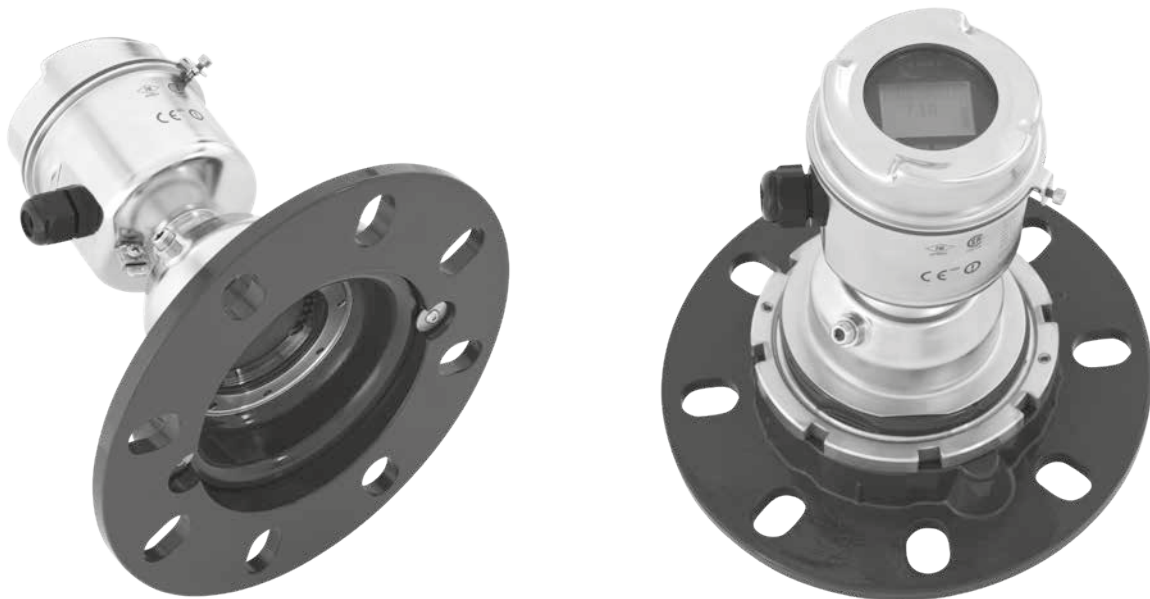
- Lens antenna and flange for quick and easy positioning
- Stainless steel housing
- Plane flanges and Easy aimer flanges

#### Service

- Plug and play system, simple installation and commissioning
- Configuration with only 6 parameters on display with push buttons
- Alternative configuration via HART possible.

#### Approvals

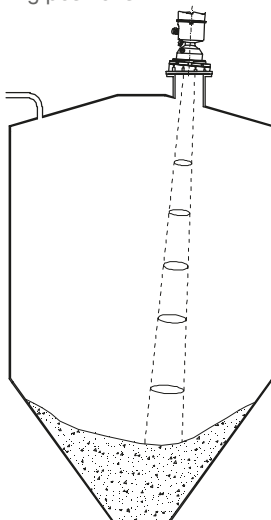
- Approval for use in Hazardous Locations
- 2011/65/EU RoHS conform



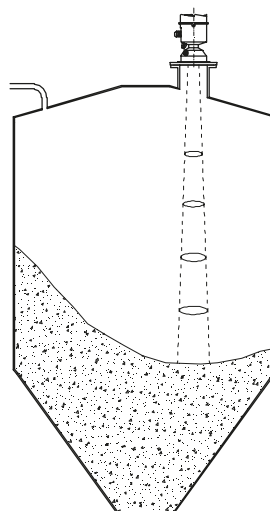
### Application

#### Solids measurement

Aiming is strongly suggested for solid measurement. It helps to optimize the echo signal (mainly for low material level in the cone) and helps to solve not perfect mounting positions.



For proper mounting positions vertical installation without aiming is possible.



## Specification

### Specification

<b>Process</b>	Measurement range	40 m (131 ft) or 100 m (328 ft)
	Min. detectable distance	400 mm (15.7") from sensor reference point
	Process temperature	-40 .. +100°C (-40 .. 121°F) or -40 .. +200°C (-40 .. 392°F)
	Process overpressure	-1 .. +0.5 bar (-14.5 .. +43 psi) or -1 .. +3.0 bar (-14.5 .. +43 psi)
<b>Performance</b>	Frequency	78 .. 79 GHz FMCW
	Beam angle	4°
	Accuracy of measurement	5 mm (0.2")
	Update time	Maximum 10 seconds (Response Rate (2.4.1.) set to FAST)
	Dielectric constant of material measured	For ranges up to 20 m (65.6 ft): min. DK = 1.6 For ranges up to 100 m (328 ft): min. DK = 2.5
<b>Mechanics</b>	Ingress protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP68
	Enclosure	316L/ 1.4404 Lid with window (window material polycarbonate)
	Lens antenna	Material: 40 m version: PEI 100 m version: PEEK
	Air Purge Connection	Female 1/8" NPT fitting Non return valve for 6 mm tube (optional)
<b>Electronics</b>	Power supply/ Communication	4-20 mA loop power Nominal 24V DC (16.5 .. 30 V DC) Protocol HART, Version 6.0
	Plug on display (inside housing)	Removeable graphic LCD, with bar graph representing level
<b>Approvals</b>	<b>CE</b>	
	<b>ATEX/ IEC-Ex</b>	
	Zone 20 and Zone 20/21	Dust ignition proof
	Zone 2	Non-sparking/ Energy Limited
	<b>FM/ CSA</b>	
	General purpose	
	Cl. II, III Div.1	Dust ignition proof
	Cl. I Div.2	Non-incendive
	<b>Radio</b>	
	R&TTE (Europe) FCC Conformity (US) Industry Canada	

NR 3100



Version with plane flange  
Fig. states plane flange 100 mm/ 4"



Version with Easy Aimer flange  
Fig. states Easy Aimer flange 100 mm/ 4"



Plug on Display  
With push buttons.

For programming of the unit.  
Once programmed, the Plug on Display can  
be removed if desired and used to copy  
parameters to multiple units.

Dimensions see page 7

## NR 3100

### Basic type

**NR 3100** .....

pos.2 **Certificate<sup>(1)</sup>** (detailed Ex-markings: see page 8)

	Dust	Gas	Protection method
0	CE	-	-
	FM/ CSA	-	General purpose
F	ATEX/ IEC-Ex	Zone 20 and 20/21	Dust Ignition Proof
	ATEX/ IEC-Ex	-	Zone 2
	FM/ CSA	Cl. II, III, Div.1	Non-sparking/ Energy Limited
	FM/ CSA	-	Dust Ignition Proof
	FM/ CSA	Cl. I Div.2	Non-incendive

pos.3 **Process temperature**

- 1 max. 100°C .....
- 2 max. 200°C<sup>(2)</sup> .....

pos.4 **Process pressure**

- 1 0.5 bar .....
- 2 3 bar .....

pos.5 **Electronic module**

- A 2-wire 4-20mA, HART .....

pos.6 **Process connection<sup>(3)</sup>**

- A Flange 80 mm/ 3" plane 1.4301 (304) max. 3 bar/ 200°C .....
- B Flange 80 mm/ 3" plane 1.4404 (316L) max. 3 bar/ 200°C .....
- C Flange 80 mm/ 3" Easy Aimer aluminium<sup>(4)</sup> max. 3 bar(≤ 120°C), max. 0.5 bar (>120 .. 200°C) .....
- D Flange 100 mm/ 4" plane 1.4301 (304) max. 3 bar/ 200°C .....
- E Flange 100 mm/ 4" plane 1.4404 (316L) max. 3 bar/ 200°C .....
- F Flange 100 mm/ 4" Easy Aimer aluminium<sup>(4)</sup> max. 3 bar(≤ 120°C), max. 0.5 bar (>120 .. 200°C) .....
- G Flange 150 mm/ 6" plane 1.4301 (304) max. 3 bar/ 200°C .....
- H Flange 150 mm/ 6" plane 1.4404 (316L) max. 3 bar/ 200°C .....
- I Flange 150 mm/ 6" Easy Aimer aluminium<sup>(4)</sup> max. 3 bar(≤ 120°C), max. 0.5 bar (>120 .. 200°C) .....

pos.7 **Measurement range**

- 1 max. 40 m .....
- 2 max. 100 m<sup>(2)</sup> .....

pos.8 **Cable entry**

- A M20 x 1.5 cable gland .....
- B NPT ½" conduit .....

pos.9 **Plug on Display**

- 1 Without display .....
- 2 With display .....

Basic type

<b>NR 3100</b>	<b>A</b>								
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← **Order code**

Position 1 2 3 4 5 6 7 8 9

All positions are available in special design (use code "Z").

(1) 0 and F including radio approvals R&TTE , FCC, Industry Canada  
 (2) Only available as combination 200°C and 100 m range  
 (3) Fitting to ANSI/DIN/JIS standards  
 (4) Painted

## Accessories

### Accessories

Minimum order value for separate orders of spare parts or accessories is 75 €.

zu400500	<b>Adapter M20 x 1.5 to NPT ½" conduit</b> .....	•
zu400510	<b>Sun shield cover</b> .....	•
	stainless steel 1.4301/ 304	
zu400520	<b>Non return valve</b> .....	•
	For purge inlet. Stainless steel. Connection of 6mm tube diameter. Opens at ca. 0.5 bar (7.25 psi).	
zu400530	<b>HART Modem</b> .....	•
	USB HART Interface to connect a PC with the NR 3000 for commissioning and servicing.	

### Protector plate for sensor lens

Protection of the lens against condensation, dust, buildup, crystallisation.  
 Mounting between unit flange and silo flange.  
 Material PTFE. Available up to 100°C, 0,5bar, 40m range. Not in combination with Non return valve.

zu400450	Fitting to flange 80 mm/ 3" .....	•
zu400451	Fitting to flange 100 mm/ 4" .....	•
zu400452	Fitting to flange 150 mm/ 6" .....	•

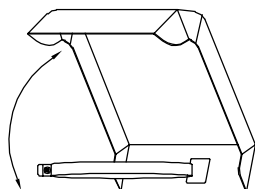
### Fixing material for mounting the unit on a flange

zu107010	8 bolts M16 x 60, 16 washers, 8 nuts. Stainless steel. Fitting for 80 mm/ 3" and 100 mm/ 4" flanges .....	•
zu107020	8 bolts M20 x 60, 16 washers, 8 nuts. Stainless steel. Fitting for 150 mm/ 6" flanges .....	•

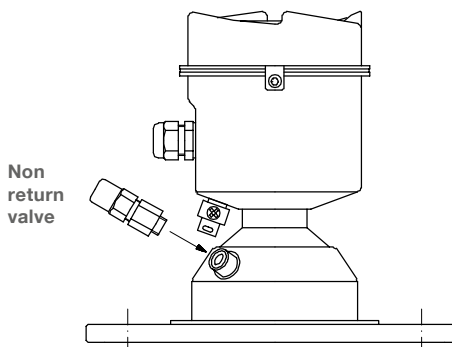
### Sealings for mounting the unit on a flange

Flange sealing fitting for plane flange or Easy Aimer flange, EN 1092-1 (PN16), ASME B16.5 (150 lb), JIS 2220 (10K)  
 Material AFM30, max. 250°C

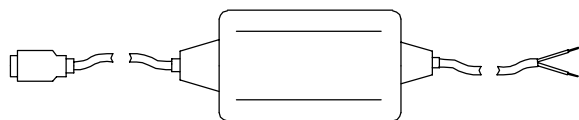
di300135	80 mm/ 3" .....	•
di300136	100 mm/ 4" .....	•
di300137	150 mm/ 6" .....	•



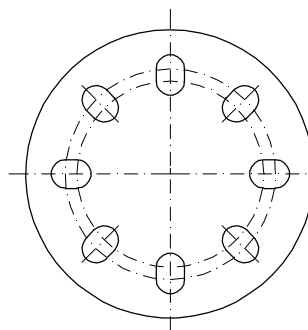
Sun protection cover



Non return valve



HART Modem

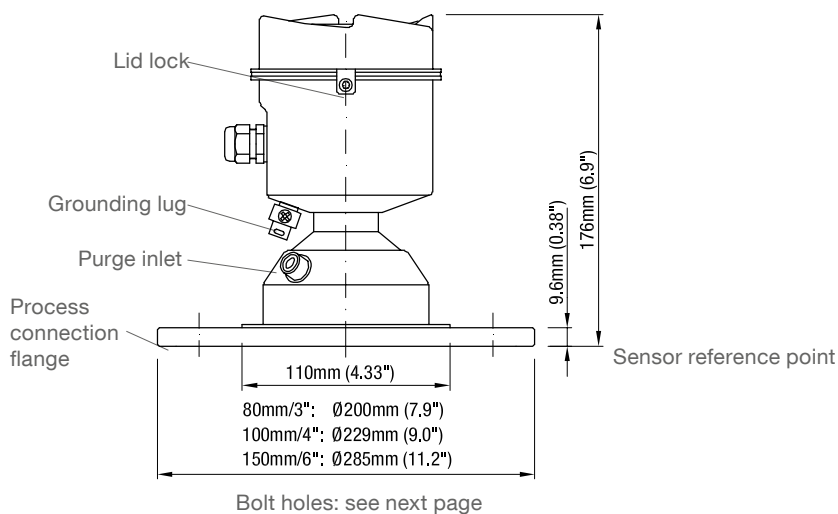


Thickness = 10mm,  
 Dimensions same as  
 flange (see page 7/8)

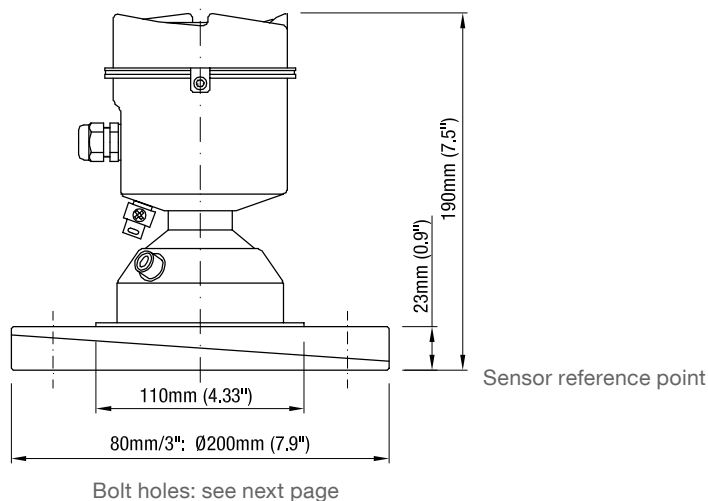
Protector plate for sensor lens

## Dimensions

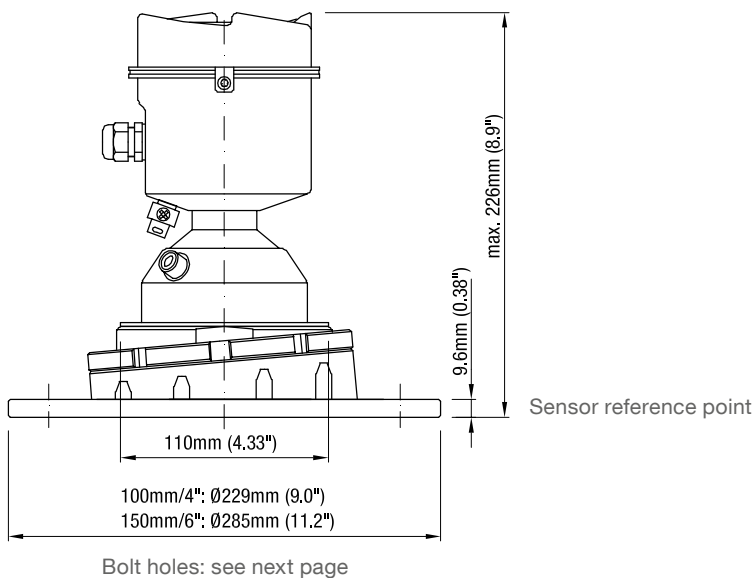
### Plane flange version



### Easy Aimer flange version 80 mm/ 3"

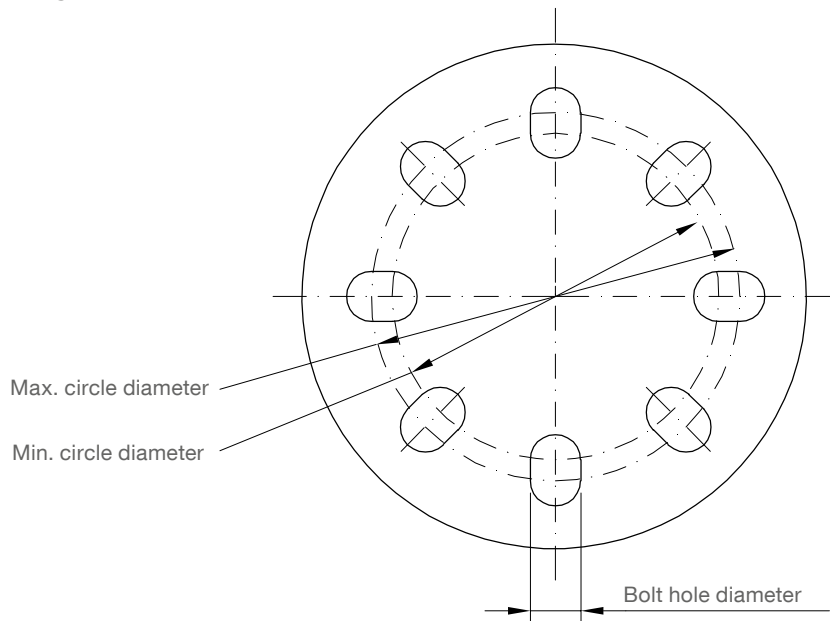


### Easy Aimer flange version 100 mm/ 4" 150 mm/ 6"



## Dimensions

### Flanges



Universal flange (plane flange and Easy aimer flange) mates with bolt hole pattern of:  
 EN 1092-1 (PN16)  
 ASME B16.5 (150 lb)  
 JIS 2220 (10K)

Pipe size	Max. circle diameter	Min. circle diameter	Bolt hole diameter	Number of bolt holes
80 mm/ 3"	160 mm (6.30")	150 mm (5.91")	19.3 mm (0.76")	8
100 mm/ 4"	191 mm (7.52")	175 mm (6.89")	19.3 mm (0.76")	8
150 mm/ 6"	242 mm (9.53")	240 mm (9.45")	23 mm (0.90")	8

## Detailed Ex-markings

pos.2 **Certificate**

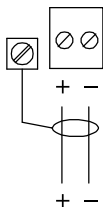
0	CE FM/ CSA	General purpose
F	ATEX IEC-Ex ATEX IEC-Ex FM/ CSA FM/ CSA	ATEX II 1D, 1/2D, 2D Ex ta IIIC Ex ta IIIC T139°C Da ATEX II 3G Ex nA II T4 Gc, Ex nL IIC T4 Gc Ex nA II T4 Gc, nL IIC T4 Gc DIP Class II, Div.1, Gr. E, F, G, Class III NI Class I, Div.2, Gr. A,B,C,D



## Electrical installation

### 4-20 mA

The terminals are located below the display. To connect the unit, remove the display by gently turning the display a quarter turn counter-clockwise until it is free.



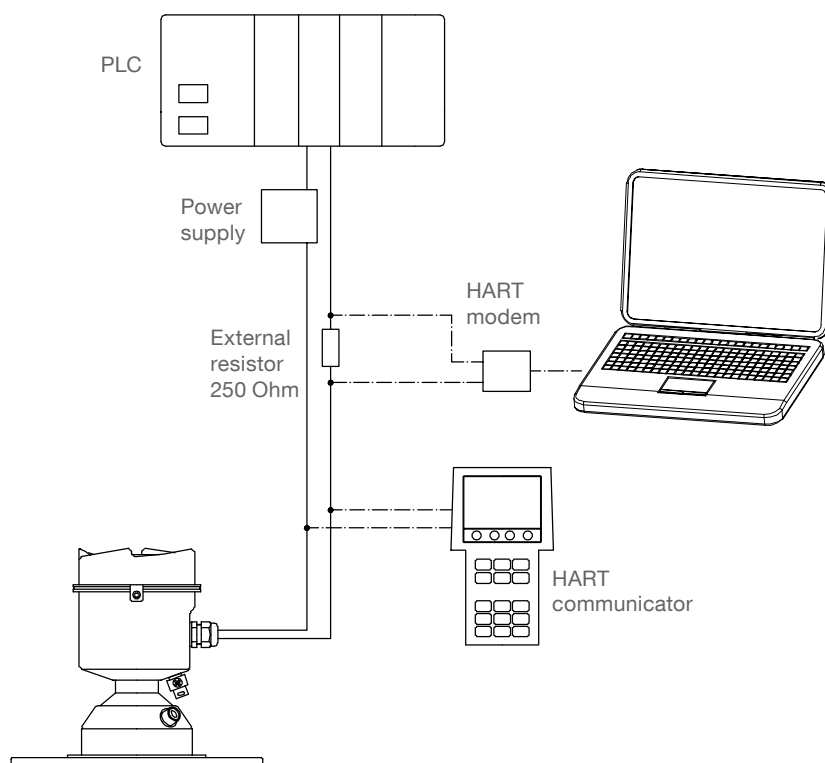
Use twisted pair cable: 0.34 mm<sup>2</sup> to 2.5 mm<sup>2</sup> (AWG 22 to 14)  
 Connect cable shield to ground terminal

24 V DC/ 4-20 mA loop

### 4-20 mA HART

Typical PLC/mA configuration with HART:

- Depending on the system design, the power supply may be separate from the PLC, or integral to it.
- HART resistance (total loop resistance, that is, cable resistance plus 250 Ohm (external resistor) must be less than 550 Ohm @24V supply for the device to function properly.
- The external resistor is not required, if the PLC has an integral 250 Ohm resistor.



## Spare parts

Minimum order value for separate orders of spare parts or accessories is 75 €.

Spare part Article number
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### Electronics

Plug on display	pl400500	•
Electronic module, measurement range max. 40 m	pl400501	•
Electronic module, measurement range max. 100 m	pl400502	•

### Sealings

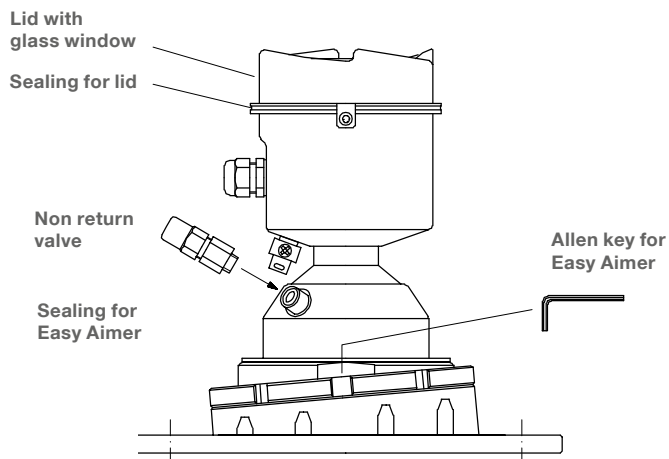
Sealing for lid	zu400505	•
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### Housing

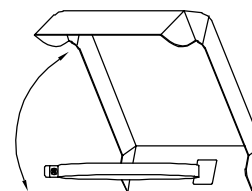
Lid with glas window	zu400509	•
Sun protection cover (stainless steel 1.4301/ 304)	zu400510	•

### Diverse

Non return valve	zu400520	•
Wrench for 100 mm/ 4" and 150 mm/ 6" Easy Aimer	zu400521	•
Allen key 3 mm for 100 mm/ 4" and 150 mm/ 6" Easy Aimer	zu400522	•



Sun protection cover



Plug on display

