

Table of contents

| | Page |
|-------------------------|-------|
| Overview | 2 |
| ----- | ----- |
| Specification | 3 |
| ----- | ----- |
| NR 3100 | 4 |
| ----- | ----- |
| Accessories | 6 |
| ----- | ----- |
| Dimensions | 7 |
| ----- | ----- |
| Electrical installation | 9 |
| ----- | ----- |
| Spare parts | 10 |

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 01.04.2021 until 31.03.2022, 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

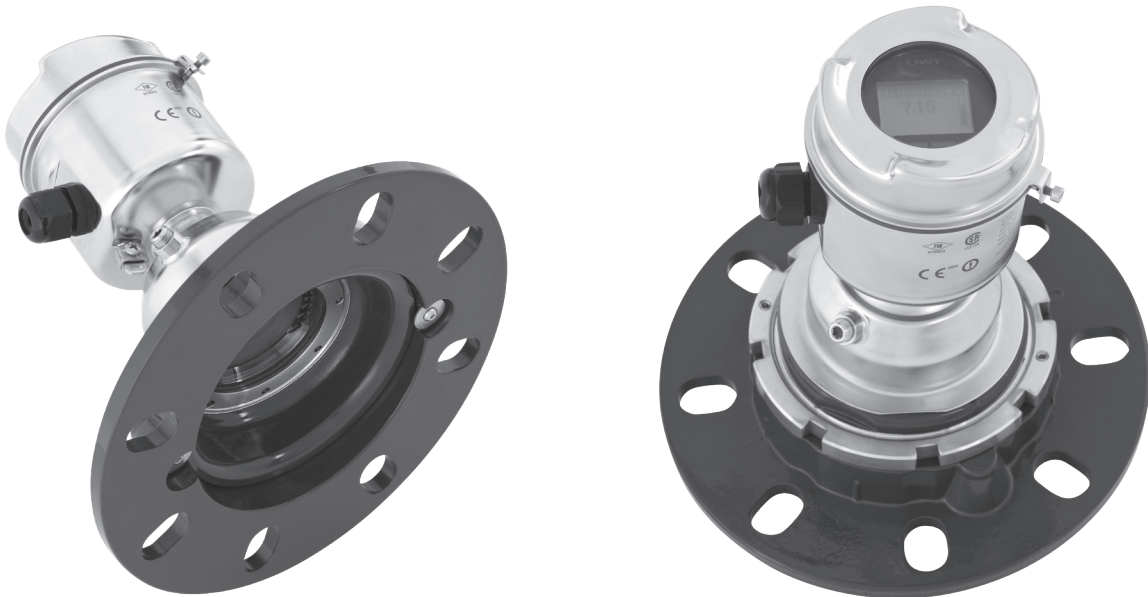
- Lens antenna and flange for quick and easy positioning
- Stainless steel housing
- Plane flanges and Easy aimer flanges

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

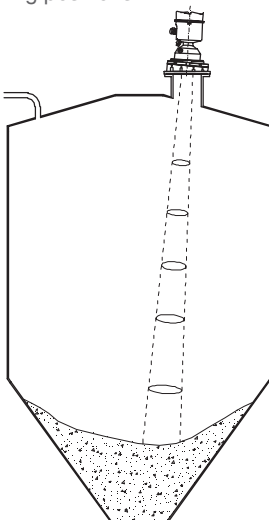
- Approval for use in Hazardous Locations (gas and dust)
- 2011/65/EU RoHS conform



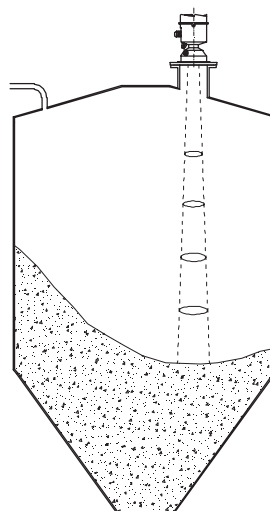
Application

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

| | | |
|--------------------|--|--|
| Process | 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) |
| Performance | 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 |
| Mechanics | 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) |
| Electronics | 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 |
| Approvals | CE | |
| | ATEX/ IEC-Ex | |
| | Zone 20 and Zone 20/21 | Dust ignition proof |
| | Zone 2 | Non-sparking/ Energy Limited |
| | FM/ CSA | |
| | General purpose | |
| | Cl. II, III Div.1 | Dust ignition proof |
| | Cl. I Div.2 | Non-incendive |
| | TR-CU | |
| | Ordinary Location | |
| | Zone 20 and Zone 20/21 | Dust ignition proof |
| | Zone 2 | Non-sparking |
| | Radio | |
| | 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⁽¹⁾** (detailed Ex-markings: see page 8)

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

pos.3 **Process temperature**

- 1 max. 100°C
- 2 max. 200°C⁽²⁾

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⁽³⁾**

- 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⁽⁴⁾ 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⁽⁴⁾ 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⁽⁴⁾ max. 3 bar(≤ 120°C), max. 0.5 bar (>120 .. 200°C)

pos.7 **Measurement range**

- 1 max. 40 m
- 2 max. 100 m⁽²⁾

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

| | | | | | | | | | |
|----------------|----------|--|--|--|--|--|--|--|--|
| NR 3100 | A | | | | | | | | |
|----------------|----------|--|--|--|--|--|--|--|--|

← **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 | Adapter M20 x 1.5 to NPT ½" conduit | • |
| zu400510 | Sun shield cover | • |
| | stainless steel 1.4301/ 304 | |
| zu400520 | Non return valve | • |
| | For purge inlet. Stainless steel. Connection of 6mm tube diameter. Opens at ca. 0.5 bar (7.25 psi). | |
| zu400530 | HART Modem | • |
| | 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" | • |

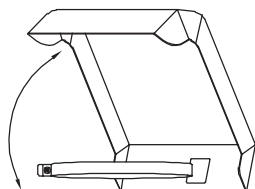
Fixing material for mounting the unit on a flange

| | | |
|-----------------|---|---|
| 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 | • |

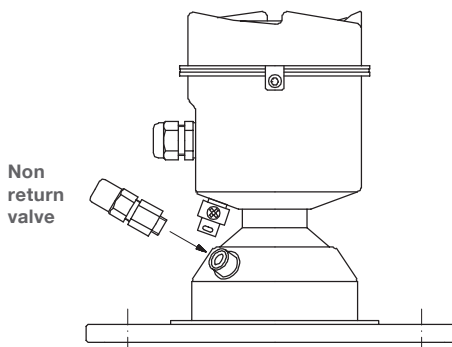
Sealings for mounting the unit on a flange

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

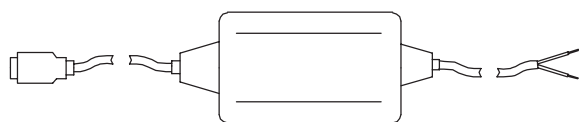
| | | |
|-----------------|------------------|---|
| di300135 | 80 mm/ 3" | • |
| di300136 | 100 mm/ 4" | • |
| di300137 | 150 mm/ 6" | • |



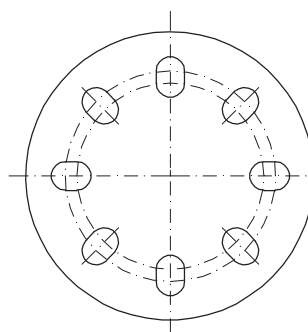
Sun protection cover



Non return valve



HART Modem

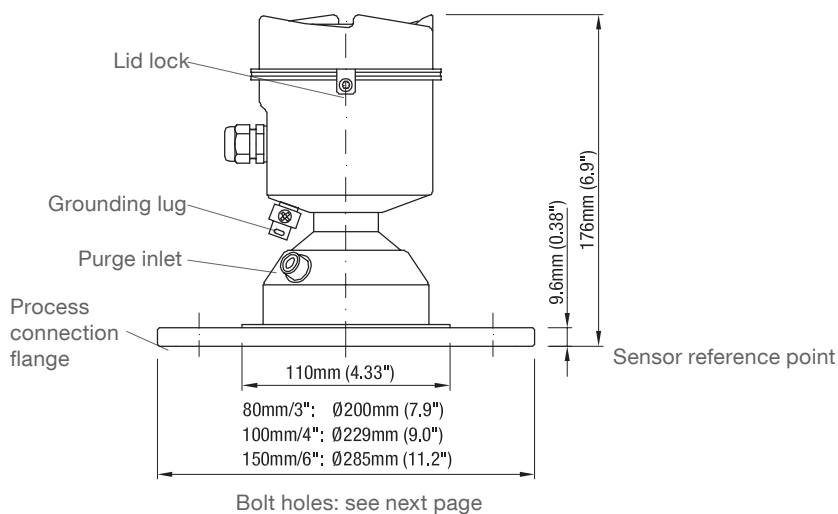


Thickness = 10mm,
 Dimensions same as
 flange (see page 7/8)

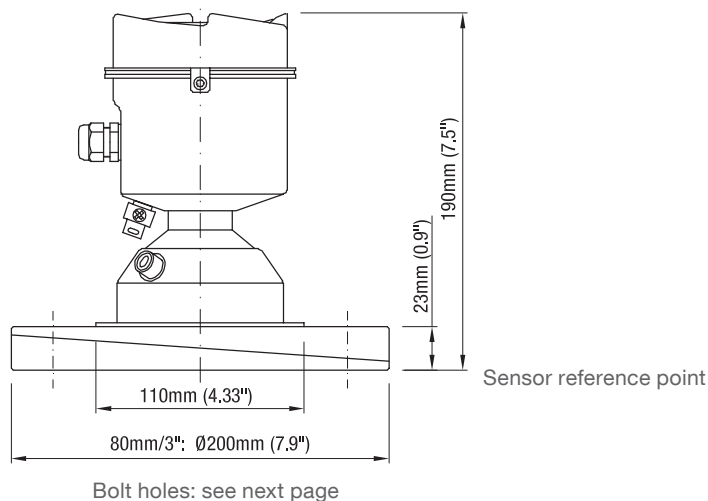
Protector plate for sensor lens

Dimensions

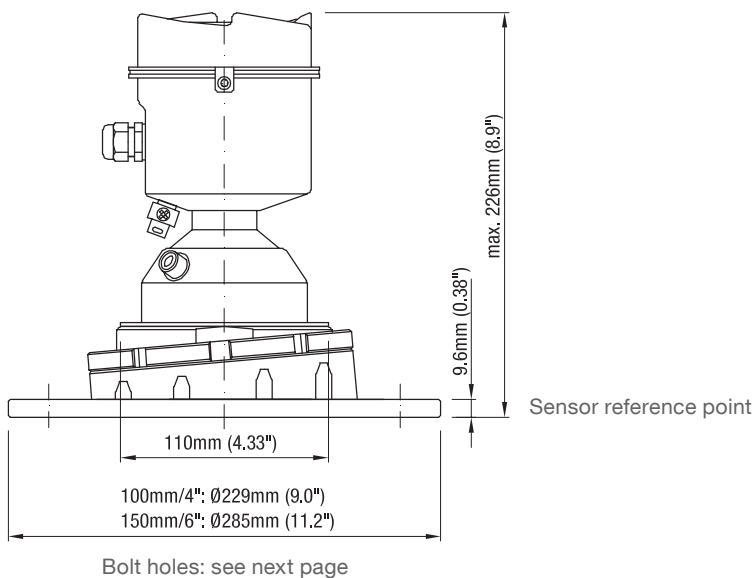
Plane flange version



Easy Aimer flange version 80 mm/ 3"

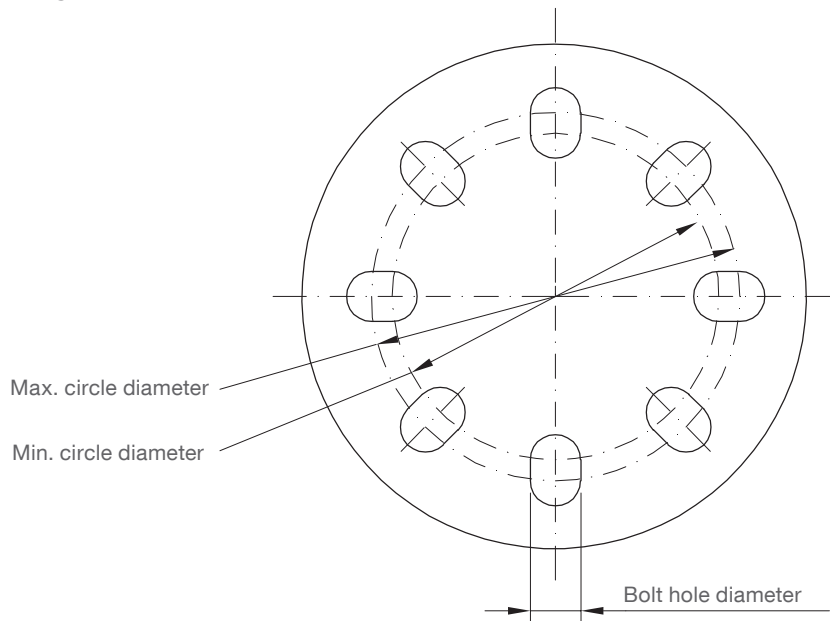


Easy Aimer flange version 100 mm/ 4" 150 mm/ 6"



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

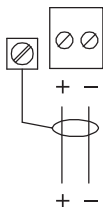
pos.2 **Certificate**

| | | |
|---|--|---|
| 0 | CE/ TR-CU FM/ CSA | General purpose |
| F | ATEX IEC-Ex ATEX IEC-Ex FM/ CSA FM/ CSA TR-CU TR-CU | ATEX II 1D, 1/2D, 2D Ex ta IIIC T139°C Da IP68 Ex ta IIIC T139°C Da IP68 ATEX II 3G Ex nA II T4 Gc, Ex nL IIC T4 Gc Ex nA II T4 Gc, Ex 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 2Ex nA IIC T4 Gc X Ex ta IIIC T139°C Da X |

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.



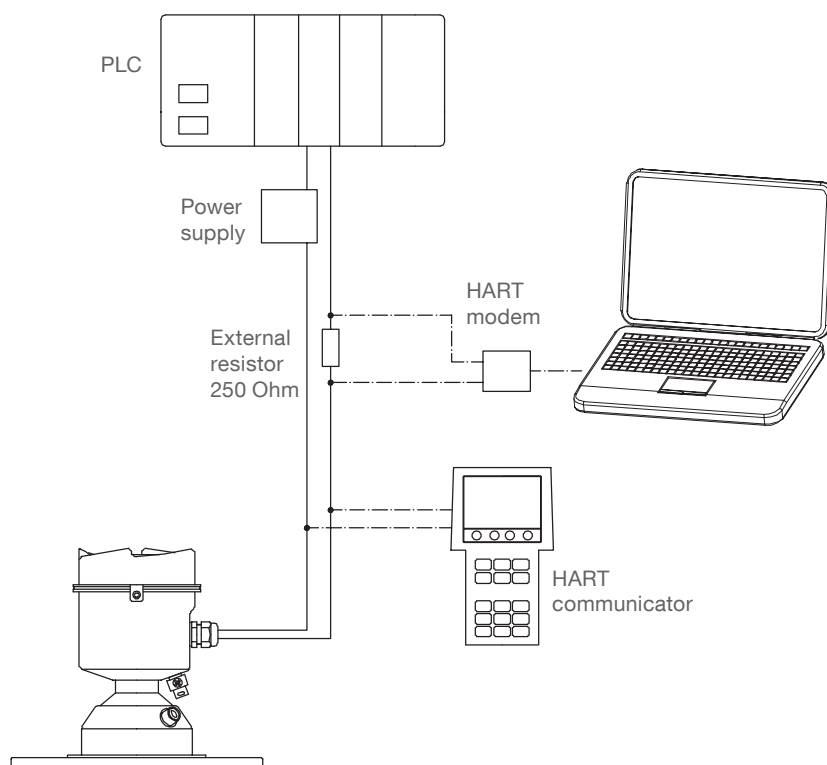
Use twisted pair cable: 0.34 mm² to 2.5 mm² (AWG 22 to 14)
 Connect cable shield to ground terminal

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 |
|------------------------------|

Electronics

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

Sealings

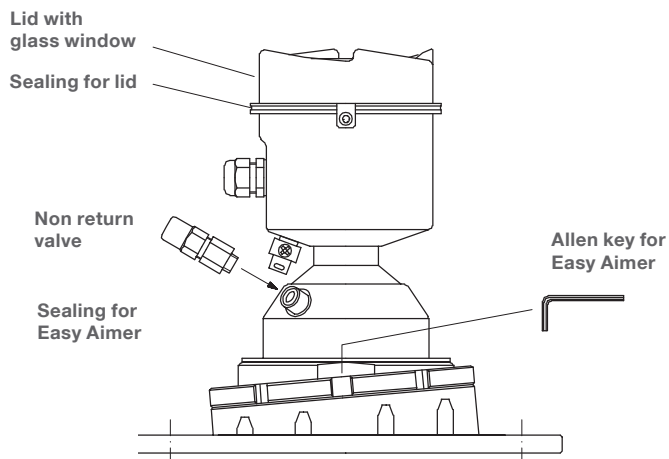
| | | |
|-----------------|----------|---|
| Sealing for lid | zu400505 | • |
|-----------------|----------|---|

Housing

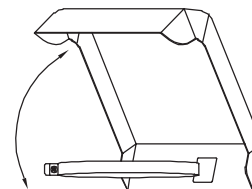
| | | |
|--|----------|---|
| Lid with glas window | zu400509 | • |
| Sun protection cover (stainless steel 1.4301/ 304) | zu400510 | • |

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

