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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 01.10.2022 until 31.12.2022, 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 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

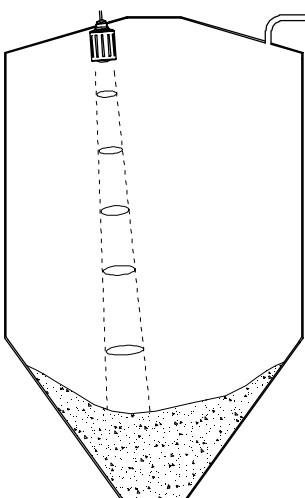
- Approval for use in Hazardous Locations (Dust and Gas)
- 2011/65/EU RoHS conform



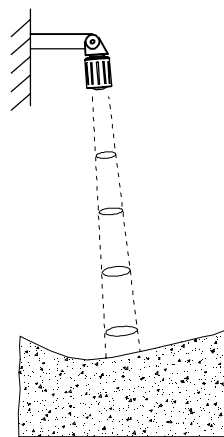
Application

Solids measurement

Closed bins

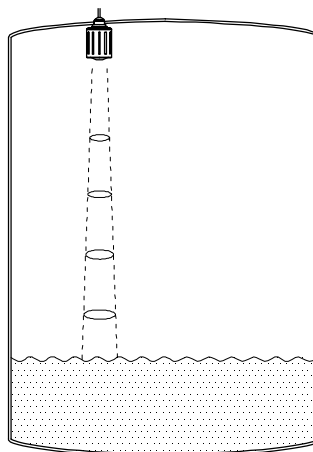


Open arrangements

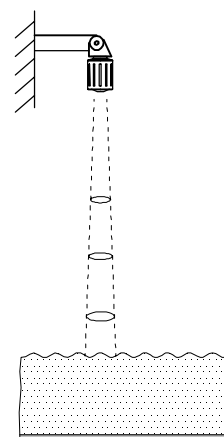


Liquids measurement

Closed bins



Open arrangements



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

Vertical installation without aiming of the antenna

Specification

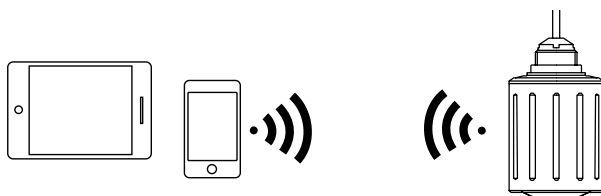
Specification

Process	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)
Process	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)
Mechanics	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
Electronics	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)
Approvals	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)



NR 4100

Basic type

NR 4100

pos.2

Certificate (detailed Ex-markings: see page 8)

	Gas	Dust	Protection method
0	CE / UKCA / cFMus	-	General purpose
T	ATEX / IEC-Ex / UKEX	Zone 1	Zone 20, 20/21 Gas: Encapsulation Dust: Protection by enclosure
S	ATEX / IEC-Ex / UKEX / cFMus cFMus	Zone 0, 0/1 Cl. I Div.1	Zone 20, 20/21 Cl. II Div.1, Cl. III Intrinsically safe
U	cFMus	Cl. I Div.2 Zone 1	Cl. II Div.1, Cl. III Zone 20, 20/21 Gas: Encapsulation Dust: Protection by enclosure
H	cFMus	Cl. I Div.2	Cl. II Div.1, Cl. III Gas: Non-incendive Dust: Protection by enclosure
F	INMETRO	Zone 0, 0/1	Zone 20, 20/21 Intrinsically safe
E	INMETRO	Zone 1	Zone 20, 20/21 Gas: Encapsulation Dust: Protection by enclosure
B	KCs	Zone 0, 0/1	Zone 20, 20/21 Intrinsically safe
D	KCs	Zone 1	Zone 20, 20/21 Gas: Encapsulation Dust: Protection by enclosure

pos.3

Process temperature

2 max. 80°C (176°F)

pos.4

Process pressure

1 3 bar

pos.5

Electronic module

H 2-wire 4-20 mA, HART⁽¹⁾

pos.6

Process connection

D Thread G 1" DIN ISO 228-1
 E Thread NPT 1" ANSI B 1.20.1
 F Thread R 1" EN 10226

pos.7

Measurement range

3 max. 30 m (98.4ft)

pos.8

Length of connection cable

E 5 m (16.4ft)
 F 10m (32.8ft)
 G 25m (82ft)
 Z Custom specified, Base price
 Price per meter (3.28ft), starting from 0, increment in meter, min. 1m (3.28ft), max. 300m (984ft)

pos.9

Programming

0 Programmable with mobile device and UWT LevelApp

Basic type

NR	4100	A		2	1	H		3		0
Position	1	2	3	4	5	6	7	8	9	

← Order code

⁽¹⁾ HART not programmable via PACTware/DTM

Options / Dimensions

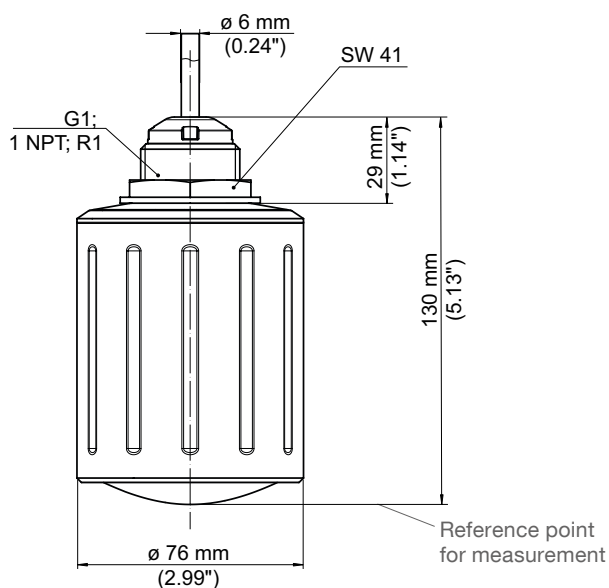
Options

pos.11 x	Guarantee extension to 5 years	•
	Overfill certificate	
pos.12 a	WHG	•
	Foodstuff-/Pharmaceutical certificate ⁽¹⁾	
pos.13 a	FDA, EG1935/2004	•
	Inspection certificate ⁽¹⁾	
pos.14 a	Inspection certificate, EN 10204 clause 3.1, incl. test data	•
pos.14 b	Inspection certificate, EN 10204 clause 3.1, incl. test data, quality- and testplan	•
	Additional cleaning procedure ⁽¹⁾	
pos.15 a	Oil-, grease and silicone oil-free, incl. inspection certificate, EN 10204 clause 3.1	•
	Measuring point identification	
pos.17 a	Measuring point identification, max. 19 characters	•

⁽¹⁾ The documents are enclosed with the delivered goods

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 ₂₀₀ 121°C Da, Da/Db II 2D Ex tb IIIC T ₂₀₀ 134°C Db
	IEC-Ex	Ex ib mb IIC T4 Gb Ex ta, ta/tb IIIC T ₂₀₀ 121°C Da, Da/Db Ex tb IIIC T ₂₀₀ 134°C Db
	UKEX	II 2G, Ex ib mb IIC T4 Gb II 1D, 1/2D Ex ta, ta/tb IIIC T ₂₀₀ 121°C Da, Da/Db II 2D Ex tb IIIC T ₂₀₀ 134°C Db
S	ATEX	II 1G, 1/2G Ex ia IIC T4 ... T1 Ga, Ga/Gb II 1D, 1/2D Ex ia IIIC T134 °C Da, Da/Db
	IEC-Ex	Ex ia IIC T4 ... T1 Ga, Ga/Gb Ex ia IIIC T134 °C Da, Da/Db
	UKEX	II 1G, 1/2G Ex ia IIC T4 ... T1 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 ₂₀₀ 121°C Da, Da/Db Ex tb IIIC T ₂₀₀ 134°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 ₂₀₀ 121°C Da, Da/Db Ex tb IIIC T ₂₀₀ 134°C Db

Accessories

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

Material for mounting

Mounting bracket ⁽¹⁾

Material 1.4404 (316L). Required counter nut G 1" made of plastics PP is included in sensor NR 4100

Incl.: 4 screws ø6 x 40 mm, washers, dowel ø8 x 40 mm

Suitable for installation with Ex-applications ⁽³⁾

zu400454	Mounting bracket, vertically rotatable	L=80mm (3.2")	•
zu400455	Mounting bracket, vertically rotatable	L=200mm (7.9")	•

Mounting plate rectangular ⁽¹⁾

Process pressure max. 0,1 bar (1.45 psi). Details to fitting counter flanges see page 11

Required counter nut G 1" made of plastics PP is included in sensor NR 4100

Incl. flat sealing between mounting plate and G 1" process connection

Not intended for installation with Ex-applications

Mounting plate rectangular:		Material:	Fitting screws for counter flange (not included):	
zu400461	Fitting to DN80 / 3"	1.4404 (316L)	M16x60 (4 pieces)	•
zu400462	Fitting to DN100 / 4"	1.4404 (316L)	M16x60 (4 pieces)	•
zu400463	Fitting to DN150 / 6"	1.4404 (316L)	M20x80 (4 pieces)	•

Mounting flange rectangular ^{(1) (2)}

Temperature range -40 ... 80 °C (-40 ... 176 °F), process pressure max. 0,1 bar (1.45 psi)

Details to fitting counter flanges see page 11

Incl. flat sealing between mounting plate and G 1" process connection

Not intended for installation with Ex-applications

Mounting flange rectangular:		Material:	Fitting screws for counter flange (not included):	
zu400465	Fitting to DN80 / 3"	PP	M16x60 (4 pieces)	•
zu400466	Fitting to DN100 / 4"	PP	M16x60 (4 pieces)	•
zu400467	Fitting to DN150 / 6"	PP	M20x80 (4 pieces)	•

Aiming flange ⁽¹⁾

For aiming of the antenna in solids

Temperature range -xx ... xx °C (-xx ... xxx °F), process pressure max. 0,1 bar (1.45 psi)

Not intended for installation with Ex-applications

zu4004??				•
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Standard flange ^{(1) (2)}

DN flanges: type A (flat faced) , ASME flanges: raised face

Suitable for installation with Ex-applications ⁽³⁾

Flange:		Material:	Fitting screws for counter flange (not included):	
zu400480	DN80 PN6, EN 1092-1	1.4541 (321)	M16x60 (4 pieces)	•
zu400481	DN80 PN6, EN 1092-1	1.4404 (316L)	M16x60 (4 pieces)	•
zu400482	DN80 PN16, EN 1092-1	1.4541 (321)	M16x60 (8 pieces)	•
zu400483	DN80 PN16, EN 1092-1	1.4404 (316L)	M16x60 (8 pieces)	•
zu400484	DN100 PN6, EN 1092-1	1.4541 (321)	M16x60 (4 pieces)	•
zu400485	DN100 PN6, EN 1092-1	1.4404 (316L)	M16x60 (4 pieces)	•
zu400486	DN100 PN16, EN 1092-1	1.4541 (321)	M16x60 (8 pieces)	•
zu400487	DN100 PN16, EN 1092-1	1.4404 (316L)	M16x60 (8 pieces)	•
zu400488	DN150 PN6, EN 1092-1	1.4541 (321)	M16x60 (8 pieces)	•
zu400489	DN150 PN6, EN 1092-1	1.4404 (316L)	M16x60 (8 pieces)	•
zu400490	DN150 PN16, EN 1092-1	1.4541 (321)	M20x80 (8 pieces)	•
zu400491	DN150 PN16, EN 1092-1	1.4404 (316L)	M20x80 (8 pieces)	•
zu400494	3" 150lbs ASME B16.5	1.4541 (321)	M16x100 (4 pieces)	•
zu400495	3" 150lbs ASME B16.5	1.4404 (316L)	M16x100 (4 pieces)	•
zu400496	4" 150lbs ASME B16.5	1.4541 (321)	M16x100 (8 pieces)	•
zu400497	4" 150lbs ASME B16.5	1.4404 (316L)	M16x100 (8 pieces)	•
zu400498	6" 150lbs ASME B16.5	1.4541 (321)	M20x80 (8 pieces)	•
zu400499	6" 150lbs ASME B16.5	1.4404 (316L)	M20x80 (8 pieces)	•

Accessories

Screws for flange fixing

Suitable for installation with Ex-applications ⁽³⁾

		Screws:	Nuts:	Washers:	Material:	
zu107002	M12 x 60	4 pieces	4 pieces	8 pieces	Stainless steel	•
zu107000	M16 x 60	4 pieces	4 pieces	8 pieces	Stainless steel	•
zu107010	M16 x 60	8 pieces	8 pieces	16 pieces	Stainless steel	•
zu107011	M16 x 100	4 pieces	4 pieces	8 pieces	Stainless steel	•
zu107012	M16 x 100	8 pieces	8 pieces	16 pieces	Stainless steel	•
zu107020	M20 x 60	8 pieces	8 pieces	16 pieces	Stainless steel	•
zu107018	M20 x 80	4 pieces	4 pieces	8 pieces	Stainless steel	•
zu107019	M20 x 80	8 pieces	8 pieces	16 pieces	Stainless steel	•

Flange sealings

Fitting to mounting plates, mounting flanges, standard flanges EN 1092-1 (PN6, PN16), ASME B16.5 (150 lbs)

Temperature range -40 ... 200 °C (-40 ... 392 °F)

Not intended for installation with Ex-applications

	Flange sealing:	Material:	
di300145	DN80 / 3"	AFM30	•
di300123	DN80 / 3"	Silicone	•
di300146	DN100 / 4"	AFM30	•
di300124	DN100 / 4"	Silicone	•
di300147	DN150 / 6"	AFM30	•
di300126	DN150 / 6"	Silicone	•

⁽¹⁾ Fitting to process connection NR 4100 with thread G 1" DIN ISO 228-1 (Pos.6 D).

⁽²⁾ Flanges are delivered with thread G 1". They are threaded on the G 1" process connection of NR 4100. Sealing between flange and G 1" process connection is done by a flat sealing (included).

⁽³⁾ Mounting with Ex applications: The components must be professionally mounted and installed in accordance with the manufacturer specification and the applicable national regulations, e.g. planning and installation in accordance with IEC/EN 60079-14.

Complementary products (from outside companies)

Terminal box / Conduct connector for extension of NR 4100 connection cable

Including 2 cable glands and connecting terminals

Possible manufacturer	Product	Series	Type	Protection method	For mounting in Ex area
Steute	Terminal box	Ex AD	Ex AD 85 e MK4 3xM20	Ex t	Zone 21
			Ex AD 85 i MK4 3xM20	Ex i	Zone 1
Stahl	Terminal box	8102	8102/21-32	Ex t	Zone 21
			8102/22-32	Ex i	Zone 1
Bartec	Terminal box	07-53	07-5311-9014	Ex t	Zone 21
			07-5312-9014	Ex i	Zone 1
Phoenix Contact	Conduct connector	Quickon	1414696	IP66/68	-

Isolated barrier

Connection to NR 4100 with protection method Intrinsically Safe.

Supply 18-30V DC, interface 4-20mA/4-20mA, galvanic isolation

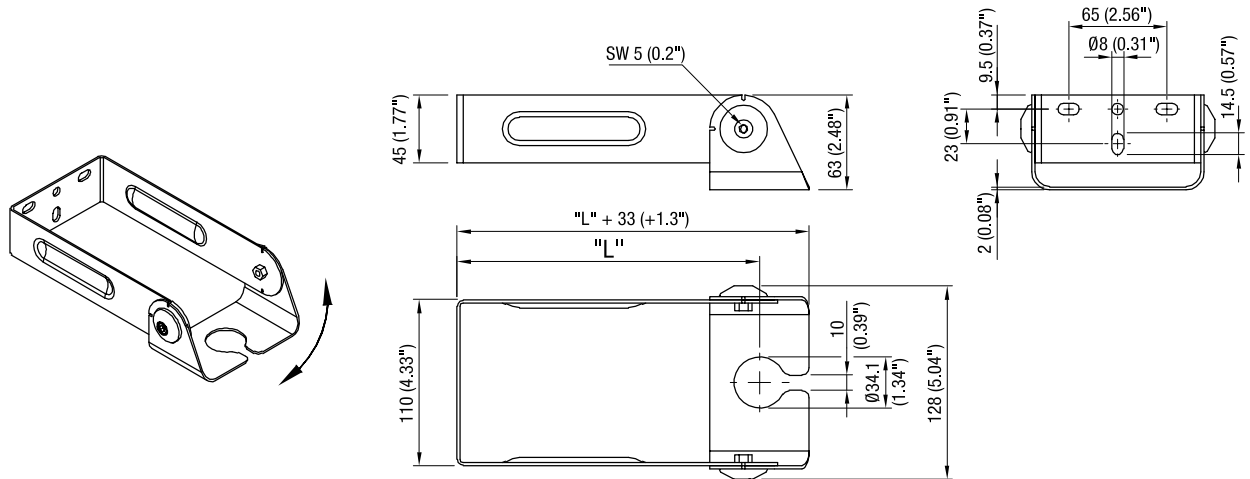
Possible manufacturer	Product / series	Type	Amount of channels	Protection method	Ex ratings for connection NR 4100 (field side)
Pepperl+Fuchs	Isolated barrier, K-System, Transmitter Power Supply	KCD2-STC-Ex1	1	[Ex ia Ga] [Ex ia Da]	U ₀ =25,2 V I ₀ =100 mA P ₀ =630mW
		KFD2-STC5-Ex2	2	[Ex ia Ga] [Ex ia Da]	U ₀ =26,2 V I ₀ =115 mA P ₀ =784mW

Accessories - dimensions

Mounting bracket

Mounting bracket, vertically rotatable

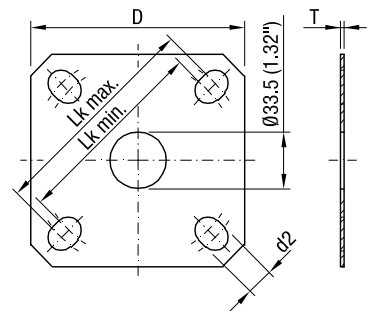
Article number: zu400454, zu400455



Mounting plate

Mounting plate rectangular, 1.4404 (316L), 2 .. 3mm (0.08 .. 0.12")

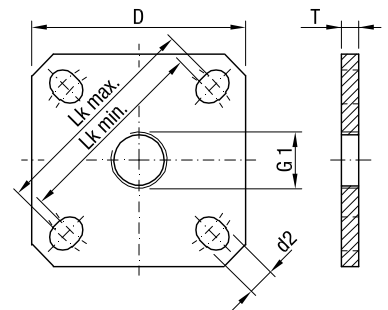
Article-number	d2 mm (Inch)	Lk min. mm (Inch)	Lk max. mm (Inch)	D mm (Inch)	T (thickness) mm (Inch)	Fitting to counter flanges
zu400461	19,1 (0.75)	150,0 (5.90)	160,0 (6.3)	150,0 (5.90)	2 (0.08)	DN80 PN6 EN 1092-1 DN80 PN16 EN 1092-1 3" ASME B16.5 150 lb
zu400462	19,1 (0.75)	170,0 (6.69)	190,5 (7.5)	170,0 (6.69)	2 (0.08)	DN100 PN6 EN 1092-1 DN100 PN16 EN 1092-1 4" ASME B16.5 150 lb
zu400463	21,0 (0.82)	225,0 (8.86)	241,3 (9.5)	215,0 (8.46)	3 (0.12)	DN150 PN6 EN 1092-1 DN150 PN16 EN 1092-1 6" ASME B16.5 150 lb



Mounting flange

Mounting flange rectangular, PP, 10 .. 18mm (0.39 .. 0.71")

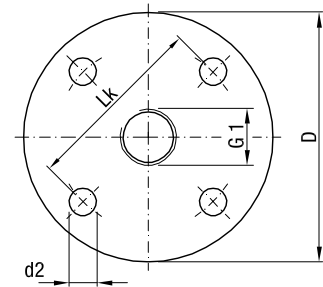
Article-number	d2 mm (Inch)	Lk min. mm (Inch)	Lk max. mm (Inch)	D mm (Inch)	T (thickness) mm (Inch)	Fitting to counter flanges
zu400465	19,1 (0.75)	150,0 (5.90)	160,0 (6.3)	150,0 (5.90)	10...12 (0.39...0.47)	DN80 PN6 EN 1092-1 DN80 PN16 EN 1092-1 3" ASME B16.5 150 lb
zu400466	19,1 (0.75)	170,0 (6.69)	190,5 (7.5)	170,0 (6.69)	10...12 (0.39...0.47)	DN100 PN6 EN 1092-1 DN100 PN16 EN 1092-1 4" ASME B16.5 150 lb
zu400467	21,0 (0.82)	225,0 (8.86)	241,3 (9.5)	215,0 (8.46)	15...18 (0.59...0.71)	DN150 PN6 EN 1092-1 DN150 PN16 EN 1092-1 6" ASME B16.5 150 lb



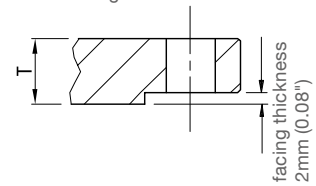
Accessories - dimensions

Standard flange

Article-number	Type	Number of holes	d2 mm (Inch)	Lk mm (Inch)	D mm (Inch)	T (thickness) mm (Inch)
zu400480/ -481	DN80 PN6	4	18,0 (0.71)	150,0 (5.91)	190,0 (7.48)	16,0 (0.63)
zu400482/ -483	DN80 PN16	8	18,0 (0.71)	160,0 (6.3)	200,0 (7.87)	20,0 (0.79)
zu400484/ -485	DN100 PN6	4	18,0 (0.71)	170,0 (6.69)	210,0 (8.27)	16,0 (0.63)
zu400486/ -487	DN100 PN16	8	18,0 (0.71)	180,0 (7.09)	220,0 (8.66)	20,0 (0.79)
zu400488/ -489	DN150 PN6	8	18,0 (0.71)	225 (8.85)	265 (10.43)	18,0 (0.71)
zu400490/ -491	DN150 PN16	8	22,0 (0.87)	240,0 (9.45)	285,0 (11.2)	22,0 (0.87)
zu400494/ -495	ASME 3" 150 lbs	4	19,1 (0.75)	152,4 (6.01)	190,5 (7.5)	23,9 (0.94)
zu400496/ -497	ASME 4" 150 lbs	8	19,1 (0.75)	190,5 (7.5)	228,6 (9.0)	23,9 (0.94)
zu400498/ -499	ASME 6" 150 lbs	8	22,2 (0.87)	241,3 (9.5)	279,4 (11.0)	25,4 (1.0)



ASME flanges raised face:

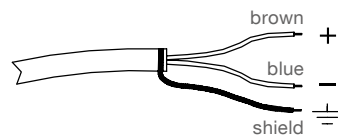


DN flanges: EN 1092-1 type A, flat faced
 ASME flanges: B16.5 raised face

Aiming flange

Electrical installation

4-20 mA



4-20 mA 2-wire loop
12 .. 35 V DC
Connecting cable 0,5 mm² (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.