Table of content

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 01.04.2019 until 31.03.2020, 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

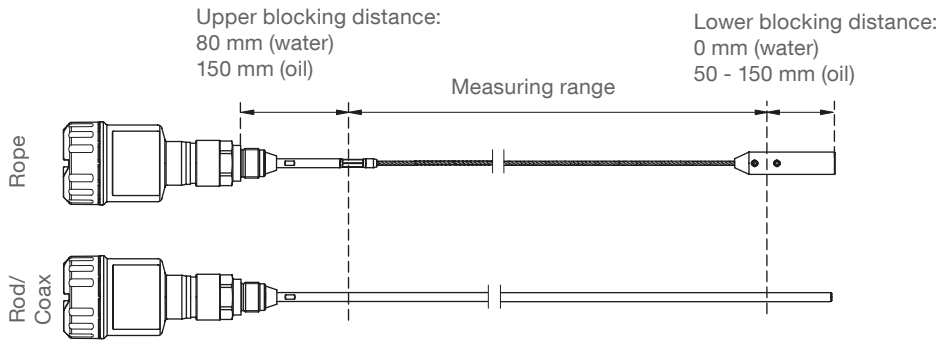
- TDR sensor for continuous level and interface measurement of liquids
- Works in applications with steam, buildup, foam generation or condensation
- Compact unit
- Wide range of applications
- Maintenance free
- Rod or rope version
- Cutable probes
- High pressure and high temperature versions
- High chemical resistance of the probe
- Second line of defense (optional)
- TDR technology (guided microwave)
- Electronic 2-wire 4 - 20 mA, HART
- Integrated Display and Adjustment Module
- Extensive Diagnostics
- Multiple approvals available
- 2011/65/EU RoHS conform

Approvals	CE		
	ATEX / IEC-Ex	Zone 0 und 0/1	Intrinsically Safe
		Zone 0/1	Flameproof
		Zone 20/21	Dust Ignition Proof
	FM	General purp.	
		Cl. I, II, III Div. 1	Intrinsically Safe
		Cl. I Div. 1	Explosionproof
		Cl. I, II, III Div. 2	Non incendive
		Cl. II, III Div. 1	Dust Ignition Proof

Electronics	Operating voltage	9.6 … 35 V DC, 2-wire loop Limited voltage range for Ex ia and with Display and Adjustment Module, see page 12
	Measuring signal	Current loop 4 - 20 mA according to NAMUR NE 43, HART
	Display and Adjustment Module	• LCD-display with background light • Display of acual measurement • Display of setup parameters (e.g. min. and max adjustment, material properties, damping, linearisation, false signal suppression) • After programming the display can be removed. The setted parameters can be copied to other units. • Display of diagnistics data (e.g. temperature, echo curve, trailing pointer) simulation of level) • Operation via push buttons

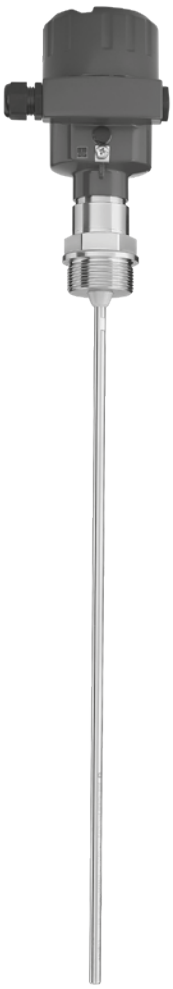
Housing	Material, version	Aluminium, single- or double chamber (powder coated) Stainless steel, single chamber (electro polished)
	Ingress protection	Type 6P/ IP66/ IP68 (0.2 bars)
	Temperature adapter	Temperature adapter for version 200°C
	Ambient temperature	-40 … +80 °C (-40 … +176 °F)

Overview

Mechanics and Process	Diameter rod/ rope, Length of extension "L"	Rod ø8 mm (ø0.31"), ø12 mm (ø0.47") 300 .. 6,000 mm (11.81 .. 236") Rope ø2 mm (ø0.08"), ø4 mm (ø0.16") 500 .. 75,000 mm (19.7 .. 2,953") Coax ø21.3 mm (ø0.84"), ø42.2 mm (ø1.67") 300 .. 6,000 mm (11.81 .. 236")
	Measuring range (blocking distance)	Upper/ lower blocking distance (no maeasurement is possible within this area) 
	Material	Rod 1.4404 (SS316L) Rope 1.4401 (SS316) Gravity weight 1.4404 (SS316L) Coax 1.4404 (SS316L)/ PFA Lead-through of probe to process side (rod/ rope/ coax lead-through): Isolation material PEEK or PPS Sealing selectable FKM, FFKM, EPDM, silicone FEP coated Process connection Thread 1.4404 (SS316L) with sealing Klingersil C-4400 Flange 1.4435 (SS316L), welded Second line of defense* (optional) Borosilicate glass GPC 540 with 316L
	Process temperature (thread- or flange temperatur)	Depending on lead-through of probe to process side (rod/ rope/ coax lead-through): Sealing FKM, EPDM, Silicone FEP coated: -40 … +150°C (-40 … +302°F) with isolation material PEEK -40 … +80°C (-40 … +176°F) with isolation material PPS Sealing FFKM: -20 … +150°C (-4 … +302°F) with isolation material PEEK -20 … +200°C (-4 … +392°F) with isolation material PEEK and temperature adapter
	Process pressure	Depending on lead-through lead-through of probe to process side (rope-/ rod lead-through): With isolation material PEEK -1 .. 40 bar (-14.5 … +580 psi g) With isolation material PPS -1 .. 6 bar (-14.5 … +87 psi g) For flanges the max. pressure rating of the flange must be additionally observed
	Lateral load/ tensile load	Max. lateral load (torque): Rod ø8 mm 10 Nm (7.38 lbf ft) Rod ø12 mm 30 Nm (22.13 lbf ft) Coax ø21.3 mm 60 Nm (44 lbf ft) Coax ø42.2 mm 300 Nm (221 lbf ft) Max. tensile load Rope ø2 mm 1.5 KN (337 lbf) Rope ø4 mm 2.5 KN (562 lbf)
	Min. dielectric constant of the medium	DK ≥1.6

* The Second Line of Defense is a second level of the process separation in the form of a gas-tight feedthrough in the lower part of the housing, preventing product from penetrating into the housing.

NG 8100



Rod version
(pos.8 E, pos.5+6 3D)

Rope version
(pos.8 A, pos.5+6 3D)

Cable entries (by default)
Depending on model selected, the following cable entries are supported (details and options see pos.13 on page 7):

Version:	Cable entry:
CE, ATEX, IEC-Ex	M20 x 1.5 1x screwed cable gland, 1x blind plug
FM	NPT ½" tapered ANSI B1.20.1 1x open conduit + 1x blind plu

Housing
Standard housing is aluminium single chamber.
Alternative housings see option pos.16 on page 7.

Display and
Adjustment Module
(pos. 9)

NG 8100

Basic type

NG 8100 ..... •

pos.2 **Certificate** (detailed Ex-markings: see page 11)

		Gas	Dust	Protection method	
0	CE	-	-		•
Q	ATEX	Zone 0 and 0/1	-	Intrinsically Safe	•
Y	ATEX	Zone 0 and 0/1	Zone 20 and 20/21	Intrinsically Safe, Dust Ignition Proof	•
V	ATEX	Zone 1 and 0/1	-	Flameproof	•
W	ATEX	-	Zone 20 and 20/21	Dust Ignition Proof	•
B	IEC Ex	Zone 0 and 0/1	-	Intrinsically Safe	•
D	IEC Ex	Zone 0 and 0/1	Zone 20 and 20/21	Intrinsically Safe, Dust Ignition Proof	•
C	IEC Ex	Zone 1 and 0/1	-	Flameproof	•
A	IEC Ex	-	Zone 20 and 20/21	Dust Ignition Proof	•
M	FM	-	-	General purpose	•
H	FM	Cl. I Div. 2	Cl. II, III Div. 2	Non incendive	•
P	FM	Cl. I Div. 1	Cl. II, III Div. 1	Intrinsically Safe	•
U	FM	Cl. I Div. 1	-	Explosionproof	•
N	FM	-	Cl. II, III Div. 1	Dust Ignition Proof	•

pos.3 **Process temperature/ Second line of defense / Lead-through of probe to process side**

	Process-temperature	Second line of defense	Lead-through of probe		Available with certificate pos.2				
			Sealing	Isolation	0,Q, B,M	V,C, U	Y,W, D,A	P,H, N	
A	-40 ... +80°C	without	FKM	PPS [9]	•		•	•	•
F	-40 ... +150°C	without	FKM	PEEK	•		•	•	•
Q	-40 ... +80°C	with	FKM	PPS [9]	•	•	•		•
G	-40 ... +150°C	with	FKM	PEEK	•	•	•	•	•
D	-20 ... +150°C	without	FFKM	PEEK	•		•	•	•
K	-20 ... +200°C	without	FFKM	PEEK	•			•	•
P	-20 ... +150°C	with	FFKM	PEEK	•	•	•	•	•
L	-20 ... +200°C	with	FFKM	PEEK	•	•	•	•	•
B	-40 ... +80°C	without	EPDM	PPS [9]	•			•	•
H	-40 ... +150°C	without	EPDM	PEEK	•			•	•
R	-40 ... +80°C	with	EPDM	PPS [9]	•	•	•		•
M	-40 ... +150°C	with	EPDM	PEEK	•	•	•	•	•
C	-40 ... +80°C	without	Silicon	PPS [9]	•			•	•
E	-40 ... +150°C	without	Silicon	PEEK	•			•	•
S	-40 ... +80°C	with	Silicon	PPS [9]	•	•	•		•
N	-40 ... +150°C	mit	Silicon	PEEK	•	•	•	•	•

pos.4 **Electronic module**

A 2-wire 4 - 20 mA, HART ..... •

pos.5+6 **Process connection**

1E	Thread M30 x 1.5		PN40, DIN3852-A	•
0S	Thread ¾" NPT		PN6, tapered, ANSI/ ASME B1.20.1 [1]	•
0A	Thread ¾" NPT		PN40, tapered, ANSI/ ASME B1.20.1	•
0B	Thread 1" NPT		PN40, tapered, ANSI/ ASME B1.20.1	•
0D	Thread 1½" NPT		PN40, tapered, ANSI/ ASME B1.20.1	•
3S	Thread G ¾"		PN6, DIN3852-A [1]	•
3A	Thread G ¾"		PN40, DIN3852-A	•
3B	Thread G 1"		PN40, DIN3852-A	•
3D	Thread G 1½"		PN40, DIN3852-A	•
5A	Flange 1"	150 lbs	RF, ASME B16.5	•
5B	Flange 1"	300 lbs	RF, ASME B16.5	•
5C	Flange 1"	600 lbs	RF, ASME B16.5	•
5D	Flange 1½"	150 lbs	RF, ASME B16.5	•
5E	Flange 1½"	300 lbs	RF, ASME B16.5	•
5F	Flange 1½"	600 lbs	RF, ASME B16.5	•
5G	Flange 2"	150 lbs	RF, ASME B16.5	•
5H	Flange 2"	300 lbs	RF, ASME B16.5	•
5J	Flange 2"	600 lbs	RF, ASME B16.5	•
5K	Flange 3"	150 lbs	RF, ASME B16.5	•
5L	Flange 3"	300 lbs	RF, ASME B16.5	•
5M	Flange 3"	600 lbs	RF, ASME B16.5	•

continuation flanges: see next page

NG 8100

5N	Flange 4"	150 lbs	RF, ASME B16.5	•
5P	Flange 4"	300 lbs	RF, ASME B16.5	•
5Q	Flange 4"	600 lbs	RF, ASME B16.5	•
6B	Flange DN25, PN40		EN 1092-1 Form B1	•
6D	Flange DN40, PN40		EN 1092-1 Form B1	•
6E	Flange DN50, PN16		EN 1092-1 Form B1 (2)	•
6F	Flange DN50, PN40		EN 1092-1 Form B1	•
6G	Flange DN65, PN40		EN 1092-1 Form B1 (2)	•
6H	Flange DN80, PN40		EN 1092-1 Form B1	•
6J	Flange DN100, PN16		EN 1092-1 Form B1	•
6K	Flange DN100, PN40		EN 1092-1 Form B1	•
6L	Flange DN150, PN16		EN 1092-1 Form B1	•
6M	Flange DN150, PN40		EN 1092-1 Form B1	•
6N	Flange DN200, PN10		EN 1092-1 Form B1	•
6P	Flange DN200, PN40		EN 1092-1 Form B1	•

pos.8 **Type and length of extension "L" (3)**

E	Rod ø8 mm (0.31") Price per 100mm (3.94") of part thereof (starting from 0mm), min. 300mm (11.81"), max. 6,000mm (236")	•
F	Rod ø12 mm (0.47") (4) Price per 100mm (3.94") of part thereof (starting from 0mm), min. 300mm (11.81"), max. 6,000mm (236")	•
B	Rope ø2 mm (0.08") with gravity weight Price per 100mm (3.94") of part thereof (starting from 0mm), min. 500mm (19.7"), max. 75,000mm (2,953")	•
U	Rope ø4 mm (0.16") without gravity weight Price per 100mm (3.94") of part thereof (starting from 0mm), min. 500mm (19.7"), max. 75,000mm (2,953")	•
A	Rope ø4 mm (0.16") with gravity weight Price per 100mm (3.94") of part thereof (starting from 0mm), min. 500mm (19.7"), max. 75,000mm (2,953")	•
K	Coax ø21.3mm (0.84") with single hole (7,8) Base price Price per 100mm (3.94") of part thereof (starting from 0mm), min. 300mm (11.81"), max. 6,000mm (236")	• •
L	Coax ø21.3mm (0.84") with multiple hole (7,8) Base price Price per 100mm (3.94") of part thereof (starting from 0mm), min. 300mm (11.81"), max. 6,000mm (236")	• •
P	Coax ø42.2mm (1.67") with multiple hole (4,7) Base price Price per 100mm (3.94") of part thereof (starting from 0mm), min. 300mm (11.81"), max. 6,000mm (236")	• •

pos.9 **Display and Adjustment Module / Inspection window in lid**

0	without Display and Adjustment Module, without inspection window in lid	•
F	without Display and Adjustment Module, with inspection window in lid (5)	•
A	with Display and Adjustment Module, with inspection window in lid	•
B	with Display and Adjustment Module (laterally in housing alu double chamber), with inspection window in lid (6)	•

pos.10 **Length of rigid part "L1"**

0	without (for rod version)	•
Z	L1 = customer specified (for rope version) Price per 100mm (3.94") of part thereof (starting from 0mm), min. 100 mm (3.94"), max. L - 300mm (11.8") or 1,000 mm (39.4")	•

(1) Process temperature (pos.3) max. 80°C.
(2) Available with rod ø12mm (pos.8 F).
(3) Rope / rod can be cut and changed.
(4) Available with following process connections: all threads 1½", flange ASME 2" or bigger, flange DN50 or bigger, not with flange DN150 PN40 and DN200 PN40.
(5) Available with certificates pos.2 0, Q, B, M, N.
(6) Not available with certificates FM non incendive (pos.2 H), available with housing double chamber (pos.16 D).
(7) Not available with process temperature 80°C pos.3 A, Q, B, R, C, S.
(8) Not available with process connections pos.5+6 1E, 0S, 3S, 6E, 6G.
(9) Available with process connections threads ¾" PN6 (Pos.5+6 0S, 3S).

NG 8100	A					1			
position	1	2	3	4	5+6	7	8	9	10

L =	mm
L1 =	mm

← Order code

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

SOLUTIONS

Options / Accessories

Options

pos.11 x **Inspection Certificate** ..... •
3.1 according to EN 10204

pos.12 **Measurement loop identification label**
1 of stainless steel ..... •
2 of foil ..... •

pos.13 **Cable entry**
Selection of the following options only necessary,
if a deviation from default is required:
D M20 x 1.5 1x screwed cable gland PA black (ø5-9mm), 1x blind plug ..... •
E M20 x 1.5 1x screwed cable gland brass nickle plated (ø6-12mm), 1x blind plug ..... •
F M20 x 1.5 1x screwed cable gland brass nickle plated (ø5-9mm), 1x blind plug ..... •
A ½" NPT 1x conduit, 1x blind plug ..... •
B ½" NPT 1x screwed cable gland brass nickle plated (ø6-12mm), 1x blind plug ..... •
C ½" NPT 1x screwed cable gland brass nickle plated; for shielded cable (ø9-13mm), 1x blind plug ..... •

pos.14 **Language of operating instruction**
Number of instructions: 1 piece. Standard is DE -German, available other languages:
2 EN - Englisch ..... •
3 FR - French ..... •
4 RU - Russian ..... •
5 ES - Spanish ..... •
6 PT - Portuguese ..... •
7 ZH - Chinese ..... •

pos.16 **Housing**
D Aluminium - double chamber ..... •
N Stainless steel -single chamber (electropolished) ..... •

(1) Available cable entries:

Cable entry	Available with certificate pos.2						
	0	Q,B	Y,W,D,A	V,C	P	M	H,U,N
D	x	x			•	•	
E	•			x			
F	•	•	x		•	•	
A	•	•	•	•	x	x	x
B	•			•		•	
C	•			•		•	

• = Cable entry optional selectable
x = Default cable entry (option pos.13 not selectable)

(2) Available without Ex-certificate (pos. 2 0,M) or with intrinsically safe version (pos.2 Q, B, P), not with cable entry pos.13 E.

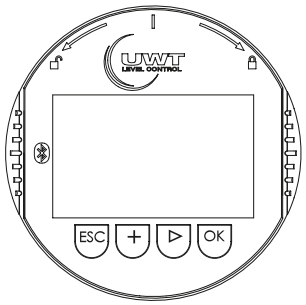
Accessories

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

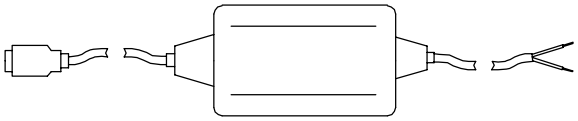
pl400510 **Display and Adjustment Module** (plug on) ..... •

zu400530 **HART Modem** ..... •
USB HART interface to connect of a PC with the NG 8000, for commissioning and servicing.

Display and Adjustment Module



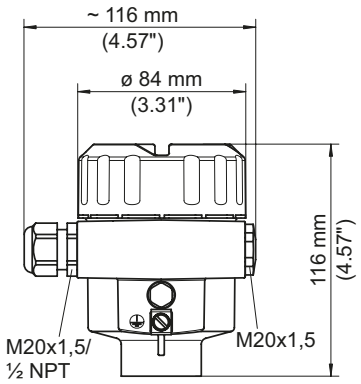
HART Modem



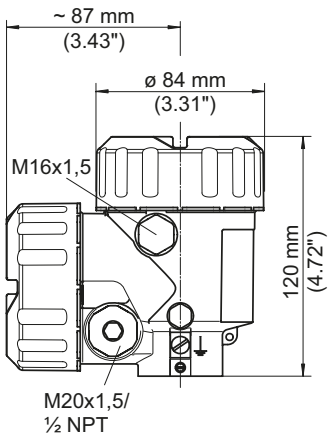
Dimensions

Housing

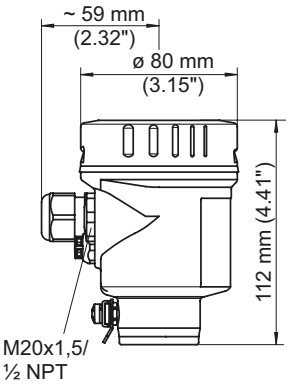
Aluminium
single chamber



Aluminium
double chamber

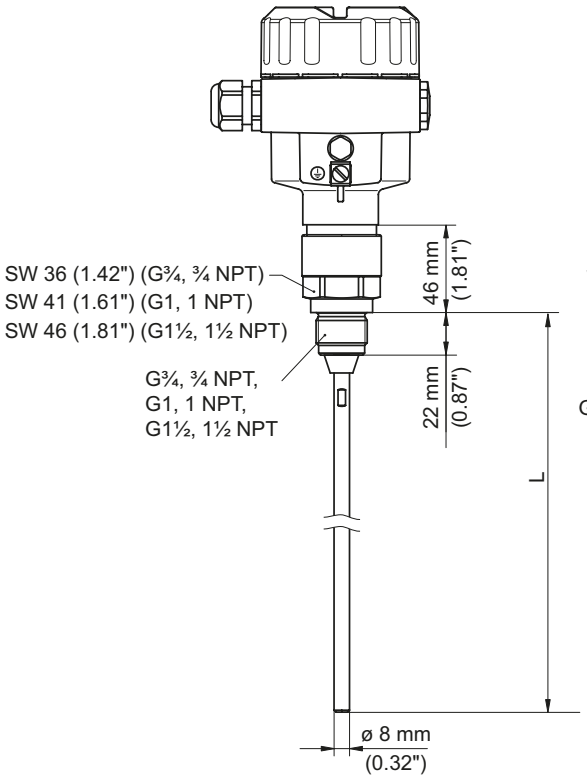


Stainless steel
single chamber

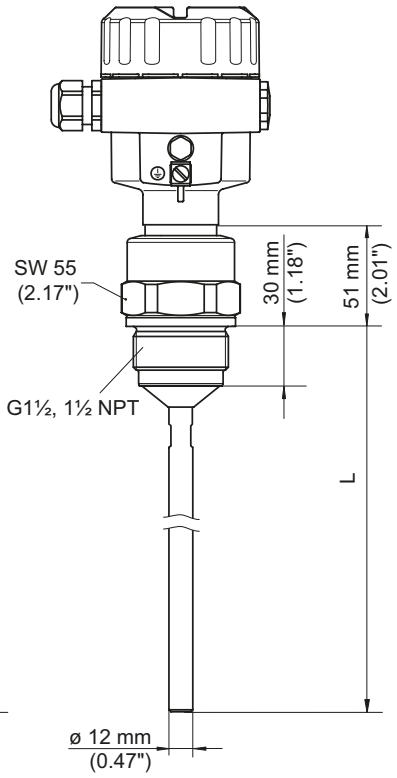


Rod version

Rod ø8 mm
Process connection: thread

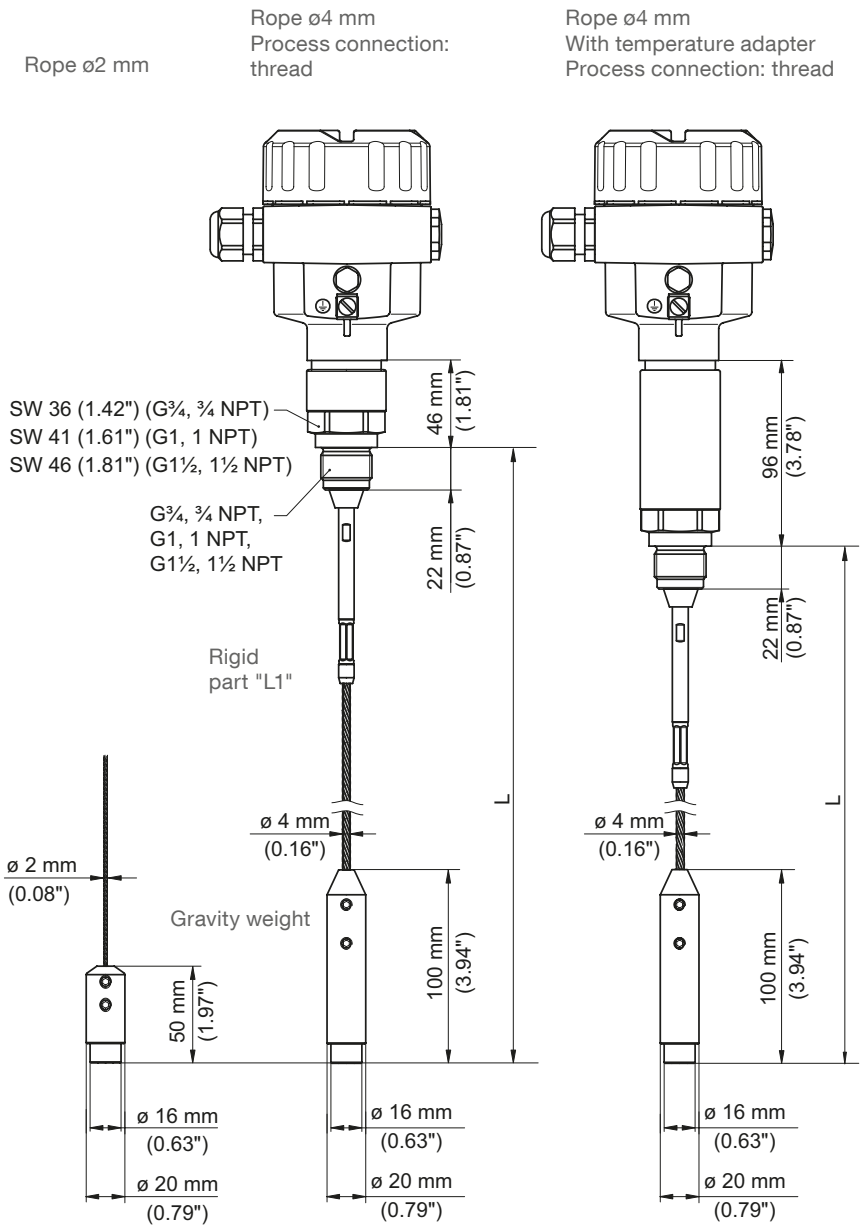


Rod ø12 mm
Process connection: thread



Dimensions

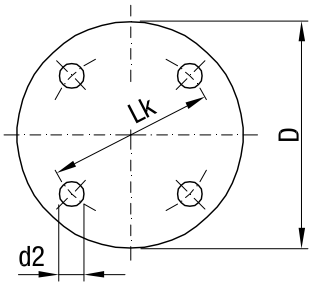
Rope version



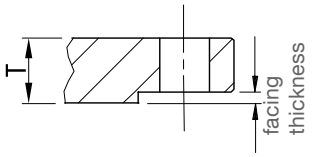
Dimensions

Flanges

	Code	Type	Number of holes	d2 mm (inch)	Lk mm (inch)	D mm (inch)	T thickness mm (inch)
ASME B16.5, raised face	5A	1" 150 lbs	4	15,9 (0.63)	79,3 (3.12)	108,0 (4.25)	14,3 (0.56)
	5B	1" 300 lbs	4	19,1 (0.75)	88,9 (3.5)	124,0 (4.88)	15,8 (0.62)
	5C	1" 600 lbs	4	19,1 (0.75)	88,9 (3.5)	124,0 (4.88)	17,5 (0.69)
	5D	1½" 150 lbs	4	15,9 (0.63)	98,6 (3.88)	127,0 (5.0)	17,5 (0.69)
	5E	1½" 300 lbs	4	22,2 (0.87)	114,3 (4.5)	155,5 (6.12)	19,1 (0.75)
	5F	1½" 600 lbs	4	22,2 (0.87)	114,3 (4.5)	155,5 (6.12)	22,4 (0.88)
	5G	2" 150 lbs	4	19,1 (0.75)	120,7 (4.75)	152,4 (6.01)	19,1 (0.75)
	5H	2" 300 lbs	8	19,1 (0.75)	127,0 (5.0)	165,1 (6.5)	20,6 (0.81)
	5J	2" 600 lbs	8	19,1 (0.75)	127,0 (5.0)	165,1 (6.5)	25,4 (1.0)
	5K	3" 150 lbs	4	19,1 (0.75)	152,4 (6.01)	190,5 (7.5)	23,9 (0.94)
	5L	3" 300 lbs	8	22,2 (0.87)	168,2 (6.62)	209,6 (8.25)	26,9 (1.06)
	5M	3" 600 lbs	8	22,2 (0.87)	168,2 (6.62)	209,6 (8.25)	31,8 (1.25)
	5N	4" 150 lbs	8	19,1 (0.75)	190,5 (7.5)	228,6 (9.0)	23,9 (0.94)
	5P	4" 300 lbs	8	22,2 (0.87)	200,2 (7.88)	254,0 (10.0)	30,2 (1.19)
	5Q	4" 600 lbs	8	25,4 (1.0)	215,9 (8.5)	273,1 (10.75)	38,1 (1.5)
EN 1092-1 type B1, raised face	6A	DN25 PN16	4	14,0 (0.55)	85,0 (3.35)	115,0 (4.53)	18,0 (0.71)
	6B	DN25 PN40	4	14,0 (0.55)	85,0 (3.35)	115,0 (4.53)	18,0 (0.71)
	6C	DN40 PN16	4	18,0 (0.71)	110,0 (4.33)	150,0 (5.91)	18,0 (0.71)
	6D	DN40 PN40	4	18,0 (0.71)	110,0 (4.33)	150,0 (5.91)	18,0 (0.71)
	6E	DN50 PN16	4	18,0 (0.71)	125,0 (4.92)	165,0 (6.5)	18,0 (0.71)
	6F	DN50 PN40	4	18,0 (0.71)	125,0 (4.92)	165,0 (6.5)	20,0 (0.79)
	6G	DN80 PN16	8	18,0 (0.71)	160,0 (6.3)	200,0 (7.87)	20,0 (0.79)
	6H	DN80 PN40	8	18,0 (0.71)	160,0 (6.3)	200,0 (7.87)	24,0 (0.94)
	6J	DN100 PN16	8	18,0 (0.71)	180,0 (7.09)	220,0 (8.66)	20,0 (0.79)
	6K	DN100 PN40	8	22,0 (0.87)	190,0 (7.48)	235,0 (9.25)	24,0 (0.94)
	6L	DN150 PN16	8	22,0 (0.87)	240,0 (9.45)	285,0 (11.2)	22,0 (0.87)
	6M	DN150 PN40	8	26,0 (1.02)	250,0 (9.84)	300,0 (11.8)	28,0 (1.10)
	6N	DN200 PN16	12	22,0 (0.87)	295,0 (11.6)	340,0 (13.4)	24,0 (0.94)
	6P	DN200 PN40	12	30,0 (1.18)	320,0 (12.6)	375,0 (14.8)	36,0 (1.42)



Raised face



Type	Facing thickness
DN25 - DN200 ASME 150 lbs ASME 300 lbs	2 mm (0.08")
ASME 600 lbs	7 mm (0.28")

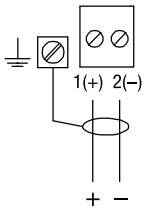
Detailed Ex-markings

pos.2	**Certificate**		**Protection method**
Q	ATEX II 1G ATEX II 1/2G	Ex ia IIC T6..T1 Ga Ex ia IIC T6..T1 Ga/Gb	Intrinsically Safe
Y	ATEX II 1G ATEX II 1/2G ATEX II 1D ATEX II 1/2D	Ex ia IIC T6..T1 Ga Ex ia IIC T6..T1 Ga/Gb Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db	Intrinsically Safe Dust Ignition Proof
V	ATEX II 1/2G ATEX II 2G	Ex d IIC T6...T1 Ga/Gb Ex d IIC T6...T1 Gb	Flameproof
W	ATEX II 1D ATEX II 1/2D	Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db	Dust Ignition Proof
B	IEC Ex	ia IIC T6..T1 Ga ia IIC T6..T1 Ga/Gb	Intrinsically Safe
D	IEC Ex	ia IIC T6..T1 Ga ia IIC T6..T1 Ga/Gb ta IIIC T! Da ta/tb IIIC T! Da/Db	Intrinsically Safe Dust Ignition Proof
C	IEC Ex	d IIC T6...T1 Ga/Gb d IIC T6...T1 Gb	Flameproof
A	IEC Ex	ta IIIC T! Da ta/tb IIIC T! Da/Db	Dust Ignition Proof
H	FM	NI Class I,II,III Div.2, Gr. A,B,C,D,F,G	Non incendive
P	FM	IS Class I, II, III Div.1, Gr. A-G	Intrinsically Safe
U	FM	XP Class I Div.1, Gr. A-D	Explosionproof
N	FM	DIP Class II,III Div.1, Gr. E,F,G	Dust Ignition Proof

Electrical Installation

4-20 mA

The terminals are located below the Display and Adjustment Module. To connect the unit, remove the display by gently turning the display counter-clockwise until it is free.



4-20 mA (Schleife)

Wire cross-section (spring-loaded terminals) :
Massive wire, stranded wire 0,2 … 2,5 mm² (AWG 24 … 14)
Stranded wire with end sleeve 0,2 … 1,5 mm² (AWG 24 … 16)
Connect cable shield to ground terminal.

Operating voltage (voltage present at terminals):

Version	Display and Adjustment Module (illuminated)	Operating voltage
Non-Ex, Ex d	without	9,6 … 35 V DC
	with	16 … 35 V DC
Ex ia	without	9,6 … 30 V DC
	without	16 … 30 V DC

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 limited to a certain value, to ensure a proper function.
  Max. loop resistance = (supply voltage - min. voltage present at terminals) / 22mA
  Example: CE-unit with 24 V DC supply: Max. loop resistance = (24 V - 9,6 V) / 22 mA = 655 Ω
- The external resistor is not required, if the PLC has an integral 250 Ohm resistor.