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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 01.04.2019 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

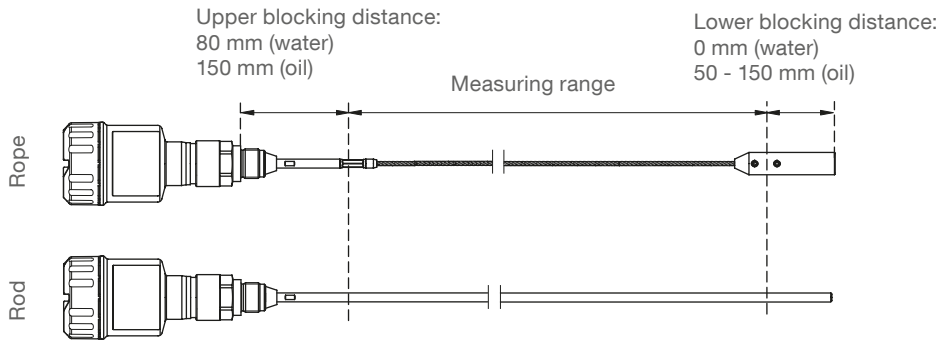
- TDR sensor for continuous level measurement of solds
- Works in applications with buildup, dust generation or condensation
- Compact unit
- Wide range of applications
- Maintenance free
- Rod or rope version
- Cutable probes
- High pressure and high temperature versions
- High chemical resistance of the probe
- 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 11
	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 ø16 mm (ø0.63") 300 .. 6,000 mm (11.81 .. 236") Rope ø4 mm (ø0.16") 500 .. 75,000 mm (19.7 .. 2,953") Rope ø6 mm (ø0.24") 500 .. 75,000 mm (19.7 .. 2,953") 500 .. 65,000 mm (19.7 .. 2,559"), PA coated Rope ø11 mm (ø0.43") 500 .. 65,000 mm (19.7 .. 2,559"), PA coated
	Measuring range (blocking distance)	Upper / lower blocking distance (no maeasurement is possible within this area) 
	Material	Rod 1.4404 (SS316L) Rope 1.4401 (SS316) Rope, PA coated Steel galvanized/ PA Gravity weight 1.4404 (SS316L) Lead-through of probe to process side (rope-/ rod lead-through): Isolation material PEEK or PPS Sealing selectable FKM, FFKM, EPDM Process connection Thread 1.4404 (SS316L) with sealing Klingersil C-4400 Flange 1.4435 (SS316L), welded
	Process temperature (thread- or flange temperatur)	Depending on lead-through of probe to process side (rope-/ rod lead-through): Sealing FKM, EPDM: -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: ø16 mm 30 Nm (22.13 lbf ft) Max. tensile load Rope: ø4 mm 12 KN (2,698 lbf) Rope: ø6 mm 30 KN (6,744 lbf) Rope: ø6 mm, PA coated 8 KN (1,798 lbf) Rope: ø11 mm, PA coated 30 KN (6,744 lbf)
	Min. dielectric constant of the medium	DK ≥1.5

NG 3100

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

Rope version
(pos.8 F, 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 entries:
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 plug

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

Display and
Adjustment Module
(pos. 9)

NG 3100

Basic type

NG 3100 ..... •

pos.2 **Certificate** (detailed Ex-markings: see page 10)

		Gas	Dust	Protection method	
0	CE	-	-		•
S	ATEX	Zone 0 and 0/1	-	Intrinsically Safe	•
T	ATEX	Zone 1 and 0/1	Zone 20 and 20/21	Flameproof, 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 1 and 0/1	Zone 20 and 20/21	Flameproof, 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/ Lead-through of probe to process side**

	Process-temperature	Sealing Lead-through of probe	Isolation Lead-through of probe	
A	-40...+80°C (1)	FKM	PPS	•
F	-40...+150°C (2)	FKM	PEEK	•
K	-20...+200°C (2)	FFKM	PEEK	•
B	-40...+80°C (1)	EPDM	PPS	•
H	-40...+150°C (2)	EPDM	PEEK	•

pos.4 **Electronic module**

A 2-wire 4 - 20 mA, HART ..... •

pos.5+6 **Process connection**

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	.....	•
3A	Thread G ¾"	PN40, DIN3852-A	.....	•
3B	Thread G 1"	PN40, DIN3852-A	.....	•
3D	Thread G 1½"	PN40, DIN3852-A	.....	•
5D	Flange 1½" 150 lbs	RF, ASME B16.5	.....	•
5G	Flange 2" 150 lbs	RF, ASME B16.5	.....	•
5H	Flange 2" 300 lbs	RF, ASME B16.5	.....	•
5K	Flange 3" 150 lbs	RF, ASME B16.5	.....	•
5L	Flange 3" 300 lbs	RF, ASME B16.5	.....	•
5N	Flange 4" 150 lbs	RF, ASME B16.5	.....	•
5P	Flange 4" 300 lbs	RF, ASME B16.5	.....	•
6F	Flange DN50, PN40	EN 1092-1 Form B1	.....	•
6H	Flange DN80, PN40	EN 1092-1 Form B1	.....	•
6L	Flange DN100, PN6	EN 1092-1 Form B1	.....	•
6J	Flange DN100, PN16	EN 1092-1 Form B1	.....	•

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

H Rod ø16 mm (0.") (5) Base price •
Price per 100 mm (3.94") of part thereof (starting from 0 mm), min. 300 mm (11.81"), max. 6,000 mm (236") •

A Rope ø4 mm (0.") with gravity weight (4)
Price per 100 mm (3.94") of part thereof (starting from 0 mm), min. 500 mm (19.7"), max. 75,000 mm (2,953") •

F Rope ø6 mm (0.") with gravity weight (5) Base price ..... •
Price per 100 mm (3.94") of part thereof (starting from 0 mm), min. 500 mm (19.7"), max. 75,000 mm (2,953") •

E Rope ø6 mm (0.") with gravity weight, PA coated (4) Base price ..... •
Price per 100 mm (3.94") of part thereof (starting from 0mm), min. 500 mm (19.7"), max.65,000 mm (2,559") •

G Rope ø11 mm (0.") with gravity weight, PA coated (5) Base price ..... •
Price per 100 mm (3.94") of part thereof (starting from 0 mm), min. 500 mm (19.7"), max.65,000 mm (2,559") •

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 (6) ..... •
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 (7) ... •

NG 3100

(1) Available only with PA-coating (pos.8 E, G), not with FM certificate (pos.2 H, P, U, N).
(2) Not available with PA-coating (pos.8 E, G).
(3) Rope / rod can be cut and changed.
(4) Not available with flange DN100 PN6 (pos.5+6 6L).
(5) Available with following process connections: all threads 1½", flange ASME 2" or bigger, flange DN50 or bigger.
(6) Available with certificates pos.2 0, S, B, M, N.
(7) Not available with certificates FM non incendive (pos.2 H), available with housing double chamber (pos.16 D).

NG 3100	A					1			L = mm
position	1	2	3	4	5+6	7	8	9	

← Order code

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

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 (ø5-9 mm), 1x blind plug ..... •
E M20 x 1.5 1x screwed cable gland brass nickle plated (ø6-12 mm), 1x blind plug ..... •
F M20 x 1.5 1x screwed cable gland brass nickle plated (ø5-9 mm), 1x blind plug ..... •
A ½" NPT 1x conduit, 1x blind plug ..... •
B ½" NPT 1x screwed cable gland brass nickle plated (ø6-12 mm), 1x blind plug ..... •
C ½" NPT 1x screwed cable gland brass nickle plated; for shielded cable (ø9-13 mm), 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	S,B	T,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 S, B, P), not with cable entry pos.13 E.

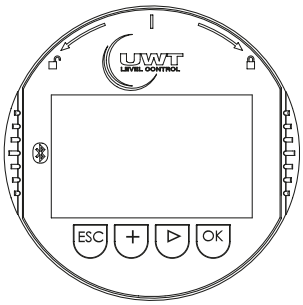
Accessories

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

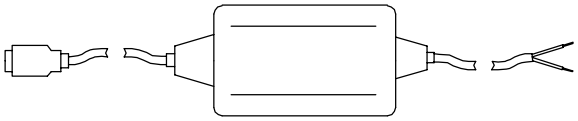
pl400510 **Display and Adjustment Module** (plug on) ..... •

zu400530 **HART Modem** ..... •
USB HART interface to connect of a PC with the NG 3000, for commissioning and servicing.

Display and Adjustment Module



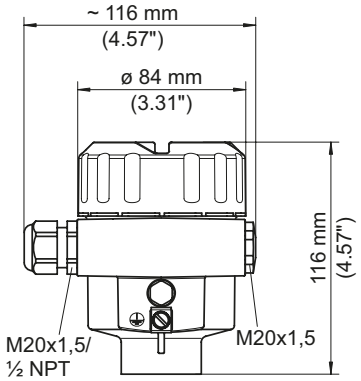
HART Modem



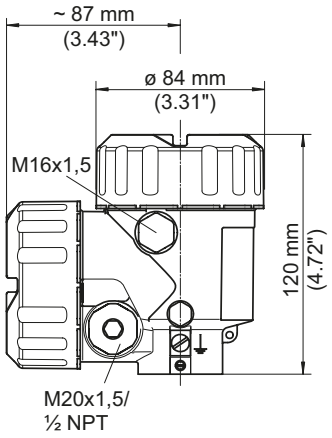
Dimensions

Housing

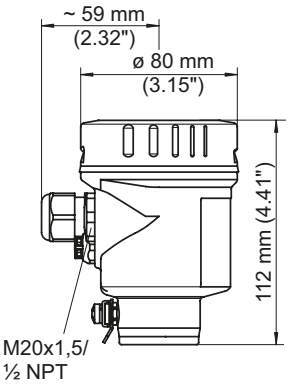
Aluminium
single chamber



Aluminium
double chamber



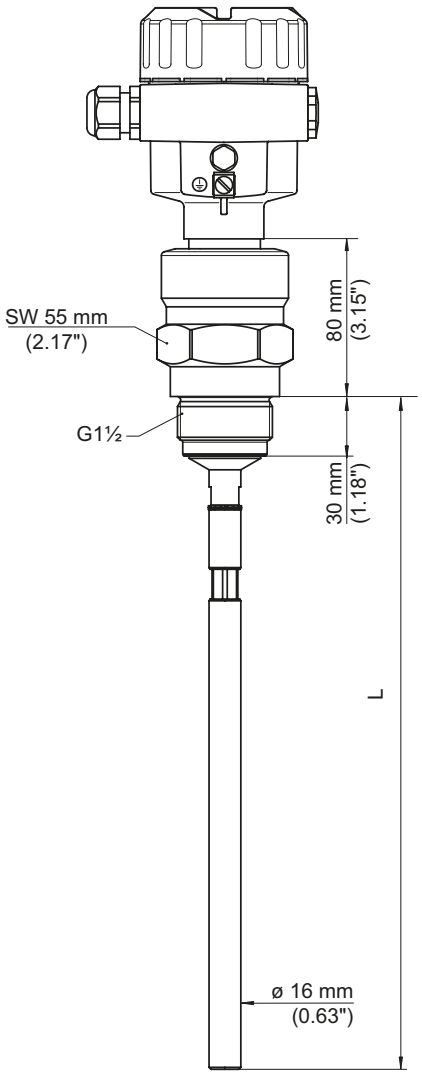
Stainless steel
single chamber



Rod version

Process connection: thread

Rod ø16mm

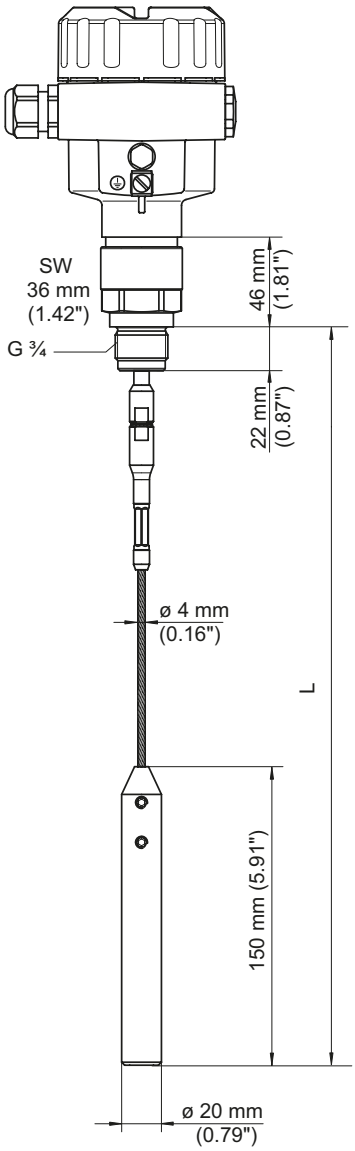


Dimensions

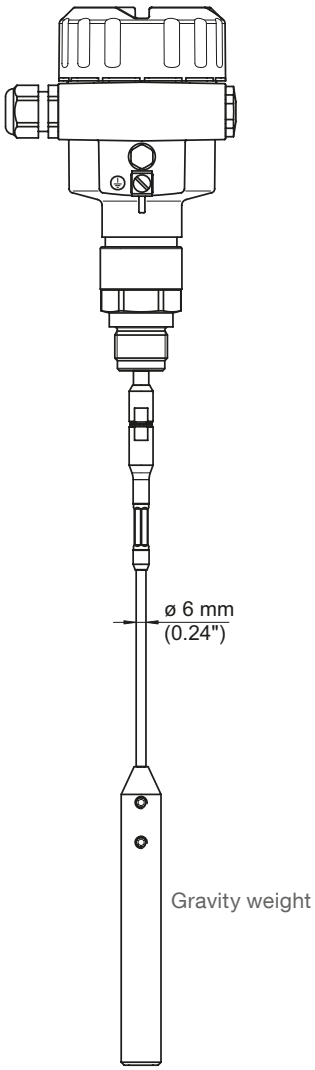
Rope version

Process connection: thread

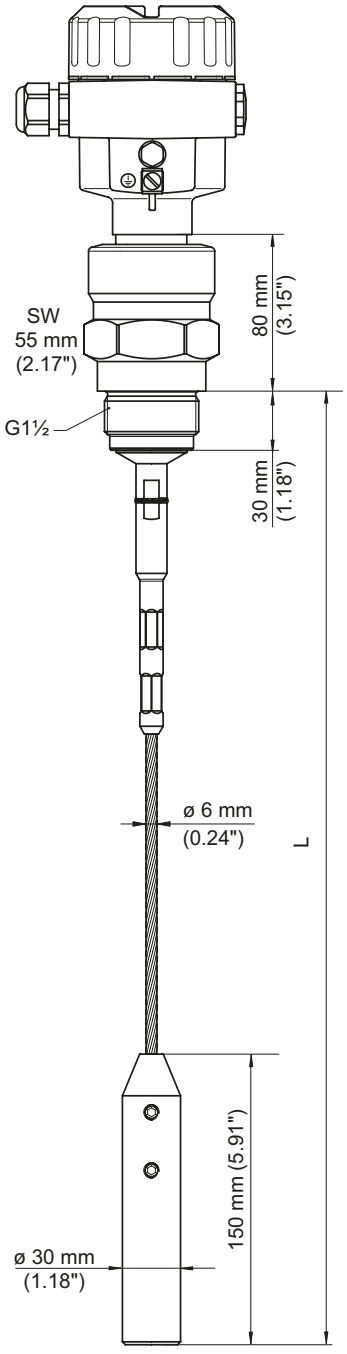
Rope ø4mm



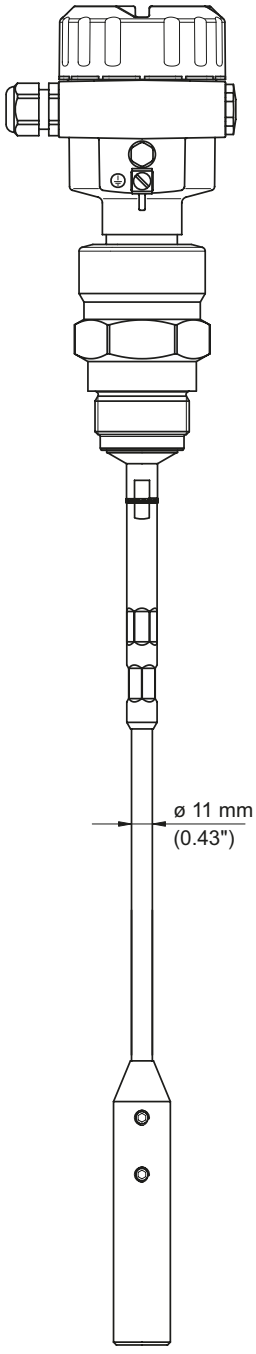
Rope ø6mm
PA coated



Rope ø6mm



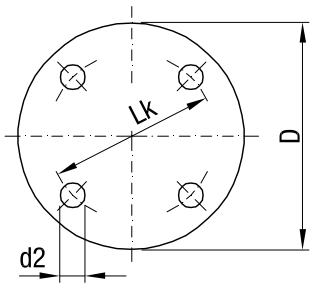
Rope ø11mm
PA coated



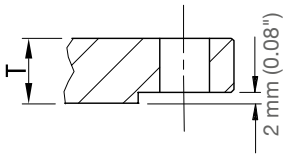
Dimensions / Detailed Ex-markings

Flanges

	Code	Type	Number of holes	d2 mm (inch)	Lk mm (inch)	D mm (inch)	T thickness mm (inch)
ASME B16.5, raised face	5D	1½" 150 lbs	4	15.9 (0.63)	98.6 (3.88)	127.0 (5.0)	17.5 (0.69)
	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)
	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)
	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)
EN 1092-1 Form B1, raised face	6F	DN50 PN40	4	18.0 (0.71)	125.0 (4.92)	165.0 (6.5)	20.0 (0.79)
	6H	DN80 PN40	8	18.0 (0.71)	160.0 (6.3)	200.0 (7.87)	24.0 (0.94)
	6L	DN100 PN6	4	18.0 (0.71)	170.0 (6.69)	210.0 (8.27)	16.0 (0.63)
	6J	DN100 PN16	8	18.0 (0.71)	180.0 (7.09)	220.0 (8.66)	20.0 (0.79)



Raised face



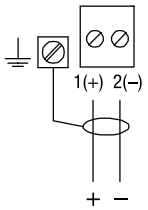
Detailed Ex-markings

Pos.2	**Certificate**		**Protection method**
S	ATEX II 1G ATEX II 1/2G	Ex ia IIC T6..T1 Ga Ex ia IIC T6..T1 Ga/Gb	Intrinsically Safe
T	ATEX II 1/2G ATEX II 2G ATEX II 1D ATEX II 1/2D	Ex d IIC T6...T1 Ga/Gb Ex d IIC T6...T1 Gb Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db	Flameproof 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	d IIC T6...T1 Ga/Gb d IIC T6...T1 Gb ta IIIC T! Da ta/tb IIIC T! Da/Db	Flameproof 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.