



NivoCapa[®] 8000

Capacitance Level Transmitter

Capacitive continuous measurement for all kinds of liquids.

High precision level monitoring of conductive and non-conductive materials.



NivoCapa® 8000

- Very user-friendly through LCD display with control buttons and diagnostic function
- Potted electronics, "Active Shield Technology" against material build-up ensures high functional safety
- PFA isolation for high chemical resistance

Applications: NivoCapa® 8000 is suitable for liquids, pastes, foam and slurry.

NC 8100 Rod Version

Shaft length max. 5m
Active probe diameter 19mm
Horizontal rod loading max. 30Nm



NC 8100 Rope Version

Shaft length max. 25m
Active probe diameter 6mm
Vertical cable loading max. 18.5KN



Inverse Frequency
Shift Technology

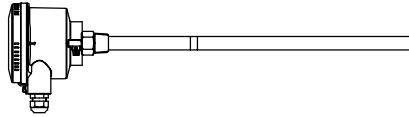


Technical Data

Housing	Aluminium powder coated, IP68/NEMA 4	
Certificates	ATEX, FM/CSA, TR-CU, INMETRO, Lloyd's	
Measuring range	Rod version	max. 5m
	Cable version	max. 25m
Process temp. range	-40°C to +200°C (-40°F to +392°F)	
Pressure range	-1 to +35 bar (-14.5 to +507.6 psi)	
Sensitivity	DK value ≥ 1.5	
Supply voltage	12..24V DC, 2-wire current loop	
Measurement signal	Current loop 4 - 20 mA or 20 - 4 mA according to NAMUR NE 43	
Measurement range	1.66 .. 3.300 pF	
Process connection	$\geq$ NPT $\frac{3}{4}$ ", $\geq$ R $\frac{3}{4}$ ", $\geq$ G $\frac{3}{4}$ ", range of flanges	
Process con. material	1.4404 (316L)	
Probe material	1.4404 (316L), isolation PEEK, coating PFA, wetted seals FKM or FFKM	

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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 01.01.2019 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

- Continuous level measurement in liquids, slurries and solids.
Performs viscous materials (conductive or nonconductive), even in challenging environments involving vapour and dust.
- Compact unit
- Wide range of applications
- No maintenance
- Rod and rope versions
- High pressure and temperature
- High chemical resistance on probes
- RF technology with active shield
- Sensitivity: dielectric constant ≥ 1.5
- 2-wire 4 - 20 mA electronics
- Integrated Local User Interface
- Self diagnostics
- Multiple approvals available
- 2011/65/EU RoHS conform

Approvals	CE		
	ATEX	Zone 0/1	Flameproof
		Zone 20/21	Dust Ignition Proof
	FM/ CSA	General purp.	
		Cl. I Div. 1	Explosionproof
		Cl. II, III Div. 1	Dust Ignition Proof
	TR-CU	Ordinary Locations, Flameproof, Dust Ignition Proof	
	INMETRO	Flameproof, Dust Ignition Proof	
	Lloyds	Categories ENV1, ENV2, ENV3 and ENV5	

Electronics	Supply voltage	12 .. 30 V DC, 2-wire current loop
	Measurement signal	Current loop 4 - 20 mA or 20 - 4 mA according to NAMUR NE 43
	Measurement range	1.66 .. 3,300 pF
	User interface	7 segment LCD display, displays the actual measurement in pF Pushbuttons and rotary switch
	Settings	Upper and lower measurement range Output delay (damping) Loop current
	Diagnostics	Over- and Under Range Internal electronic self check

Housing	Material	Aluminium, powder-coated
	Ingress protection	Type 4/ NEMA 4/ IP68
	Temperature extended shaft	1.4404 (SS316L), option
	Ambient temperature	-40 .. 85°C (-40 .. 185°F) With ATEX approval: -40 .. 80°C (-40 .. 176°F)

Overview

Mechanics and Process	Length of extension "L"	Rod Rope	300 .. 5,000 mm (11.81 .. 196.9") 1,000 .. 25,000 mm (39.37 .. 984.3")
	Diameter of rod/ rope	Rod Rope	ø19 mm (ø0.75") ø6 mm (ø0.3")
	Materials	Rod version	Probe and active shield 1.4404 (SS316L), PFA coated
		Rope version	Probe (rope) 1.4404 (SS316L), Optional PFA coated (for conductive media) Active shield 1.4404 (SS316L), PFA coated
		Process connection	1.4404 (SS316L)
		Probe Isolators	PEEK
Process temperature		Wetted seals	FKM or FFKM
Process pressure		Without temperature extended shaft:	-40 .. 85°C (-40 .. 185°F)
		With temperature extended shaft:	-40 .. 200°C (-40 .. 392°F)
Tensile load/ torque		-1 .. 35 bar g (-14.6 .. 511 psi g) nominal	Observe Pressure versus Temperature Curves
		Rope	max. 18.5 kN
		Rod	max. 30 Nm (horizontal load)

Rod version



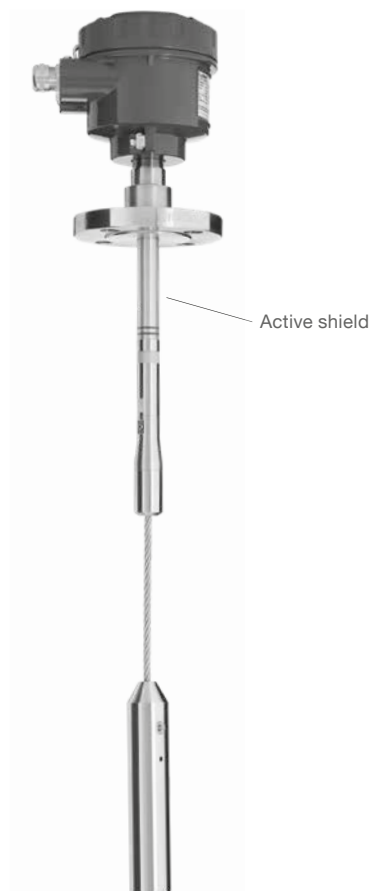
Rope version



NC 8100



Rod version
 (pos.5/6 0A and 8 Y)



Rope version
 (pos.5/6 5D and 8 Z)

Cable entries (by default)

Depending on model selected, the following cable entries are supported (options see pos.33 on page 6):

Version:	Cable entries:
Flameproof (pos.2 T,D)	M20 x 1.5 (1x open conduit + 1x Ex-d blind plug)
FM/ CSA (pos.2 M,U,N)	NPT 1/2" tapered ANSI B1.20.1 (1x open conduit + 1x Ex-d blind plug)
All other versions	M20 x 1.5 (1x screwed cable gland + 1x blind plug)

Dimensions see pages 7 - 10

Basic type

NC 8100

pos.2

Certificate (detailed Ex-markings: see page 10)

	Gas	Dust	Protection method
0	CE ⁽⁴⁾	-	-
Q	CE/ FM/ CSA ^(1, 4)	-	General purpose
T	ATEX ^(2, 4)	Zone 0/1	Flameproof, Dust Ignition Proof
W	ATEX ^(2, 4)	-	Dust Ignition Proof
M	FM/ CSA ⁽⁴⁾	-	General purpose
U	FM/ CSA ⁽⁴⁾	Cl. I Div. 1	Explosion Proof, Dust Ignition Proof
N	FM/ CSA ⁽⁴⁾	-	Dust Ignition Proof
D	INMETRO	Zone 1	Flameproof, Dust Ignition Proof

pos.3

Temperature extended shaft

1	without
2	with

pos.4

Electronic module

A	2-wire 4 - 20 mA
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NC 8100

pos.5+6

Process connection

0A	Thread ¾" NPT	taper, ANSI/ ASME B1.20.1 ⁽⁵⁾		•
0B	Thread 1" NPT	taper, ANSI/ ASME B1.20.1 ⁽⁵⁾		•
0C	Thread 1¼" NPT	taper, ANSI/ ASME B1.20.1	.....	•
0D	Thread 1½" NPT	taper, ANSI/ ASME B1.20.1	.....	•
1A	Thread R ¾"	BSPT, EN 10226/ PT (JIS-T), JIS B 0203 ⁽⁵⁾		•
1B	Thread R 1"	BSPT, EN 10226/ PT (JIS-T), JIS B 0203 ⁽⁵⁾		•
1D	Thread R 1½"	BSPT, EN 10226/ PT (JIS-T), JIS B 0203	.....	•
3A	Thread G ¾"	BSPP, EN ISO 228-1/ PF (JIS-P), JIS B 0202 ⁽⁵⁾		•
3B	Thread G 1"	BSPP, EN ISO 228-1/ PF (JIS-P), JIS B 0202 ⁽⁵⁾		•
3D	Thread G 1½"	BSPP, EN ISO 228-1/ PF (JIS-P), JIS B 0202	.....	•
5A	Flange 1" 150 lbs	ASME B16.5, raised face ⁽⁵⁾		•
5B	Flange 1" 300 lbs	ASME B16.5, raised face ⁽⁵⁾		•
5C	Flange 1" 600 lbs	ASME B16.5, raised face ⁽⁵⁾		•
5D	Flange 1½" 150 lbs	ASME B16.5, raised face	.....	•
5E	Flange 1½" 300 lbs	ASME B16.5, raised face	.....	•
5F	Flange 1½" 600 lbs	ASME B16.5, raised face	.....	•
5G	Flange 2" 150 lbs	ASME B16.5, raised face	.....	•
5H	Flange 2" 300 lbs	ASME B16.5, raised face	.....	•
5J	Flange 2" 600 lbs	ASME B16.5, raised face	.....	•
5K	Flange 3" 150 lbs	ASME B16.5, raised face	.....	•
5L	Flange 3" 300 lbs	ASME B16.5, raised face	.....	•
5M	Flange 3" 600 lbs	ASME B16.5, raised face	.....	•
5N	Flange 4" 150 lbs	ASME B16.5, raised face	.....	•
5P	Flange 4" 300 lbs	ASME B16.5, raised face	.....	•
5Q	Flange 4" 600 lbs	ASME B16.5, raised face	.....	•
6A	Flange DN25, PN16	EN 1092-1 type A flat faced ⁽⁵⁾		•
6B	Flange DN25, PN40	EN 1092-1 type A flat faced ⁽⁵⁾		•
6C	Flange DN40, PN16	EN 1092-1 type A flat faced	.....	•
6D	Flange DN40, PN40	EN 1092-1 type A flat faced	.....	•
6E	Flange DN50, PN16	EN 1092-1 type A flat faced	.....	•
6F	Flange DN50, PN40	EN 1092-1 type A flat faced	.....	•
6G	Flange DN80, PN16	EN 1092-1 type A flat faced	.....	•
6H	Flange DN80, PN40	EN 1092-1 type A flat faced	.....	•
6J	Flange DN100, PN16	EN 1092-1 type A flat faced	.....	•
6K	Flange DN100, PN40	EN 1092-1 type A flat faced	.....	•

pos.8

Length of extension "L"

Y	Rod, "L"= customer specified		
	Price per 100 mm (3.94") of part thereof (starting from 0 mm)	.....	•
	min. 300 mm (11.81"), max. 5,000 mm (196.9")		
Z	Rope, "L"= customer specified		
	Base price	.....	•
	Price per 100 mm (3.94") of part thereof (starting from 0 mm)	.....	•
	min. 1,000 mm (39.37"), max. 25,000 mm (984.3") ⁽⁶⁾		

pos.9

Material of process connection and extension "L"

2	Rod version: 1.4404 (SS316L), rod PFA coated ⁽⁷⁾		↑
	Rope version: 1.4404 (SS316L), rope not PFA coated ⁽⁸⁾		↑
3	Rope version: 1.4404 (SS316L), rope PFA coated ⁽⁹⁾		↑

Further options: see page 6

(1) Included is: TR-CU (Ordinary Locations).

(2) Included is: TR-CU.

(4) Included is: Lloyds.

(5) Not available with rope version (pos.8 Z).

(6) "L">15,000 mm (591") available for application in non conductive media.

(7) Probe and active shield are throughout PFA coated.

(8) Applicable for isolating (non conductive) media only. Active shield is PFA coated.

(9) Available with rope version (pos.8 Z). Applicable for conductive and non conductive media. Active shield is PFA coated.

NC 8100	A					1		
Position	1	2	3	4	5+6	7	8	9

L = mm ← **Order code**

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

Options/ Accessories

Options

pos.11 x	Guarantee extension to 5 years	•
pos.17 x	FFKM wetted seals ⁽¹⁾	•
pos.18 x	Mounting eye ⁽²⁾	•
pos.25 x	Inspection certificate	•
	Type 3.1 (EN 10204)	
pos.26 x	Manufacturer's Test Certificate	•
	M to DIN 55350, Part 18 and to ISO 9000	
pos.30 x	Stainless steel tag	•
	Measuring point number/ identification (max. 27 characters)	

Cable entry

Selection of the following options only necessary,
if a deviation from default is required:

pos.33 x	M20 x 1.5 2x screwed cable gland ⁽³⁾	•
pos.33 e	M20 x 1.5 1x screwed cable gland +1x blind plug ⁽⁴⁾	•
pos.33 a	NPT ½" tapered ANSI B1.20.1 (1x conduit + 1x Ex-d blind plug) ⁽⁵⁾	•

Plug ^(6, 8)

pos.35 x	Valve connector (incl. mating plug)	4-pole (incl. PE)	•
pos.35 a	M12 (without mating plug)	4-pole	•
pos.35 b	M12 (without mating plug)	5-pole (incl. PE)	•
pos.35 c	Harting Han 4A (incl. mating plug)	5-pole (incl. PE)	•

pos.36 x	Glass window in lid ⁽⁷⁾	•
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(1) Process temperature limited to -20°C (-4°F), not with FM/ CSA certificate (pos.2 M,U,N).

(2) Available for rope version with PFA coated rope (pos.8 Z with pos.9 3). See drawing on page 9.

(3) Available for all versions except flameproof/ explosion proof version (pos.2 T,U,D).

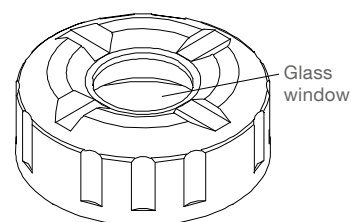
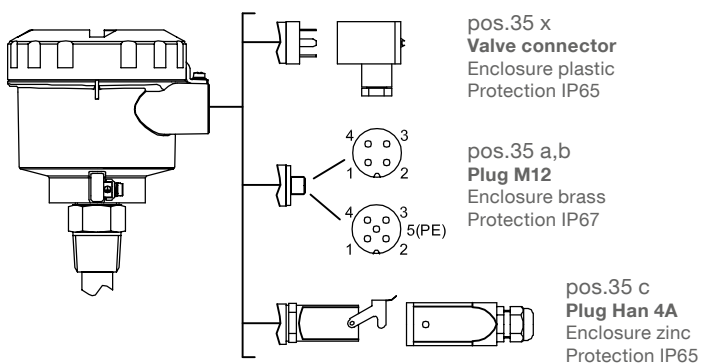
(4) Available for FM/ CSA version (pos.2 M,N) except explosion proof version (pos.2 U).

(5) Available for all versions except FM/ CSA (pos.2 M,U,N).

(6) Available for CE (pos.2 0). Not in combination with cable entries pos.33 x,e, a. Connection of plug wires to internal terminals according to customer specification.

(7) Available for CE (pos.2 0) and ATEX (pos.2 W,T).

(8) Not available with certificate Lloyds.

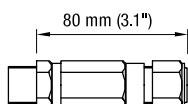


pos.36 x
Glass window in lid

Accessories

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

em440041	Cable gland M20 x 1.5 Ex-d	•
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For use with version
ATEX flameproof (pos.2 T).
Type: Stahl T3CDS 246560

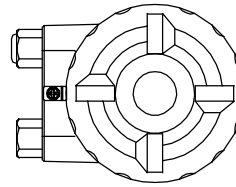
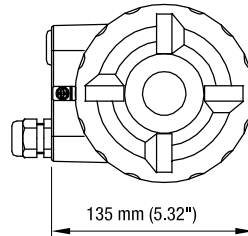
Dimensions

Enclosure

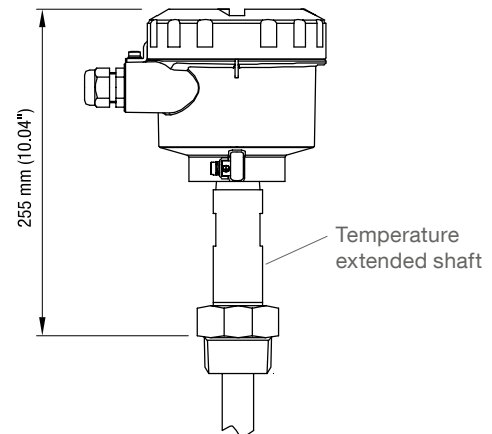
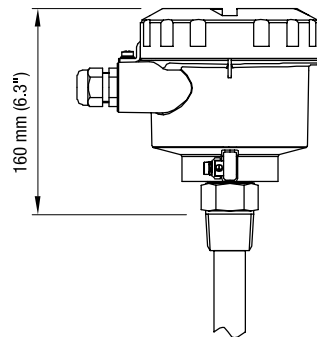
Top view

M20 x 1.5 cable gland

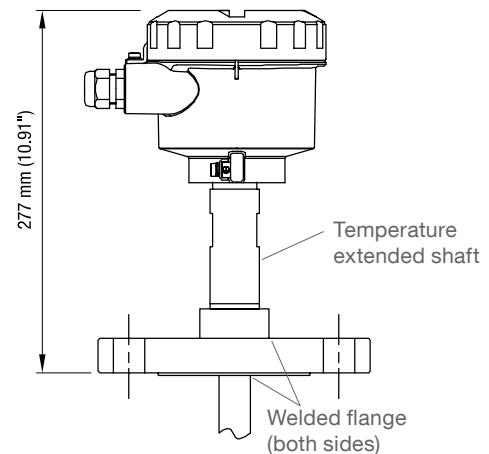
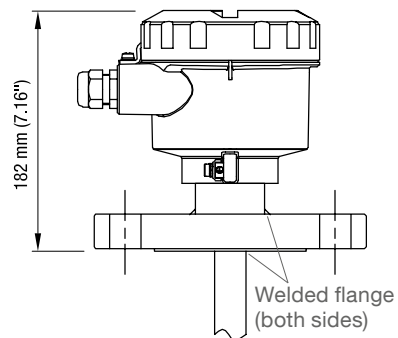
NPT ½" conduit



Threaded process connection



Flanged process connection



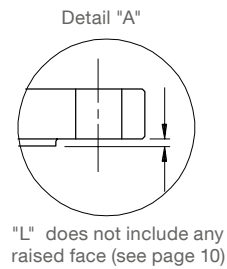
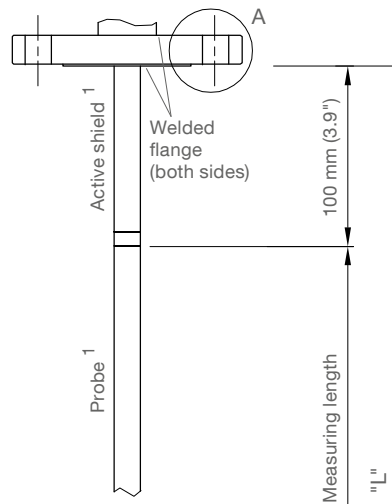
Dimensions

Rod version

Threaded process connection



Flanged process connection



¹ Active shield and probe is PFA coated

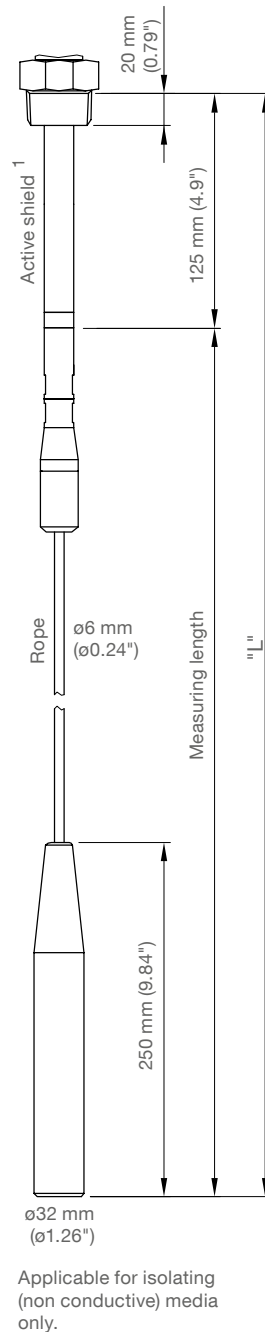
Dimensions

Rope version

Rope not PFA coated

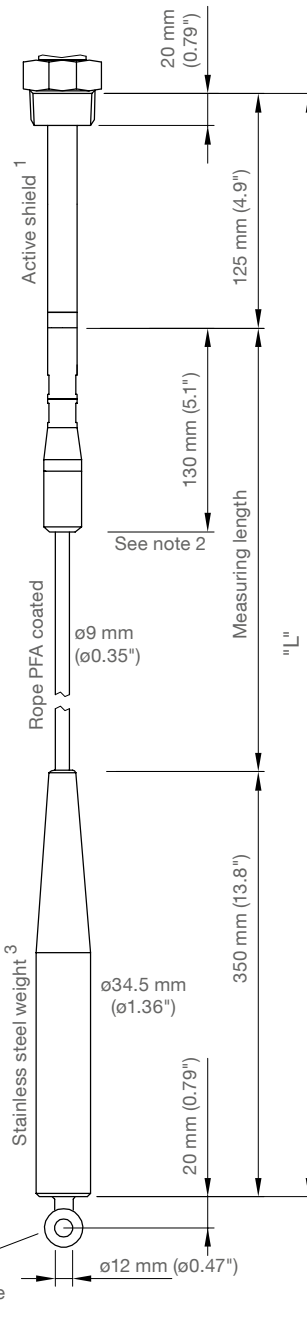
Applicable for isolating (non conductive) media only

Threaded process connection

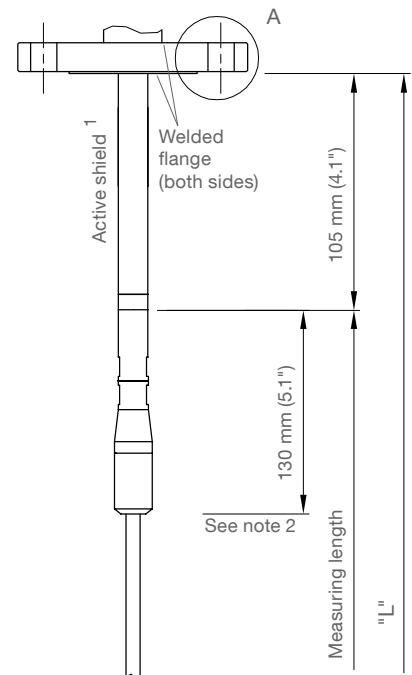


Rope PFA coated

Threaded process connection



Flanged process connection



"L" does not include any raised face (see page 10)

¹ Active shield is PFA coated

² For version with PFA coated rope:

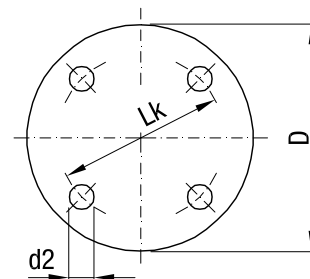
For conductive materials, the measuring length includes the exposed PFA coated rope only. Any fluid contact with the upper rod assembly (level above PFA rope) will result in a short circuit and incorrect readings.

³ Weight is electrically isolated from rope, but not PFA coated

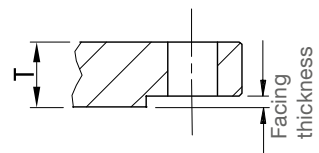
Dimensions/ Detailed Ex-markings

Flanges

	Code	Type	Number of holes	d2 mm (inch)	Lk mm (inch)	D mm (inch)	T thickness mm (inch)
ASME B16.5, raised face	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)	123.8 (4.87)	17.5 (0.69)
	5C	1" 600 lbs	4	19.1 (0.75)	88.9 (3.5)	123.8 (4.87)	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)	155.6 (6.13)	20.6 (0.81)
	5F	1½" 600 lbs	4	22.2 (0.87)	114.3 (4.5)	155.6 (6.13)	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)	22.2 (0.87)
	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)	28.6 (1.13)
	5M	3" 600 lbs	8	22.2 (0.87)	168.2 (6.62)	209.6 (8.25)	31.7 (1.25)
	5N	4" 150 lbs	8	19.1 (0.75)	190.5 (7.5)	228.6 (9.0)	23.9 (0.94)
EN 1092-1 type A, flat faced	5P	4" 300 lbs	8	22.2 (0.87)	200.0 (7.87)	254.0 (10.0)	31.7 (1.25)
	5Q	4" 600 lbs	8	25.4 (1.0)	215.9 (8.5)	273.1 (10.75)	38.1 (1.5)
	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)



Raised face



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

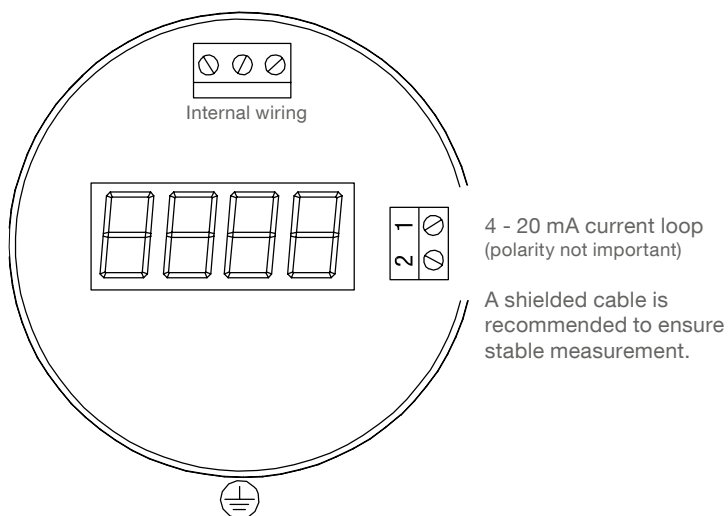
Detailed Ex-markings

pos.2	Certificate		Protection method
T	ATEX II 1/2G ATEX II 1/2D	Ex ia/db [ia Ga] IIC T Δ Ga/Gb Ex ia/tb [ia Da] IIIC T Δ Da/Db	Flameproof, Dust Ignition Proof
W	ATEX II 1/2D	Ex ia/tb [ia Da] IIIC T Δ Da/Db	Dust Ignition Proof
U	FM/ CSA	XP-AIS Class I, Div.1, Gr. A, B, C, D DIP-AIS Class II, Div.1, Gr. E, F, G DIP-AIS Class III T4	Explosion Proof, Dust Ignition Proof
N	FM/ CSA	DIP-AIS Class II, Div.1, Gr. E, F, G DIP-AIS Class III T4	Dust Ignition Proof
D	INMETRO	Ex d [ia Ga] IIC T6...T1 Gb Ex tb IIIC T85°C... 100°C Db IP65/IP68	Flameproof, Dust Ignition Proof

Electrical installation

Electrical installation

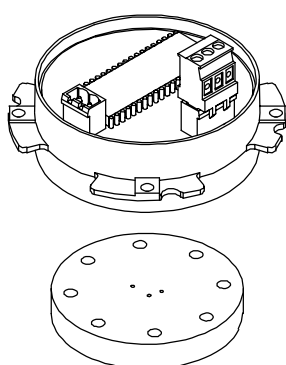
Power supply/ signal output:
 12 - 30 V DC
 2-wire current loop 4 - 20 mA
 max. resistance value 550 Ω @ 24 V DC



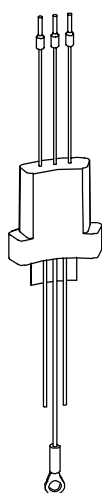
Spare parts

Minimum order value for separate orders of spare parts or accessories is 75 €.		Fitting to model code	Spare part Article number	
Electronic module				
Electronic module 2-wire 4 - 20 mA		pos.4 A	pl440300	•
Internal Safety barrier (required for Ex approvals)		pos.4 A pos.2 T,W,U,N,D	pl440060	•
Rope extension kit				
1.4404 (SS316L), including fixing parts.				
"L"=1 m (39.4")	Rope not PFA coated (rope can be shortened by customer)	pos.8 Z pos.9 2	zu440100	•
"L"=5 m (197")	Rope not PFA coated (rope can be shortened by customer)	pos.8 Z pos.9 2	zu440110	•
"L"=10 m (394")	Rope not PFA coated (rope can be shortened by customer)	pos.8 Z pos.9 2	zu440120	•
"L"=20 m (787")	Rope not PFA coated (rope can be shortened by customer)	pos.8 Z pos.9 2	zu440130	•
"L"=1 m (39.4")	Rope PFA coated (rope can <u>not</u> be shortened by customer)	pos.8 Z pos.9 3	zu440300	•
"L"=5 m (197")	Rope PFA coated (rope can <u>not</u> be shortened by customer)	pos.8 Z pos.9 3	zu440310	•
"L"=10 m (394")	Rope PFA coated (rope can <u>not</u> be shortened by customer)	pos.8 Z pos.9 3	zu440320	•
"L"=20 m (787")	Rope PFA coated (rope can <u>not</u> be shortened by customer)	pos.8 Z pos.9 3	zu440330	•
Rope weight				
Single part, 1.4404 (SS316L), for use with rope versions (for not PFA coated rope only)		pos.8 Z pos.9 2	zu440350	•
Mounting eye				
Single part, 1.4404 (SS316L), for use with rope versions (for PFA coated rope only)		pos.8 Z pos.9 3 pos.18 x	zu440360	•

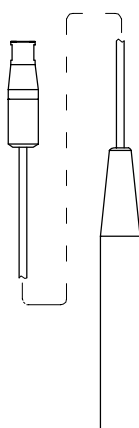
Electronic module



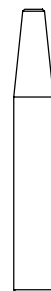
Internal Safety barrier



Rope extension kit



Rope weight



Mounting eye