

Overview

- TDR sensor for continuous level measurement of solids
- 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 / INMETRO	Zone 0 and 0/1	Intrinsically Safe
		Zone 1 and 0/1	Flameproof
		Zone 20 and 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 incensive
	TR-CU	Cl. II, III Div. 1	Dust Ignition Proof
		Ordinary Locations	
		Zone 0 and 0/1	Intrinsically Safe
		Zone 1 and 0/1	Flameproof
	Functional safety	Zone 20 and 20/21	Dust Ignition Proof
IEC 61508		SIL 2 single-channel / SIL 3 multi-channel	

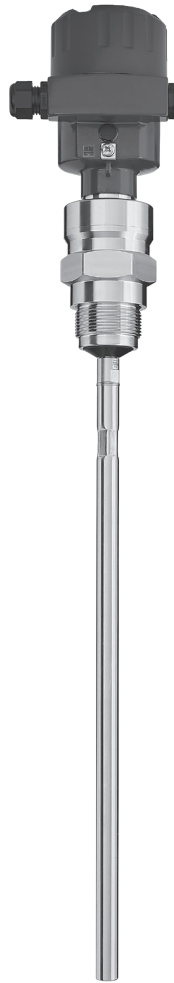
Electronics	Operating voltage	9.6 ... 35 V DC, 2-wire loop Limited voltage range for Ex ia and with Display and Adjustment Module
	Measuring signal	Current loop 4 - 20 mA according to NAMUR NE 43, HART
	Display and Adjustment Module	<ul style="list-style-type: none"> • LCD-display with background light • Display of actual 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 diagnostics 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 $\varnothing 16$ mm ($\varnothing 0.63$ ") Rope $\varnothing 4$ mm ($\varnothing 0.16$ ") Rope $\varnothing 6$ mm ($\varnothing 0.24$ ") Rope $\varnothing 11$ mm ($\varnothing 0.43$ ")	300 .. 6,000 mm (11.81 .. 236") 500 .. 75,000 mm (19.7 .. 2,953") 500 .. 75,000 mm (19.7 .. 2,953") 500 .. 65,000 mm (19.7 .. 2,559") , PA coated 500 .. 65,000 mm (19.7 .. 2,559") , PA coated
	Measuring range (blocking distance)	Upper / lower blocking distance (no measurement is possible within this area)	
	Material	Rod Rope Rope, PA coated Gravity weight Lead-through of probe to process side (rope-/ rod lead-through): Process connection	1.4404 (SS316L) 1.4401 (SS316) Steel galvanized/ PA 1.4404 (SS316L) Isolation material PEEK or PPS Sealing selectable FKM, FFKM, EPDM Thread 1.4404 (SS316L) with sealing Klingersil C-4400 Flange 1.4435 (SS316L), welded
	Process temperature (thread- or flange temperature)	Depending on lead-through of probe to process side (rope-/ rod lead-through): Sealing FKM, EPDM: Sealing FFKM:	-40 ... +150°C (-40 ... +302°F) with isolation material PEEK -40 ... +80°C (-40 ... +176°F) with isolation material PPS -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 of probe to process side (rope-/ rod lead-through): With isolation material PEEK With isolation material PPS For flanges the max. pressure rating of the flange must be additionally observed	-1 .. 40 bar (-14.5 ... +580 psi g) -1 .. 6 bar (-14.5 ... +87 psi g)
Lateral load / tensile load	Max. lateral load (torque): Rod: $\varnothing 16$ mm Max. tensile load Rope: $\varnothing 4$ mm Rope: $\varnothing 6$ mm Rope: $\varnothing 6$ mm, PA coated Rope: $\varnothing 11$ mm, PA coated	30 Nm (22.13 lbf ft) 12 KN (2,698 lbf) 30 KN (6,744 lbf) 8 KN (1,798 lbf) 30 KN (6,744 lbf)	
Min. dielectric constant of the medium	DK ≥ 1.5 Applications with DK values between 1,5 ... ca. 2,0 must be individually checked		

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:

Version:	Cable entries:
CE, ATEX, IEC-Ex, INMETRO, TR-CU	M20 x 1.5 1x screwed cable gland + 1x blind plug
FM	NPT 1/2" tapered ANSI B1.20.1 1x open conduit + 1x blind plug

Housing

Standard housing is aluminium single chamber.
 Alternative housings see option pos.16

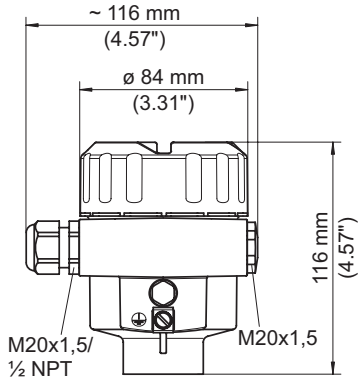


Display and Adjustment Module
 (pos. 9)

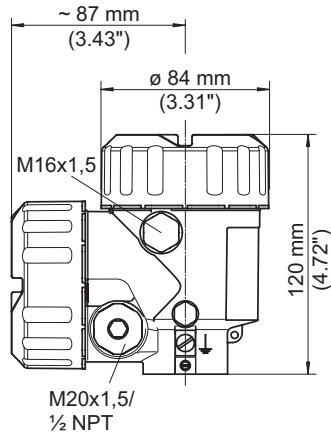
Dimensions

Housing

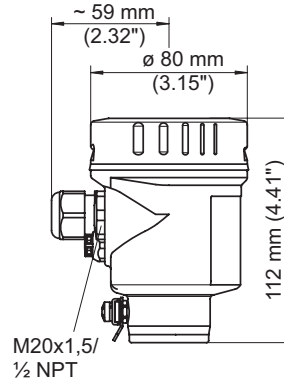
Aluminium
single chamber



Aluminium
double chamber

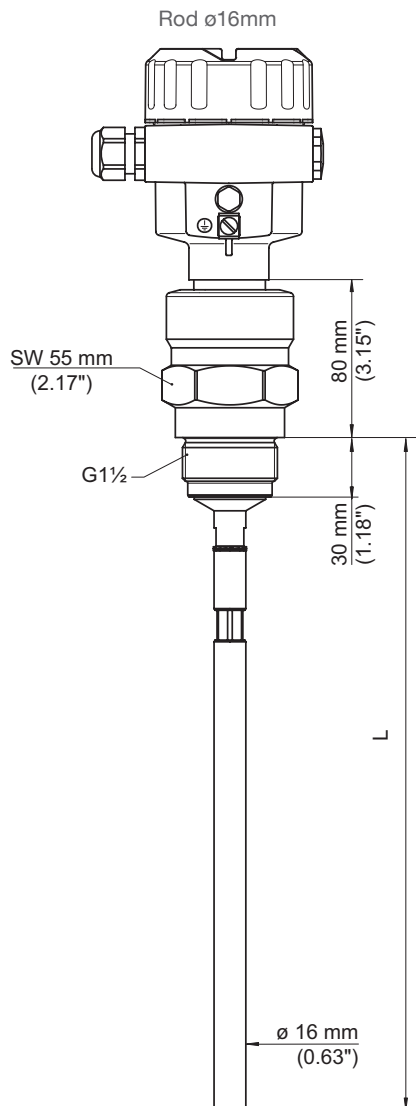


Stainless steel
single chamber



Rod version

Process connection: thread

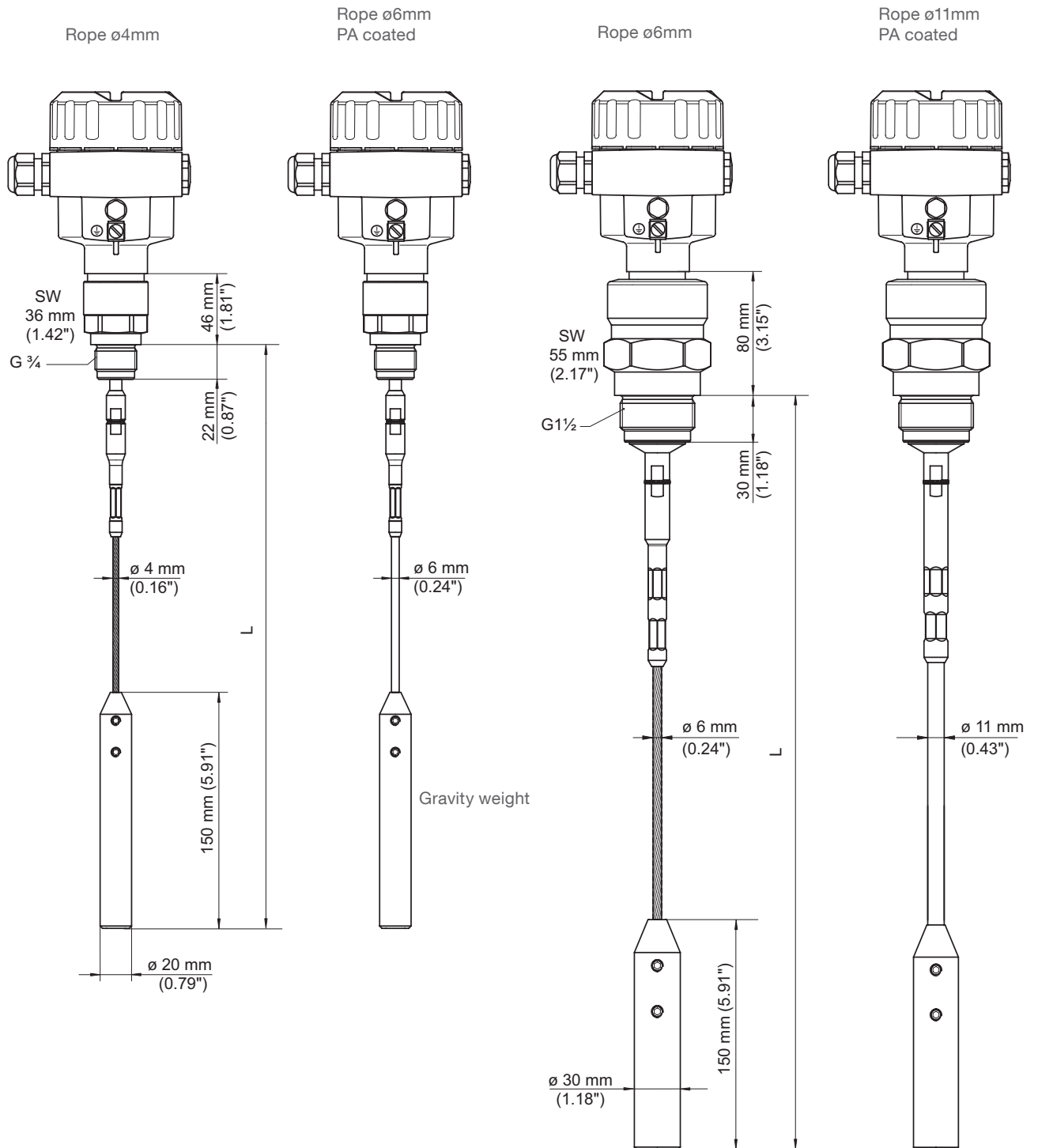


Flange
welded

Dimensions

Rope version

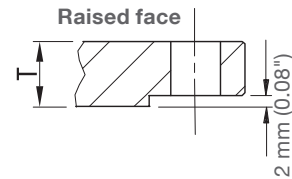
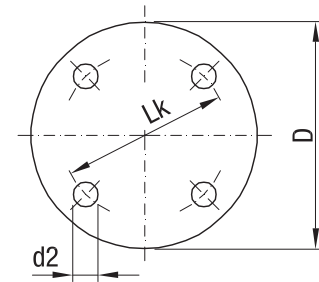
Process connection: thread



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")



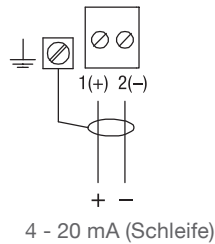
Detailed Ex-markings

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	Ex db IIC T6...T1 Ga/Gb Ex db IIC T6...T1 Gb Flameproof
	ATEX II 1D ATEX II 1/2D	Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db Dust Ignition Proof
V	ATEX II 1/2G ATEX II 2G	Ex db IIC T6...T1 Ga/Gb Ex db 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	Ex ia IIC T6..T1 Ga Ex ia IIC T6..T1 Ga/Gb Intrinsically Safe
D	IEC Ex	Ex db IIC T6...T1 Ga/Gb Ex db IIC T6...T1 Gb Flameproof
		Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db Dust Ignition Proof
C	IEC Ex	Ex db IIC T6...T1 Ga/Gb Ex db IIC T6...T1 Gb Flameproof
A	IEC Ex	Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db Dust Ignition Proof
F	INMETRO	Ex ia IIC T6...T1 Ga Ex ia IIC T6...T1 Ga/Gb Intrinsically Safe
E	INMETRO	Ex db IIC T6...T1 Ga/Gb Ex db IIC T6...T1 Gb Flameproof
		Ex ta IIIC T! Da Ex ta/tb IIIC T! Da/Db Dust Ignition Proof
K	INMETRO	Ex db IIC T6...T1 Ga/Gb Ex db IIC T6...T1 Gb Flameproof
L	INMETRO	Ex ta IIIC T! Da Ex 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 incensive
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
X	TR-CU	0Ex ia IIC T6...T1 Ga X Ga/Gb Ex ia IIC T6...T1 X Intrinsically Safe
J	TR-CU	Ga/Gb Ex db IIC T6...T1 X 1Ex db IIC T6...T1 Gb X Flameproof
		Ex ta IIIC T... Da X Ex ta/tb IIIC T... Da/Db X Dust Ignition Proof
R	TR-CU	Ga/Gb Ex db IIC T6...T1 X 1Ex db IIC T6...T1 Gb X Flameproof
1	TR-CU	Ex ta IIIC T... Da X Ex ta/tb IIIC T... Da/Db X 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.



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.

