

LMK 358H

Separable Stainless Steel Probe with HART[®]-communication

Ceramic Sensor

accuracy according to IEC 60770:
0.1 % FSO



Nominal pressure

from 0 ... 60 cmH₂O up to 0 ... 100 mH₂O

Output signals

2-wire: 4 ... 20 mA
others on request

Special characteristics

- ▶ diameter 39.5 mm
- ▶ cable and sensor section separable
- ▶ HART[®] communication (setting of offset, span and damping)
- ▶ permissible temperatures up to 85 °C
- ▶ high long-term stability


Optional versions


- ▶ IS-version zone 0
- ▶ cable protection via corrugated pipe
- ▶ diaphragm 99.9 % Al₂O₃


The separable stainless steel probe LMK 358H has been designed for level measurement in waste water, waste and higher viscosity media. Basic element is a capacitive ceramic sensor.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembly with a connector and can be changed easily.

Preferred areas of use are

 Water
ground water level measurement
rain spillway basin

 Sewage
waste water treatment
water recycling

 Fuel / Oil
level monitoring in open tanks
with low filling heights
fuel storage
tank farms
biogas plants



Input pressure range ¹								
Nominal pressure gauge	[bar]	0.06	0.16	0.4	1	2	5	10
Level	[mH ₂ O]	0.6	1.6	4	10	20	50	100
Overpressure	[bar]	2	4	6	8	15	25	35

¹ On customer request we adjust the devices by software on the required pressure ranges, within the turn-down-possibility (starting at 0.02 bar)

Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V _S = 12 ... 36 V _{DC} with HART [□] communication	V _{S rated} = 24 V _{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V _S = 12 ... 28 V _{DC} with HART [□] communication	V _{S rated} = 24 V _{DC}

Performance				
Accuracy ²	P _N ≥ 160 mbar	TD ≤ 1:5	≤ ± 0.2 % FSO	TD _{max} = 1:10
		TD > 1:5	≤ ± [0.2 + 0.03 x TD] % FSO	
	P _N < 160 mbar		≤ ± [0.2 + 0.1 x TD] % FSO	TD _{max} = 1:3
	P _N ≥ 1 bar	TD ≤ 1:5	≤ ± 0.1 % FSO	TD _{max} = 1:10
		TD > 1:5	≤ ± [0.1 + 0.02 x TD] % FSO	
Permissible load	R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω load at HART [®] -communication: R _{min} = 250 Ω			
Long term stability	≤ ± (0.1 x turn-down) % FSO / year at reference conditions			
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ			
Turn-on time	850 msec			
Mean response time	140 msec – without consideration of electronic damping		measuring rate 7/sec	
Max. response time	380 msec			
Adjustability	configuration of following parameters possible (interface / software necessary ³)			
	- electronic damping 0 ... 100 sec			
	- offset: 0 ... 80 % FSO			
	- turn-down of span: max. 1:10			

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ software, interface, and cable have to be ordered separately (software appropriate for Windows[®] 95, 98, 2000, NT Version 4.0 or higher, and XP)

Thermal effects (Offset and Span) / - permissible temperatures	
Tolerance band	≤ ± (0.2 x turn-down) % FSO
TC, average	± (0.02 x turn-down) % FSO / 10 K
in compensated range	-20 ... 80 °C
Permissible temperatures	medium: -25 ... 85 °C electronic / environment: -25 ... 85 °C storage: -25 ... 85 °C

Electrical protection ⁴	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

⁴ additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request

Mechanical stability	
Vibration	4 g (according to: DIN EN 60068-2-6)

Electrical connection	
Cable with sheath material ⁵	PVC (-5 ... 70 °C) grey PUR (-25 ... 70 °C) black FEP (-25 ... 70 °C) black TPE (-25 ... 85 °C) blue

⁵ shielded cable with integrated air tube for atmospheric pressure reference

Materials (media wetted)	
Housing	stainless steel 1.4404 (316L)
Seals	FKM EPDM others on request
Diaphragm	standard: ceramics Al ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 99.9 %
Protection cap	POM

Explosion protection	
Approval DX15A-LMK 358H	IBExU 10 ATEX 1186 X Zone 0 ⁶ : II 1G Ex ia IIB T4 zone 20: II 1D Ex iaD 20 T85°C
Safety technical maximum values	U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i = 0 nF, L _i = 0 μH, the supply connections have an inner capacity of max. 27 nF opposite the enclosure
Permissible media temperature	in zone 0: -20 ... 60 °C with p _{atm} 0.8 bar up to 1.1 bar zone 1 or higher: -25 ... 70 °C
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m

⁶ for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4" (zone 0)

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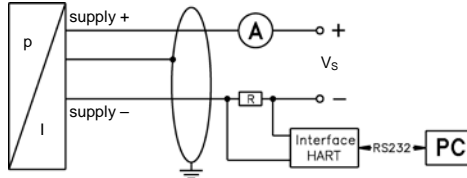
Stainless Steel Probe

Technical Data

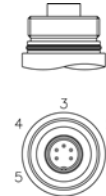
Miscellaneous	
Option cable protection	stainless steel pipe for probe in stainless steel: available as compact product (standard: stainless steel pipe with a total length up to 2 m possible; other lengths on request)
Current consumption	max. 21 mA
Weight	approx. 650 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC

Wiring diagram

2-wire-system (current) HART®



connector

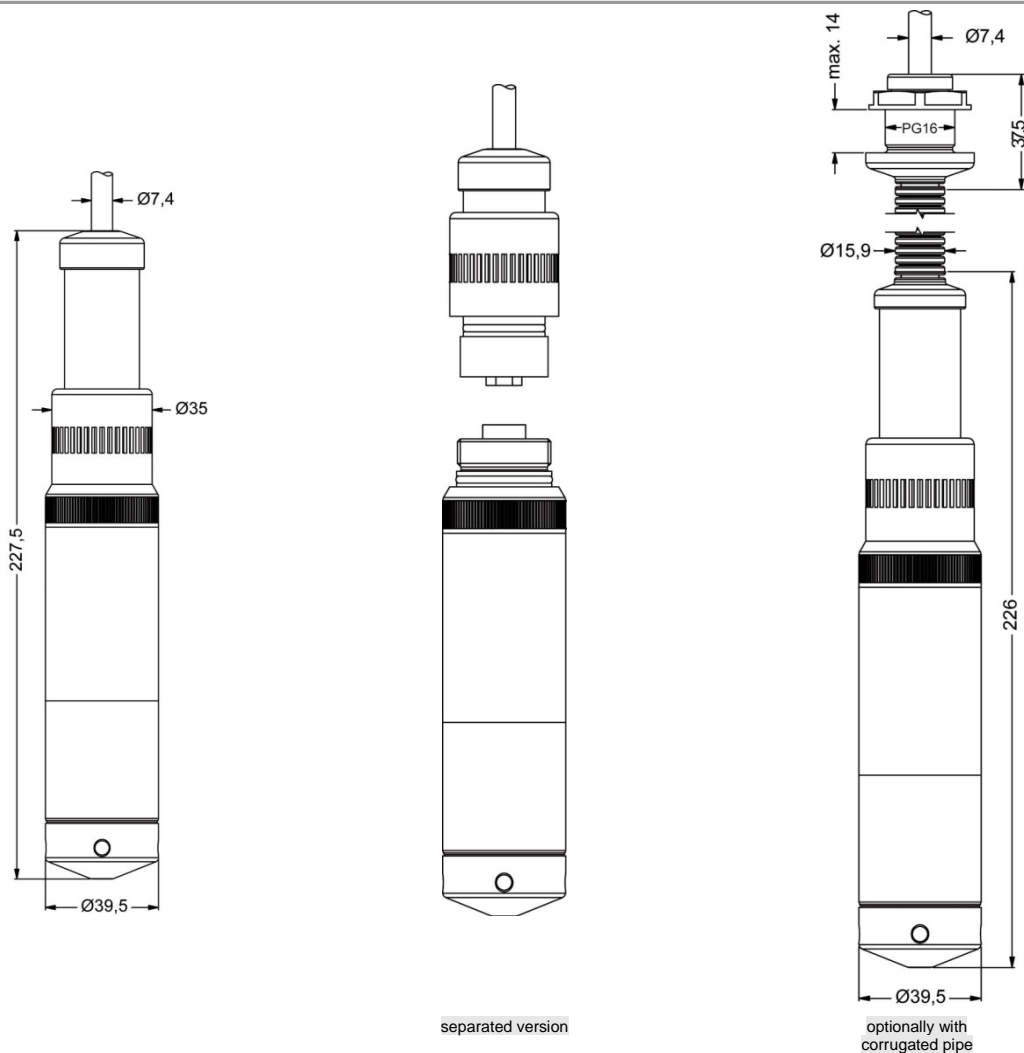


Pin configuration

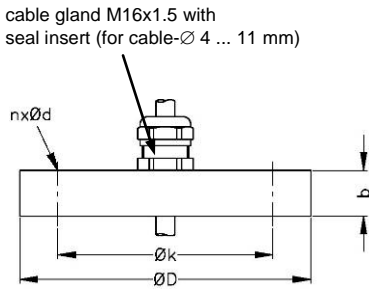
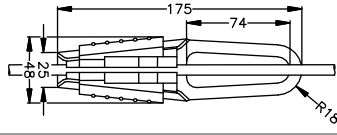

Electrical connection	Binder series 723 ⁷ (5-pin)	cable colours (DIN 47100)
Supply +	3	wh (white)
Supply -	1	gn (brown)
Shield	5	gn/ye (yellow / green)

⁷ in separated version

Dimensions (in mm)



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Windows® is a registered trade mark of Microsoft Corporation

Mounting flange with cable gland	
Technical data	
Suitable for	all probes
Flange material	stainless steel 1.4404 (316L)
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic
Seal insert	material: TPE (ingress protection IP 68)
Hole pattern	according to DIN 2507
Version	Size (in mm)
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18
Weight	
DN25 / PN40	1.4 kg
DN50 / PN40	3.2 kg
DN80 / PN16	4.8 kg
Ordering type	Ordering code
DN25 / PN40 with cable gland brass, nickel plated	ZMF2540
DN50 / PN40 with cable gland brass, nickel plated	ZMF5040
DN80 / PN16 with cable gland brass, nickel plated	ZMF8016
Terminal clamp	
Technical Data	
Suitable for	all probes with cable \varnothing 5.5 ... 10.5 mm
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)
Weight	approx. 160 g
Ordering type	Ordering code
Terminal clamp, steel, zinc plated	Z100528
Terminal clamp, stainless steel 1.4301 (304)	Z100527
Display program	
<p>CIT 200 Process display with LED display</p> <p>CIT 250 Process display with LED display and contacts</p> <p>CIT 300 Process display with LED display, contacts and analogue output</p> <p>CIT 350 Process display with LED display, bargraph, contacts and analogue output</p> <p>CIT 400 Process display with LED display, contacts, analogue output and Ex-approval</p> <p>CIT 600 Multichannel process display with graphics-capable LC display</p> <p>CIT 650 Multichannel process display with graphics-capable LC display and datalogger</p> <p>CIT 700 Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts</p> <p>PA 440 Field display with 4-digit LC display</p>	
<p>For further information please contact our sales department or visit our homepage: http://www.bdsensors.com</p>	
 <p>cable gland M16x1.5 with seal insert (for cable-\varnothing 4 ... 11 mm)</p>	
	
	

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