

# LMK 358H

## Separable Stainless Steel Probe with HART<sup>®</sup>-communication

Ceramic Sensor

accuracy according to IEC 60770:  
0.1 % FSO



### Nominal pressure

from 0 ... 60 cmH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

### Output signals

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

### Special characteristics

- ▶ diameter 39.5 mm
- ▶ cable and sensor section separable
- ▶ HART<sup>®</sup> 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 % Al<sub>2</sub>O<sub>3</sub>


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 <sup>1</sup>								
Nominal pressure gauge	[bar]	0.06	0.16	0.4	1	2	5	10
Level	[mH <sub>2</sub> O]	0.6	1.6	4	10	20	50	100
Overpressure	[bar]	2	4	6	8	15	25	35
<sup>1</sup> 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 <sub>S</sub> = 12 ... 36 V <sub>DC</sub> with HART <sup>□</sup> communication					V <sub>S rated</sub> = 24 V <sub>DC</sub>		
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 12 ... 28 V <sub>DC</sub> with HART <sup>□</sup> communication					V <sub>S rated</sub> = 24 V <sub>DC</sub>		
Performance								
Accuracy <sup>2</sup>	P <sub>N</sub> ≥ 160 mbar	TD ≤ 1:5 ≤ ± 0.2 % FSO TD > 1:5 ≤ ± [0.2 + 0.03 x TD] % FSO				TD <sub>max</sub> = 1:10		
	P <sub>N</sub> < 160 mbar	≤ ± [0.2 + 0.1 x TD] % FSO				TD <sub>max</sub> = 1:3		
	P <sub>N</sub> ≥ 1 bar	TD ≤ 1:5 ≤ ± 0.1 % FSO TD > 1:5 ≤ ± [0.1 + 0.02 x TD] % FSO				TD <sub>max</sub> = 1:10		
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω load at HART <sup>®</sup> -communication: R <sub>min</sub> = 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 <sup>3</sup> ) - electronic damping 0 ... 100 sec - offset: 0 ... 80 % FSO - turn-down of span: max. 1:10							
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)								
<sup>3</sup> software, interface, and cable have to be ordered separately (software appropriate for Windows <sup>®</sup> 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 <sup>4</sup>								
Short-circuit protection	permanent							
Reverse polarity protection	no damage, but also no function							
Electromagnetic compatibility	emission and immunity according to EN 61326							
<sup>4</sup> 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 <sup>5</sup>	PVC (-5 ... 70 °C) grey PUR (-25 ... 70 °C) black FEP <sup>6</sup> (-25 ... 70 °C) black TPE (-25 ... 85 °C) blue							
<sup>5</sup> shielded cable with integrated air tube for atmospheric pressure reference								
<sup>6</sup> do not use freely suspended probes with an FEP cable if effects due to highly charging processes are expected								
Materials (media wetted)								
Housing	stainless steel 1.4404 (316L)							
Seals	FKM EPDM others on request							
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 96 % option: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %							
Protection cap	POM							
Explosion protection								
Approval DX15A-LMK 358H	IBExU 10 ATEX 1186 X zone 0 <sup>7</sup> : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T85 °C Da							
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 13,2 nF, L <sub>i</sub> = 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 <sub>atm</sub> 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							
<sup>7</sup> for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4" (zone 0)								

# LMK 358H

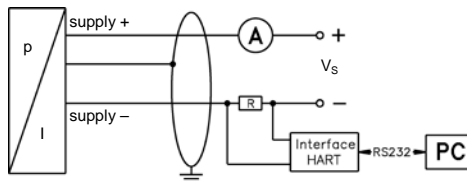
Stainless Steel Probe

Technical Data

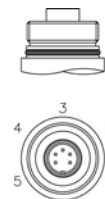
Miscellaneous	
Option cable protection	stainless steel pipe for probe in stainless steel: available as compact product (standard: stainless steel pipe with a total length up to 2 m possible; other lengths on request)
Current consumption	max. 21 mA
Weight	approx. 650 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

## Wiring diagram

2-wire-system (current) HART®



connector

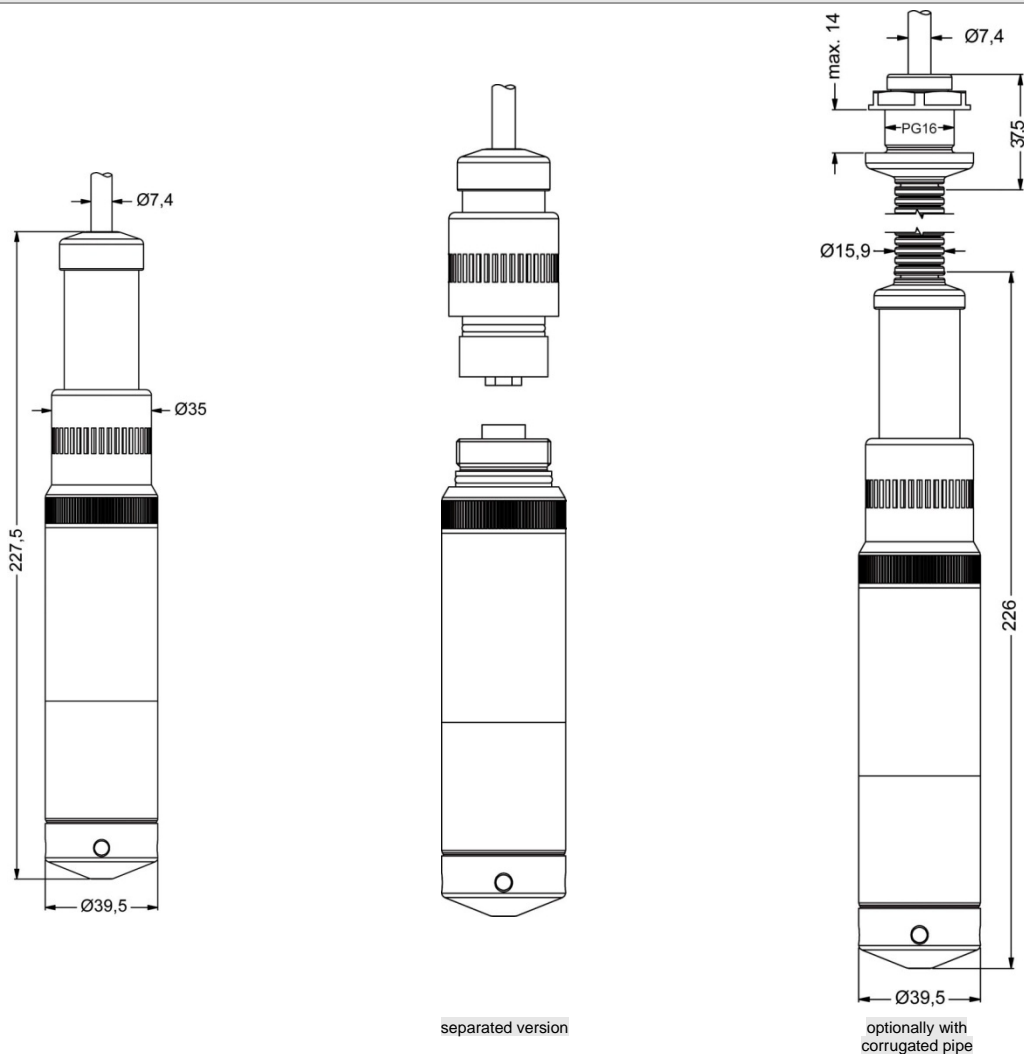


## Pin configuration

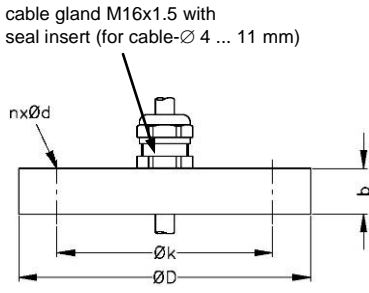
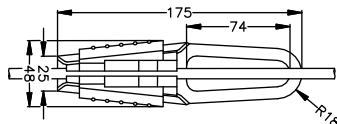

Electrical connection	Binder series 723 <sup>8</sup> (5-pin)	cable colours (IEC 60757)
Supply +	3	wh (white)
Supply -	1	gn (brown)
Shield	5	gnye (green-yellow)

<sup>8</sup> in separated version

## Dimensions (in mm)



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Windows® is a registered trade mark of Microsoft Corporation

Mounting flange with cable gland		
<b>Technical data</b>		
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	
<b>Version</b>	<b>Size (in mm)</b>	<b>Weight</b>
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	1.4 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	3.2 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	4.8 kg
<b>Ordering type</b>		<b>Ordering code</b>
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
<b>Terminal clamp</b>		
<b>Technical Data</b>		
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	
<b>Ordering type</b>		<b>Ordering code</b>
Terminal clamp, steel, zinc plated		Z100528
Terminal clamp, stainless steel 1.4301 (304)		Z100527
<b>Display program</b>		
<p><b>CIT 200</b> Process display with LED display</p> <p><b>CIT 250</b> Process display with LED display and contacts</p> <p><b>CIT 300</b> Process display with LED display, contacts and analogue output</p> <p><b>CIT 350</b> Process display with LED display, bargraph, contacts and analogue output</p> <p><b>CIT 400</b> Process display with LED display, contacts, analogue output and Ex-approval</p> <p><b>CIT 600</b> Multichannel process display with graphics-capable LC display</p> <p><b>CIT 650</b> Multichannel process display with graphics-capable LC display and datalogger</p> <p><b>CIT 700</b> Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts</p> <p><b>PA 440</b> Field display with 4-digit LC display</p> <p>For further information please contact our sales department or visit our homepage: <a href="http://www.bdsensors.com">http://www.bdsensors.com</a></p>		 <p>cable gland M16x1.5 with seal insert (for cable-<math>\varnothing</math> 4 ... 11 mm)</p> 
<p><b>CIT 200</b> Process display with LED display</p> <p><b>CIT 250</b> Process display with LED display and contacts</p> <p><b>CIT 300</b> Process display with LED display, contacts and analogue output</p> <p><b>CIT 350</b> Process display with LED display, bargraph, contacts and analogue output</p> <p><b>CIT 400</b> Process display with LED display, contacts, analogue output and Ex-approval</p> <p><b>CIT 600</b> Multichannel process display with graphics-capable LC display</p> <p><b>CIT 650</b> Multichannel process display with graphics-capable LC display and datalogger</p> <p><b>CIT 700</b> Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts</p> <p><b>PA 440</b> Field display with 4-digit LC display</p> <p>For further information please contact our sales department or visit our homepage: <a href="http://www.bdsensors.com">http://www.bdsensors.com</a></p>		

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## Ordering code LMK 358H

LMK 358H

[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

<b>Pressure</b>		in bar	4	4	5																
		in mH <sub>2</sub> O	4	4	6																
<b>Input</b>	[mH <sub>2</sub> O]	[bar]																			
	0.60	0.06	0	6	0	0															
	1.60	0.16	1	6	0	0															
	4.00	0.40	4	0	0	0															
	10	1.0	1	0	0	1															
	20	2.0	2	0	0	1															
	50	5.0	5	0	0	1															
	100	10	1	0	0	2															
	customer		9	9	9	9														consult	
<b>Housing</b>																					
	Stainless steel 1.4404 (316L)		1																		
	customer		9																		consult
<b>Diaphragm</b>																					
	Ceramics Al <sub>2</sub> O <sub>3</sub> 96%		2																		
	Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%		C																		
	customer		9																		consult
<b>Output</b>																					
	HART®-communication								H												
	4 ... 20 mA / 2-wire																				
	HART®-communication								I												
	Intrinsic safety 4 ... 20 mA / 2-wire																				
	customer		9																		consult
<b>Seals</b>																					
	FKM		1																		
	EPDM		3																		
	customer		9																		consult
<b>Electrical connection</b>																					
	PVC-cable <sup>1</sup>								1												
	PUR-cable <sup>1</sup>								2												
	FEP-cable <sup>1</sup>								3												
	TPE-cable								4												
	customer		9																		consult
<b>Accuracy</b>																					
	P <sub>N</sub> ≥ 1 bar	0.1 %							1												
	P <sub>N</sub> < 1 bar	0.2 %							B												
	customer		9																		consult
<b>Cable length</b>		in m									9	9	9								
<b>Special version</b>																					
	standard											0	0	0							
	prepared for mounting <sup>2</sup>											1	0	6							
	with stainless steel pipe																				
	cable protection with																				
	stainless steel corrugated pipe											1	0	3		9	9	9			consult
	with pipe length in m																				
	customer		9	9	9																consult

<sup>1</sup> cable with integrated air tube for atmospheric pressure reference  
<sup>2</sup> stainless steel pipe is not part of the supply  
  
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