

LMK 358



Detachable Stainless Steel Probe

Ceramic Sensor

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO

Nominal pressure

from 0 ... 40 cmH₂O up to 0 ... 100 mH₂O

Output signals

2-wire: 4 ... 20 mA
3-wire: 0 ... 10 V
others on request

Special characteristics

- ▶ cable assembly and sensor head detachable
- ▶ diameter 39.5 mm
- ▶ especially suitable for sewage, viscous and pasty media

Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gas and dust
- ▶ cable protection with stainless steel corrugated pipe
- ▶ diaphragm 99.9 % Al₂O₃
- ▶ different kinds of cables and elastomers

The detachable stainless steel probe LMK 358 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 sensor 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 and oil

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



Input pressure range														
Nominal pressure gauge	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10
Level	[mH ₂ O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35
Max. ambient pressure (housing): 40 bar														
Output signal / Supply														
Standard	2-wire: 4 ... 20 mA / V _S = 9 ... 32 V _{DC}													
Option IS-version	2-wire: 4 ... 20 mA / V _S = 14 ... 28 V _{DC}													
Option 3-wire	3-wire: 0 ... 10 V / V _S = 12.5 ... 32 V _{DC}													
Performance														
Accuracy ¹	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO													
Permissible load	R _{max} = [(V _S - V _{Smin}) / 0.02 A] Ω													
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ													
Long term stability	≤ ± 0.1 % FSO / year at reference conditions													
Turn-on time	700 msec													
Mean response time	≤ 200 msec							measuring rate 5/sec						
Max. response time	380 msec													
¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)														
Thermal effects (offset and span)														
Tolerance band	≤ ± 1 % FSO													
in compensated range	-20 ... 80 °C													
Permissible temperatures														
Permissible temperatures	medium /electronic / environment:							-25 ... 125 °C						
	storage:							-40 ... 125 °C						
Electrical protection ²														
Short-circuit protection	permanent													
Reverse polarity protection	no damage, but also no function													
Lightning protection	2-wire: integrated							3-wire: without						
Electromagnetic compatibility	emission and immunity according to EN 61326													
² additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request														
Electrical connection														
Cable with sheath material ³	PVC (-5 ... 70 °C) grey Ø 7.4 mm PUR (-25 ... 70 °C) black Ø 7.4 mm FEP ⁴ (-25 ... 70 °C) black Ø 7.4 mm TPE-U (-25 ... 125 °C) blue Ø 7.4 mm													
Bending radius	static installation:							10-fold cable diameter						
	dynamic application:							20-fold cable diameter						
³ shielded cable with integrated ventilation tube for atmospheric pressure reference														
⁴ 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 ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 99.9 %													
Protection cap	POM-C													
Cable sheath	PVC, PUR, FEP, TPE-U													
Explosion protection (only for 4 ... 20 mA / 2-wire)														
Approval DX14-LMK 358	IBExU05ATEX1070 X Zone 0 ⁵ : II 1G Ex ia IIB T4 Ga Zone 20: II 1D Ex ia IIIC T85 °C Da													
Safety technical maximum values	U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i = 27 nF, L _i = 5 μH, C _{gnd} = 27 nF													
Permissible 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: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m													
⁵ for optional stainless steel corrugated pipe following designation is valid: "II 1G Ex ia IIC T4 Ga" (zone 0)														
Miscellaneous														
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													

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Technical Data

Wiring diagram

2-wire-system (current)

3-wire-system (voltage)

connector

A-A

B-B

Pin configuration

Electrical connection	Binder series 723 ⁶ (5-pin)		cable colours (IEC 60757)
	2-wire	3-wire	
Supply +	3	3	WH (white)
Supply -	1	4	BN (brown)
Signal + (only for 3-wire)	-	1	GN (green)
Shield	5	5	GNYE (green-yellow)

⁶ if detached

Dimensions (mm / in)

standard

option

protection cap removable

sensor head and cable detached

corrugated pipe

Mounting flange with cable gland

dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

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		
Ordering type	Ordering code	Weight	
DN25 / PN40 with cable gland brass, nickel plated	ZMF2540	1.4 kg	
DN50 / PN40 with cable gland brass, nickel plated	ZMF5040	3.2 kg	
DN80 / PN16 with cable gland brass, nickel plated	ZMF8016	4.8 kg	

Terminal clamp

Technical data

Suitable for	all probes with cable Ø 5.5 ... 10.5 mm		
Material of housing	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)		
Material of clamping jaws and positioning clips	PA (fibre-glass reinforced)		
Dimensions (mm)	174 x 45 x 32		
Hook diameter	20 mm		
Ordering type	Ordering code	Weight	
Terminal clamp, steel, zinc plated	Z100528	approx. 160 g	
Terminal clamp, stainless steel 1.4301 (304)	Z100527		

Display program

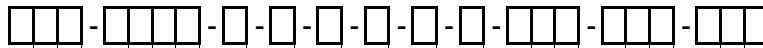
- CIT 200** Process display with LED display
- CIT 250** Process display with LED display and contacts
- CIT 300** Process display with LED display, contacts and analogue output
- CIT 350** Process display with LED display, bargraph, contacts and analogue output
- CIT 400** Process display with LED display, contacts, analogue output and Ex-approval
- CIT 600** Multichannel process display with graphics-capable LC display
- CIT 650** Multichannel process display with graphics-capable LC display and datalogger
- CIT 700 / CIT 750** Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts
- PA 440** Field display with 4-digit LC display

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Ordering code LMK 358

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Pressure																					
	in bar	4	4	5																	
	in mH ₂ O	4	4	6																	
Input		[mH ₂ O]	[bar]																		
	0.4	0.04		0	4	0	0														
	0.6	0.06		0	6	0	0														
	1.0	0.10		1	0	0	0														
	1.6	0.16		1	6	0	0														
	2.5	0.25		2	5	0	0														
	4.0	0.40		4	0	0	0														
	6.0	0.60		6	0	0	0														
	10	1.0		1	0	0	1														
	16	1.6		1	6	0	1														
	25	2.5		2	5	0	1														
	40	4.0		4	0	0	1														
	60	6.0		6	0	0	1														
	100	10		1	0	0	2														
	customer			9	9	9	9													consult	
Housing																					
	stainless steel 1.4404 (316L)							1													
	customer							9													consult
Diaphragm																					
	ceramics Al ₂ O ₃ 96 %							2													
	ceramics Al ₂ O ₃ 99.9 %							C													
	customer							9													consult
Output																					
	4 ... 20 mA / 2-wire								1												
	0 ... 10 V / 3-wire								3												
	intrinsic safety 4 ... 20 mA / 2-wire								E												
	customer								9												consult
Seals																					
	FKM								1												
	EPDM								3												
	customer								9												consult
Electrical connection																					
	PVC-cable (grey, Ø 7.4 mm) ¹									1											
	PUR-cable (black, Ø 7.4 mm) ¹									2											
	FEP-cable (black, Ø 7.4 mm) ¹									3											
	TPE-U-cable (blue, Ø 7.4 mm) ¹									4											
	customer									9											consult
Accuracy																					
	standard	0.35 % FSO								3											
	option	0.25 % FSO								2											
	customer									9											consult
Cable length																					
	in m										9	9	9								
Special version																					
	standard													0	0	0					
	cable protection with																				
	stainless steel corrugated pipe													1	0	3			9	9	9
	with pipe length in m																				consult
	customer																				consult

¹ shielded cable with integrated ventilation tube for atmospheric pressure reference