LMK 387

Stainless Steel Probe

Ceramic Sensor

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

Nominal pressure

from 0 ... 1 mH_2O up to 0 ... 100 mH_2O

Output signals

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

Special characteristics

- diameter 22 mm
- diaphragm ceramics 96% Al_2O_3
- good long-term stability
- especially for waste water,

Optional versions

- diaphragm ceramics 99,9% Al_2O_3
- IS-version
  Ex ia = intrinsically safe for
  gases and dust
- mounting with stainless steel tube
- different kinds of cable
- different kinds of elastomer

The stainless steel probe LMK 387 was developed for level and gauge measurement in wastewater, sludge or water courses. The mechanical robustness of the front-flush ceramic diaphragm facilitates an easy disassembly and cleaning of the probe in case of service.

Compared to the level probe LMK 382 the outside-diameter is only 22mm, which allows an easy installation and backfitting in 1“ tubes or in cramped fitting conditions. An IS-version is also available.

Preferred areas of use

Water
Groundwater and level monitoring

Sewage
waste water treatment
water recycling

Fuel and oil
Tank battery
Biogas plants

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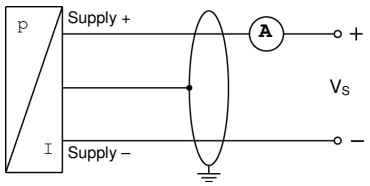
Input pressure range												
Nominal pressure gauge	[bar]	0,1	0,16	0,25	0,4	0,6	1	1,6	2,5	4	6	10
Level	[mH_2O]	1	1,6	2,5	4	6	10	16	25	40	60	100
Overpressure	[bar]	3	4	5	5	7	7	12	20	20	20	20
Berst pressure ≥	[bar]	4	6	8	8	9	9	18	25	25	30	30
Permissible vacuum	[bar]	-0.2	-0.3	-0.5				-1				

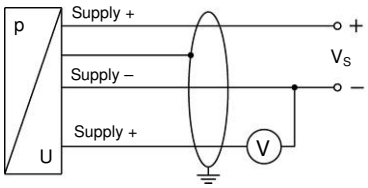
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 12 ... 36 V_{DC}
Option IS-version	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}
Option	3-wire: 0 … 10 V / V_S = 14 ... 36 V_{DC}
Performance	
Accuracy [1]	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO others on request
Permissible load	2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± 0.1 % FSO / year
Turn-on time	450 msec
Mean response time	≤ 70 msec
Measuring rate	80 Hz
[1] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)	
Thermal effects (Offset and Span)	
Tolerance band [% FSO]	≤ 1.0% FSO in compensated range -20 ... 80 °C
Permissible temperatures	
Permissible temperatures	medium: -40 ... 85 °C electronics / environment: -40 ... 85 °C storage: -40 ... 85 °C
Electrical protection [2]	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
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 outlet	shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed)
Materials (media wetted)	
Housing	standard: stainless steel 1.4404 (316 L) others on request
Cable	PVC (-5 … 70 °C) gray PUR (-25 … 70 °C) black FEP[3] (-25 … 70 °C) black TPE (-25 …125 °C) blue others on request
Seals (O-rings)	standard: FKM option: EPDM; FFKM (min. permissible temperature from -15 °C) others on request
Diaphragm	standard: ceramics Al_2O_3 96% option: ceramics Al_2O_3 99,9%
Protection cap	POM
[3] do not use freely suspended probes with an FEP cable if effects due to highly charging processes are expected	
IS-protection	
Approval DX14B-LMK 387	**IBExU 15 ATEX 1066 X** zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 49,2 nF; L_i = 0 µH; the supply connections have an inner capacity of max. 100 nF opposite the enclosure
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar zone 1 and higher: -25 ... 65 °C
Connecting cables (by factory)	cable capacity: signal line/shield as well as signal line/signal line: 160 pF/m cable inductance: signal line/shield as well as signal line/signal line: 1 µH/m
Miscellaneous	
Current consumption	max. 22 mA
Weight	approx. 180 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU
Pin configuration	
Electrical connection	cable colours (IEC 60757)
Supply + Supply – signal + (only 3-wire)	wh (white) bn (brown) gn (green)
Shield	gnye (green-yellow)

Wiring diagrams

2-wire-system (current)

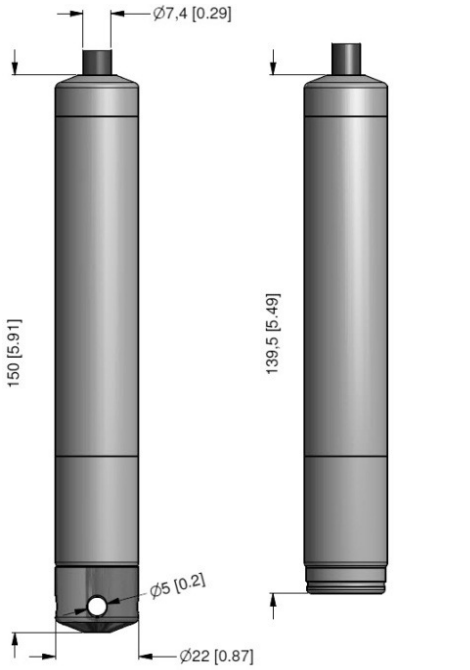


3-wire-system (voltage)

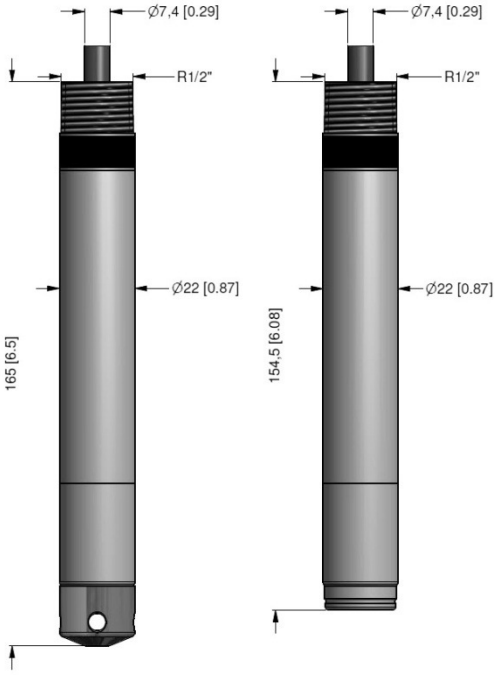


Dimensions (in mm/in)

standard

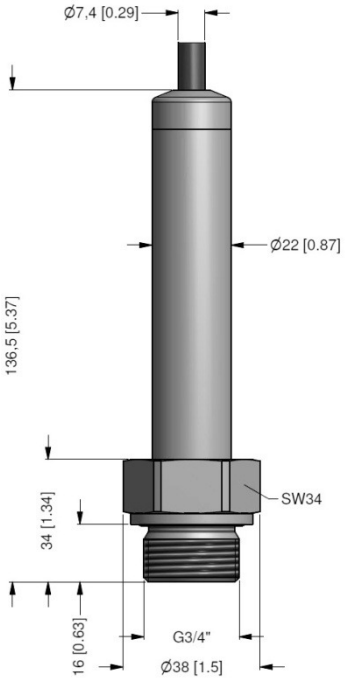


with protection cap without protection cap

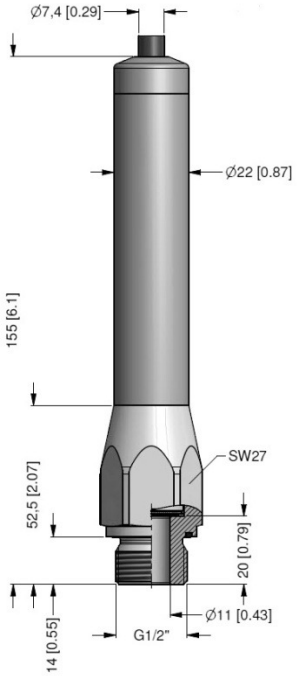


with thread R1/2“ for
mounting with stainless steel tube

option: screw-in version

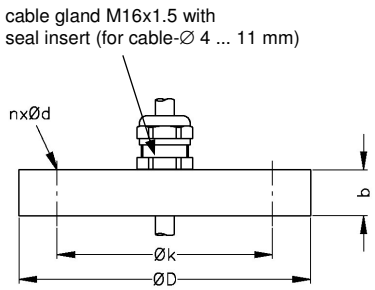


G3/4“



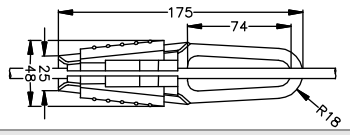
G1/2“ open

Mounting flange with cable gland		
Technical data		
Suitable for	all probes	
Flange material	Stainless steel 1.4404 (316 L)	
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)**	**Weight**
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



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 ∅ 5.5 ... 10.5 mm	
Werkstoff	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

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 387

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Pressure																									
gauge in bar			3	6	0																				
absolute in bar			3	6	3																				consult
gauge in mH_2O			3	6	1																				
Input	**[mH_2O]**	**[bar]**																							
	1	0.1				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
Design																									
probe											1														
screw-in version G1/2" open											A														
screw-in version G3/4" flush											B														
Diaphragm																									
Ceramics Al_2O_3 96%												2													
Ceramics Al_2O_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											
FFKM [1]														7											consult
customer														9											consult
Electrical connection																									
PVC-cable [2]															1										
PUR-cable [2]															2										
FEP-cable [2]															3										
TPE-cable [2]															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		
prepared for mounting with st. steel pipe [3]																					5	0	2		
customer																					9	9	9		consult

min. permissible temperature from -15 °C
cable with integrated air tube for atmospheric pressure reference
stainless steel pipe is not part of the supply

11.11.2015

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