LMK 387

Stainless Steel Probe 22 mm

Ceramic Sensor

accuracy according to IEC 60770:
0.35 % FSO

Nominal pressure

from 0 ... 4 mH_2O up to 0 ... 200 mH_2O

Ausgangssignale

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

Special characteristics

- diameter 22 mm
- diaphragm ceramics 96% Al_2O_3
- high long-term stability
- highly appropriated for wastewater, sludge and viscous media

Optional versions

- diaphragm ceramics 99,9% Al_2O_3 (on request)
- IS-version **(in preparation)** Ex ia = intrinsically safe for gases and dust
- mounting with stainless stell 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 faciliates 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

Wastewater
Sewage works
Water preparation

Water
Groundwater and level monitoring

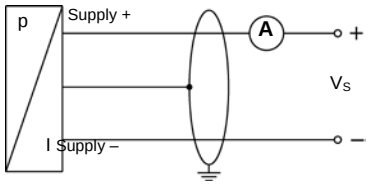
Fuel and oil
Tank battery
Biogas plants

Input pressure range											
Nominal pressure gauge	[bar]	0,4	0,6	1	1,6	2,5	4	6	10	16	20
Level	[mH_2O]	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	5	7	7	12	20	20	20	20	40	40
Berst pressure ≥	[bar]	8	9	9	18	25	25	30	30	45	45
Permissible vacuum	[bar]	-0.5			-1						

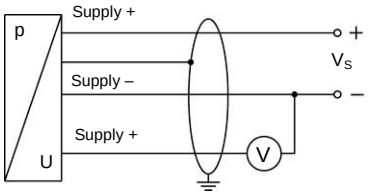
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 12 ... 36 V_{DC}
Option IS-version	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}
Option	3-wire: 0 … 10 V / V_S = 14 ... 36 V_{DC}
Performance	
Accuracy [1]	≤ ± 0.35 % FSO — others on request
Permissible load	2-wire: R_{max} = [(V_S – $V_{S\ min}$) / 0.02 A] Ω
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: standard: -40 ... 85 °C option: -40 … 125 °C (on request) electronics / environment: standard: -40 ... 85 °C option: -40 … 125 °C (on request) 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 (seawater resistant) TPE (-25 …125 °C) blue (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil) 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% (on request)
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 487 **(in preparation)**	IBExU13ATEX xxxx X — zone 0: II 1G Ex ia IIB T4 Ga — zone 20: II 1D Ex iaD 20 T 85°C
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 105 nF; L_i = 5 µH; the supply connections have an inner capacity of max. 140 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 ... 70 °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: 2004/108/EC
Pin configuration	
Electrical connection	cable colours (DIN 47100)
Supply + Supply – signal + (only 3-wire)	wh (white) bn (brown) gn (green)
Shield	ye/gn (yellow / green)

Wiring diagrams

2-wire-system (current)

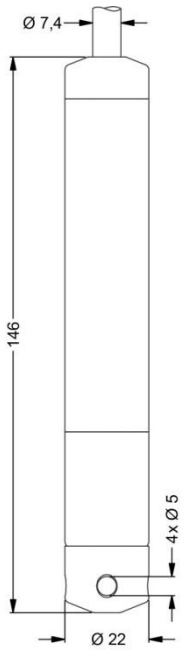


3-wire-system (voltage)

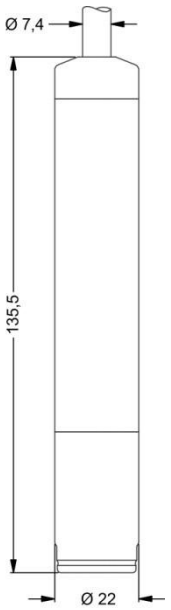


Dimensions (in mm)

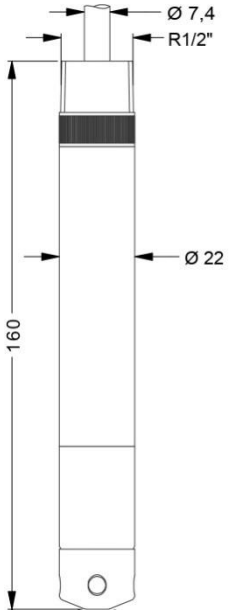
standard

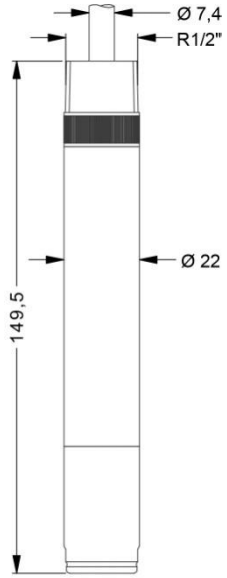


with protection cap



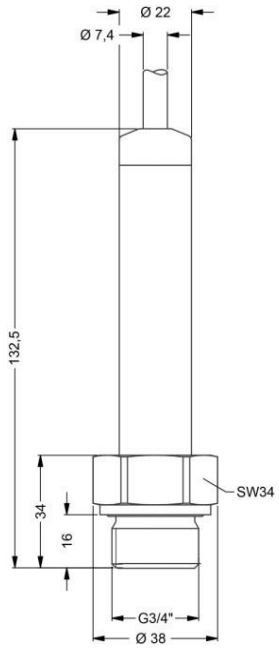
without protection cap



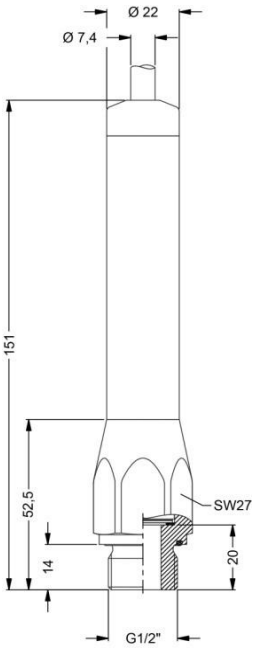


with thread R1/2“ for
mounting with stainless steel tube

option: screw-in version

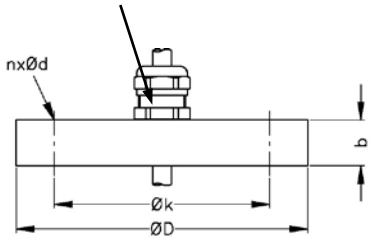


G3/4“

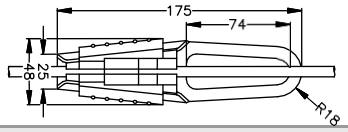


G1/2“ open

Mounting flange with cable gland			
Technical data			cable gland M16x1.5 with seal insert (for cable-∅ 4 ... 11 mm)
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
For further information please contact our sales department or visit our homepage: http://www.bdsensors.com

Ordering code LMK 387

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Pressure			
gauge in bar		3 6 0	
absolute in bar		3 6 3	
gauge in mH_2O		3 6 1	
Input [mH_2O]	[bar]		
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	
160	16	1 6 0 2	
200	20	2 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	consult
customer		9	consult
Output			
4 … 20 mA / 2-wire		1	
Intrinsic safety 4 … 20 mA / 2-wire (in preparation)		E	
customer		9	consult
Seals			
FKM		1	
EPDM		3	
FFKM [1]		7	
customer		9	consult
Electrical connection			
PVC-cable [2]		1	
PUR-cable [2]		2	
FEP-cable [2]		3	
TPE-cable [2]		D	
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

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

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