



LMK 387H

Stainless Steel Probe with HART®-communication

Ceramic Sensor

accuracy according to IEC 61298-2:
standard: 0.35 % FSO
option: 0.25 % FSO

Nominal pressure

from 0 ... 1 mH₂O up to 0 ... 100 mH₂O

Output signals

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

Special characteristics

- ▶ diameter 22 mm
- ▶ HART® communication (revision 7)
- ▶ setting of offset, span and damping
- ▶ diaphragm ceramics 99.9% Al₂O₃
- ▶ good long-term stability
- ▶ especially for waste water

Optional versions

- ▶ housing material titanium
- ▶ IS-version
Ex ia = intrinsically safe for gas and dust
- ▶ drinking water certificate
according to DVGW and KTW
- ▶ temperature element Pt 100
- ▶ different kinds of elastomer

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

The outer diameter is only 22 mm, whereby the installation or retrofitting can be easily carried out in 1" pipes or in confined installation conditions. In addition to an intrinsically safe version (zone 0), a version with temperature signal is available.

Preferred areas of use



Water

groundwater and level monitoring



Sewage

waste water treatment
water recycling

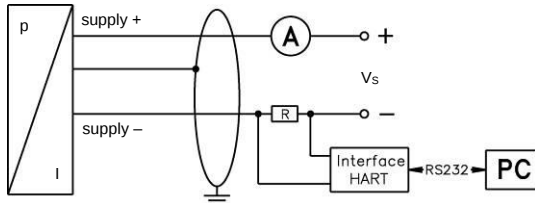
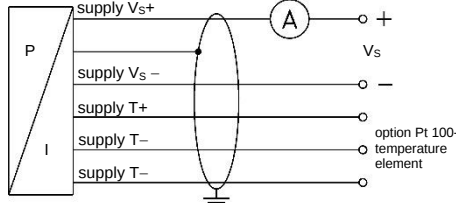
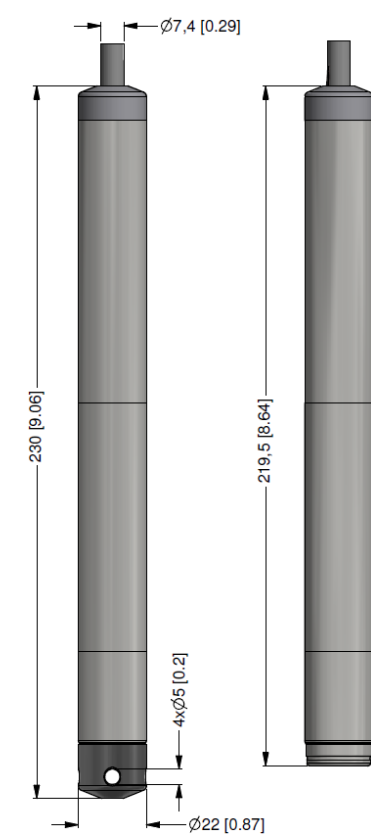
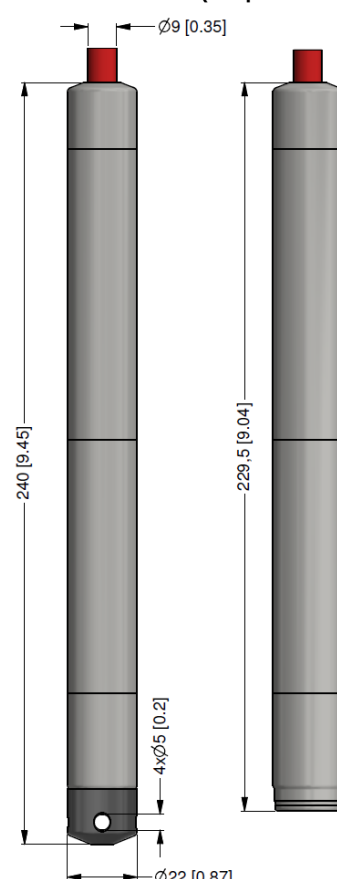


Fuel and oil

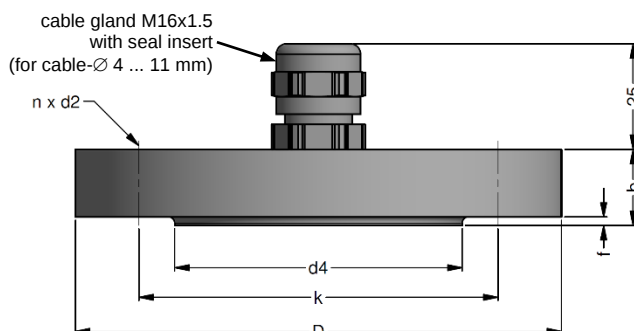
tank battery
biogas plants



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 ₂ O]	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
Burst pressure ≥	[bar]	4	6	8	8	9	9	18	25	25	30	30
Permissible vacuum	[bar]	-0.2	-0.3	-0.5				-1				
Max. ambient pressure (housing): 40 bar												
Output signal / Supply												
Standard		2-wire: 4 ... 20 mA / V _S = 12 ... 36 V _{DC} with HART® communication (revision 7) / V _{S rated} = 24 V _{DC}										
Option IS-version		2-wire: 4 ... 20 mA / V _S = 14 ... 28 V _{DC} with HART® communication (revision 7) / V _{S rated} = 24 V _{DC}										
Option Pt 100-temperature element												
Temperature range		-25 ... 125 °C					max. voltage 10 V _{DC} , max. current 2 mA, max. power 10 mW, in intrinsically safe circuit 30 V _{DC} in intrinsically safe circuit 54 mA in intrinsically safe circuit 405 mW					
Connectivity technology		3-wire										
Resistance		100 Ω at 0 °C										
Temperature coefficient		3850 ppm/K										
Supply I _S		0.3 ... 1.0 mA _{DC}										
Performance												
Accuracy ¹		standard	p _N ≥ 160 mbar	TD ≤ 1:5 TD > 1:5	≤ ± 0.35 % FSO ≤ ± [0.35 + 0.05 x TD] % FSO					TD _{max} = 1:10		
			p _N < 160 mbar		≤ ± [0.35 + 0.15 x TD] % FSO					TD _{max} = 1:3		
		option	p _N ≥ 160 mbar	TD ≤ 1:5 TD > 1:5	≤ ± 0.25 % FSO ≤ ± [0.25 + 0.05 x TD] % FSO					TD _{max} = 1:10		
				p _N < 160 mbar		≤ ± [0.25 + 0.15 x TD] % FSO					TD _{max} = 1:3	
Permissible load		R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω load at HART®-communication: R _{min} = 250 Ω										
Influence effects		supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ										
Long term stability		≤ ± (0.1 x turn-down) % FSO / year at reference conditions										
Turn-on time		≤ 3 sec										
Mean response time		≤ 50 msec without electronic damping										
Measuring rate		≤ 20 Hz										
Adjustability		configuration of following parameters possible (interface / software necessary ²): electronic damping: 0 ... 100 sec offset: 0 ... 80 % FSO turn down of span: max. 1:10										
¹ accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability) ² software, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or higher, and												
Thermal effects (offset and span)												
Tolerance band		≤ ± 1 % FSO in compensated range -20 ... 80 °C										
Permissible temperatures												
Permissible temperatures		medium / electronics / environment / storage: -40 ... 85 °C										
Electrical protection ³												
Short-circuit protection		permanent										
Reverse polarity protection		no damage, but also no function										
Electromagnetic compatibility		emission and immunity according to EN 61326										
³ 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 ⁴		TPE-U	blue	Ø 7.4 mm	(without / with drinking water certificate)							
		TPE-U ⁵	red	Ø 9.0 mm	others on request							
Bending radius		static installation: 10-fold cable diameter dynamic application: 20-fold cable diameter										
⁴ shielded cable with integrated ventilation tube for atmospheric pressure reference ⁵ only in combination with IS-version (explosion protection) and temperature element Pt100												
Materials (media wetted)												
Housing		standard: stainless steel 1.4404 (316 L); option: titanium										others on request
Seals (O-rings)		standard: FKM										others on request
		option: EPDM (without / with drinking water certificate) FFKM (min. permissible temperature from -15 °C)										
Diaphragm		ceramics Al ₂ O ₃ 99.9%										
Protection cap		POM-C										
Cable sheath		TPE-U										
Explosion protection												
Approval		IBExU 15 ATEX 1066 X / IECEx IBE 18.0019X										
DX14B-LMK 387H		zone 0: II 1G Ex ia IIB T4 Ga; zone 20: II 1D Ex ia IIIC T135 °C Da										
Safety technical maximum values (pressure)		U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i = 14 nF, L _i = 0 µH; the supply connections have an inner capacity of max. 27 nF opposite the enclosure										
Safety technical maximum values (temperature)		U _i = 30 V, I _i = 54 mA, P _i = 405 mW, C _i = 0 nF, L _i = 0 µH (temperature element Pt 100)										
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 also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m										

Miscellaneous		
Drinking water certificate ⁶	according to DVGW W 270 and UBA KTW (with order the indication "with drinking water certificate" is necessary)	
Current consumption	max. 22 mA	
Weight	approx. 280 g (without cable)	
Ingress protection	IP 68	
CE-conformity	EMC Directive: 2014/30/EU	
ATEX Directive	2014/34/EU	
⁶ only possible with EPDM seal in combination with TPE-U cable; not possible with IS-version (explosion protection) or housing material titanium		
Pin configuration		
Electrical connection	cable colours (IEC 60757)	
	4 ... 20 mA / HART®	4 ... 20 mA / HART® (pressure) with Pt 100 (temperature)
Supply V _S +	WH (white)	WH (white)
Supply V _S –	BN (brown)	BN (brown)
Supply T+ (with Pt 100)	-	YE (yellow)
Supply T– (with Pt 100)	-	GY (grey)
Supply T– (with Pt 100)	-	PK (pink)
Shield	GNYE (green-yellow)	GNYE (green-yellow)
Wiring diagrams		
2-wire-system current HART® 		2-wire-system HART® (pressure) / 3-wire-system (temperature) 
Dimensions (mm / in)		
standard 		IS-version with Pt100 (temperature element) 
HART® is a registered trademark of HART Communication Foundation; Windows® is a registered trademark of Microsoft Corporation		

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

For further information please contact our sales department or visit our homepage:
<http://www.bdsensors.de>



Ordering code LMK 387H

LMK 387H

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[illegible]

¹ drinking water certification only possible with EPDM seal (code 3T) in combination with TPE-U cable (code F); not possible with IS-protection (explosion protection) or housing material titanium

² min. permissible temperature from -15 °C³ shielded cable with integrated ventilation tube for atmospheric pressure reference

⁴ only in combination with Ex version (explosion protection) and temperature element Pt 100

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