



# 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<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

### Output signal

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

### Special characteristics

- ▶ diameter 22 mm
- ▶ diaphragm ceramics 99.9% Al<sub>2</sub>O<sub>3</sub>
- ▶ 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
- ▶ mounting with stainless steel tube
- ▶ different kinds of cables and elastomers

The stainless steel probe **LMK 387** was developed for level and gauge measurement in waste water, 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.

Compared to the level probe LMK 382 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. An IS-version (zone 0) 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



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	[mHzO]	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 $\geq$	[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 / $V_S = 12 \dots 36 V_{DC}$											
Option IS-version	2-wire: 4 ... 20 mA / $V_S = 14 \dots 28 V_{DC}$											
Option temperature element Pt 100												
Temperature range	-25 ... 125 °C											
Connectivity technology	3-wire											
Resistance	100 $\Omega$ at 0 °C											
Temperature coefficient	3850 ppm/K											
Supply Is	0.3 ... 1.0 mA DC											
			max. voltage 10 $V_{DC}$ , in intrinsically safe circuit 30 $V_{DC}$ max. current 2 mA, in intrinsically safe circuit 54 mA max. power 10 mW, in intrinsically safe circuit 405 mW									
Performance												
Accuracy <sup>1</sup>	standard: $\leq \pm 0.35$ % FSO					option: $\leq \pm 0.25$ % FSO						
Permissible load	$R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$											
Influence effects	supply: 0.05 % FSO / 10 V						load: 0.05 % FSO / k $\Omega$					
Long term stability	$\leq \pm 0.1$ % FSO / year											
Turn-on time	450 msec											
Mean response time	$\leq 70$ msec											
Measuring rate	80 Hz											
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)												
Thermal effects (offset and span)												
Tolerance band	$\leq \pm 1$ % FSO											
in compensated range	-20 ... 80 °C											
Permissible temperatures												
Permissible temperatures	medium / storage: -25 ... 85 °C											
Electrical protection <sup>2</sup>												
Short-circuit protection	permanent											
Reverse polarity protection	no damage, but also no function											
Electromagnetic compatibility	emission and immunity according to EN 61326											
<sup>2</sup> 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 <sup>3</sup>	PUR	(-25 ... 70 °C)	black	$\varnothing$ 7.4 mm								
	FEP <sup>4</sup>	(-25 ... 70 °C)	black	$\varnothing$ 7.4 mm								
	TPE-U	(-25 ... 125 °C)	blue	$\varnothing$ 7.4 mm	(without / with drinking water certificate)							
	TPE-U <sup>5</sup>	(-25 ... 125 °C)	red	$\varnothing$ 9.0 mm	others on request							
Bending radius	static installation: 10-fold cable diameter						dynamic application: 20-fold cable diameter					
<sup>3</sup> shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute, the ventilation tube is closed)												
<sup>4</sup> do not use freely suspended probes with an FEP cable if effects due to highly charging processes are expected												
<sup>5</sup> only in combination with IS-version (explosion protection) and temperature element Pt 100												
Materials (media wetted)												
Housing	standard: stainless steel 1.4404 (316 L) option: titanium others on request											
Seals (O-rings)	standard: FKM option: EPDM (without / with drinking water certificate) FFKM (min. permissible temperature from -15 °C) others on request											
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%											
Protection cap	POM-C											
Cable sheath	PUR, FEP, TPE-U											
Explosion protection												
Approval DX14B-LMK 387	IBExU 15 ATEX 1066 X / IECEx IBE 18.0019X 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, $C_i = 49.2$ nF, $L_i = 0$ $\mu$ H; the supply connections have an inner capacity of max. 100 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, $L_i = 0$ $\mu$ H (temperature element Pt 100)											
Permissible temp. 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 $\mu$ H/m											
Miscellaneous												
Drinking water certificate <sup>6</sup>	according to DVGW W 270 and UBA KTW (with order the indication "with drinking water certificate" is necessary)											
Option cable protection	prepared for mounting with stainless steel pipe; available as compact product (standard: stainless steel pipe with a total length up to 2 m possible; other lengths on request)											
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											
<sup>6</sup> only possible with EPDM seal in combination with TPE-U cable; not possible with IS-version (explosion protection) or housing material titanium												

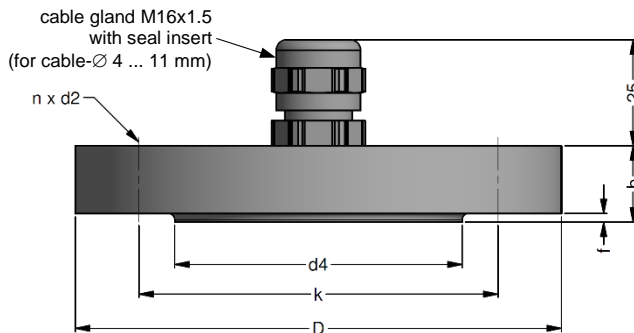
# LMK 387

Stainless Steel Probe

Technical Data

Pin configuration	
Electrical connection	cable colours (IEC 60757)
Supply V <sub>S</sub> +	WH (white)
Supply V <sub>S</sub> -	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)
Wiring diagrams	
<p>2-wire-system (current)</p>	<p>2-wire-system current (pressure) / 3-wire-system (temperature Pt 100)</p>
Dimensions (mm/in)	
<p><b>standard</b></p>	
protection cap removable	with thread R1/2" for mounting with stainless steel tube
<p><b>option: screw-in version</b></p>	
G3/4"	G1/2" open
⇒ cable diameter Ø9 mm for TPE-U cable (red), drawings for option with Pt 100 on request	

### 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		
<b>Ordering type</b>			<b>Weight</b>
DN25 / PN40 with cable gland brass, nickel plated			1.4 kg
DN50 / PN40 with cable gland brass, nickel plated			3.2 kg
DN80 / PN16 with cable gland brass, nickel plated			4.8 kg

### Terminal clamp

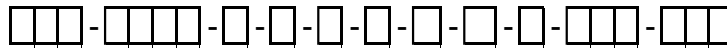


#### Technical data

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		
<b>Ordering type</b>			<b>Weight</b>
Terminal clamp, steel, zinc plated			approx. 160 g
Terminal clamp, stainless steel 1.4301 (304)			

## Ordering code LMK 387

LMK 387



<b>Pressure</b>																				
	gauge in bar	3	6	0																
	absolute in bar	3	6	3																consult
	gauge in mH <sub>2</sub> O	3	6	1																
<b>Input</b>																				
	[mH <sub>2</sub> O]																			
	[bar]																			
	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
<b>Housing</b>																				
	stainless steel 1.4404 (316L)							1												
	titanium							T												
	customer							9												consult
<b>Design</b>																				
	probe							1												
	screw-in version G1/2" open							A												
	screw-in version G3/4" flush							B												
<b>Diaphragm</b>																				
	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %							C												
	customer							9												consult
<b>Output</b>																				
	4 ... 20 mA / 2-wire							1												
	intrinsic safety 4 ... 20 mA / 2-wire							E												
	customer							9												consult
<b>Seals</b>																				
	FKM							1												
	EPDM							3												
DVGW / KTW:	EPDM <sup>1</sup>							3T												
	FFKM <sup>2</sup>							7												consult
	customer							9												consult
<b>Electrical connection</b>																				
	PUR-cable (black, Ø 7.4 mm) <sup>3</sup>							2												
	FEP-cable (black, Ø 7.4 mm) <sup>3</sup>							3												
	TPE-U-cable (blue, Ø 7.4 mm) <sup>3</sup>							4												
	TPE-U-cable (red, Ø 9.0 mm) <sup>3,4</sup>							42												
DVGW / KTW:	TPE-U-cable (blue, Ø 7.4 mm) <sup>1,3</sup>							F												
	customer							9												consult
<b>Accuracy</b>																				
standard	0.35 % FSO							3												
option	0.25 % FSO							2												
	customer							9												consult
<b>Cable length</b>																				
	in m											9	9	9						
<b>Special version</b>																				
	standard																			
	with temperature sensor Pt 100														0	0	0			
	prepared for mounting with stainless steel pipe <sup>5</sup>														0	1	3			
	customer														5	0	2			
															9	9	9			consult

<sup>1</sup> 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

<sup>2</sup> min. permissible temperature from -15 °C

<sup>3</sup> shielded cable with integrated air tube for atmospheric pressure reference

<sup>4</sup> only in combination with IS version (explosion protection) and temperature element Pt 100

<sup>5</sup> stainless steel pipe is not part of the supply

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