

# LMK 382



## Stainless Steel Probe

Ceramic Sensor

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

### Nominal pressure

from 0 ... 40 cmH<sub>2</sub>O up to 0 ... 200 mH<sub>2</sub>O

### Output signals

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

### Special characteristics

- ▶ diameter 39.5 mm
- ▶ diaphragm ceramics Al<sub>2</sub>O<sub>3</sub> 99.9 %
- ▶ especially for sewage, viscous and pasty media

### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gas and dust
- ▶ temperature element Pt 100
- ▶ mounting with stainless steel pipe
- ▶ flange version
- ▶ different kinds of cables and elastomers

The stainless steel probe LMK 382 has been designed for continuous level measurement in waste water, polluted and higher viscosity media.

Basic element is a robust and high overpressure capable capacitive ceramic sensor which is suitable e. g. for low levels.

### Preferred areas of use are



#### Water

drinking water abstraction



#### Sewage

waste water treatment  
water recycling

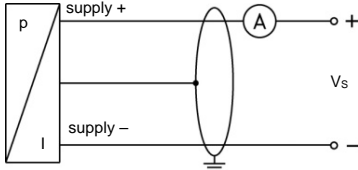
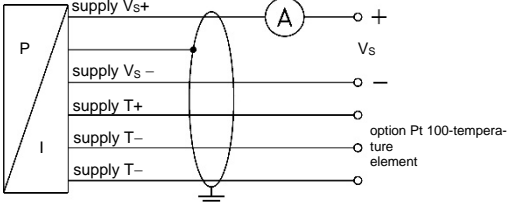


#### Fuel and oil

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

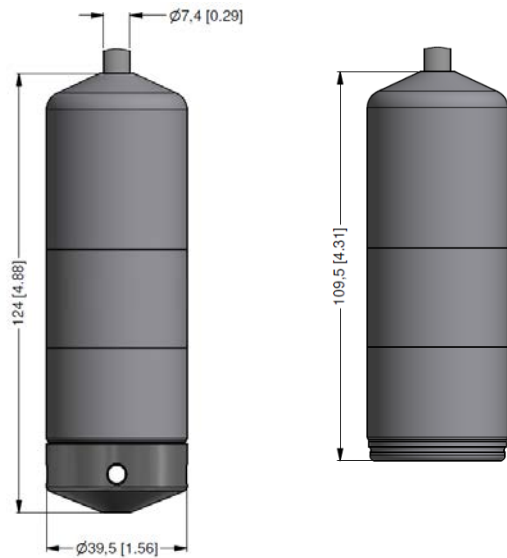


Input pressure range																
Nominal pressure gauge	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Max. ambient pressure (housing): 40 bar																
Output signal / Supply																
Standard		2-wire: 4 ... 20 mA / V <sub>S</sub> = 9 ... 32 V <sub>DC</sub>														
Option IS-version		2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>														
Option temperature element Pt 100																
Temperature range		-25 ... 125 °C														
Connectivity technology		3-wire														
Resistance		100 Ω at 0 °C														
Temperature coefficient		3850 ppm/K														
Supply I <sub>S</sub>		0.3 ... 1.0 mA <sub>DC</sub>														
		max. voltage 10 V <sub>DC</sub> , max. current 2 mA, max. power 10 mW,														
		in intrinsically safe circuit 30 V <sub>DC</sub> in intrinsically safe circuit 54 mA in intrinsically safe circuit 405 mW														
Performance																
Accuracy <sup>1</sup>		standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO														
Permissible load		R <sub>max</sub> = [(V <sub>S</sub> – V <sub>S min</sub> ) / 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														
Max. response time		380 msec														
		measuring rate 5/sec														
<sup>1</sup> accuracy according to IEC 61298-2 – 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 / electronics / environment / storage: -25 ... 125 °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>		PVC (-5 ... 70 °C) grey Ø 7.4 mm PUR (-25 ... 70 °C) black Ø 7.4 mm FEP <sup>4</sup> (-25 ... 70 °C) black Ø 7.4 mm TPE-U (-25 ... 125 °C) blue Ø 7.4 mm TPE-U <sup>5</sup> (-25 ... 125 °C) red Ø 9.0 mm														
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																
<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		stainless steel 1.4404 (316 L)														
Seals		FKM, FFKM, EPDM others on request														
Diaphragm		ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %														
Protection cap		POM-C														
Cable sheath		PVC, PUR, FEP, TPE-U														

Explosion protection	
Approval DX14-LMK 382	IBExU05ATEX1070 X zone 0 <sup>6</sup> : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T110 °C Da
Safety technical maximum values (pressure)	$U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i = 14 \text{ nF}$ , $L_i \approx 0 \text{ }\mu\text{H}$ , $C_{\text{gnd}} = 27 \text{ nF}$
Safety technical maximum values (temperature)	$U_i = 30 \text{ V}$ , $I_i = 54 \text{ mA}$ , $P_i = 405 \text{ mW}$ , $C_i = 0 \text{ nF}$ , $L_i = 0 \text{ }\mu\text{H}$ (temperature element Pt 100)
Permissible media temperature	in zone 0: -10 ... 60 °C with $p_{\text{atm}}$ 0.8 bar up to 1.1 bar zone 1 and higher: -10 ... 70 °C
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 220 pF/m cable inductance: signal line/shield also signal line/signal line: 1.5 $\mu\text{H}/\text{m}$
<sup>6</sup> for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4 Ga" (zone 0)	
Miscellaneous	
Option cable protection for probes	prepared for mounting with stainless steel pipe
Current consumption	max. 21 mA
Weight	approx. 400 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU
Wiring diagrams	
2-wire-system (current)	
	
2-wire-system current (pressure) / 3-wire-system (temperature Pt 100)	
	
Pin configuration	
Electrical connection	cable colours (IEC 60757)
for Pt 100:	WH (white)
Supply $V_{S+}$	BN (brown)
Supply $V_{S-}$	YE (yellow)
Supply $T+$	GY (grey)
Supply $T-$	PK (pink)
Supply $T-$	GNYE (green-yellow)
Shield	

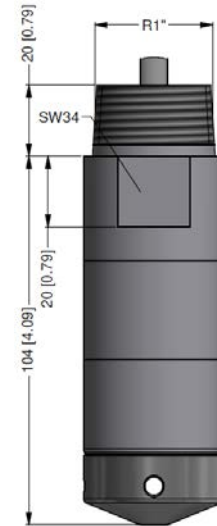
## Dimensions (mm / in)

### standard



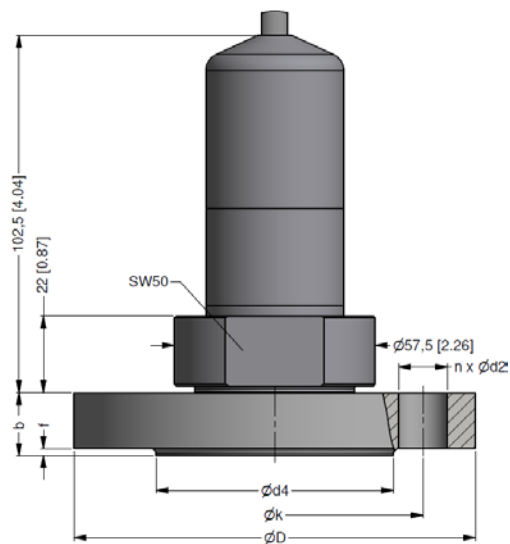
protection cap removable

### option



prepared for mounting with stainless steel pipe

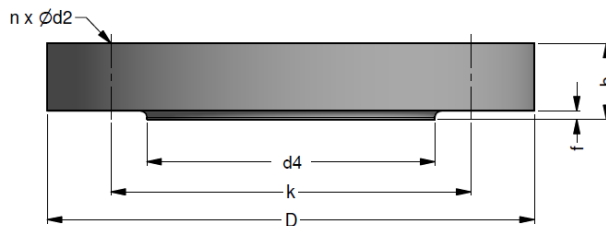
### flange version



⇒ transmitter flange is not part of supply and has to be ordered separately

⇒ cable diameter Ø9 mm for TPE-U cable (red), drawings for option with Pt 100 on request

### Transmitter flange for flange version



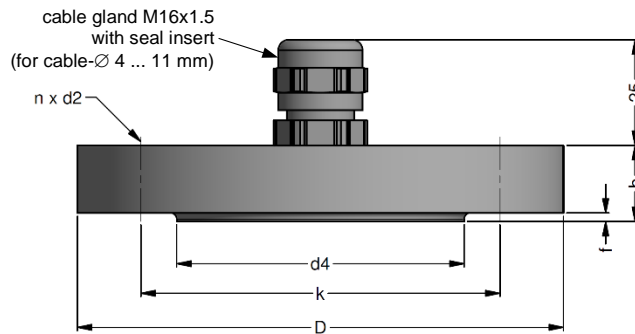
dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

#### Technical data

Suitable for	LMK 382, LMK 382H, LMK 458, LMK 458H
Flange material	stainless steel 1.4404 (316L)
Hole pattern	according to DIN 2507

Ordering type	Ordering code	Weight
Transmitter flange DN25 / PN40	ZSF2540	1.2 kg
Transmitter flange DN50 / PN40	ZSF5040	2.6 kg
Transmitter flange DN80 / PN16	ZSF8016	4.1 kg

### 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	

## Ordering code LMK 382

LMK 382

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Pressure									
	in bar	5	6	5					
	in mH <sub>2</sub> O	5	6	6					
Input									
	[mH <sub>2</sub> 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		
	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					
Diaphragm									
	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %			C					
Output									
	4 ... 20 mA / 2-wire			1					
	intrinsic safety 4 ... 20 mA / 2-wire			E					
Seal									
	FKM			1					
	EPDM			3					
	FFKM			7					
Electrical connection / cable length									
<b>PVC-cable (grey, Ø 7.4 mm) <sup>1</sup></b>									
	3 m			1		0	0	3	
	5 m			1		0	0	5	
	10 m			1		0	1	0	
	15 m			1		0	1	5	
	special length in m			1		9	9	9	
<b>PUR-cable (black, Ø 7.4 mm) <sup>1</sup></b>									
	3 m			2		0	0	3	
	5 m			2		0	0	5	
	10 m			2		0	1	0	
	15 m			2		0	1	5	
	special length in m			2		9	9	9	
<b>FEP-cable (black, Ø 7.4 mm) <sup>1</sup></b>									
	5 m			3		0	0	5	
	10 m			3		0	1	0	
	special length in m			3		9	9	9	
<b>TPE-U-cable (blue, Ø 7.4 mm) <sup>1</sup></b>									
	special length in m			4		9	9	9	
<b>TPE-U-cable (red, Ø 9.0 mm) <sup>1,2</sup></b>									
	special length in m			42		9	9	9	
Accuracy									
standard	0.35 % FSO			3					
option	0.25 % FSO			2					
Special version									
	standard					0	0	0	
	with temperature sensor Pt 100					0	1	3	
	prepared for mounting								
	with stainless steel pipe <sup>3</sup>					5	0	2	
	flange version <sup>4</sup>					5	1	0	
	customer					9	9	9	consult

<sup>1</sup> shielded cable with integrated ventilation tube for atmospheric pressure reference

<sup>2</sup> only in combination with IS version (explosion protection) and temperature element Pt 100

<sup>3</sup> stainless steel pipe is not part of the supply

<sup>4</sup> mounting accessories are not part of supply and have to be ordered separately