

# LMK 382



## Stainless Steel Probe

Ceramic Sensor

accuracy according to IEC 60770:  
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  
3-wire: 0 ... 10 V  
others on request

### Special characteristics

- ▶ diameter 39.5 mm
- ▶ especially for sewage, viscous and pasty media

### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gas and dust
- ▶ mounting with stainless steel pipe
- ▶ flange version
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- ▶ 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



<b>Input pressure range</b>																
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
<b>Output signal / Supply</b>																
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 3-wire	3-wire: 0 ... 10 V / V <sub>S</sub> = 12.5 ... 32 V <sub>DC</sub>															
<b>Performance</b>																
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										measuring rate 5/sec					
Max. response time	380 msec															
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																
<b>Thermal effects (Offset and Span)</b>																
Thermal error	≤ ± 0.1 % FSO / 10 K										in compensated range 0 ... 70 °C					
<b>Permissible temperatures</b>																
Permissible temperatures	medium / electronics / environment / storage: -25 ... 125 °C															
<b>Electrical protection <sup>2</sup></b>																
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																
<b>Electrical connection</b>																
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												
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																
<b>Materials (media wetted)</b>																
Housing	stainless steel 1.4404 (316 L)															
Seals	FKM, FFKM, EPDM, others on request															
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 96 % option: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %															
Protection cap	POM-C															
Cable sheath	PVC, PUR, FEP, TPE-U															
<b>Explosion protection (only for 4 ... 20 mA / 2-wire)</b>																
Approval DX14-LMK 382	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T85 °C Da															
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 µH, C <sub>gnd</sub> = 27 nF															
Permissible media temperature	in zone 0: -10 ... 60 °C with p <sub>atm</sub> 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: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m															
<sup>5</sup> for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4 Ga" (zone 0)																
<b>Miscellaneous</b>																
Option cable protection for probes	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. 21 mA															
Weight	approx. 400 g (without cable)															
Ingress protection	IP 68															
CE-conformity	EMC Directive: 2014/30/EU															
ATEX Directive	2014/34/EU															

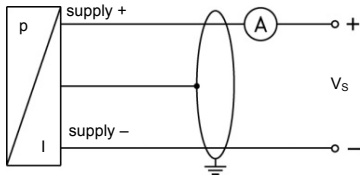
# LMK 382

Stainless Steel Probe

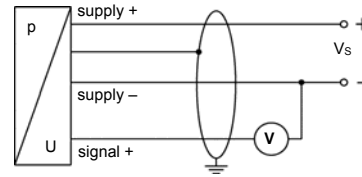
Technical Data

## Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



## Pin configuration

Electrical connection

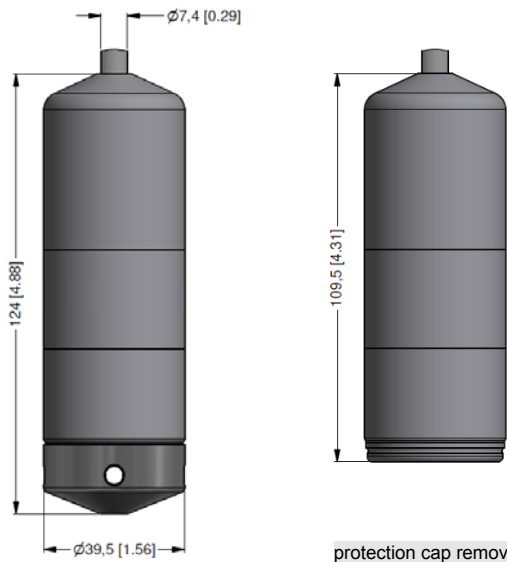
Supply +  
Supply -  
Signal + (only for 3-wire)  
Shield

cable colours (IEC 60757)

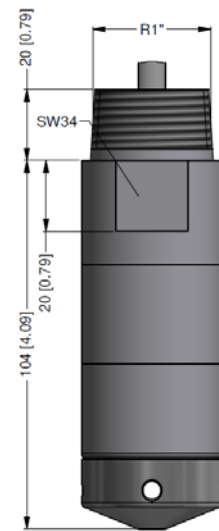
WH (white)  
BN (brown)  
GN (green)  
GNYE (green-yellow)

## Dimensions (mm / in)

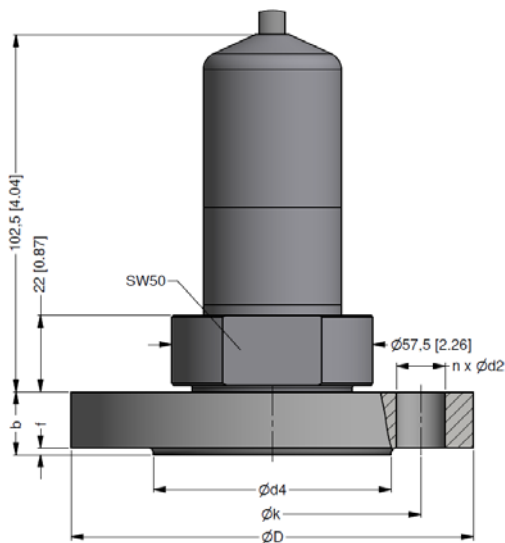
standard



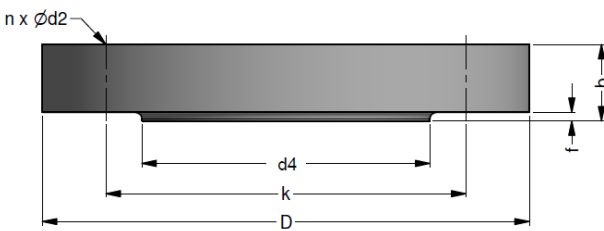
option

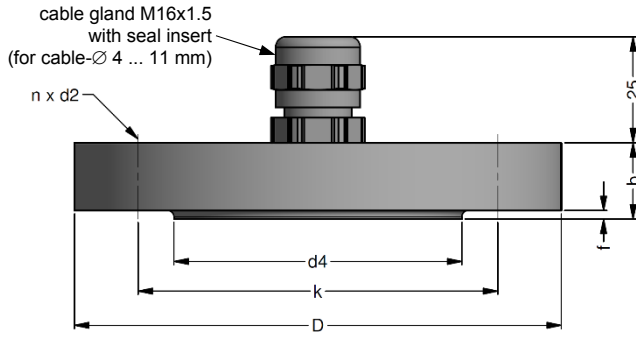



flange version



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

Transmitter flange for flange version																																							
		<table border="1"> <thead> <tr> <th colspan="4">dimensions in mm</th> </tr> <tr> <th>size</th> <th>DN25 / PN40</th> <th>DN50 / PN40</th> <th>DN80 / PN16</th> </tr> </thead> <tbody> <tr> <td>b</td> <td>18</td> <td>20</td> <td>20</td> </tr> <tr> <td>D</td> <td>115</td> <td>165</td> <td>200</td> </tr> <tr> <td>d2</td> <td>14</td> <td>18</td> <td>18</td> </tr> <tr> <td>d4</td> <td>68</td> <td>102</td> <td>138</td> </tr> <tr> <td>f</td> <td>2</td> <td>3</td> <td>3</td> </tr> <tr> <td>k</td> <td>85</td> <td>125</td> <td>160</td> </tr> <tr> <td>n</td> <td>4</td> <td>4</td> <td>8</td> </tr> </tbody> </table>		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
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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																																							
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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														
	.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																	consult
	customer			9																	consult
Diaphragm																					
	ceramics Al <sub>2</sub> O <sub>3</sub> 96%			2																	
	ceramics Al <sub>2</sub> O <sub>3</sub> 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			7																	
	customer			9																	consult
Electrical connection																					
	PVC-cable (grey, Ø 7.4 mm)	<sup>1</sup>		1																	
	PUR-cable (black, Ø 7.4 mm)	<sup>1</sup>		2																	
	FEP-cable (black, Ø 7.4 mm)	<sup>1</sup>		3																	
	TPE-U-cable (blue, Ø 7.4 mm)	<sup>1</sup>		4																	
	customer			9																	consult
Accuracy																					
	standard	0.35 % FSO		3																	
	option	0.25 % FSO		2																	
	customer			9																	consult
Cable length																					
	in m																				
	standard: 3 m	PVC		0	0	3															
	standard: 5 m	PVC		0	0	5															
	standard: 10 m	PVC		0	1	0															
	standard: 15 m	PVC		0	1	5															
	standard: 20 m	PVC		0	2	0															
	<b>special length</b>	<b>PVC</b>		<b>9</b>	<b>9</b>	<b>9</b>															
	standard: 3 m	PUR		0	0	3															
	standard: 5 m	PUR		0	0	5															
	standard: 10 m	PUR		0	1	0															
	standard: 15 m	PUR		0	1	5															
	standard: 20 m	PUR		0	2	0															
	<b>special length</b>	<b>PUR</b>		<b>9</b>	<b>9</b>	<b>9</b>															
	standard: 5 m	FEP		0	0	5															
	standard: 10 m	FEP		0	1	0															
	<b>special length</b>	<b>FEP</b>		<b>9</b>	<b>9</b>	<b>9</b>															
	<b>special length</b>	<b>TPE-U</b>		<b>9</b>	<b>9</b>	<b>9</b>															
Special version																					
	standard			0	0	0															
	prepared for mounting			5	0	2															
	with stainless steel pipe <sup>2</sup>			5	1	0															
	flange version			5	1	0															
	customer			9	9	9															consult

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

<sup>2</sup> stainless steel pipe is not part of the supply

standard lengths 3 / 5 / 10 / 15 / 20 m are available from stock, special lengths are manufactured order-related