

LMK 382 LMK 382 H

Stainless Steel Submersible Transmitter with Ceramic Sensor

- ▶ Diameter: 39.5 mm
- ▶ hydrostatic level measurement in sewage water and contaminated media
- ▶ nominal pressure ranges from 0 ... 40 cmWC up to 0 ... 100 mWC (0 ... 40 mbar up to 0 ... 10 bar)

The submersible transmitter LMK 382 and LMK 382 H have been designed for continuous level measurement in sewage water and contaminated media.

On basis on a mechanically robust and highly over loadable capacitive ceramic sensor the transmitters are among others suited for the measurement of low filling heights with good long term stability. Usage in more viscous media such as slurries is possible - removing the protective cap makes the transmitter flush.

In addition to the several cable materials (PVC, PUR and FEP) the customer has the possibility to consider different versions of cable protection. The submersible transmitter is suited for explosive area (zone 0).

Preferred areas of use are:

- ▶ level monitoring in open tanks with low filling heights
- ▶ depth or level measurement in wells and open waters
- ▶ ground water level measurement
- ▶ sewage and water treatment plants
- ▶ chemical and pharmaceutical industries

- ▶ small thermal effect
- ▶ excellent linearity
- ▶ good long term stability
- ▶ **accuracy LMK 382:**
0.175 % / 0.125 % FSO BFSL
(0.35 % / 0.25 % FSO IEC 60770)
- ▶ **accuracy LMK 382 H:**
0.1 % FSO BFSL
(0.2 % FSO IEC 60770)
- ▶ **LMK 382 H:**
HART® communication
- ▶ **option Ex version**
(only for 4 ... 20 mA / 2-wire)
LMK 382: IBExU 05 ATEX 1070 X
LMK 382 H: FTZÜ 06 ATEX 0018 X
- ▶ optional:
 - cable protection
 - diaphragm in Al₂O₃ 99.9 %
 - customer versions on request

Characteristics

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Stainless Steel Level Transmitter



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Stainless Steel Level Transmitter

Technical Data

Input pressure range ¹													
LMK 382													
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
Level [mWC]	0.4	0.6	1	1,6	2.5	4	6	10	16	25	40	60	100
Permissible overpressure [bar]	2	2	4	4	6	6	8	8	15	25	25	35	35
LMK 382 H													
Nominal pressure gauge [bar]	0.06		0.16		0.4		1		2		5		10
Level [mWC]	0.6		1.6		4		10		20		50		100
Permissible overpressure [bar]	2		4		6		8		15		25		35

On customer request we adjust the devices by software on the required pressure ranges, within the turn-down-possibility (starting at 0.02 bar).

Output signal / Supply		
LMK 382		
2-wire	4 ... 20 mA / $V_s = 9 \dots 36 V_{DC}$	Ex-protection: $V_s = 12 \dots 28 V_{DC}$
LMK 382 H		
2-wire	4 ... 20 mA / $V_s = 12 \dots 36 V_{DC}$ with modulated HART [®] signal	Ex-protection: $V_s = 12 \dots 28 V_{DC}$ with modulated HART [®] signal

Performance		
LMK 382		
Accuracy	IEC 60770 ² standard: $\leq \pm 0.35 \% \text{ FSO}$ option: $\leq \pm 0.25 \% \text{ FSO}$	BFSL standard: $\leq \pm 0.175 \% \text{ FSO}$ option: $\leq \pm 0.125 \% \text{ FSO}$
Permissible load	$R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$	
Influence effects	supply: 0.05 % FSO / 10 V	load: 0.05 % FSO / k Ω
Long term stability	$\leq \pm 0.1 \% \text{ FSO} / \text{year}$	
Response time	< 200 msec	
LMK 382 H		
Accuracy	IEC 60770 ² : $\leq \pm 0.2 \% \text{ FSO}$ relating to nominal range BFSL: $\leq \pm 0.1 \% \text{ FSO}$ relating to nominal range	
Permissible load	$R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$	load during HART [®] communication: $R_{min} = 250 \Omega$
Influence effects	supply: 0.05 % FSO / 10 V	load: 0.05 % FSO / k Ω
Long term stability	$\leq \pm (0.1 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO} / \text{year}$	
Response time	200 ms – without consideration of electronic damping	measuring rate 5/s
Adjustability	configuration of following parameters possible (interface / software necessary ³): - electronic damping: 0 ... 100 s - offset: 0 ... 67 % FSO - turn down of span: max. 1:3	

Thermal effects	
LMK 382	
Thermal error for offset and span in compensated range	$\leq \pm 0.1 \% \text{ FSO} / 10 \text{ K}$ 0 ... 70 °C
LMK 382 H	
Tolerance band	$\leq \pm (0.2 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO}$
TC, average in compensated range	$\pm (0.02 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO} / 10 \text{ K}$ 0 ... 70 °C

¹ version with Al₂O₃ 99.9% possible for pressure ranges from 0.1 bar up to 1 bar

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ software, interface, and cable have to be ordered separately (software appropriate for Windows[®] 95, 98, 2000, NT Version 4.0 or higher, and XP)

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Stainless Steel Level Transmitter

Technical Data

Materials

Housing	stainless steel 1.4571 (316Ti)	
Seals	FKM / EPDM / others on request	
Diaphragm	Standard: ceramics Al_2O_3 96 % Option: ceramics Al_2O_3 99.9 % (possible for pressure ranges from 0.1 bar up to 1 bar)	
Cable sheath	PVC / PUR / FEP	

Miscellaneous

Cable capacitance	signal line/shield: 150 pF/m	signal line/signal line: 100 pF/m
Cable inductance	signal line/shield: 1.0 μ H/m	signal line/signal line: 1.0 μ H/m
Current consumption	max. 21 mA	
Ingress protection	IP 68	
Weight	approx. 400 g (without cable)	

Mounting accessories (not included in delivery)

Transmitter flange, stainless steel 1.4571 (316Ti):

DN25 / PN40 (\varnothing 115, 18 thick, 4 drill holes \varnothing 14 at \varnothing 85)

DN50 / PN16 (\varnothing 165, 18 thick, 4 drill holes \varnothing 18 at \varnothing 125)

DN80 / PN16 (\varnothing 200, 20 thick, 8 drill holes \varnothing 18 at \varnothing 160)

Mounting flange for transmitter fixing, stainless steel 1.4571 (316Ti):

DN25 / PN40 (\varnothing 115, 18 thick, 4 drill holes \varnothing 14 at \varnothing 85)

DN50 / PN16 (\varnothing 165, 18 thick, 4 drill holes \varnothing 18 at \varnothing 125)

DN80 / PN16 (\varnothing 200, 20 thick, 8 drill holes \varnothing 18 at \varnothing 160)

Screw fitting, stainless steel 1.4571 (316 Ti)

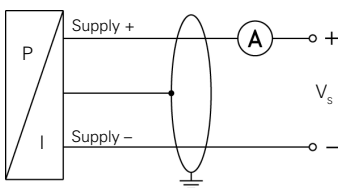
Terminal clamp, stainless steel 1.4301 (304) or steel, zinc plated

Pin configuration

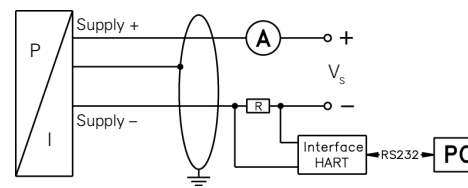
Electrical connection	cable colours (DIN 47100)	
2-wire-system	Supply +	white
	Supply -	brown
	Ground	yellow / green (shield)

Wiring diagram

2-wire-system (current)



2-wire-system (current) HART®



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Windows® is a registered trade mark of Microsoft Corporation

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

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BD SENSORS
pressure measurement

Ordering Code LMK 382

LMK 382

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Pressure		in bar	5	6	5															
	in mWC	5	6	6																
Input		[mWC]	[bar]																	
	0,40	0,04			0	4	0	0												
	0,60	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												
	customer				9	9	9	9												
Housing																				
	Stainless steel 1.4571 (316Ti)							1												
	customer							9												
Diaphragm																				
	Ceramics Al ₂ O ₃ 96%							2												
	Ceramics Al ₂ O ₃ 99,9% ¹							C												
	customer							9												
Output																				
	4 ... 20 mA / 2-wire							1												
	Intrinsic safety 4 ... 20 mA / 2-wire							E												
	customer							9												
Seals																				
	FKM							1												
	EPDM							3												
	customer							9												
Electrical connection																				
	PVC-cable ²							1												
	PUR-cable ²							2												
	FEP-cable ²							3												
	customer							9												
Accuracy																				
	standard	0,35 %						3												
	option	0,25 %						2												
	customer							9												
Cable length																				
	in m							9	9	9										
Special version																				
	standard							0	0	0										
	prepared for mounting with st. steel pipe ³							5	0	2										
	flange version							5	1	0										
	customer							9	9	9										

¹ diaphragm Al₂O₃ 99,9% possible for pressure ranges from 0.1 bar up to 1 bar

² cable with integrated air tube for atmospheric pressure reference

³ stainless steel pipe is not part of the supply

