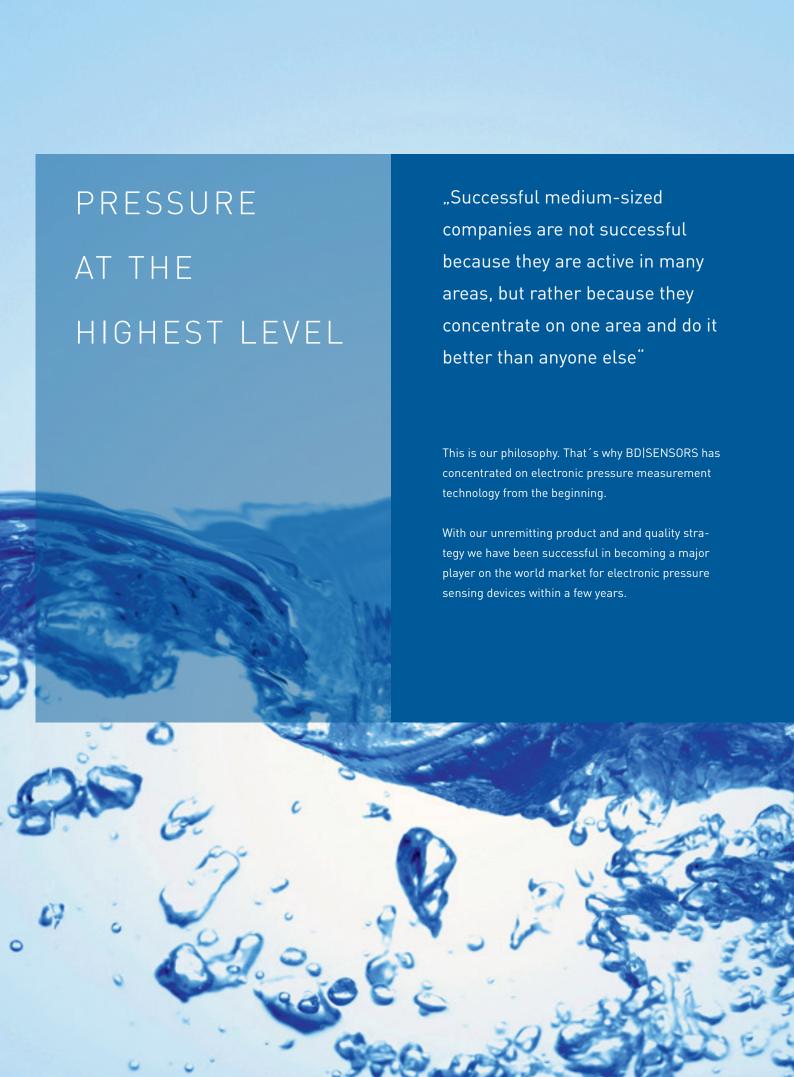
# PRODUCT CATALOGUE HYDROSTATIC PROBES SCREW-IN TRANSMITTERS









With 260 employees at 4 locations in Germany, the Czech Republic, Russia and China BD|SENSORS has solutions from 0.1 mbar to 6000 bar:

- → pressure sensors, pressure transducers pressure transmitters
- → electronic pressure switches
- → pressure measuring devices with display and switching outputs
- → hydrostatic level probes

Two pressure transmitters and a submersible probe, based on a stainless steel silicon sensor were the beginning. Today the range extends to more than 70 standard products, from economical OEM devices to high-end products with HART® communication or field bus interface.

In addition we have developed hundreds of customerspecific applications, underlining the competence and flexibility of BDISENSORS. The excellent price/performance ratio of our products is proof of the fact that we are able to meet the toughest demand: Being a problem-solver for our

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For large production batches as well as for small production numbers, no matter for what medium or external factors, with almost any mechanical or electrical connection - we solve your problem

flexibly, quickly and cost-efficiently.

		ousir ateri	_					pref	erred a	reas of	use		ole- isor		
	stainless steel	plastic	CuNiFe	ø [mm]	stainless steel sensor	ceramic sensor	pressure range / level [mH <sub>2</sub> 0]	water	sewage	fuel and oil	aggressive media	not separable	separable	certificates	ebed
precision															
LMP 307i	•			26.5	•		0 0.4 up to 0 200	0		0		•		EX	5-8
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LMK 382H	•			39.5	•		0 0.6 up to 0 100	0	0	0		•		EX, HART®	13-16
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industry															
LMP 305	•			19	•		0 1 up to 0 250	0				•			25-28
LMP 307	•			27	•		0 1 up to 0 250	0		0		•		EX, SIL	29-32
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LMK 458	•		•	39.5		•	0 0.4 up to 0 200	0	0	0		•		EX, DNV, GL, CCS	61-64
LMK 358	•			39.5		•	0 0.4 up to 0 100	0	0	0			•	EX	65-68
LMP 808		•		35	•		0 1 up to 0 100	0					•	SIL	69-72
LMK 806		•		21		•	0 6 up to 0 200		0		0	•			73-76
LMK 807		•		35		•	0 4 up to 0 100		0		0	•		SIL	77-80
LMK 809		•		45		•	0 0.4 up to 0 100		0		0	•			81-84
LMK 858		•		45		٠	0 0.4 up to 0 100		0		0		•		85-88
screw-in transmitter															
LMP 331	•				•		0 1 up to 0 400	0		0				EX, SIL, UL	89-92
LMK 331	•	•				•	0 4 up to 0 600	0	0	0	0			EX, SIL, UL	93-96
LMK 351	•	•				•	0 0.4 up to 0 200	0	0	0	0			EX,UL	97-100
special versions															
EP 500		•				•	0 60 mbar up to 0 20 bar	0	0	0	0			GL, CCS	101-104

# **LMP 307i**



### **Stainless Steel Probe**

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.1 % FSO

### **Nominal pressure**

from 0 ... 0.4 mH<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 26.5 mm
- small thermal effect
- excellent accuracy
- excellent long term stability

#### **Optional versions**

- IS-protection zone 0
- cable protection via corrugated pipe
- different kinds of cables
- different kinds of seal materials

The stainless steel probe LMP 307i is designed for continuous level measurement in water and clean or waste fluids.

Basic element is a high quality stainless steel sensor with high requirements for exact measurement with excellent long term stability.

### Preferred areas of use are

### Water / filtrated sewage



drinking water system ground water level measurement rain spillway basin pump and booster stations level measurement in container water treatment plants water recycling



#### Fuel / Oil

fuel storage tank farm







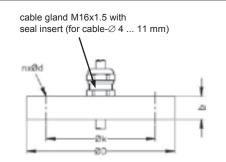


Input pressure range <sup>1</sup>							
Nominal pressure gauge	[bar]	0.40	1	2	4	10	20
Level	[mH <sub>2</sub> O]	4	10	20	40	100	200
Overpressure	[bar]	2	5	10	20	40	80
Burst pressure	[bar]	3	7.5	15	25	50	120
<sup>1</sup> On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.							

Output signal / Supply	
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 12 36 V <sub>DC</sub>
Option Ex-protection	2-wire: 4 20 mA / V <sub>S</sub> = 14 28 V <sub>DC</sub>
Options 3-wire	3-wire: 0 10 V / V <sub>S</sub> = 14 36 V <sub>DC</sub>
Performance	
Accuracy	nominal pressure ≥ 0.1 bar: ≤ ± 0.1 % FSO nominal pressure < 0.1 bar: ≤ ± 0.2 % FSO
Permissible load	$R_{\text{max}} = [(V_S - V_S  \text{min}) / 0.02  \text{A}]  \Omega$
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / $k\Omega$
Long term stability	≤ ± 0.1 % FSO / year at reference conditions
<sup>1</sup> accuracy according to IEC 60770 – limi	t point adjustment (non-linearity, hysteresis, repeatability)
Thermal effects (Offset and Span	
Tolerance band [% FSO]	≤ ± 0.2 in compensated range -20 80°C
TC [% FSO / 10K]	<u> </u>
Permissible temperatures	, ,
Permissible temperatures	medium: -10 70 °C storage: -25 70 °C
Electrical protection <sup>2</sup>	<u> </u>
Insulation resistance	> 100 MΩ
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
<sup>2</sup> additional external overvoltage protecti	on 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 PUR (-10 70 °C) black FEP⁴ (-10 70 °C) black
<ul> <li>cable with integrated air tube for atmos</li> <li>do not use freely suspended probes wit</li> </ul>	oheric pressure reference h an FEP cable if effects due to highly charging processes are expected
Materials (media wetted)	
Housing	stainless steel 1.4404 (316L)
Seals	FKM others on request
Diaphragm	stainless steel 1.4435 (316L)
Protection cap	POM
Explosion protection (only for 4.	20 mA / 2-wire)
Approvals DX19-LMP 307i	IBEXU 10 ATEX 1068 X
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H},$ the supply connections have an inner capacity of max. 27 nF to the housing
Ambient temperature range	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar in zone 1 or higher: -20 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: 1µH/m
Miscellaneous	
Current consumption	max. 25 mA
Weight	approx. 200 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC
ATEX Directive	94/9/EG

### Technical Data

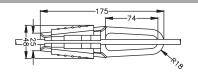
Mounting flange with cable gland							
Technical data							
Suitable for	all probes						
Flange material	stainless steel 1.4404 (316L)						
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303);	plastic					
Seal insert	material: TPE (ingress protection IP 68)						
Hole pattern	according to DIN 2507						
Version	Size (in mm)	Weight					
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d= 14	1.4 kg					
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d= 18	3.2 kg					
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d= 18	4.8 kg					
Ordering type		Ordering code					



2			0, 0 .0	
Ordering type				Ordering code
DN25 / PN40 with cable g	gland brass,	nickel plated		ZMF2540
DN50 / PN40 with cable	gland brass,	nickel plated		ZMF5040
DN80 / PN16 with cable	gland brass,	nickel plated		ZMF8016

#### Terminal clamp

Technical data					
Suitable for	all probes with cable Ø 5.5 10.5 mm				
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)				
Weight	approx. 160 g				



Ordering type	Ordering code
Terminal clamp, steel, zinc plated	Z100528
Terminal clamp, stainless steel 1.4301 (304)	Z100527

### Display program

#### **CIT 200**

Process display with LED display

Process display with LED display and contacts

### **CIT 300**

Process display with LED display, contacts and analogue output

Process display with LED display, bargraph, contacts and analogue output

Process display with LED display, contacts, analogue output and Ex-approval

Multichannel process display with graphics-capable LC display

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.com



LMP 307i		]-[]-[]		<u> </u>		
D						
Pressure in bar	4 5 0					
in mH <sub>2</sub> O	4 5 0 4 5 1					
Input [mH <sub>2</sub> O] [bar]						
4.0 0.40	4 0 0 0					
10 1.0	1 0 0 1					
25 2	2 0 0 1					
40 4.0 100 10	4 0 0 1 1 0 0 2					
100 10 200 20	1 0 0 2					
customer	2 0 0 2 9 9 9 9					consult
Housing	5   5   5   5					Jonath
Stainless steel 1.4404 (316L)		1				
customer		9				consult
Diaphragm						
Stainless steel 1.4435 (316L)		1				
customer		9				consult
Output						
4 20 mA / 2-wire		1				
intrinsic safety 4 20 mA / 2 wire 0 10 V / 3-wire		E 3				
customer		9				consult
Seals		9				CONSUIT
FKM		1				
customer		9				consult
Accuracy						
standard for $P_N \ge 0.1$ bar 0.1 %			1			
standard for $P_N < 0.1$ bar 0.2 %			В			
customer			9			consult
Electrical connection  PVC-cable <sup>1</sup>						
PUR-cable 1			1			
FEP-cable <sup>1</sup>			3			
customer			2 3 9			consult
Cable length						
in m						
Special version						
standard				1 1 1		
cable protection with				4 0 0		
stainless steel corrugated pipe				1 0 3	9 9 9	consult
with pipe length in m customer				9 9 9		consult
Customer				9 9 9		COHSUIL

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



## **LMP 308i**

### Separable **Stainless Steel Probe** Precision

Stainless Steel Sensor

accuracy according to IEC 60770: 0.1 % FSO

### **Nominal pressure**

from 0 ... 4 mH<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 35 mm
- cable and sensor section separable
- excellent accuracy
- communication connection
- thermal error in compensated range -20 ... 70 °C: 0.2 % FSO TC 0.02 % FSO / 10K
- Turn-Down 1:10

### **Optional versions**

- IS-version zone 0
- cable protection via corrugated pipe
- mounting accessories as cable gland and terminal clamp in stainless steel
- different kinds of cables
- different kinds of seal materials

The separable precision stainless steel probe LMP 308i is designed for continuous fill level and level measurement of water and liquid mediums. The signal processing of sensor signal is done by digital electronics with 16-bit analog digital converter. Consequently it is possible to conduct an active compensation of sensor intrinsic deviations from normal condions like nonlinearity and thermal error.

In order to facilitate stock-keeping and maintenance the transmitter body is plugged to the cable assembly with a connector and can be changed easily.

#### Preferred areas of use are

### Water / filtrated Sewage



ground water level measurement level measurement in wells and open waters / rain spillway basin level measurement in container water treatment plants water recycling



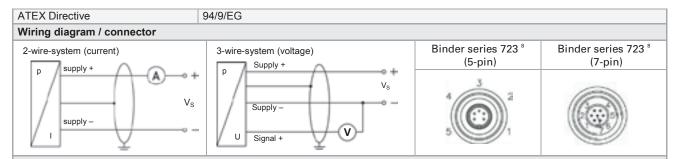






Input pressure range 1							
Nominal pressure gauge	[bar]	0.40	1	2	4	10	20
Level	[mH <sub>2</sub> O]	4	10	20	40	100	200
Overpressure	[bar]	2	5	10	20	40	80
Burst pressure	[bar]	3	7.5	15	25	50	120
<sup>1</sup> On customer request we ad							120
Output signal / Supply	just the device	, within the tarn down	r possibility by soit	tware on the regain	ca pressure range	•	
Standard		2-wire: 4 20	0 mA / V <sub>S</sub> = -	12 36 \/	with DS 232 or	ommunication in	torface
Option IS-protection			$0 \text{ mA} / V_S = 14$		WILLI K3-232 C	offiffiuffication in	шенасе
Options			$0 \text{ V} / \text{V}_{\text{S}} = 12$				
<u> </u>		3-WITE. U 10	J V / V <sub>S</sub> = 1-	+ 30 V <sub>DC</sub>			
Performance		1500050	0.10/ 500				
Accuracy	ourn (TD)	IEC 60770 <sup>2</sup> : ≤ ±	0.1 % FSO				
Performance after turn-do - TD ≤ 1:5	own (TD)	no change of acc	curacy <sup>3</sup>				
- TD > 1:5		formula for accur		(for nominal pres	0 > anine	40 har see note	3).
15 1.0		≤ ± [0.1 + 0.015 :	x turn-down1 % F	FSO	oure gaage = 0.	TO Dai occ note	0).
		with turn-down =			ed range		
		e.g. follwing accu	uracy can be cal	culated for turn-	down 1:10:		
		≤ ± (0.1 + 0.015	x 10) % FSO viz	the accuracy is	≤ ± 0.25 % FS0	)	
Permissible load		current 2-wire:	$R_{max} = [('$	$V_{\rm S} - V_{\rm S  min}) / 0.02$	. A] Ω		
		voltage 3-wire:	$R_{min} = 10$				
Influence effects			5 % FSO / 10 V	load:	0.05 % FSO /	kΩ	
Long term stability		≤ ± (0.1 x turn-do	own) % FSO / ye	ear at reference	conditions		
Response time		ca. 200 msec					
		following parame	eters can be adju	usted (interface /	software neede	ed <sup>4</sup> )	
Adjustability		electronic dampi		;		·	
		offset: 0 90 %		rn-down of span	max. 1:10		
<sup>2</sup> accuracy according to IEC 6	60770 – limit p	oint adjustment (non-	-linearity, hysteres	is, repeatability)			
<sup>3</sup> nominal pressure gauges ≤	0,40 bar are e	excluded; for these the	e calculation of ac	curacy is as follows	S:	^	
$\leq$ ± (0.1 + 0.02 x turn-down) % software, interface and cable							er and XP)
Thermal effects (Offset			aro io compandio i	viiii vviiiaovio oo,	50, 2000, 111 110111	voroion 1.0 or mgm	or and m
Tolerance band	[% FSO]	≤ ± (0.2 x turn-do	in o	ompensated ran	70 20 70 °C		
	SO / 10 K]	± (0.2 x turn-dow	,	<u> </u>	J		
		,	<u>'</u>	ompensated ran	•	/ any dramants OF	GE °C
Permissible temperatures		medium: -20 7	<u>'</u>		•	/ enviroment: -25	5 65 °C
Permissible temperatures Electrical protection <sup>5</sup>		medium: -20 7	<u>'</u>		•	/ enviroment: -25	5 65 °C
Permissible temperatures <b>Electrical protection</b> <sup>5</sup> Short-circuit protection	5	medium: -20 7	70 °C stor		•	/ enviroment: -25	5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio	on	medium: -20 7 permanent no damage, but a	70 °C stor	rage: -25 70 °0	•	/ enviroment: -25	5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib	on Dility	medium: -20 7  permanent no damage, but a emission and imi	70 °C stor also no function munity according	rage: -25 70 °0	electronics .		5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib <sup>5</sup> additional external overvolta	on Dility	medium: -20 7  permanent no damage, but a emission and imi	70 °C stor also no function munity according	g to EN 61326	electronics .		5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib	on Dility	medium: -20 7  permanent no damage, but a emission and imi	70 °C stor also no function munity according	g to EN 61326	electronics .		5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib <sup>5</sup> additional external overvolta	on pility age protection	permanent no damage, but a emission and imit unit in terminal box k	also no function munity according (L 1 or KL 2 with a	g to EN 61326	electronics .		5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib <sup>5</sup> additional external overvolta  Electrical connection	on pility age protection	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °	also no function munity according (L 1 or KL 2 with a	g to EN 61326	electronics .	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5  additional external overvolta  Electrical connection  Cable with sheath materia	on polity age protection	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °FEP <sup>7</sup> (-20 70 °C	also no function munity according (L 1 or KL 2 with a  C) grey C) black °C) black	g to EN 61326	electronics .	ble on request	5 65 °C
Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatible <sup>5</sup> additional external overvolta  Electrical connection  Cable with sheath material	on  poility  age protection  al <sup>6</sup>	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 ° FEP <sup>7</sup> (-20 70 °	also no function munity according KL 1 or KL 2 with a C) grey C) black °C) black ce	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia 6 cable with integrated air tube 7 do not use freely suspended	on  polity  age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 ° FEP <sup>7</sup> (-20 70 °	also no function munity according KL 1 or KL 2 with a C) grey C) black °C) black ce	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia 6 cable with integrated air tube 7 do not use freely suspended  Materials (media wetted	on  polity  age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 ° FEP <sup>7</sup> (-20 70 ° eric pressure reference an FEP cable if effect	also no function munity according (L 1 or KL 2 with a C) grey C) black °C) black ce s due to highly cha	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia 6 cable with integrated air tube 7 do not use freely suspended  Materials (media wetted  Housing	on  polity  age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 ° FEP <sup>7</sup> (-20 70 ° eric pressure reference an FEP cable if effect  stainless steel 1.	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protection  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia  6 cable with integrated air tubo 7 do not use freely suspended  Materials (media wetted Housing Seals	on  polity  age protection  al <sup>6</sup> e for atmosphed probes with a	medium: -20 7  permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C ric pressure referent an FEP cable if effect  stainless steel 1. FKM, EPDM, oth	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatible 5  additional external overvolta  Electrical connection  Cable with sheath materia  6  cable with integrated air tuber 7  do not use freely suspended  Materials (media wetted Housing Seals  Diaphragm	on  polity  age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C ric pressure referent an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1.	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia 6 cable with integrated air tubo 7 do not use freely suspended  Materials (media wetted  Housing  Seals  Diaphragm  Protection cap	on  polity age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C reic pressure reference an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	rage: -25 70 °(	electronics	ble on request	
Permissible temperatures  Electrical protection 5  Short-circuit protection  Reverse polarity protectio  Electromagnetic compatib 5 additional external overvolta  Electrical connection  Cable with sheath materia 6 cable with integrated air tubo 7 do not use freely suspended  Materials (media wetted  Housing  Seals  Diaphragm  Protection cap	on  polity age protection  al <sup>6</sup> e for atmosphed probes with a	permanent no damage, but a emission and imi unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C reic pressure reference an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	rage: -25 70 °(	electronics	ble on request	
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Permissible temperatures  Electrical protection <sup>5</sup> Short-circuit protection  Reverse polarity protectio  Electromagnetic compatible <sup>5</sup> additional external overvoltate  Electrical connection  Cable with sheath material	on poility page protection poility page protection poility page protection poility page protection page protec	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C PEP <sup>7</sup> (-20 70 °C peric pressure reference an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM 20 mA / 2-wire)  IBEXU 10 ATEX zone 0: II 10 zone 20: II 10 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93	also no function munity according (L 1 or KL 2 with a C) grey C) black C) black Co black Cs due to highly chack (s due to highly chack (4404 (316L) Ders on request (4435 (316L)  1068 X / IEC (5 Ex ia IIC T4 Ga (5 Ex ia IIIC T 85 (6 Ex ia IIIC T 85 (7 Ex ia IIIC T 85 (8 Ex ia IIIC T 85 (9 Ex ia IIIC T 85 (9 Ex ia IIIC T 85 (1 Ex ia III	g to EN 61326  g to EN 61326  tmospheric pressu  arging processes a  C Da  W, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈	re reference availa	others or	
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Permissible temperatures  Electrical protection 5  Short-circuit protection Reverse polarity protection Electromagnetic compatible 4  Electrical connection Cable with sheath material 6  Cable with integrated air tuber 7  do not use freely suspended Materials (media wetted Housing Seals Diaphragm Protection cap  Explosion protection (or Approvals DX19-LMP 308 i  Safety technical maximum Ambient temperature range Connecting cables (by factory)  Miscellaneous	on polity age protection al <sup>6</sup> e for atmosphed probes with a l) nly for 4 2	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C PUR (-20 70 °C ric pressure referent an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM 20 mA / 2-wire)  IBEXU 10 ATEX zone 0: II 10 zone 20: II 10 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 the supply conne in zone 0: in zone 1 or high cable capacitance	also no function munity according (L 1 or KL 2 with a C) grey C) black C) black C) black Cs due to highly chace (S	g to EN 61326  g to EN 61326  tmospheric pressur  arging processes a  °C Da  W, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈  inner capacity of  °C with p <sub>atm</sub> 0.8  °C  nield also signal line	re reference availare expected  c 0 µH, max. 27 nF to the par up to 1.1 bar ine/signal line: 1	others or others or he housing	
Permissible temperatures  Electrical protection 5  Short-circuit protection Reverse polarity protection Electromagnetic compatible 5  additional external overvolta  Electrical connection Cable with sheath material Cable with integrated air tuble 7  do not use freely suspended Materials (media wetted Housing Seals Diaphragm Protection cap  Explosion protection (or Approvals DX19-LMP 308 i  Safety technical maximum Ambient temperature range Connecting cables (by factory)  Miscellaneous Current consumption	on polity age protection al <sup>6</sup> e for atmosphed probes with a l) nly for 4 2	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C FEP <sup>7</sup> (-20 70 °C peric pressure referent an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM 20 mA / 2-wire)  IBEXU 10 ATEX zone 0: II 10 zone 20: II 10 ui = 28 V, Ii = 93 the supply conne in zone 1 or high cable capacitance signal output cur	also no function munity according (L 1 or KL 2 with a C) grey (C) black (C)	g to EN 61326  g to EN 61326  tmospheric pressur  arging processes a  °C Da  W, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈  inner capacity of  °C with p <sub>atm</sub> 0.8  °C  nield also signal line	re reference availare expected  c 0 µH, max. 27 nF to the par up to 1.1 bar ine/signal line: 1	others or others or he housing	
Permissible temperatures  Electrical protection 5  Short-circuit protection Reverse polarity protection Electromagnetic compatible 5  additional external overvolta Electrical connection Cable with sheath material Cable with integrated air tuber 7  do not use freely suspended Materials (media wetted Housing Seals Diaphragm Protection cap Explosion protection (or Approvals DX19-LMP 308 i  Safety technical maximum Ambient temperature range Connecting cables (by factory) Miscellaneous Current consumption	on polity age protection al <sup>6</sup> e for atmosphed probes with a l) nly for 4 2	permanent no damage, but a emission and imit unit in terminal box k  PVC (-5 70 °C PUR (-20 70 °C PUR (-20 70 °C FEP <sup>7</sup> (-20 70 °C peric pressure referent an FEP cable if effect  stainless steel 1. FKM, EPDM, oth stainless steel 1. POM 20 mA / 2-wire)  IBEXU 10 ATEX zone 0: II 10 zone 20: II 10 ui = 28 V, Ii = 93 the supply conne in zone 1 or high cable capacitance signal output cur	also no function munity according (L 1 or KL 2 with a C) grey C) black C) black C) black Cs due to highly chace (S	g to EN 61326  g to EN 61326  tmospheric pressur  arging processes a  °C Da  W, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈  inner capacity of  °C with p <sub>atm</sub> 0.8  °C  nield also signal line	re reference availare expected  c 0 µH, max. 27 nF to the par up to 1.1 bar ine/signal line: 1	others or others or he housing	

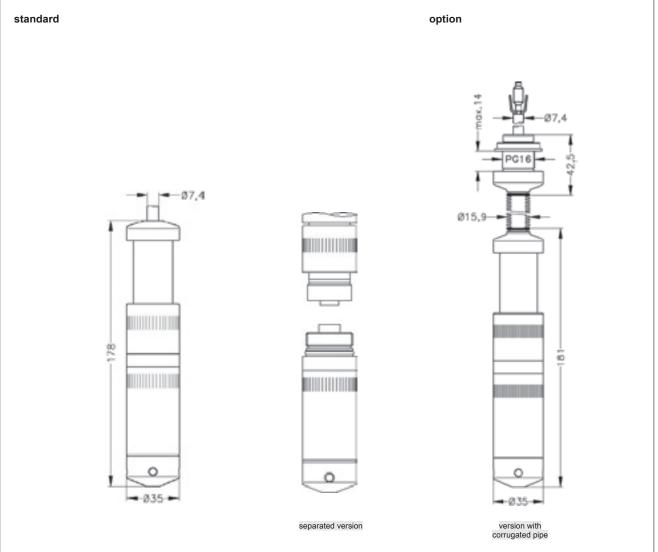
### Technical Data



Pin configuration				
Electrical connection	Binder series 723 ° (5-pin) / 2-wire	Binder series 723 ° (5-pin) / 3-wire	Binder series 723 <sup>s</sup> (7-pin) / 2-wire with communication interface	cable colours (DIN 47100)
Supply +	3	3	3 / wh (white)	wh (white)
Supply –	1	4	1 / bn (brown)	bn (brown)
Signal + (for 3-wire)	-	1	(6) / gn (green)	gn (green)
RxD	-	-	4 / ye (yellow)	-
TxD	-	-	5 / gr (gray)	-
GND	-	-	7 / gn (green)	-
Shield	5	5	2 / gn/ye (green / yellow)	gn/ye (green / yellow)

<sup>&</sup>lt;sup>8</sup> in separated version

### Dimensions (in mm)



### <sup>12</sup> LMP 308i

## Ordering code

LMP 308i		
Pressure  in bar in mH₂O  Input  [mH₂O]  4.0  0.40  10  1.0  20  2.0  40  4.0  100  10  200  200	4 0 0 0 0 1 2 0 0 1 4 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 2 2 2 0 0 0 2 9 9 9 9 9	
customer	9 9 9 9	consult
Stainless steel 1.4404 (316L) customer	1 9	consult
Diaphragm Stainless steel 1.4435 (316L) customer	1 9	consult
Output 4 20 mA / 2-wire	1	
Intrinsic safety 4 20 mA / 2-wire 0 10 V / 3-wire	E 3	
Seals	9	consult
FKM EPDM customer	1 3 9	consult
Electrical connection	9	Consult
PVC-cable <sup>1</sup> PUR-cable <sup>1</sup> FEP-cable <sup>1</sup>	1 2 3	
customer	9	consult
Accuracy		
0.1 % <sup>2</sup> customer	1 9	consult
Cable length	9	Corisuit
in m	9 9 9	consult
Version standard	1 1 1	
with communicaton interface <sup>3</sup>	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
prepared for mounting <sup>4</sup> with stainless steel pipe	1 2 6	consult
cable protection with stainless steel corrugated pipe with pipe length in m	1 2 3 9 9 9	consult
customer	9 9 9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

Windows® is a registrated trademark of Microsoft Corporation

 $<sup>^{2}</sup>$  available on request: calibration of individual pressure range higher than 400 mbar with accuracy 0.1 %

<sup>&</sup>lt;sup>3</sup> Software, interface and cable have to be order separately (Ordering code: CIS-G; Software appropriate for Windows<sup>®</sup> 95, 98, 2000, NT Version 4.0 or newer and XP)

<sup>&</sup>lt;sup>4</sup> stainless steel pipe is not part of the supply



## **LMK 382H**

# Stainless Steel Probe with HART®-communication

Ceramic Sensor

accuracy according to IEC 60770: 0.1 % FSO

### **Nominal pressure**

from 0 ... 60 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
- HART® communication (setting of offset, span and damping)
- permissible temperatures up to 85 °C
- high overpressure resistance
- high long-term stability

### **Optional versions**

- IS-version zone 0
- mounting with stainless steel pipe
- flange version
- diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- accessories e.g. assembling and probe flange, mounting clamp

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

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

#### Preferred areas of use are



#### Water

ground water level measurement rain spillway basin



### <u>Sewage</u>

waste water treatment water recycling

### Fuel / Oil



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







### <sup>14</sup> LMK 382 H

Pressure ranges <sup>1</sup>									
Nominal pressure	[bar]	0.06	0.16	0.4	1	2	5	10	20
Level	[mH <sub>2</sub> O]	0.6	1.6	4	10	20	50	100	200
Overpressure	[bar]	2	4	6	8	15	25	35	45
On customer request we adjust the devices by software on the required pressure ranges, within the turn-down possibility (starting at 0.02 bar).									

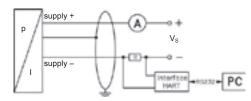
Output signal / Supply					
Standard	2-wire: 4 20 mA / Va	= 12 36	S V <sub>DC</sub> with HART® communic	cation V <sub>e</sub>	rated = 24 V <sub>DC</sub>
Option IS- protection			B V <sub>DC</sub> with HART® communic		rated = 24 V <sub>DC</sub>
Performance	,				30
Accuracy <sup>2</sup>	P <sub>N</sub> ≥ 160 mbar	TD ≤ 1:5	≤ ± 0.2 % FSO		TD <sub>max</sub> = 1:10
	1 10	TD > 1:5	$\leq \pm [0.2 + 0.03 \times TD] \%$	FSO	TDmax 1.10
	P <sub>N</sub> < 160 mbar		≤ ± [0.2 + 0.1 x TD] % F		TD <sub>max</sub> = 1:3
	P <sub>N</sub> ≥ 1 bar	TD ≤ 1:5	≤± 0.1 % FSO	00	TD <sub>max</sub> = 1:10
	I N = I Dai	TD > 1:5	≤ ± [0.1 + 0.02 x TD] %	ESO	1D <sub>max</sub> = 1.10
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0]$		load at HART®-com		= 250 O
Long term stability			at reference conditions	munication. K <sub>mir</sub>	1 - 250 52
Influence effects	supply: 0.05 % FSO /			e load: 0.05 % F	SO / kO
Turn-on time	850 msec	10 V	permissible	5 10au. 0.05 /0 1	30 / K22
Mean response time	140 msec without cons	sideration of e	electronic damping	mean me	easuring rate 7/sec
Max. response time	380 msec	ordination of t	sioca of no damping	mount	bacaring rate 77000
Adjustability		ng paramete	rs possible (interface / softw	are necessary	3):
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- electronic damping			,	,
	- offset:	0 80 '	% FSO		
	- turn down of span:				
<sup>2</sup> accuracy according to IEC 60770 – lin				F. V	
3 software, interface, and cable have to		are appropriate	e ior vvindows 95, 98, 2000, N i	version 4.0 or hi	yner, and XP)
Thermal effects (Offset and Spa	<u>'</u> .	/ 500			
Tolerance band	≤ ± (0.2 x turn-down) °				
TC, average	± (0.02 x turn-down) %	0 FSU / 10 K			
in compensated range Permissible temperatures	medium:	25	85 °C		
Permissible temperatures	electronics / environm		85 °C		
	storage:		85 °C		
Electrical protection 4	, consign				
Short-circuit protection	permanent				
Reverse polarity protection	no damage, but also n	o function			
Electromagnetic compatibility	emission and immunity		EN 61326		
					.1
<sup>4</sup> additional external overvoltage protect	tion unit in terminal box KL 1	or KL 2 with ati	mospneric pressure reference a	valiable on reques	<u> </u>
Mechanical stability					
Vibration	4 g (according to: DIN	EN 60068-2-	6)		
Electrical connection					
Cable outlet with sheat material <sup>5</sup>	PVC (-5 70 °C) grey				
	PUR (-25 70 °C) bla				
	FEP <sup>6</sup> (-25 70 °C) bl				
<sup>5</sup> shielded cable with integrated air tube	TPE (-25 85 °C) blu				
<sup>6</sup> do not use freely suspended probes w			raina processes are expected		
Materials	illi all i Li Cable II ellecto da	e to nigniy chai	ging processes are expected		
	atainless steel 1 4404				
Housing Seals	stainless steel 1.4404				
Seals	FFKM				
	EPDM				
	others on request				
Diaphragm	standard: ceramics A				
	option: ceramics A	l <sub>2</sub> O <sub>3</sub> 99.9 %			
Protection cap	POM				
Miscellaneous					
Option cable protection			nless steel: available as cor m possible; other lengths o		standard: stainless
Ingress protection	IP 68	J 1	, , , , , , , , , , , , , , , , , , , ,	. ,	
Current consumption	max. 21 mA				
Weight	approx. 400 g (without	cable)			
CE-conformity	EMC Directive: 2004/1	08/50			

### Technical Data

IS-protection				
Approval DX15A-LMK 382H	IBExU 10 ATEX 1186 X			
	zone 0 <sup>7</sup> : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T85 °C Da			
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i = 13,2 \text{ nF}, L_i = 0 \mu\text{H},$			
Salety technical maximum values	the supply connections have an inner capacity of max. 27 nF opposite the enclosure			
Permissible media temperature	in zone 0: -10 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar			
	zone 1 or higher: -25 70 °C			
Connecting cables	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m			
(by factory)	cable inductance: signal line/shield also signal line/signal line: 1μH/m			
<sup>7</sup> for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4" (zone 0)				

### Wiring diagram

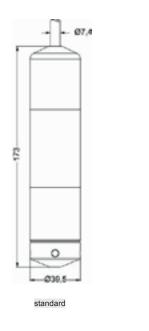
2-wire-system (current) HART®

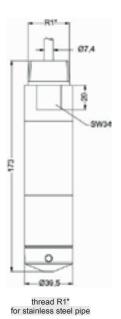


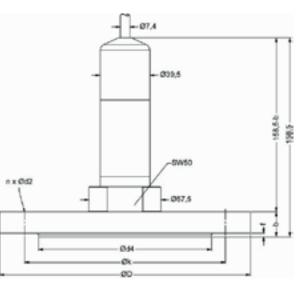
#### Pin configuration

garacter	
Electrical connection	cable colours (IEC 60575)
	wh (white) bn (brown)
117	
Shield	gnye (green-yellow)

### Dimensions (in mm)







flange version

dimensions in mm						
dimen-	DN25 /	DN40/	DN50 /	DN80 /		
sions	PN40	PN40	PN40	PN16		
D	115	150	165	200		
K	85	110	125	160		
d4	68	88	102	138		
b	18	18	20	20		
f	2	3	3	3		
n	4	4	4	8		
d2	14	18	18	18		

HART® is a registered trade mark of HART Communication Foundation; Windows® is a registered trade mark of Microsoft Corporation

# 16 LMK 382 H Ordering code

Pressure	LMK 382H	<u> </u>	
Imput			
Imput		5 6 5	
0.60	in mH <sub>2</sub> O		
Stainless steel 1.4404 (316L)   1		0 6 0 0	
Stainless steel 1.4404 (316L)   1		1 6 0 0	
Stainless steel 1.4404 (316L)   1		4 0 0 0	
Stainless steel 1.4404 (316L)   1		1 0 0 1	
Stainless steel 1.4404 (316L)   1		2 0 0 1	
Stainless steel 1.4404 (316L)   1		5 0 0 1	
Stainless steel 1.4404 (316L)   1		1 0 0 2	
Stainless steel 1.4404 (316L)   1		2 0 0 2	
Stainless steel 1.4404 (316L)   1		9 9 9 9	consult
Customer   9			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1	
Ceramics Al₂O₃ 99%		9	consult
Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%	Ceramics ALO, 96%	2	
Customer         9         Consult           Output         HART®-communication 4 20 mA / 2-wire HART®-communication Intrinsic safety 4 20 mA / 2-wire Customer         H         I <t< td=""><td></td><td>2</td><td></td></t<>		2	
Coutput			consult
HART		3	CONSUM
4 20 mA / 2-wire   T	HART®-communication	11	
Intrinsic safety 4 20 mA / 2-wire customer    Seals	4 20 mA / 2-wire	"	
Intrinsic safety 4 20 mA / 2-wire customer		1	
FKM			
FKM		9	consult
EPDM FFKM Customer Customer  PVC-cable ¹ PUR-cable ¹ PUR-cable ¹ FEP-cable ¹ TPE-cable ¹ Customer  PN ≥ 1 bar PN < 1 bar PN < 1 bar Customer  Cable length  in m  Special version  Electrical connection  PVC-cable ¹ 1 2 4 Cunsult  Consult			
FFKM customer 9			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		7	
Electrical connection $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			consult
PVC-cable ¹ PUR-cable ¹ PUR-cable ¹ PUR-cable ¹ FEP-cable ¹ TPE-cable ¹ Customer 9		3	Sonsuit
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PVC-cable <sup>1</sup>		1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	PUR-cable <sup>1</sup>		2
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			3
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			9 consult
P <sub>N</sub> < 1 bar			
customer 9 consult  Cable length in m 9 9 9 9  Special version standard 0 0 0 0  prepared for mounting 2 5 0 2  with stainless steel pipe flange version 5 1 0			
Cable length  in m  Special version  Standard prepared for mounting 2 with stainless steel pipe flange version  5 1 0			
in m  Special version  Standard prepared for mounting 2 with stainless steel pipe flange version  in m  9 9 9 9  0 0 0  2			consuit
Special version  standard prepared for mounting 2 with stainless steel pipe flange version  standard prepared for mounting 2 standard prepared for mounting 2 standard standar			9 9 9
standard  prepared for mounting 2 with stainless steel pipe flange version  standard  0 0 0  2			9 9 9
prepared for mounting <sup>2</sup> with stainless steel pipe flange version  5 0 2	standard		0 0 0
with stainless steel pipe flange version  5 0 2 1 0	prepared for mounting <sup>2</sup>		
flange version 5   1   0			
customer 9 9 9 consult			5 1 0
	customer		

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

HART® is a registered trade mark of HART Communication Foundation

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



### **LMK 458H**

# Probe with HART<sup>®</sup>-communication for Marine and Offshore

Ceramic Sensor

accuracy according to IEC 60770: 0.1 % FSO

#### **Nominal pressure**

from 0 ... 60 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

- shipping approvals acc. to: Lloyd's Register (LR), Germanischer Lloyd (GL), Det Norske Veritas (DNV) China Classification Society (CCS), American Bureau of Shipping (ABS)
- ▶ diameter 39.5 mm
- ► HART® communication (setting of offset, span and damping)
- high overpressure resistance
- high long-term stability

#### **Optional versions**

- ▶ IS-version zone 0
- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 99.9 %
- different housing materials (stainless steel, CuNiFe)
- screw-in and flange version
- accessories e. g. assembling and probe flange, mounting clamp

The hydrostatic probe LMK 458H has been developed for measuring level in service and storage tanks and is as a consequence certificated for shipbuilding and offshore applications.

A permissible operating temperature of up to 85°C and the possibility to use the device in intrinsic safe areas enable to measure the pressure of various fluids under extreme conditions. The basis for the LMK 458H is a capacitive ceramic sensor element, which offers a high overload resistance and medium compatibility.

#### Preferred areas of use are



### Water

Drinking water abstraction
Desalinization plant

Shipbuilding / Offshore



Ballast tanks

Draught monitoring Level measurement in ballast and storage tanks











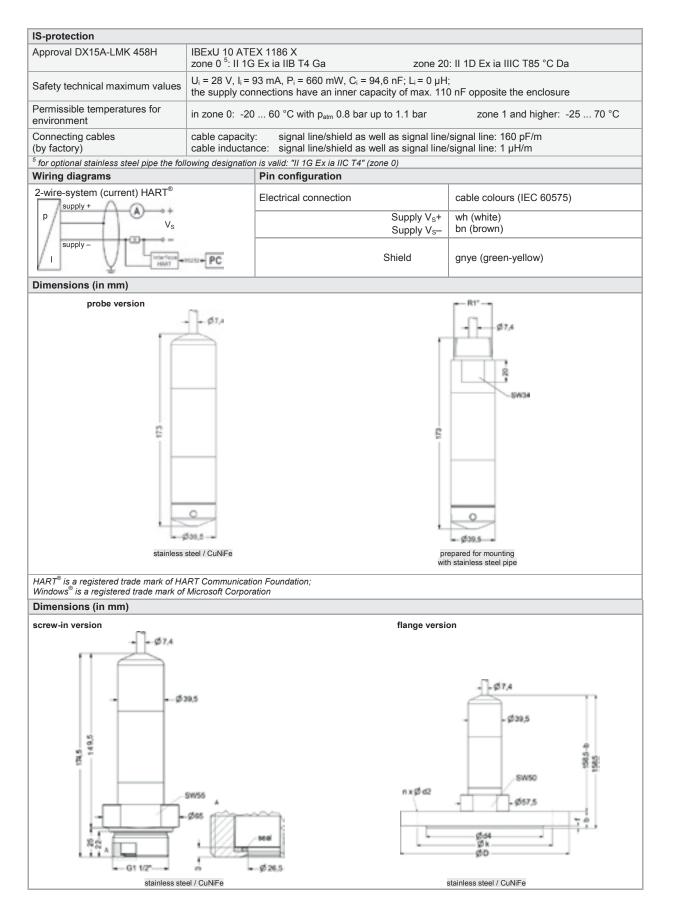


### LMK 458 H

Pressure ranges								
Nominal pressure <sup>1</sup> [bar]	0.06	0.16	0.4	1	2	5	10	20
Level [mH <sub>2</sub> O]	0.6	1.6	4	10	20	50	100	200
Overpressure [bar]	2	4	6	8	15	25	35	45
<sup>1</sup> On customer request we adjust the d	evices by softwa	are on the requ	ired pressure ran	ges, within the	turn-down po	ossibility (starti	ng at 0.02 bai	·).
Output signal / Supply								
Standard	2-wire: 4 2	20 mA / V <sub>S</sub> =	12 36 V <sub>DC</sub>	with HART®	communica	ation Vs	s <sub>rated</sub> = 24 V <sub>D</sub>	ıc.
Option IS-version			14 28 V <sub>DC</sub>	with HART®			$S_{rated} = 24 V_{\Gamma}$	
Performance	Z WII C. 4 2	20 111/17 15	14 20 VDC	WIGHTIAGE	COMMITTALING	ation vs	s rated 2-7 V L	)C
Accuracy 2			TD < 1.5	< + 0	2 % FSO			
Accuracy	P <sub>N</sub> ≥ 160 mb	ar	TD ≤ 1:5 TD > 1:5	≤ <b>±</b> [0	.2 + 0.03 x T		TD <sub>max</sub> = 1	
	$P_N$ < 160 mb	ar		≤ <b>±</b> [0	.2 + 0.1 x TI	D] % FSO	$TD_{max} = 1$	:3
	P <sub>N</sub> ≥ 1 bar		TD ≤ 1:5 TD > 1:5		1 % FSO .1 + 0.02 x 1	TD] % FSO	TD <sub>max</sub> = 1	: 10
Permissible load	$R_{max} = [(V_S - V_S)]$	V <sub>S min</sub> ) / 0.02	2 Α] Ω			unication: R <sub>m</sub>	$_{\rm nin}$ = 250 $\Omega$	
Long term stability			O / year at refe					
Influence effects	·	% FSO / 10				oad: 0.05 %	FSO / kΩ	
Turn-on time	850 msec							
Mean response time	140 msec w	ithout consid	leration of elect	ronic dampir	ıg	mean	measuring r	ate 7/sec
Max. response time	380 msec							
Adjustability	- electronic - offset: 0 - turn dow	c damping: 0 80 % FSO n of span: m	ax. 1:10		face / softwa	are necessary	y <sup>3</sup> ):	
<sup>2</sup> accuracy according to IEC 60770 – ling <sup>3</sup> software, interface, and cable have to	nit point adjustn be ordered sep	nent (non-linea earately (softwa	rity, hysteresis, re are appropriate fo	peatability) Windows® 95	i, 98, 2000, N	T Version 4.0 c	or higher, and	XP)
Thermal effects (Offset and Spa	n) / Permissi	ble temperat	tures					
Tolerance band	≤ ± [0.2 x tu	rn-down] % F	-SO					
TC, average	≤ ± [0.02 x t	urn-down] %	FSO / 10 K					
in compensated range	-20 80 °C	;						
Permissible temperatures	medium: -25	5 85 °C	electronics	/ environmer	nt: -25 85	°C stora	age: -25 8	35 °C
Electrical protection 4								
Short-circuit protection	permanent							
Reverse polarity protection	no damage,	but also no f	function					
Electromagnetic compatibility	emission an - EN 613	d immunity a 26		scher Lloyd	(GL)	- Det N	Norske Verita	as (DNV)
<sup>4</sup> additional external overvoltage protec	tion unit in term	inal box KL 1 c	or KL 2 with atmos	spheric pressu	re reference a	available		
Mechanical stability								
Vibration	4 g (accordi	ng to GL: cur	rve 2 / according	g to DNV: CI	ass B / bas	is: DIN EN 60	0068-2-6)	
Electrical connection								
Cable		ole with integ	rated air tube fo	or atmosphe	ric reference	e (for nomina	l pressure ra	anges abso-
Materials (media wetted)	iato, trio all	10 010361	~,					
Housing	standard:	etainless eta	el 1.4404 (316L	1				
Cable sheath	option:	CuNi10Fe1M	In (resistant ag ant, halogen fre	áinst sea wa		against ail ar		n request
		resistant aga	ainst salt, sea w			agairist oii ai	iu gasoiirie,	
Seals	FKM; FFKM others on re	quest	0.000/					
Diaphragm	option:	ceramics Al <sub>2</sub> ceramics Al <sub>2</sub>						
Nose cone	POM							
Miscellaneous								
Cable protection	steel pipe w		robe in stainles: gth up to 2 m p				(standard: s	stainless
Ingress protection	IP 68							
Current consumption	max. 21 mA							
Weight		without cable						
CE-conformity	EMC Directi	ve: 2004/108	3/EC					
Category of the environment								
Lloyd's Register (LR)	EMV1, EMV	/2, EMV3, EN	MV4	r	umber of ce	ertificate: 13/2	20056	
Germanischer Lloyd (GL)	D, EMC 1			r	number of ce	ertificate: 19	777 - 11 HH	
Det Norske Veritas (DNV)	temperature	: D	humidity: B	V	ribration: B			
	electromagr	netic compati	bility: B	r	umber of ce	ertificate: A-1	2144	

### LMK 458 H

### Technical Data



This document contains product specifications; properties are not guaranteed. Subject to change without notice.

### <sup>20</sup> LMK 458 H

### Ordering code

LMK 458H		Ш	
Pressure  in bar, gauge in bar, sealed gauge 1 in bar, absolute 1 in mH <sub>2</sub> O	7 6 E 7 6 G 7 6 H 7 6 F	cons	sult
Input [mH <sub>2</sub> O] [bar] 0.60 0.06 1.60 0.16 4.00 0.40 10 1.0 20 2.0	0 6 0 0 1 6 0 0 4 0 0 0 1 0 0 1		
50 5.0 100 10 200 20 customer	2 0 0 1 5 0 0 1 1 0 0 2 2 0 0 2 9 9 9 9	cons	sult
Stainless steel 1.4404 (316L)  Copper-Nickel-alloy (CuNi10Fe1Mn)  customer	1 K 9	cons	sult
Design  Submersible transmitter <sup>2</sup> Flange transmitter <sup>2</sup> Screw-in transmitter <sup>2</sup>	1 3 5		
Diaphragm			
Ceramics Al <sub>2</sub> O <sub>3</sub> 96% Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9% customer	2 C 9	cons	sult
Output  HART®-communication 4 20 mA / 2-wire	н		
HART <sup>®</sup> -communication Intrinsic safety 4 20 mA / 2-wire customer	1 9	cons	sult
Seals FKM	1		
EPDM FFKM	3 7		
Customer  Electrical connection  TPE-U-cable <sup>3</sup> customer	9 4 9	cons	sult
Accuracy $P_N \ge 1 \text{ bar}$ 0.1 %	1		
P <sub>N</sub> < 1 bar 0,2 % customer	B 9	cons	sult
Cable length			
in m Special version standard	9 9 9	0 0	
prepared for mounting with st. steel pipe <sup>2, 4</sup> customer	5 9	0 0 0 2 9 9 cons	sult

<sup>&</sup>lt;sup>1</sup> nominal pressure ranges sealed gauge and absolute from 1 bar

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<sup>&</sup>lt;sup>2</sup> mounting accessories are not part of supply and have to be ordered separately

<sup>&</sup>lt;sup>3</sup> shielded cable with integrated air tube for atmospheric reference

<sup>4</sup> stainless steel pipe is not part of the supply

## **LMK 358H**



Separable
Stainless Steel Probe
with HART®-communication

Ceramic Sensor

accuracy according to IEC 60770: 0.1 % FSO

#### **Nominal pressure**

from 0 ... 60 cmH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

### **Output signals**

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

### **Special characteristics**

- ▶ diameter 39.5 mm
- cable and sensor section separable
- HART<sup>®</sup> communication (setting of offset, span and damping)
- permissible temperatures up to 85 °C
- high long-term stability

### **Optional versions**

- IS-version zone 0
- cable protection via corrugated pipe
- diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>

The separable stainless steel probe LMK 358H has been designed for level measurement in waste water, waste and higher viscosity media. Basic element is a capacitive ceramic sensor.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembly with a connector and can be changed easily.

#### Preferred areas of use are



#### Water

ground water level measurement rain spillway basin



#### <u>Sewage</u>

waste water treatment water recycling

### Fuel / Oil



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







### LMK 358 H

Input pressure range 1								
Nominal pressure gauge	[bar]	0.06	0.16	0.4	1	2	5	10
Level	[mH <sub>2</sub> O]	0.6	1.6	4	10	20	50	100
Overpressure	[bar]	2	4	6	8	15	25	35
<sup>1</sup> 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							
Standard	2-wire: 4 20 mA	/ V <sub>S</sub> = 12 36 V <sub>DC</sub> w	ith HART <sup>□</sup> communication	$V_{S rated} = 24 V_{DC}$			
Option IS-protection	2-wire: 4 20 mA	/ V <sub>S</sub> = 12 28 V <sub>DC</sub> w	ith HART <sup>□</sup> communication	V <sub>S rated</sub> = 24 V <sub>DC</sub>			
Performance							
Accuracy <sup>2</sup>	P <sub>N</sub> ≥ 160 mbar	TD ≤ 1:5 ≤ ± 0.2	% FSO	TD <sub>max</sub> = 1:10			
. 1000.00)	. 14 = 155561		2 + 0.03 x TD] % FSO	TDmax 1.10			
	P <sub>N</sub> < 160 mbar	-	2 + 0.1 x TD] % FSO	TD <sub>max</sub> = 1:3			
	$P_N \ge 1$ bar	<u> </u>	% FSO	TD <sub>max</sub> = 1:10			
	I N = I Dai		1 + 0.02 x TD] % FSO	1D <sub>max</sub> = 1.10			
Permissible load	D = [(\/ \/ \/ \/	•	d at HART®-communication:	D = 250 O			
Long term stability	$R_{\text{max}} = [(V_S - V_{S \text{ min}}) / $	) % FSO / year at reference		R <sub>min</sub> - 230 12			
Influence effects	supply: 0.05 % FSO		ad: 0.05 % FSO / kΩ				
Turn-on time	850 msec	7 10 V	au. 0.05 % F3O / K12				
		consideration of electronic	domning	magazina rata 7/20/			
Mean response time Max. response time	380 msec	consideration of electronic	damping	measuring rate 7/sec			
Adjustability		ving parameters possible (	interface / software necessa	m, 3\			
Aujustability	- electronic damping - offset: 0 80 % F - turn-down of span	g 0 100 sec	interface / Surware necessa	"y )			
<sup>2</sup> accuracy according to IEC 60770 – li. <sup>3</sup> software, interface, and cable have to	mit point adjustment (non-lir	nearity, hysteresis, repeatabilit	y) s <sup>®</sup> 95, 98, 2000, NT Version 4.0	or higher, and XP)			
Thermal effects (Offset and Spa				,			
Tolerance band	≤ ± (0.2 x turn-down)						
TC, average	± (0.02 x turn-down)						
in compensated range	-20 80 °C	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Permissible temperatures	medium:	-25 85 °C					
,	electronic / environm storage:						
Electrical protection <sup>4</sup>							
Short-circuit protection	permanent						
Reverse polarity protection	no damage, but also	no damage, but also no function					
Electromagnetic compatibility	emission and immuni	emission and immunity according to EN 61326					
<sup>4</sup> additional external overvoltage protection u	ınit in terminal box KL 1 or KL 2 v	with atmospheric pressure reference	e available on request				
Mechanical stability							
Vibration	4 g (according to: DII	N EN 60068-2-6)					
Electrical connection	3 (***** 3 **	,					
Cable with sheath material <sup>5</sup>	PVC (-5 70 °C) gre	01/					
	PUR (-25 70 °C) b FEP <sup>6</sup> (-25 70 °C) b TPE (-2585 °C) bb	olack black ue					
<sup>5</sup> shielded cable with integrated air tube							
<sup>6</sup> do not use freely suspended probes v	with an FEP cable if effects	due to highly charging process	ses are expected				
Materials (media wetted)							
Housing	stainless steel 1.4404	4 (316L)					
Seals	FKM EPDM others on request						
Diaphragm	standard: ceramics option: ceramics	Al <sub>2</sub> O <sub>3</sub> 96 % Al <sub>2</sub> O <sub>3</sub> 99.9 %					
Protection cap	POM						
Explosion protection							
Approval DX15A-LMK 358H	IBExU 10 ATEX 1180 zone 0 7: II 1G Ex ia		zone 20: II 1D Ex ia IIIC 1	Г85 °C Da			
Safety technical maximum values		, $P_i$ = 660 mW, $C_i$ = 13,2 nl ns have an inner capacity					
	in zone 0:	-20 60 °C with p <sub>atm</sub> 0.8 b	ar up to 1.1 bar				
Permissible media temperature	zone 1 or higher: -	-25 70 °C					
Permissible media temperature  Connecting cables (by factory)	zone 1 or higher: -	-25 70 °C	al line/signal line: 160 pF/m				

### LMK 358 H

Miscellaneous		
Option cable protection	stainless steel pipe for probe in	stainless steel: available as compact product (standard: stainless
		to 2 m possible; other lengths on request)
Current consumption	max. 21 mA	
Weight	approx. 650 g (without cable)	
ngress protection	IP 68	
CE-conformity	EMC Directive: 2004/108/EC	
Viring diagram		
2-wire-system (current) HART®		connector
	Vs  o —  erfoce —  erfoce —  PC	
Pin configuration		
lectrical connection	Binder series 723 8 (	(5-pin) cable colours (IEC 60575)
Supply +	3	wh (white)
Supply –	1	gn (brown)
Shield	5	gnye (green-yellow)
in separated version	<u> </u>	3 7 (3 - 2 7 - 2 7
Dimensions (in mm)		
\$'222	36	\$15.9 \$27
939,5	separate	ed version optionally with corrugated pipe

# 24 LMK 358 H Ordering code

LMK 358H	Ш-Ш-	Q-Q-Q-Q-	0-0	<b></b>	
$\begin{tabular}{ll} \textbf{Pressure} & & & & & & & & & & & \\ & & & & & & & $	0 6 0 0 1 6 0 0 4 0 0 0 1 0 0 1 2 0 0 1 5 0 0 1 1 0 0 2 9 9 9 9				consult
Housing Chairless should 4404 (24CL)		4			
Stainless steel 1.4404 (316L) customer		1 9			consult
Diaphragm					
Ceramics Al <sub>2</sub> O <sub>3</sub> 96% Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%		2 C			
customer		9			consult
Output					
HART®-communication 4 20 mA / 2-wire		Н			
HART®-communication					
Intrinsic safety 4 20 mA / 2-wire		•			
customer		9			consult
Seals FKM		1			
EPDM		3			
customer		9			consult
Electrical connection					
PVC-cable <sup>1</sup>			1		
PUR-cable <sup>1</sup>			2 3		
FEP-cable <sup>1</sup> TPE-cable			4		
customer			9		consult
Accuracy					OGITOGIC
$P_N \ge 1 \text{ bar}$ 0.1 %			1		
$P_N < 1 \text{ bar}$ 0,2 %			В		
customer			9		consult
Cable length					
in m Special version			9 9 9		
standard				0 0 0	
prepared for mounting 2	!			1 0 6	
with stainless steel pipe				1 0 0	
cable protection with					
stainless steel corrugated pipe				1 0 3 9 9 9	consult
with pipe length in m customer				9 9 9	consult
Customer				5 3 3	COHOUIL

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

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This document contains product specifications; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.

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



### **Slimline Probe**

Stainless Steel 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 ... 250 mH<sub>2</sub>O

#### **Output signals**

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

### **Special characteristics**

- diameter 19 mm for cramped areas
- small thermal effect
- excellent long term stability
- excellent linearity

### **Optional versions**

- different kinds of cable
- customer specific versions
   e.g. special pressure ranges

The slimline probe LMP 305 with silicon stainless steel sensor is designed for continuous level measurement in confined space conditions. Permissible media are clean or waste water and thin fluids.

A piezoresistiv stainless steel sensor with low thermal error, an excellent linearity and a long term stability, is basis of LMP 305.

### Preferred areas of use are

### <u>Water</u>

level measurement in confined space conditions

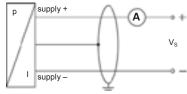


ground water monitoring
depth or level measurement in wells
and open waters
drinking water system
level measurement in container



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	16	25
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250
Overpressure	[bar]	1	1	1	1	3	3	6	6	20	20	60	60	100

Output signal / Supply											
Standard	2-wire: 4 20	$mA / V_S = 12 36 V$	DC								
Performance											
Accuracy	nomin	nominal pressure ≤ 0.4 bar: ≤ ± 0.50 % FSO									
Permissible load	$R_{\text{max}} = [(V_S - V_{S \text{ min}})]$	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$									
Influence effects	load: 0.05 %	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ									
Long term stability	≤ ± 0.1 % FSO / ye	≤ ± 0.1 % FSO / year at reference conditions									
Response time	< 10 msec										
<sup>1</sup> accuracy according to IEC 60770	– limit point adjustment (non-linearity, hysteresis, repeatability)										
Thermal effects (Offset and	Span)										
Nominal pressure P <sub>N</sub>	[bar] ≤ 0.1	≤ 0.1 ≤ 0.25 ≤ 0.4 ≤ 1									
Tolerance band [% F	[SO] ≤±2	≤ ± 1.5	≤ ± 1	≤ ± 1	≤ ± 0.75						
TC, average [% FSO / 1	0 K] ± 0.3	± 0.2	± 0.14	± 0.1	± 0.07						
in compensated range	[°C]	050									
Permissible temperatures											
Permissible temperatures medium: -10 70 °C storage: -25 70 °C											
Electrical protection <sup>2</sup>		-									
Short-circuit protection	permanent	permanent									
Reverse polarity protection	<u>'</u>	no damage, but also no function									
Electromagnetic compatibility											
<sup>2</sup> additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request											
	otection unit in terminal box i	NE TOTAL 2 WILL ALTHOS	nieric pressure referei	ice available off reques	St.						
Electrical connection	D) (0 ( 5 - 70 00)										
Cable with sheath material <sup>3</sup>	PVC (-5 70 °C) PUR (-10 70 °C) FEP <sup>4</sup> (-10 70 °C) others on request	) black c) black									
<sup>3</sup> cable with integrated air tube for <sup>4</sup> do not use freely suspended prob	atmospheric pressure referer es with an FEP cable if effec	nce ts due to highly charging	processes are expec	ted							
Materials (media wetted)		10.1.10.101.									
Housing Seals	stainless steel 1.44	104 (316L)									
Seals Diaphragm	stainless steel 1.44	135 (316L)									
Protection cap	POM	100 (010L)									
Cable sheath	PVC / PUR / FEP										
Miscellaneous											
Connecting cables	cable capacitance:	signal line/shield a	lso signal line/signa	Il line: 160 pF/m							
(by factory)	cable inductance:	0	lso signal line/signa								
Current consumption	signal output curre										
Weight	approx. 100 g (with	nout cable)									
Ingress protection	IP 68										
CE-conformity	EMC Directive: 200	04/108/EC									
Wiring diagram											
2-wire-system (current)  p supply +	)+										



### Technical Data

Pin configuration	
Electrical connection	cable colours (IEC 60575)
Supply +	wh (white)
Supply + Supply –	bn (brown)
Shield	gnye (green-yellow)
Dimensions (in mm)	
	97.4  © 021  Protection cap removable

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# 28 LMP 305 Ordering code

LMP 305	Ш-Ш	]- <b>_</b>				
Pressure						
in bar	4 0 0 4 0 1					
in mH <sub>2</sub> O Input [mH <sub>2</sub> O] [bar]	4   0   1					
Input [mH <sub>2</sub> O] [bar] 1.0 0.10	1 0 0 0					
1.6 0.16	1 0 0 0 1 6 0 0 2 5 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 2 5 0 2					
250 25 customer	1 0 0 2 1 6 0 2 2 5 0 2 9 9 9 9					conquit
Housing	9 9 9 9					consult
Stainless steel 1.4404 (316L)		1			_	
customer		1 9				consult
Diaphragm		3				Consuit
Stainless steel 1.4435 (316L)		1			_	
customer		9				consult
Output						
4 20 mA / 2-wire		1				
customer		9				consult
Seals						
FKM			1			
EPDM			3			
customer			9			consult
Accuracy						
standard for $P_N > 0.4$ bar $0.35 \%$			3			
standard for $P_N \le 0.4$ bar $0.5\%$			5			
option for P <sub>N</sub> > 0.4 bar 0.25 %			9			aanault
Electrical connection			9			consult
PVC-cable <sup>1</sup>			1			
PUR-cable <sup>1</sup>			2			
FEP-cable <sup>1</sup>			3			
customer			9			consult
Cable length						
in m				9 9 9		
Special version						
standard				0	0 0	
customer				9	9 9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



### Stainless Steel Probe

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % / 0.1 % FSO

### **Nominal pressure**

from  $0 \dots 1 \text{ mH}_2\text{O}$  up to  $0 \dots 250 \text{ mH}_2\text{O}$ 

### **Output signals**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

### **Special characteristics**

- diameter 26.5 mm
- small thermal effect
- excellent accuracy
- excellent long term stability

### **Optional versions**

- IS-protection zone 0
- SIL 2 (Safety Integrity Level)
- cable protection via corrugated pipe
- different kinds of cables
- different kinds of seal materials

The stainless steel probe LMP 307 is designed for continuous level measurement in water and clean or waste fluids.

Basic element is a high quality stainless steel sensor with high requirements for exact measurement with excellent long term stability.

### Preferred areas of use are

### Water / filtrated sewage



drinking water system ground water level measurement rain spillway basin pump and booster stations level measurement in container water treatment plants water recycling



Fuel / Oil

fuel storage tank farm





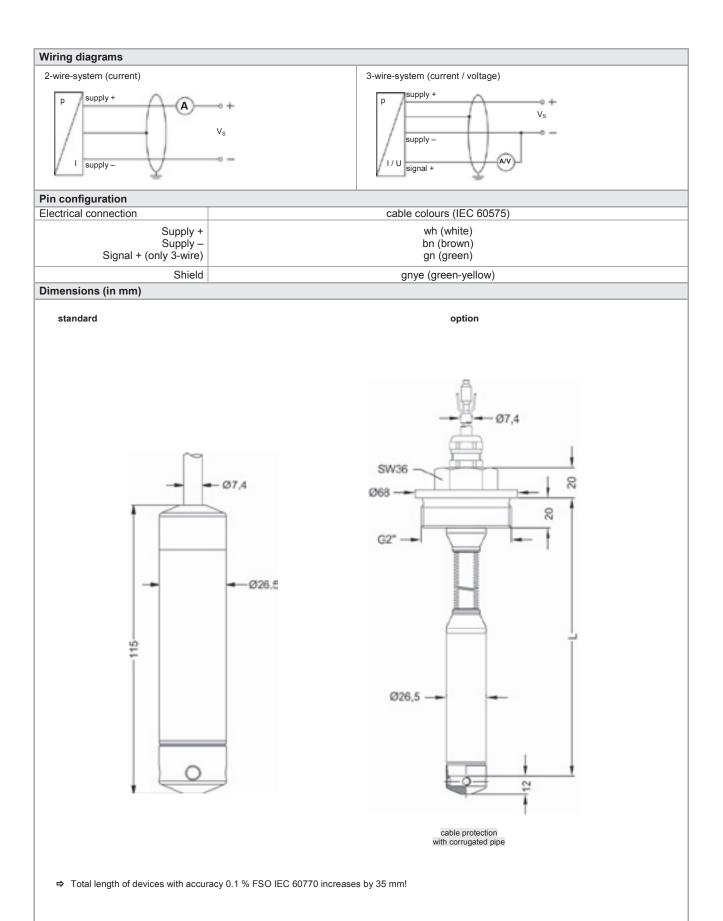






Input pressure range														
Nominal pressure gauge	[bar]	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250
Overpressure	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80
Burst pressure >	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120

Output signal / Supply								
Standard	2-wire: 4 20 mA / $V_S$ = 8 32 $V_{DC}$ SIL-version: $V_S$ = 14 28 $V_{DC}$							
Option Ex-protection	2-wire: 4 20 mA / V <sub>S</sub> = 10 28 V <sub>DC</sub> SIL-version: V <sub>S</sub> = 14 28 V <sub>DC</sub>							
Options 3-wire	3-wire: 0 20 mA / V <sub>S</sub> = 14 30 V <sub>DC</sub>							
	$0 \dots 10 \text{ V}$ / $V_S = 14 \dots 30 \text{ V}_{DC}$							
Performance								
Accuracy	standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO							
	nominal pressure $\geq 0.4$ bar: $\leq \pm 0.35 \%$ FSO							
	option 1: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO option 2: for all nominal pressures: ≤ ± 0.1 % FSO							
Permissible load	current 2-wire: $R_{\text{max}} = [(V_S - V_S \text{ min}) / 0.02 \text{ A}] \Omega$							
	current 3-wire: $R_{max} = 500 \Omega$							
	voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$							
Influence effects	supply: 0.05 % FSO / 10 V							
	load: 0.05 % FSO / kΩ							
Long term stability	≤ ± 0.1 % FSO / year at reference conditions							
Response time	2-wire: < 10 msec; 3-wire: < 3 msec							
accuracy according to IEC 60770 – I	imit point adjustment (non-linearity, hysteresis, repeatability)							
Thermal effects (Offset and Sp	an)							
Nominal pressure P <sub>N</sub> [ba	r]   < 0.40							
Tolerance band [% FSC	D] ≤±1 ≤±0.75							
in compensated range [°C	0 70							
Permissible temperatures								
Permissible temperatures	medium: -10 70 °C storage: -25 70 °C							
Electrical protection <sup>2</sup>	<u> </u>							
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 prote	ection 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 PUR (-10 70 °C) black FEP⁴ (-10 70 °C) black							
<sup>3</sup> cable with integrated air tube for atm								
	with an FEP cable if effects due to highly charging processes are expected							
Materials (media wetted)	atainless atasl 1 4404 (246L)							
Housing	stainless steel 1.4404 (316L)							
Seals	FKM others on request							
Diaphragm	stainless steel 1.4435 (316L)							
Protection cap	POM							
Explosion protection (only for								
	IBExU 10 ATEX 1068 X							
DX19-LMP 307	zone 0: II 1G Ex ia IIC T4 Ga							
57(10 E.W. 007	zone 20: II 1D Ex ia IIIC T 85°C Da							
Safety technical maximum values								
	the supply connections have an inner capacity of max. 27 nF to the housing							
Ambient temperature range	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar							
Connecting cables	in zone 1 or higher: -20 70 °C  cable capacitance: signal line/shield also signal line/signal line: 160 pF/m							
(by factory)	cable inductance: signal line/shield also signal line/signal line: 1µH/m							
Miscellaneous	,							
Option SIL <sup>5</sup> 2 application	according to IEC 61508 / IEC 61511							
Current consumption	signal output current: max. 25 mA / signal output voltage: max. 7 mA							
Weight	approx. 200 g (without cable)							
Ingress protection	IP 68							
ingress protection	EMC Directive: 2004/108/EC							
CE-conformity								
<u> </u>	EMC Directive: 2004/108/EC 94/9/EG							



### Ordering code

LMP 307		-Ш	Д.	- 🗌	-	-	[- <u></u>	]-[	-	- [	П	]-[			]-[	L		
Pressure																		
in bar in mH₂O	4 5 0 4 5 1																	
Input [mH <sub>2</sub> O] [bar]	., 6, .																	
1.0 0.10 1.6 0.16		1 0	0 0															
2.5 0.25		2 5	0 0															
4.0 0.40 6.0 0.60			0 0															
10 1.0		1 0	0 1															
16 1.6 25 2.5		1 6 2 5	0 1 0 1															
40 4.0		4 0	0 1															
60 6.0 100 10		6 0 1 0	0 1 0 2															
160 16		1 6 2 5	0 2 0 2															
250 25		2 5 9 9	0 2															oonoult.
Housing		9 9	9 9															consult
Stainless steel 1.4404 (316L)				1														
Diaphragm				9														consult
Stainless steel 1.4435 (316L)					1											П		
Output					9													consult
4 20 mA / 2-wire				_		1							_	П		П	П	
0 20 mA / 3-wire 0 10 V / 3-wire						2												
Intrinsic safety 4 20 mA / 2-wire						Ε												
SIL2 4 20 mA / 2-wire SIL2 with Intrinsic safety						1S												
4 20 mA / 2-wire						ES												
customer			_			9							_			L		consult
Seals FKM			_	_	_	_	1			_	_		-			П	П	
customer				_	_		9			_			_			ш		consult
Accuracy standard for P <sub>N</sub> ≥ 0.4 bar 0.35 %								3					-			П		
standard for P <sub>N</sub> < 0.4 bar 0.5 %								5										
option 1 for $P_N \ge 0.4$ bar $0.25 \%$ option 2 $0.1 \%$ $1$								2										
customer								9										consult
Electrical connection  PVC-cable <sup>2</sup>				-	-				1	-			-			г	Н	
PUR-cable <sup>2</sup>									2							Е		
FEP-cable <sup>2</sup> customer									3									consult
Cable length									٦									Corrodit
in m standard: 3 m PVC										0	0	2						
standard: 5 m PVC										0	0 3	5						
standard: 10 m PVC standard: 15 m PVC										0	1 (	)						
standard: 20 m PVC										0	1 3 2 0 9 9	)						
special length PVC										9	9 9	)						
standard: 3 m PUR										0	0 :	3						
standard: 5 m PUR										0	0 :	5						
standard: 10 m PUR standard: 15 m PUR										0	1 (	5						
standard: 20 m PUR										0	2 (	)						
special length PUR										9	9 !	,						
standard: 5 m FEP										0	0 :	5						
standard: 10 m FEP special length FEP										0	1 9							
Special version										Ť	, J ,							
standard cable protection with													0 0	0				
stainless steel corrugated pipe													1 (	3	9	9	9	consult
with pipe length in m customer													9 9	0				consult
Customer													9   5	9				Corisuit

<sup>&</sup>lt;sup>1</sup> not in combination with SIL

 $<sup>^{\</sup>rm 2}$  cable with integrated  $\,$  air tube for atmospheric pressure reference



# **LMP 307T**

# **Level and Temperature Transmitter**

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

### Nominal pressure / nominal temperature

from 0 ... 1 mH $_2$ O up to 0 ... 250 mH $_2$ O from 0 ... 30 °C up to 0 ... 70 °C

others on request

#### **Output signals**

2-wire: 4 ... 20 mA (pressure)

2-wire: 4 ... 20 mA (temperature)

#### **Special characteristics**

- ▶ diameter 26,5 mm
- separate output signals
   for pressure and temperature ranges
- easy handling
- low maintenance and wiring costs

### **Optional versions**

- different kinds of cables
- different kinds of seal materials
- customer specific versions

BD|SENSORS has developed the stainless steel submersible probe LMP 307T for continuous level and temperature measurement in water and in clean to lightly-soiled liquids.

The advantage: simultaneous recording of level and temperature with separate independent signal amplification. The maintenance and wiring costs are considerably reduced.

In addition to classical signal processing of the level, an additional signal circuit independent of the level which converts the temperature signal into a 4 ... 20 mA analogue signal in 2-wire technology is provided.

Typical application areas are, for example, drinking water purification, monitoring of rainwater overflow basins and river courses, in addition to level measurement in containers or tank batteries.

#### Preferred areas of use are



Water / filtrated sewage e.g. drinking water system

water recycling



Fuel / Oil e.g. tank farm



### LMP 307 T

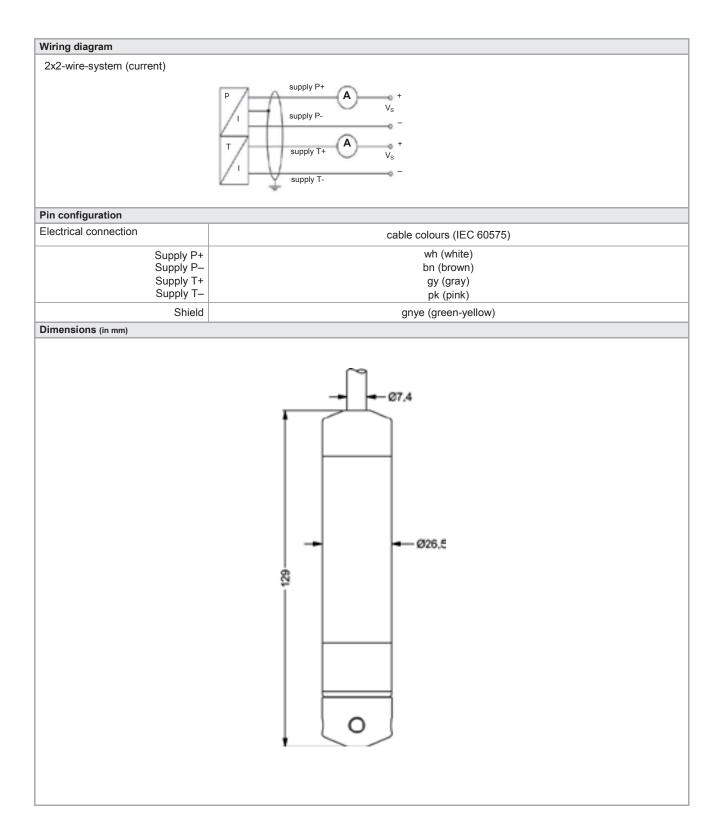
### Technical Data

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	16	25
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	1.0	2.5	40	60	100	160	250
		0.5	1.0	1	2	5	5	10	10	20	40	40	80	80
Overpressure	[bar]			1.5	3	7.5	7.5	15	15	25		-	120	120
Burst pressure >	[bar]	1.5	1.5	1.5	<u> </u>	7.5	7.5	15	15	25	50	50	120	120
Input temperature range														
Temperature measuring r	ange													
standard			0 30	°C		0 5	O°C		0	70 °C		others	on requ	uest <sup>1</sup>
<sup>1</sup> min. temperature range: 30°														
min. temperature: -10°C; ma	ax. tempera	ture: 70	C											
Output signal / Supply  2-wire (pressure) <sup>2</sup>		4 20	) m / / / /	- 10	20.17									
2-wire (pressure)  2-wire (temperature) <sup>2</sup>			4 20 mA / V <sub>S</sub> = 10 30 V <sub>DC</sub> 4 20 mA / V <sub>S</sub> = 10 30 V <sub>DC</sub>											
<sup>2</sup> the circuits are galvanically i	icalated fra			s = 10	. 30 V <sub>D</sub>									
Performance	isolaled ITOI	ii eacii o	ше											
Accuracy (pressure) <sup>3</sup>		standa	rd: no	minal n	roccuro	< 0.4 ba	ar.	< +	0.5 % F	SO.				
Accuracy (pressure)		Starius				≥ 0.4 b			0.35 % 1					
		option	1: nc	minal p	ressure	≥ 0,4 ba	ar:		0,25 % 1					
Accuracy (temperature) 4		≤±1°	,C											
Permissible load		R <sub>max</sub> =	[(V <sub>S</sub> - V	/ <sub>s</sub> min) /	0.02 A	Ω								
Influence effects		supply				O / 10 V	,							
		load:		0.0	5 % FS	O / kΩ								
Long term stability	ng term stability ≤ ± 0.1 % FSO / year at reference conditions													
Response time < 10 ms (for output signal 2-wire (pressure))														
<sup>3</sup> accuracy according to IEC 6														
<sup>4</sup> Pt 100 class B; compensation		o 1h dep	ending or	n constan	t temper	ature and	environ	mental i	respective	ly mass c	condition	S		
Thermal effects (Offset ar	. ,	I			0.40						-			
Nominal pressure P <sub>N</sub>	[bar]		< 0.40 ≥ 0.40											
	[% FSO]				≦ ± 1			0 7	,		≤ ± 0.	.75		
in compensated range	[°C]							0 70	)					
Permissible temperatures		mediu				.10 70	· ° C							
Permissible temperatures		storag				.25 70								
Electrical protection 5														
Short-circuit protection		perma	nent											
Reverse polarity protectio	n		nage, bu	ıt also n	o functi	on								
Electromagnetic compatib		emissi	on and i	mmunity	/ accord	ding to E	N 6132	6						
<sup>5</sup> additional external overvolta									e referenc	e availabi	le on req	uest		
Electrical connection														
Cable with sheath materia	al <sup>6</sup>	PVC	(-5	. 70 °C)		grey								
		PUR	,	70 °C	,	black								
		FEP <sup>7</sup>	•	70 °C	<del>;</del> )	black								
<sup>6</sup> cable with integrated air tub	- ft		on requ											
<sup>7</sup> do not use freely suspended	e for atmos <sub>i</sub> I probes wit	oneric pr h an FEF	essure re P cable if	rerence effects du	ue to hia	hlv charqi	na proce	sses are	expected	1				
Materials (media wetted)	,		222.0 .7			,g	3 1.000							
Housing		stainle	ss steel	1.4404	(316L)									
		FKM			,/									
Seals			on requ	est										
Diaphragm		stainless steel 1.4435 (316L)												
Protection cap		POM												
Cable sheath		PVC, I	PUR, FE	P										
Miscellaneous														
Connecting cables		cable	capacita	nce: s	ignal lir	ne/shield	also sig	gnal line	e/signal l	ine: 160	pF/m			
(by factory)		cable	inductan	ice: s	ignal lir	ne/shield	l also si	gnal line	e/signal l	ine: 1µH	l/m			
Current consumption		signal	output c	urrent:	max.	25 mA /	signal o	output v	oltage:	max. 7 r	nA			
Weight		approx	k. 200 g	(without	cable)									
Ingress protection		IP 68												
CF-conformity		EMC	Directive	2004/4	08/EC									

CE-conformity

EMC Directive: 2004/108/EC

### LMP 307 T



### <sup>36</sup> LMP 307 T

### Ordering code

LMP 307T	ш-ш-ш-п-п-п-п-п-п-п-п-п-п-п-п-п-п-п-п-п	7-0-000-000
Pressure  in bar in mH₂O  Input  [mH₂O]  1.0  1.0  0.10  1.6  0.16  2.5  0.25  4.0  0.40  6.0  0.60  10  1.0  16  1.6  2.5  2.5	1 0 0 0 1 6 0 0 2 5 0 0 4 0 0 0 6 0 0 0 1 1 6 0 1 2 5 0 1 4 0 0 0	
40	6 0 0 1 1 1 0 0 2 1 6 0 2 2 5 0 2 9 9 9 9	
0 50 0 70 customer Housing Stainless steel 1.4404 (316L) customer	0 0 0 x 3 0 0 0 0 x 5 0 0 0 0 x 7 0 9 9 9 9 9 9	
Output temperature  Stainless steel 1.4435 (316L)  customer  4 20 mA / 2-wire	1 9	
$\begin{array}{c} 4 \dots 20 \text{ mA / } 2\text{-wire} \\ \hline \text{Seals} \\ \hline \text{FKM} \\ \hline \text{customer} \\ \hline \text{Accuracy} \\ \text{standard for P}_{N} \ge 0.4 \text{ bar} \\ \hline 0.35 \% \\ \end{array}$	1 1 9	3
standard for $P_N < 0.4$ bar option 1 for $P_N \ge 0.4$ bar $0.25\%$ customer  Electrical connection  PVC-cable $^1$ PUR-cable $^1$		5 2 9 1 1 2 1 2 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1
FEP-cable 1 customer  Cable length  in m standard: 3 m PVC standard: 5 m PVC		3 9 0 0 3 0 0 5
standard: 10 m PVC standard: 15 m PVC standard: 20 m PVC special length PVC standard: 3 m PUR standard: 5 m PUR		0 1 0 0 1 5 0 2 0 9 9 9 0 0 3 0 0 5 0 1 0
standard: 10 m PUR standard: 15 m PUR standard: 20 m PUR special length PUR standard: 5 m FEP standard: 10 m FEP		9 9 9 0 0 0 3 0 0 5 0 0 1 5 0 0 2 0 9 9 9 0 0 0 5 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
special length FEP  Special version standard customer		0 0 0 0 9 9 9

 $<sup>^{\</sup>mbox{\scriptsize 1}}$  cable with integrated  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left$ 

Standard lengths 3 / 5 / 10 / 15 / 20 m are available from stock, special lengths are manufactured order-related, price per meter (see above).

This document contains product specifications; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.



## **LMP 308**

### Separable **Stainless Steel Probe**

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO / 0.1 % FSO

#### **Nominal pressure**

from 0 ... 1 mH<sub>2</sub>O up to 0 ... 250 mH<sub>2</sub>O

#### **Output signals**

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

#### **Special characteristics**

- diameter 35 mm
- cable and sensor section separable
- excellent accuracy
- excellent long term stability

#### **Optional versions**

- IS-version zone 0
- SIL 2 (Safety Integrity Level)
- cable protection via corrugated pipe
- mounting accessories as cable gland and terminal clamp of stainless steel
- different kinds of cables
- different kinds of seal materials

The separable stainless steel probe LMP 308 is designed for the continually level measurement of water and thin fluids.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembly with a connector and can be changed easily.

#### Preferred areas of use are

#### Water / filtrated sewage



ground water level measurement level measurement in wells and open waters

rain spillway basin level measurement in container water treatment plants water recycling











## 38 LMP 308

Input pressure range														
Nominal pressure gauge	[bar]	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250
Overpressure	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80
Burst pressure	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120
Output signal / Supply														

Output signal / Supply							
Standard	2-wire: $4 \dots 20 \text{ mA} / V_S = 8 \dots 32 V_{DC}$ SIL-version: $V_S = 14 \dots 28 V_{DC}$						
Option IS-protection	2-wire: 4 20 mA / V <sub>S</sub> = 10 28 V <sub>DC</sub> SIL-version: V <sub>S</sub> = 14 28 V <sub>DC</sub>						
Performance							
Accuracy <sup>1</sup>	standard:       nominal pressure < 0.4 bar:						
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$						
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ						
Long term stability	≤ ± 0.1 % FSO / year at reference conditions						
Response time	< 10 msec						
	it point adjustment (non-linearity, hysteresis, repeatability)						
Thermal effects (Offset and Span)							
Nominal pressure P <sub>N</sub> [bar]							
Tolerance band [% FSO]							
in compensated range [°C]	0 70						
Permissible temperatures							
Permissible temperatures	medium: -20 70 °C storage: -25 70 °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 protecti	on 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 PUR (-20 70 °C) black FEP <sup>4</sup> (-20 70 °C) black others on request						
	pheric pressure reference th an FEP cable if effects due to highly charging processes are expected						
Materials (media wetted)	-(-'-l()-/-/-/-/-(040L)						
Housing Seals	stainless steel 1.4404 (316L)  FKM  EPDM others on request						
Diaphragm	stainless steel 1.4435 (316L)						
Protection cap	POM						
Explosion protection							
Approvals DX19-LMP 308	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da						
Safety technical maximum values	$U_i$ = 28 V, $I_i$ = 93 mA, $P_i$ = 660 mW, $C_i$ ≈ 0nF, $L_i$ ≈ 0 $\mu$ H, the supply connections have an inner capacity of max. 27 nF to the housing						
Ambient temperature range	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar in zone 1 or higher: -20 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: 1µH/m						
Miscellaneous							
Option SIL <sup>5</sup> 2 application	according to IEC 61508 / IEC 61511						
Current consumption	signal output current: max. 25 mA						
Weight	approx. 250 g (without cable)						
Ingress protection	IP 68						
CE-conformity	EMC Directive: 2004/108/EC						
ATEX Directive	94/9/EG						
<sup>5</sup> not in combination with the accuracy 0.	1%						

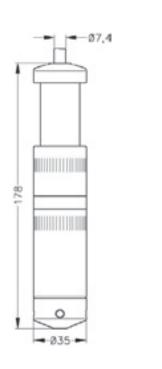
#### Technical Data



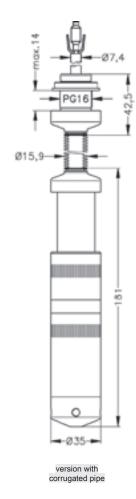
Pin configuration		
Electrical connection	Binder series 723 <sup>6</sup> (5-pin)	cable colours (IEC 60575)
Supply + Supply –	3 1	wh (white) bn (brown)
Shield	5	gnye (green-yellow)
<sup>6</sup> in separated version		

#### Dimensions (in mm)

standard option







⇒ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 16 mm! (standard, Ex-protection and SIL-version)

# 40 LMP 308 Ordering code

LMP 308	Ш-Ш-О-О-О-О-О-			]-[			
in bar	4 4 0				_		
in mH <sub>2</sub> O	4 4 0 4 1						
Input [mH <sub>2</sub> O] [bar]							
1.0 0.10	1 0 0 0 1 6 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 2 5 0 1						
25 2.5 40 4.0	2 5 0 1 4 0 0 1						
60 6.0	6 0 0 1						
100 10	1 0 0 2						
160 16	1 6 0 2						
250 25	2 5 0 2						
customer	1 0 0 2 1 6 0 2 2 5 0 2 9 9 9 9					consu	lt
Housing							
Stainless steel 1.4404 (316L)	1				П		
customer	9					consu	lt
Diaphragm							
Stainless steel 1.4435 (316L)	1						
customer	9					consu	lt
Output							
4 20 mA / 2-wire	1						
Intrinsic safety 4 20 mA / 2-wire SIL2 4 20 mA / 2-wire	E						
SIL2 4 20 mA / 2-wire SIL2 with Intrinsic safety							
4 20 mA / 2-wire	ES						
customer	9					consu	lt
Seals							
FKM	1						
EPDM	3						
customer	9					consu	lt
Electrical connection							
PVC-cable <sup>1</sup>	1						
PUR-cable <sup>1</sup>	2						
FEP-cable <sup>1</sup>	3 9						I4
Accuracy	3					consu	IL
standard for $P_N \ge 0.4$ bar 0.35 %	3						
standard for $P_N < 0.4$ bar $0.5\%$	5						
option 1 for $P_{\nu} \ge 0.4$ bar $0.25\%$	2						
option 2 0.1 % <sup>2</sup>	1						
customer	9					consu	lt
Cable length							
in m	9 9	9					
Version							
standard		0	0 0				
prepared for mounting $_{ m 3}$ with stainless steel pipe		1	0 6	3		consu	lt
cable protection with							
stainless steel corrugated pipe		1	0 3	3 0	9	9 consul	lt
with pipe length in m					"	o consu	
customer		9	9 9	9		consu	lt
		- 1	- 1 -	1			

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

<sup>&</sup>lt;sup>2</sup> not in combination with SIL

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



#### **Stainless Steel Probe**

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

from 0 ... 6 mH<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 17 mm
- suitable for hydrostatic level measurement e.g. 3/4" pipes
- excellent linearity
- excellent long term stability

#### **Optional versions**

- different cable materials
- customer specific versionse.g. special pressure ranges

The slimline probe LMK 306 with ceramic sensor has been especially designed for the continuous level measurement at confined space conditions. Permissible media are clean or slightly contaminated water and thin fluids.

Different cable sheath materials are available in order to achieve maximum media compatibility.

#### Preferred areas of use are

#### **Water**



level measurement at confined space conditions ground water monitoring depth or level measurement in wells drinking water abstraction level measurement in open tanks

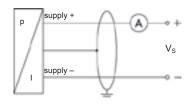


## Technical Data

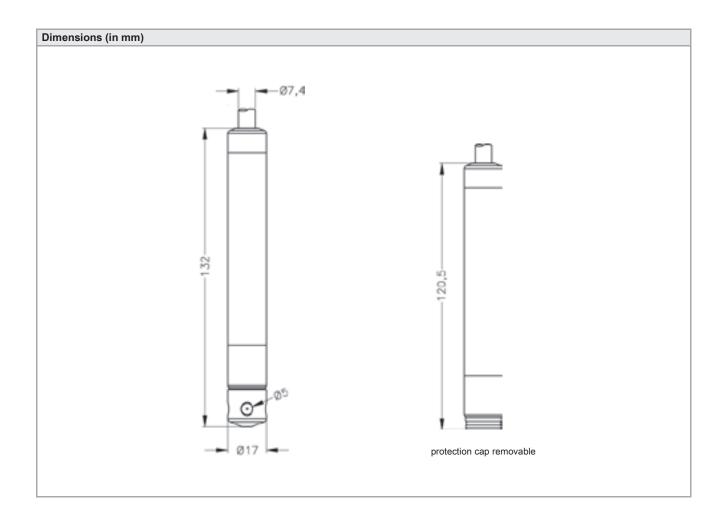
Input pressure range										
Nominal pressure gauge	[bar]	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	10	10	20	40	40
Burst pressure ≥	[bar]	4	4	5	5	12	12	25	50	50

Output signal / Supply						
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 12 36 V <sub>DC</sub>					
Performance						
Accuracy	≤ ± 0.5 % FSO					
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$					
Influence effects	supply: 0.05 % FSO / 10 V					
D	load:					
Response time	≤ 10 msec					
	limit point adjustment (non-linearity, hysteresis, repeatability)					
	an) / Permissible temperatures					
Thermal error	≤±0.2 % FSO / 10 K					
	in compensated range -25 70 °C					
Permissible temperatures	medium: -10 70 °C storage: -25 70 °C					
Electrical protection <sup>2</sup>	<u> </u>					
Short-circuit protection	permanent					
Reverse polarity protection	no damage, but also no function					
Electromagnetic protection	emission and immunity according to EN 61326					
	ection 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 PUR (-10 70 °C) black FEP⁴ (-10 70 °C) black					
<sup>3</sup> shielded cable with integrated air tul <sup>4</sup> do not use freely suspended probes	be for atmospheric pressure reference with an FEP cable if effects due to highly charging processes are expected					
Materials (media wetted)						
Housing	stainless steel 1.4404 (316L)					
Seals	FKM					
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %					
Protection cap	POM					
Miscellaneous						
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					
Current consumption	max. 25 mA					
Weight	approx. 100 g (without cable)					
Ingress protection	IP 68					
CE-conformity EMC Directive: 2004/108/EC						
Wiring diagram						

#### 2-wire-system (current)



Pin configuration	
Electrical connection	cable colours (IEC 60575)
	wh (white) bn (brown)
Shield	gnye (green-yellow)



#### Accessories

Terminal clamp			
Technical Data			175
Suitable for	all probes with cable Ø 5.5 10.5 mm		74
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Weight	approx. 160 g		~/~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Ordering type		Ordering code	
Terminal clamp, steel, z	inc plated	Z100528	
Terminal clamp, stainles	s steel 1.4301 (304)	Z100527	

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LMK 306	Ш-Ш	- 🗆 - 🗆 -		- 🗆 - [	]-□	Π.	-Ц	I	
Pressure									
in bar	3 7 0 3 7 1							Т	
in mH <sub>2</sub> O	3 7 1								
Input [mH₂O] [bar]									
6 0.60	6 0 0 0								
10 1.0	1 0 0 1								
16 1.6 25 2.5	1 6 0 1 2 5 0 1								
40 4.0	2 5 0 1 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	1 0 0 2 1 6 0 2 2 0 0 2 9 9 9 9								consult
Housing									
Stainless steel 1.4404 (316L)		1							
customer		9							consult
Diaphragm									
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%		2							
customer		9							consult
Output									
4 20 mA / 2-wire			1						
customer			9						consult
Seals FKM			4						
customer			1						consult
Accuracy			9						Consuit
0.5 %				5					
customer				9					consult
Electrical connection									Concar
PVC-cable <sup>1</sup>					1				
PUR-cable <sup>1</sup>					2				
FEP-cable <sup>1</sup>					2 3				
customer					9				consult
Cable length									
in m					9	9 9			
Special version									
standard							0	0 0 9 9	
customer							9	9   9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



#### Stainless Steel Probe

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

from 0 ... 4 mH<sub>2</sub>O up to 0 ... 250 mH<sub>2</sub>O

#### **Output signals**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

#### Special characteristics

- diameter 27 mm
- good linearity
- good long term stability
- easy handling

#### **Optional versions**

- **IS-protection**
- SIL 2 (Safety Integrity Level) according to IEC 61508 / IEC 61511
- different kinds of cables and elastomeres
- customer specific versions e. g. special pressure ranges

The level transmitter LMK 307 is designed for continuous level measurement in water or waste water applications. Basic element is a flush mounted ceramic sensor.

Suitable for all fluids which are compatible with media wetted materials. Different cable and elastomer matierals can be offered according to the customer-specific operating conditions.

#### Preferred areas of use are

Water



drinking water system ground water monitoring storm water systems

Sewage



waste water treatment water recycling dumpsite

Fuel / Oil



fuel storage tank farm biogas plants





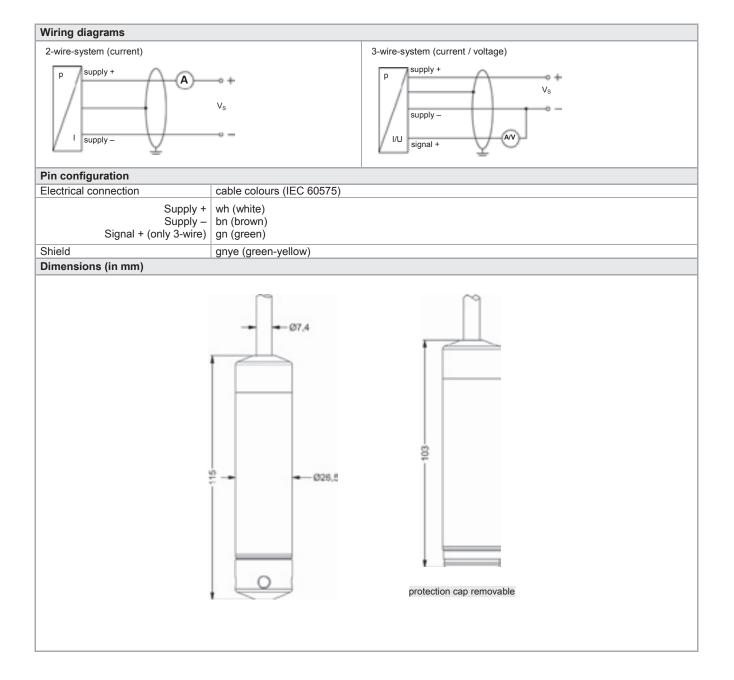






Input pressure range											
Nominal pressure gauge	[bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25
Level	[mH <sub>2</sub> O]	4	6	10	16	25	40	60	100	160	250
Overpressure	[bar]	2	2	2	4	4	10	10	20	40	40
Burst pressure	[bar]	4	4	4	5	5	12	12	25	50	50

Output signal / Supply	
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 8 32 V <sub>DC</sub> SIL-version: V <sub>S</sub> = 14 28 V <sub>DC</sub>
Option IS-protection	2-wire: 4 20 mA / $V_S$ = 10 28 $V_{DC}$ SIL-version: $V_S$ = 14 28 $V_{DC}$
Options 3-wire	3-wire: 0 20 mA / $V_S = 14$ 30 $V_{DC}$
	0 10 V / V <sub>S</sub> = 14 30 V <sub>DC</sub>
Performance	
Accuracy	≤±0.5 % FSO
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$
	current 3-wire: $R_{max} = 500 \Omega$
	voltage 3-wire: $R_{min} = 10 \text{ k} \Omega$
Influence effects	supply: 0.05 % FSO / 10 V
	load: 0.05 % FSO / kΩ
Response time	≤ 10 msec
	it point adjustment (non-linearity, hysteresis, repeatability)
Thermal effects (Offset and Span	
Thermal error	≤±0.2 % FSO / 10 K
	in compensated range -25 70 °C
Permissible temperatures	
Permissible temperatures	medium: -10 70 °C
<b></b>	storage: -25 70 °C
Electrical protection <sup>2</sup>	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic protection	emission and immunity according to EN 61326
	on unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request
Electrical connection	DV0 ( F. 70 00)
Cable with sheath material <sup>3</sup>	PVC (-5 70 °C) grey
	PUR (-10 70 °C) black FEP⁴ (-10 70 °C) black
<sup>3</sup> shielded cable with integrated air tube	
<sup>4</sup> do not use freely suspended probes wit	th an FEP cable if effects due to highly charging processes are expected
Materials (media wetted)	
Housing	stainless steel 1.4404 (316L)
Seals	FKM
	EPDM
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %
Protection cap	POM
Explosion protection (only for 4.	,
Approvals	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X
DX19-LMK 307	zone 0: II 1G Ex ia IIC T4 Ga
Safety technical maximum values	zone 20: II 1D Ex ia IIIC T 85°C Da
Salety technical maximum values	$U_i$ = 28 V, $I_i$ = 93 mA, $P_i$ = 660 mW, $C_i \approx 0$ nF, $L_i \approx 0$ μH, the supply connections have an inner capacity of max. 27 nF to the housing
	, , ,
Ambient temperature range	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar
Connecting cobles	in zone 1: -20 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: 1µH/m
· · · · · · · · · · · · · · · · · · ·	Cable inductance. Signal interstrictu also signal intersignal inte. ΤμΠ/ΙΙΙ
Miscellaneous	
Option SIL <sup>5</sup> 2 application	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA
	signal output voltage: max. 7 mA
Weight	approx. 250 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC
ATEX Directive	94/9/EG
<sup>5</sup> only for 420mA / 2-wire	



LMK 307	Ш-Ш-О-О-О-О-	]-[]]
Pressure		
in bar in mH₂O	3 8 0	
Input [mH <sub>2</sub> O] [bar]		
4.0 0.40	4 0 0 0	
6.0 0.60	6 0 0 0	
10 1.0 16 1.6	1 0 0 1 1 1 6 0 1	
25 2.5	1 6 0 1 2 5 0 1 4 0 0 1	
40 4.0	4 0 0 1	
60 6.0	6 0 0 1	
100 10	1 0 0 2 1 6 0 2	
160 16 250 25	1 6 0 2	
customer	1 6 0 2 2 5 0 2 9 9 9 9	consult
Housing		
Stainless steel 1.4404 (316L)	1	
customer	9	consult
Diaphragm Ceramics Al <sub>2</sub> O <sub>3</sub> 96%	2	
customer	2 9	consult
Output		Concan
4 20 mA / 2-wire	1	
0 20 mA / 3-wire	2	
0 10 V / 3-wire	3	
Intrinsic safety 4 20 mA / 2-wire SIL2 4 20 mA / 2-wire	E	
SIL2 with Intrinsic safety		
4 20 mA / 2-wire	ES	
customer	9	consult
Seals		
FKM EPDM	1 3	
customer	9	consult
Accuracy		
0.5 %	5	
customer Electrical connection	9	consult
PVC-cable <sup>1</sup>	1	
PUR-cable <sup>1</sup>	2	
FEP-cable <sup>1</sup>	3	
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 9   9	0
special length PVC	9 9	9
standard: 3 m PUR	0 0	3
standard: 5 m PUR	0 0	5 0
standard: 10 m PUR	0 1	0
standard: 15 m PUR	0 1 0 2 9 9	5
standard: 20 m PUR special length PUR	0   2 9   9	9
Special leligiti FUR	3 3	
standard: 5 m FEP	0 0	5
standard: 10 m FEP	0   1 9   9	0
special length FEP	9 9	9
Special version standard		0 0 0
customer		0 0 0 9 9 9 consult
333000		-   -   -

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

Standard lengths 3 / 5 / 10 / 15 / 20 m are available from stock, special lengths are manufactured order-related, price per meter (see above).

This document contains product specifications; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.

## **LMK 307T**



## **Level and Temperature Transmitter**

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### Nominal pressure / nominal temperature

from 0 ... 4 mH $_2$ O up to 0 ... 250 mH $_2$ O from 0 ... 30 °C up to 0 ... 70 °C others on request

#### **Output signals**

2-wire: 4 ... 20 mA (pressure)

2-wire: 4 ... 20 mA (temperature)

#### **Special characteristics**

- diameter 26,5 mm
- separate output signals
   for pressure and temperature ranges
- good lang term stability
- easy handling
- low maintenance and wiring costs

#### **Optional versions**

- different kinds of cables
- different kinds of seal materials
- customer specific versions

BD|SENSORS has developed the stainless steel submersible probe LMK 307T with flush mounted ceramic sensor for continuous level and temperature measurement in water or waste water applications.

The advantage: simultaneous recording of level and temperature with separate independent signal amplification. The maintenance and wiring costs are considerably reduced.

In addition to classical signal processing of the level, an additional signal circuit independent of the level which converts the temperature signal into a 4 ... 20 mA analogue signal in 2-wire technology is provided.

#### Preferred areas of use are

#### <u>Water</u>



e.g. drinking water system, RÜBs ground water monitoring storm water systems



#### <u>Sewage</u>

waste water treatment, water recycling, dumpsite, waste water tanks



#### Fuel / Oil

fuel storage tank farm, biogas plants

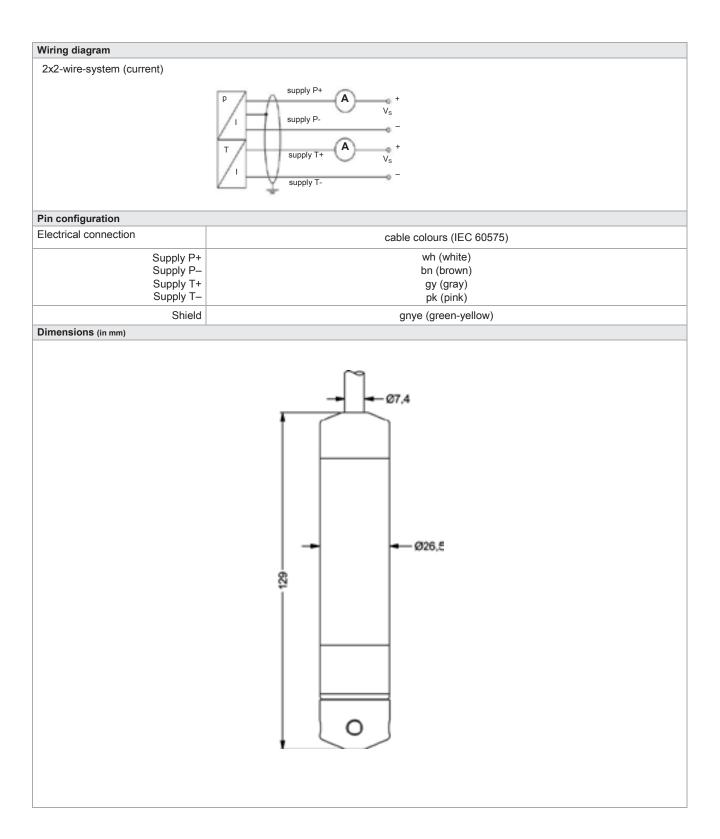


Input pressure range											
Nominal pressure gauge	[bar]	0,4	0,6	1	1,6	2,5	4	6	10	16	25
Level	[mH <sub>2</sub> O]	4	6	10	16	25	40	60	100	160	250
Overpressure	[bar]	1	2	2	4	4	10	10	20	40	40
Burst pressure >	[bar]	2	4	4	5	5	12	12	25	50	50

Input temperature range	
Temperature measuring range	
standard	0 30 °C 0 50 °C 0 70 °C others on request
<sup>1</sup> min. temperature range: 30°C; max. min. temperature: -10°C; max. temp	
Output signal / Supply	
2-wire (pressure) <sup>2</sup>	$4 20 \text{ mA} / V_S = 10 30 V_{DC}$
2-wire (temperature) <sup>2</sup>	$4 20 \text{ mA} / V_S = 10 30 V_{DC}$
<sup>2</sup> the circuits are galvanically isolated	rom each other
Performance	
Accuracy (pressure) 3	≤±0.5 % FSO
Accuracy (temperature) 4	≤±1°C
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S}}  \text{min}) /  0.02  \text{A}]  \Omega$
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± 0.3 % FSO / year at reference conditions
Response time	< 10 ms (for output signal 2-wire (pressure))
•	imit point adjustment (non-linearity, hysteresis, repeatability)
<sup>4</sup> Pt 100 class B; compensation time	up to 1h depending on constant temperature and environmental respectively mass conditions
Thermal effects (Offset and Spar	
Thermal error	≤±0.2 % FSO / 10 K in compensated range -25 70 °C
Permissible temperatures	
Permissible temperatures	medium: -10 70 °C storage: -25 70 °C
Electrical protection <sup>5</sup>	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
<sup>5</sup> additional external overvoltage prote	ction unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request
Electrical connection	
Cable with sheath material <sup>6</sup>	PVC (-5 70 °C) grey PUR (-10 70 °C) black FEP <sup>7</sup> (-10 70 °C) black others on request
<sup>6</sup> cable with integrated air tube for atn	ospheric pressure reference
	with an FEP cable if effects due to highly charging processes are expected
Materials (media wetted)	
Housing	stainless steel 1.4404 (316L)
Seals	FKM EPDM others on request
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96%
Protection cap	POM
Cable sheath	PVC, PUR, FEP
Miscellaneous	
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: 1µH/m
Current consumption	max. 25 mA
Weight	approx. 250 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC
CL-COIIIOIIIIIty	LIVIO DIIEGLIVE. 2004/100/EG

## LMK 307T

#### Technical Data



This document contains product specifications; properties are not guaranteed. Subject to change without notice.

## LMK 307T

### Ordering code

LMK 307T		Q-Q-Q- <del>-</del>
Pressure  in bar in mH <sub>2</sub> O  Input  [mH <sub>2</sub> O]	3 8 A 3 8 B 4 0 0 0 0 6 0 0 0 1 0 0 1 1 6 0 1 2 5 0 1 4 0 0 1 6 0 0 1 1 0 0 2 1 6 0 2 2 5 0 2 9 9 9 9	
Input temperature °C 0 30 0 50 0 70	0 0 0 x 3 0 0 0 0 x 5 0 0 0 0 x 7 0	
Customer Housing Stainless steel 1.4404 (316L) customer Diaphragm	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	
Ceramic Al <sub>2</sub> O <sub>3</sub> 96 % customer Output pressure	2 9	
4 20 mA / 2-wire Output temperature 4 20 mA / 2-wire Seals	1	
FKM EPDM customer		1 3 9
Accuracy 0.5 % customer Electrical connection		5 9
PVC-cable <sup>1</sup> PUR-cable <sup>1</sup> FEP-cable <sup>1</sup> customer		1 2 3 9
Cable length in m		
standard: 3 m PVC standard: 5 m PVC standard: 10 m PVC standard: 15 m PVC standard: 20 m PVC special length PVC		0 0 3 0 0 5 0 1 0 0 1 5 0 2 0 9 9 9
special length PVC standard: 3 m PUR standard: 5 m PUR standard: 10 m PUR standard: 15 m PUR		0 0 3 0 5 0 1 0
standard: 20 m PUR special length PUR standard: 5 m FEP standard: 10 m FEP		0 1 5 0 2 0 9 9 9 0 0 5 0 1 0 9 9 9
special length FEP Special version standard customer		9 9 9 0 0 0 9 9 9

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

Standard lengths 3 / 5 / 10 / 15 / 20 m are available from stock, special lengths are manufactured order-related, price per meter (see above).



#### **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-protection zone 0
- mounting with stainless steel pipe
- flange version
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- different kinds of cables
- different kinds of elastomers

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

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

#### Preferred areas of use are



#### **Water**

drinking water abstraction



#### <u>Sewage</u>

waste water treatment water recycling

#### Fuel / Oil



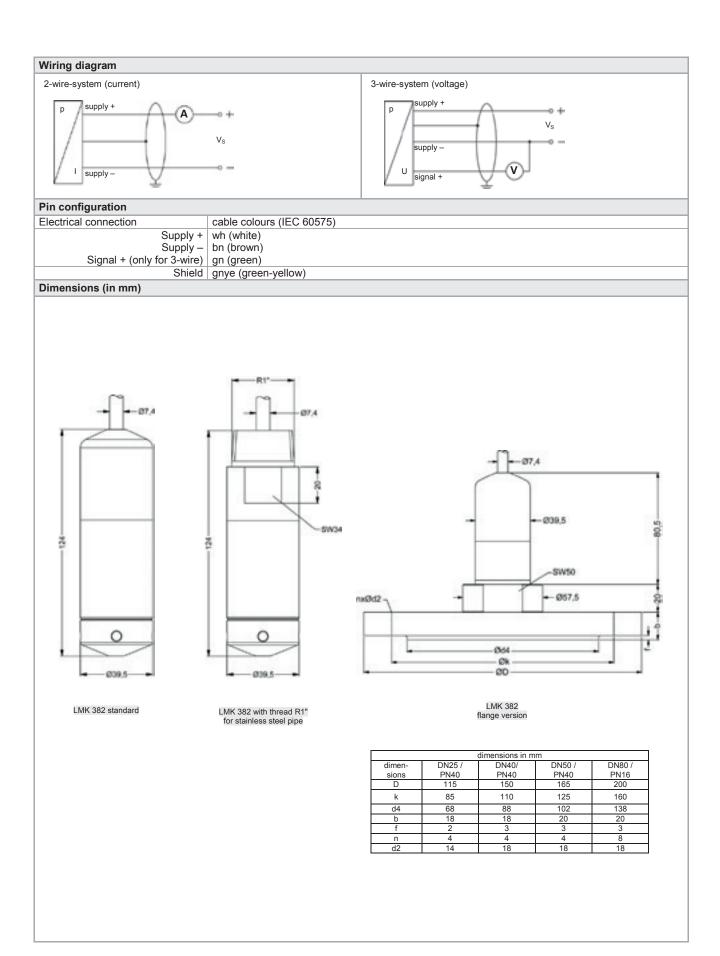
level monitoring in open tanks with low filling heights fuel storage tank farms / biogas plants





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

Output signal / Supply			
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9	. 32 V <sub>DC</sub>	
Option IS-protection	2-wire: 4 20 mA / V <sub>S</sub> = 14		
Option 3-wire			
·	3-wire: 0 10 V / V <sub>S</sub> = 12	32 V <sub>DC</sub>	
Performance			
Accuracy 1	standard: ≤ ± 0.35 % FSO		
Permissible load	option: ≤ ± 0.25 % FSO		
	$R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02 \text{ A}]$	22	
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / $k\Omega$		
Long term stability	≤ ± 0.1 % FSO / year at refe	rence conditions	
Turn-on time	700 msec	Terrice corruitions	
Mean response time	< 200 msec	m	easuring rate 5/sec
Max. response time	380 msec		
<sup>1</sup> accuracy according to IEC 60770 – lim		ysteresis, repeatability)	
Thermal effects (Offset and Span			
Thermal error	≤ ± 0.1 % FSO / 10 K		
	in compensated range 0 7	0 °C	
Permissible temperatures			
Permissible temperatures	medium:	-25 125 °C	
·	electronics / environment:	-25 125 °C	
	storage:	-25 125 °C	
Electrical protection <sup>2</sup>			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no fund		
Electromagnetic compatibility	emission and immunity acco		
<sup>2</sup> additional external overvoltage protecti	on unit in terminal box KL 1 or KL	2 with atmospheric pressure	reference available on request
Electrical connection (only for 4	20 mA / 2-wire)		
Cable with sheath material <sup>3</sup>	PVC (-5 70 °C) grey PUR (-25 70 °C) black FEP <sup>4</sup> (-25 70°C) black TPE (-25 125 °C) blue		
<sup>3</sup> shielded cable with integrated air tube	for atmospheric pressure reference	;	
4 do not use freely suspended probes with	th an FEP cable if effects due to h	gniy cnarging processes are	expected
Materials (media wetted)	1-	`	
Housing Seals	stainless steel 1.4404 (316 I	.)	
Seals	FFKM EPDM others on request		
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 9 Option: ceramics Al <sub>2</sub> O <sub>3</sub> 9		
Nose cone			
Nose cone	POM		
Explosion protection	POM		
	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 0 zone 20: II 1D Ex ia IIIC T85		
Explosion protection	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 0	°C Da	μΗ
Explosion protection Approval DX14-LMK 382	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 (	°C Da 60 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 60 °C with p <sub>atm</sub> 0.8 bar up	
Explosion protection  Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 (	°C Da 0 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 0 °C with p <sub>atm</sub> 0.8 bar up 70 °C	to 1.1 bar
Explosion protection Approval DX14-LMK 382 Safety technical maximum values	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal	°C Da 0 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 0 °C with p <sub>atm</sub> 0.8 bar up 70 °C	to 1.1 bar e/signal line: 160 pF/m
Explosion protection Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature  Connecting cables	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal cable inductance: signal	°C Da 60 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 60 °C with p <sub>atm</sub> 0.8 bar up 70 °C ine/shield also signal line ine/shield also signal line	to 1.1 bar e/signal line: 160 pF/m
Explosion protection  Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature  Connecting cables (by factory)	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal cable inductance: signal	°C Da 60 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 60 °C with p <sub>atm</sub> 0.8 bar up 70 °C ine/shield also signal line ine/shield also signal line	to 1.1 bar e/signal line: 160 pF/m
Explosion protection  Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature  Connecting cables (by factory)  for optional stainless steel pipe following Miscellaneous	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal cable inductance: signal g	°C Da 60 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 60 °C with p <sub>atm</sub> 0.8 bar up 70 °C ine/shield also signal line ine/shield also signal line	to 1.1 bar e/signal line: 160 pF/m
Explosion protection  Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature  Connecting cables (by factory) <sup>5</sup> for optional stainless steel pipe following	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal cable inductance: signal g	°C Da $^{\circ}$ C Da $^{\circ}$ C mW, $C_{i}$ = 27 nF, $L_{i}$ = 50 °C with $p_{atm}$ 0.8 bar up $^{\prime}$ 70 °C ine/shield also signal line ine/shield also signal line $^{\prime}$ IIC T4 Ga" (zone 0)	to 1.1 bar e/signal line: 160 pF/m
Explosion protection  Approval DX14-LMK 382  Safety technical maximum values Permissible media temperature  Connecting cables (by factory)  for optional stainless steel pipe following Miscellaneous  Current consumption	IBExU05ATEX1070 X zone 0 <sup>5</sup> : II 1G Ex ia IIB T4 ( zone 20: II 1D Ex ia IIIC T85 U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 66 in zone 0: -10 ( zone 1 and higher: -10 ( cable capacitance: signal cable inductance: signal g	°C Da $^{\circ}$ C Da $^{\circ}$ C mW, $C_{i}$ = 27 nF, $L_{i}$ = 50 °C with $p_{atm}$ 0.8 bar up $^{\prime}$ 70 °C ine/shield also signal line ine/shield also signal line $^{\prime}$ IIC T4 Ga" (zone 0)	to 1.1 bar e/signal line: 160 pF/m



LMK 382	<u> </u>	
$\begin{array}{c} \text{Pressure} \\ \text{in bar} \\ \text{in mH}_2\text{O} \end{array}$	5 6 5 5 6 6	
Input [mH <sub>2</sub> O] [bar]		
0.40 0.04 0.60 0.06	0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
1.0 0.10 1.6 0.16	1 0 0 0 1 6 0 0	
2.5 0.25	2 5 0 0	
4.0 0.40 6.0 0.60	4 0 0 0 0 6 0 0 0	
10 1.0 16 1.6	1 0 0 1 1 1 6 0 1	
25 2.5	2 5 0 1	
40 4.0 60 6.0	4 0 0 1 6 0 0 1	
100 10	1 0 0 2	
160 16 200 20	1 6 0 2 2 0 0 0 2	
customer	9 9 9 9	consult
Stainless steel 1.4404 (316L)	1	
Diaphragm	9	consult
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%	2	
Ceramics $\mathrm{AI_2O_3}$ 99.9% customer	C 9	consult
Output 4 20 mA / 2-wire		
0 10 V / 3-wire	1 3	
Intrinsic safety 4 20 mA / 2-wire customer	E 9	consult
Seals		
FKM EPDM	1 3	
FFKM customer	7 9	aanault
Electrical connection		consult
PVC-cable <sup>1</sup> PUR-cable <sup>1</sup>	1 2	
FEP-cable <sup>1</sup>	3	
TPE-cable customer	4 9	consult
Accuracy standard 0.35 %	3	
option 0.25 %	2	
Cable length customer	9	consult
in m		
standard: 3 m PVC standard: 5 m PVC	0 0 3 0 0 5	
standard: 10 m PVC	0 1 0	
standard: 15 m PVC standard: 20 m PVC	0 0 5 0 1 0 0 1 5 0 1 5 0 2 0 9 9 9	
special length PVC		
standard: 3 m PUR	0 0 3	
standard: 5 m PUR standard: 10 m PUR	0 0 5 0 1 0	
standard: 15 m PUR	0 1 5	
standard: 20 m PUR special length PUR	0 0 3 0 0 5 0 1 0 0 1 5 0 2 0 9 9 9	
standard: 5 m FEP standard: 10 m FEP	0 0 5 0 1 0 9 9 9	
special length FEP	9 9 9	
special length TPE	9 9 9	
Special version standard	0 0 0	
prepared for mounting <sup>2</sup>	5 0 2	
with stainless steel pipe flange version		
customer	5 1 0 9 9 9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

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



#### 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 signals**

2-wire: 4 ... 20 mA 3-wire: 0 ... 10 V others on request

#### **Special characteristics**

- diameter 22 mm
- diaphragm ceramics 96% Al<sub>2</sub>O<sub>3</sub>
- good long-term stability
- especially for waste water,

#### **Optional versions**

- diaphragm ceramics 99,9% Al<sub>2</sub>O<sub>3</sub>
- IS-version Ex ia = intrinsically safe for gases and dust
- mounting with stainless steel tube
- different kinds of cable
- different kinds of elastomer

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

Compared to the level probe LMK 382 the outside-diameter is only 22mm, which allows an easy installation and backfitting in 1" tubes or in cramped fitting conditions. An IS-version is also available.

#### Preferred areas of use



Groundwater and level monitoring



Sewage

waste water treatment water recycling



Fuel and oil

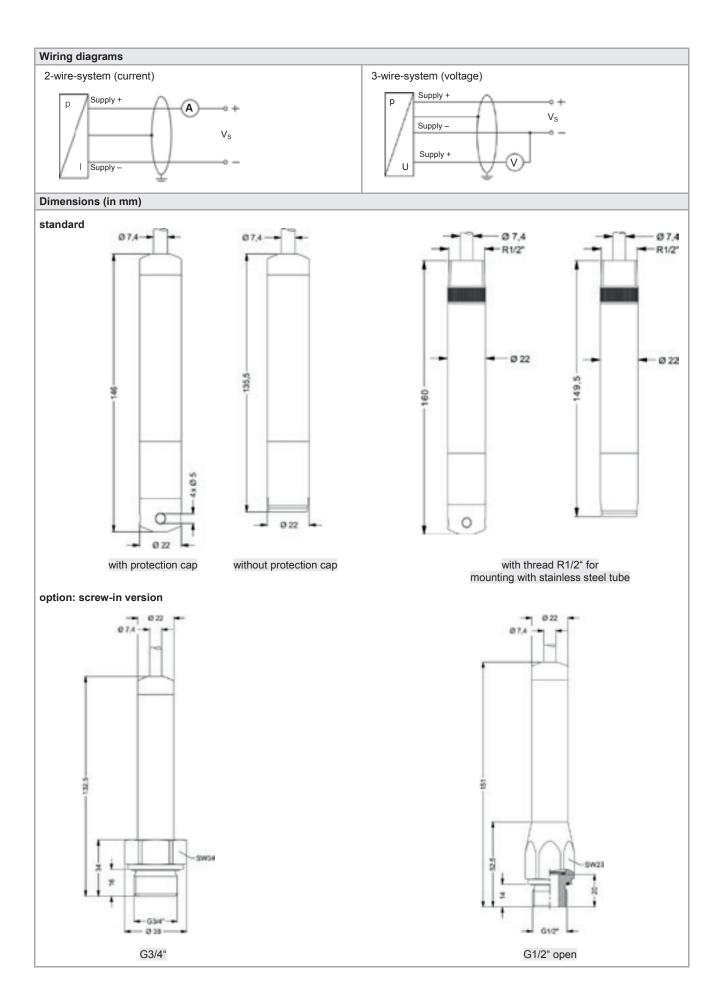
Tank battery Biogas plants





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
	H <sub>2</sub> O]	1	1,6	2,5	4	6	10	1,0	25	40	60	100
Overpressure	[bar]	3	4	5	5	7	7	12	20	20	20	20
Berst pressure ≥	[bar]	4	6	8	8	9	9	18	25	25	30	30
Permissible vacuum	[bar]	-0.2	-0.3		_	0.5		10	20	-1		00
Output signal / Supply												
Standard		2-wire: 4	20 m	A / V <sub>S</sub> = 1	2 36 V	D.C.						
Option IS-version				$A/V_S = 1$								
<u>'</u>												
Option		3-wire: 0	10 V	/ V <sub>S</sub> = 1	4 36 V	OC .						
Performance												
Accuracy <sup>1</sup>		standard option:		35 % FSC 25 % FSC							others on	reque
Permissible load		2-wire: F	$R_{\text{max}} = [(V_{\text{max}})]$	/ <sub>S</sub> - V <sub>S min</sub> )	/ 0.02 A]	Ω						
Influence effects		supply:	0.0	05 % FSC	) / 10 V			loa	id: 0.0	05 % FS0	O / kΩ	
Long term stability		≤ ± 0.1 %	% FSO /	year								
Turn-on time		450 mse	ec									
Mean response time		≤ 70 ms	ес									
Measuring rate		80 Hz										
<sup>1</sup> accuracy according to IEC 60770	0 – limi	t point adju	stment (no	on-linearity	hysteresi	s, repeatab	oility)					
Thermal effects (Offset and	Span)	)										
Tolerance band [% F	FSO]	≤ 1.0% F	SO				in co	mpensate	ed range -	-20 80	°C	
Permissible temperatures												
Permissible temperatures		medium: electroni storage:		ronment:	-40	85 °C 85 °C 85 °C						
Electrical protection <sup>2</sup>												
Short-circuit protection		permane	ent									
Reverse polarity protection		no dama	ige, but a	also no fui	nction							
Electromagnetic compatibility				nunity acc								
<sup>2</sup> additional external overvoltage p	rotectio	on unit in te	rminal box	x KL 1 or K	L 2 with at	mospheric	pressure r	eference a	vailable on	request		
Electrical connection												
Cable outlet				th integrat ube is clo		e for atm	ospheric	reference	e (for nom	inal pres	sure rang	es
Materials (media wetted)												
Housing				ss steel 1.		6 L)				ot	thers on re	equest
Cable		PVC PUR FEP <sup>3</sup> TPE	(-25 (-25	70°C) gra 70°C) bl 70°C) bl 125°C) b	ack ack					ot	thers on re	oguos:
Seals (O-rings)		standard	I: FKM	л; FFKM (		nissible te	emperatui	re from -1	5 °C)		thers on re	•
Diaphragm				cs Al <sub>2</sub> O <sub>3</sub> 9			n: cerami					- 4000
Protection cap		POM		2-3		-1		2-3	.,			
<sup>3</sup> do not use freely suspended prob	bes wit		able if effe	ects due to	highly cha	rging proce	esses are e	expected				
IS-protection												
Approval DX14B-LMK 387		IBExU 1		<b>1066 X</b> ia IIC T4 (	3a		zone 20.	II 1D Ev	ia IIIC T1:	35 °C Da		
Safety technical maximum val	lues	U <sub>i</sub> = 28 \	/, I <sub>i</sub> = 93	$mA, P_i = 6$	60 mW,	C <sub>i</sub> = 49,2 e enclosu	nF; $L_i = 0$					inner

Protection cap	POM
<sup>3</sup> do not use freely suspended probes wit	th an FEP cable if effects due to highly charging processes are expected
IS-protection	
Approval DX14B-LMK 387	IBExU 15 ATEX 1066 X
	zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da
Safety technical maximum values	$U_i$ = 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
Permissible temperatures for	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar
environment	zone 1 and higher: -25 65 °C
Connecting cables	cable capacity: signal line/shield as well as signal line/signal line: 160 pF/m
(by factory)	cable inductance: signal line/shield as well as signal line/signal line: 1 µH/m
Miscellaneous	
Current consumption	max. 22 mA
Weight	approx. 180 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC
Pin configuration	
Electrical connection	cable colours (IEC 60575)
Supply +	wh (white)
Supply –	, ,
signal + (only 3-wire)	gn (green)
Shield	gnye (green-yellow)
BD SENSORS www.bdsensors	o.com



Ordering code

LMK 3	887		-	]-[	]-[	- 🗆	- 🗆 -	- 🗆 -	-	□-[		]-[			
Pressure Input	gauge in bar absolute in bar gauge in mH <sub>2</sub> O [mH <sub>2</sub> O] [bar]	3 6 0 3 6 3 3 6 1				_	I		I	Ι			I	I	consult
	1 0.1 1.6 0.16 2.5 0.25 4.0 0.40		1 0 0 1 6 0 2 5 0 4 0 0	0 0 0											
	6.0 0.60 10 1.0 16 1.6 25 2.5		6 0 0 1 0 0 1 6 0 2 5 0	0 1 1											
	40 4.0 60 6.0 100 10 customer		4 0 0 6 0 0 1 0 0 9 9 9	1 1 2 9											consult
Housing				·											
Stainless	steel 1.4404 (316L) customer			1 9											consult
Design	and be														
	probe version G1/2" open				1 A										
Diaphragm screw-in	version G3/4" flush		_	-	В			-		_					
	Ceramics Al <sub>2</sub> O <sub>3</sub> 96%					2									
Ce	eramics Al <sub>2</sub> O <sub>3</sub> 99.9%					C 9									14
Output	customer					9									consult
Сигриг	4 20 mA / 2-wire				_		1								
	0 10 V / 3-wire						3								
Intrinsic safety	4 20 mA / 2-wire						Е								
Cools	customer						9							_	consult
Seals	FKM							1						_	
	EPDM							3							
	FFKM <sup>1</sup>							7							consult
	customer							9							consult
Electrical connection	PVC-cable <sup>2</sup>														
	PUR-cable <sup>2</sup>								1 2						
	FEP-cable <sup>2</sup>								3						
	TPE-cable 2								4						
	customer								9						consult
Accuracy	0.05.0/ 50.0														
standard	0.35 % FSO									3					
option	0.25 % FSO customer									9					consult
Cable length	in m										9 9 !	0			
Special version	111111										9 9 :	9			
	standard											-	0 0	0	
prepared for mounti	ng with st. steel pipe 3												0 0 5 0	2	
	customer											!	9 9	9	consult

min. permissible temperature from -15 °C cable with integrated air tube for atmospheric pressure reference stainless steel pipe is not part of the supply



## Probe For Marine And Offshore

Ceramic Sensor

accuracy according to IEC 60770: standard: 0.25 % FSO option: 0.1 % 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
- ► LR-certificate (Lloyd's Register)
- ► GL-certificate (Germanischer Lloyd)
- DVN-certificate (Det Norske Veritas)
- ABS-certificate (American Bureau of Shipping)
- CCS-certificate (China Classification Society)
- high overpressure resistance
- high long-term stability

#### **Optional versions**

- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 99.9 %
- different housing materials (stainless steel, CuNiFe)
- ▶ IS-version zone 0
- screw-in and flange version
- accessories e.g. assembling and probe flange, mounting clamp

The hydrostatic probe LMK 458 has been developed for measuring level in service and storage tanks and is as a consequence certificated for shipbuilding and offshore applications.

A permissible operating temperature of up to 125°C and the possibility to use the device in intrinsic safe areas enable to measure the pressure of various fluids under extreme conditions. The basis for the LMK 458 is a capacitive ceramic sensor element designed by BD|SENSORS, which offers a high overload resistance and medium compatibility.

#### Preferred areas of use are



#### Water

drinking water abstraction desalinization plant

Shipbuilding / Offshore

ballast tanks



monitoring of a ship's position and draught

level measurement in ballast and storage tanks



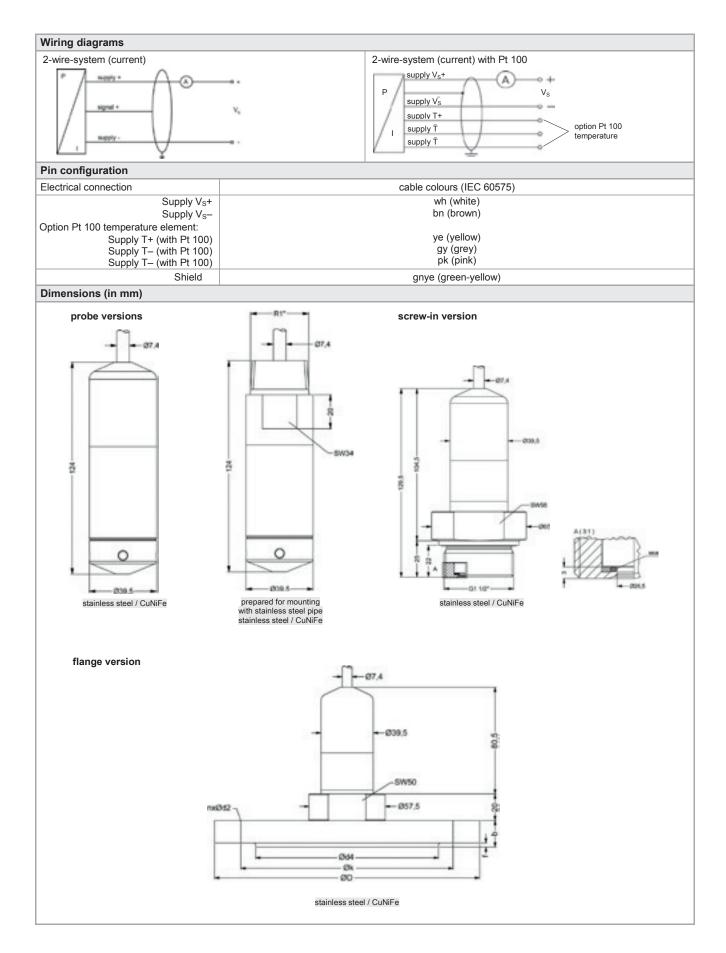








Pressure ranges Nominal pressure 1	[horl	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
· · · · · · · · · · · · · · · · · · ·	[bar]	_		-	_	-	-		+	_	-		-	-	-	_
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	20
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]		.2		0.3	. 4 5	-0	.5					-1			
1 available in gauge and al		nai press	ure rang	es abso	iute tron	1 1 bar										
Output signal / Supply		0	4 20	Λ / \ /	- 0	22.1/		\/		24.17						
Standard Option IS-version			4 20			32 V <sub>DC</sub> . 28 V <sub>DC</sub>			S rated = :							
Performance		z-wire.	4 20	IIIA / V	s – 14	. 20 V DC	;	V	S rated = 2	24 VDC						
			-d. < 1 0	25.0/.5	-00					fan F	> 0.0	har 3.	< 1.0.1	0/ 500		
Accuracy <sup>2</sup>			$d: \leq \pm 0$						optic	n: for F	N ≥ U.0	bar :	≤ ± 0.1	% FSC	,	
Permissible load Long term stability			[(V <sub>S</sub> - V			ence cor	nditions									
Influence effects			: 0.05 %			51100 001	iditions		ner	missible	load.	0.05 %	FSO /	'kO		
Turn-on time		700 m							ρο.		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.00 /0				
Mean response time		< 200	msec						mea	an mea	suring i	ate 5/s	sec			
Max. response time		380 m	sec													
<sup>2</sup> accuracy according to IEC	C 60770 – limi	t point ac	djustmen	t (non-li	nearity,	hysteres	is, repea	atability	)							
<sup>3</sup> Under the influence of dis				I 61000	-4-4 (200	04) +2 k\	/ accura	acy dec	reased	$to \leq \pm 0$ .	25 % F	SO.				
Thermal effects / Perm	nissible tem															
Thermal error			% FSC						range -	20 8						
Permissible temperatures	8	mediu	n / elect	ronics	enviror	nment: -	25 12	25 °C		stora	ge: -40	125	°C			
Electrical protection <sup>4</sup>																
Short-circuit protection		perma														
Reverse polarity protection			nage, bu													
Electromagnetic compati	bility		on and i N 61326		y accor		maniec	hor I lo	yd (GL	`		Do	t Norek	o Varita	as (DN\	Λ
<sup>4</sup> additional external overvo	Itana protecti				1 or KI						availal		LINUISK	e vent	35 (DIVV	v )
Mechanical stability	nage protection	orr arm m	terriiria	I DOX INL	- TOTAL	2 WILIT G	шозрп	crio pro	33410 10	210101100	avana	,,,,				
Vibration		4 g (ac	cordina	to GI ·	curve 2	/ accord	dina to I	DNV- C	Class B	/ basis	· DIN F	N 6000	38-2-6			
Electrical connection		1 9 (ac	ooranig	10 01.	00110 2	7 400010	anig to i	5144. 0	nace B	7 50010			50 2 0)			
Cable outlet		shielde	d cable	with int	egrated	air tube	for atn	nosphe	ric refe	rence (	or nom	inal pr	essure	ranges	sealed	1
						be is plu								. 5		
Materials																
Housing		standa	rd: stain	less ste	eel 1.44	04 (316I	L)									
						nt agair		water)					(	others o	n reque	est
Seals (media wetted)		standa		(M												
		options				in. perm	nissible	tempe							n reque	est
Diaphragm			rd: cera			% halogei				tion: ce						
Cable sheath		TPE -U				naloger salt, se				stance	against	on and	i gasoi	me,		
Miscellaneous			- 10	Joiotain	agains	. Juit, Ju	a water	, ricav	y Oii)							
Optionally cable protection	n	stainle	ss steel	nine fo	r probe	in stainle	ess ste	el· ava	ilable a	s comp	act pro	duct (st	tandard	d: stainl	ess ste	el pir
opionany cable protection						ossible;					. o. p. o.					o. p.p
Ingress protection		IP 68														
Current consumption		max. 2														
Weight			50 g (wit													
CE-conformity			Directive	: 2004/	108/EC											
Option Pt 100 tempera	ture eleme		10505													
Temperature range		-25	125°C													
Connection temperature	element	3-wire	1.000													
Resistance		100 Ω														
Temperature coefficient Supply Is		3850 p	pm/K 1.0 mA [	20												
Supply Is  Category of the enviro	nmont	0.5	I.U IIIA [	JC												
	mment	ENAL CO		ENAL (C						mb = = :	00416	ot-: 41	12005	-		
Lloyd's Register (LR)			, EMV2	, EIVIV	5, EIVIV4					mber of						
Germanischer Lloyd (GL)		D, EN								mber of		ate: 60	481 -	09 HH		
Det Norske Veritas (DNV	)		erature: omagne			midity: E / <sup>:</sup> B	3			ration: mber of		ate: A.	12144			
IS-protection			3.70		,	_										
•	Ω	IPE	J 07 AT	EY 440	n Y				70	ne 0: I	110 E	(ia IID	T4 Ca			
Approval DX14A-LMK 45	U					0 mW, 0	C. = 105	nF· I							ner can	nacity
Safety technical maximur	n values	of ma	x. 140 n	F oppo	site the	enclosu	ire								iner cap	Jacity
Permissible temp.for envi	ironment	in zor	0 6. 0	0 60	°C with	n 00	harun	to 1.1	bar zo	ne 1 ar	d highe	er: -25	70°C			
Connecting cables		_	capacity			ne/shiel										



# 64 LMK 458 Ordering code

LMK 458		]-□		- [	]-[	-	-[	-	-[	-	-	I	]	- 🗌			
Pressure in bar, gauge	7 6 5																
in bar, gauge	7 6 5	3															
in mH <sub>2</sub> O	7 6 8 7 6 6	5															
Input [mH <sub>2</sub> O] [bar]		0	4 0 0														
0.40 0.04 0.60 0.06		0 4	4 0 0 6 0 0														
1.0 0.10		1 (	0 0 0														
1.6 0.16		1 6	6 0 0														
2.5 0.25 4.0 0.40			5 0 0 0 0 0														
6.0 0.60		6 (	0 0 0														
10 1.0		1 (	0 0 1														
16 1.6			6 0 1														
25 2.5 40 4.0			5 0 1 0 0 1														
60 6.0			0 0 1														
100 10			0 0 2														
160 16		1 6	6 0 2														
200 20 customer		2 (	0 0 2														consult
Housing		9 3	9 9 9														Consuit
Stainless steel 1.4404 (316L)				1									Т				
Copper-Nickel-alloy (CuNi10Fe1Mn)				K													
customer			_	9								_			_		consult
Design Probe					1								-				
Flange version <sup>2</sup>					3												
Screw-in version					5												
Diaphragm						2											
Ceramics Al <sub>2</sub> O <sub>3</sub> 96% Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%						2 C											
customer						9											consult
Output																	
4 20 mA / 2-wire							1										
Intrinsic safety 4 20 mA / 2-wire customer							E 9										consult
Seals																	Coriodit
FKM								1									
EPDM FFKM <sup>3</sup>								3									
customer								7									consult
Electrical connection								Ü									Coriodit
TPE-U-cable <sup>4</sup>									4								
customer									9								consult
Accuracy standard 0.25 %										2							
option für $P_N \ge 0.6$ bar: 0.1 %										1							
customer										9							consult
Cable length												0 1					
in m Special version											9	9 9	9				
standard														0	0	0	
with temperature sensor Pt 100														0	1	3	
prepared for mounting with st. steel pipe 5														5	9	2	14
customer														9	9	9	consult

<sup>&</sup>lt;sup>1</sup> nominal pressure ranges absolute from 1 bar

This document contains product specifications; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.

 $<sup>^{\</sup>rm 2}$  mounting accessories are not part of supply and have to be ordered separately

<sup>&</sup>lt;sup>3</sup> min. permissible temperature from -15°C

<sup>&</sup>lt;sup>4</sup> shielded cable with integrated air tube for atmospheric reference

<sup>&</sup>lt;sup>4</sup> stainless steel pipe is not part of the supply



## Separable Stainless Steel Probe

Ceramic Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

#### **Nominal pressure**

from 0 ... 40 cm $H_2O$  up to 0 ... 100 m $H_2O$ 

#### **Output signals**

2-wire: 4 ... 20 mA 3-wire: 0 ... 10 V others on request

#### **Special characteristics**

- cable and probe separable
- diameter 39.5 mm
- especially for sewage, viscous and pasty media

#### **Optional versions**

- ▶ IS-protection zone 0
- cable protection via corrugated pipe
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- different kinds of cable
- different kinds of elastomers

The separable stainless steel probe LMK 358 has been designed for level measurement in waste water, waste and higher viscosity media. Basic element is a capacitive ceramic sensor.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembly with a connector and can be changed easily.

#### Preferred areas of use are



#### Water

ground water level measurement rain spillway basin



#### Sewage

waste water treatment water recycling





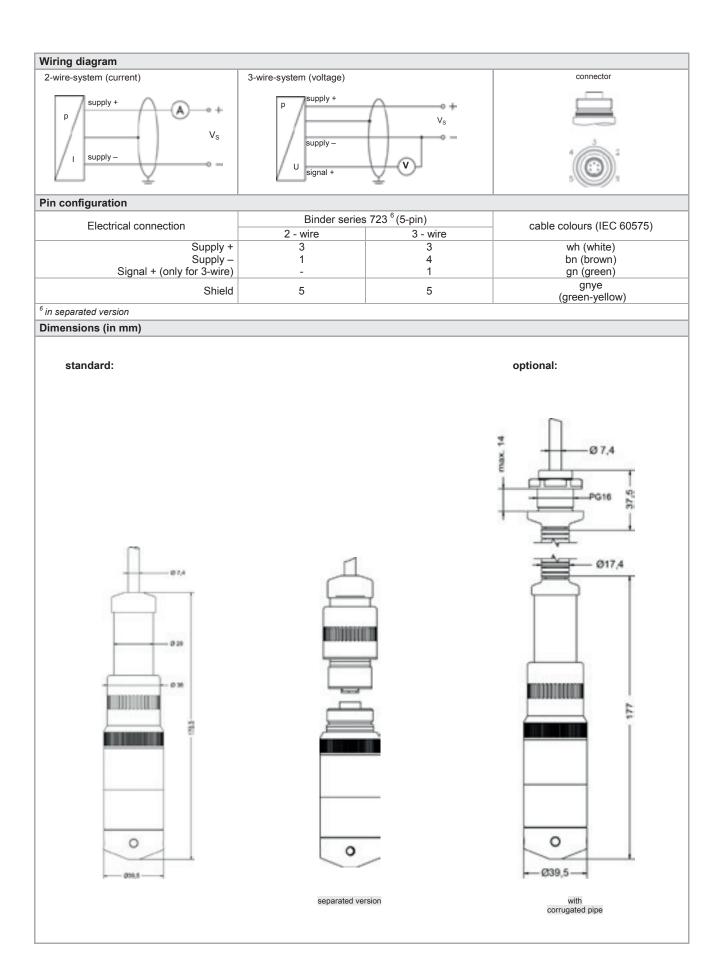
level monitoring in open tanks with low filling heights fuel storage tank farms / biogas plants





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
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35

Output signal / Supply						
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9 32 V <sub>DC</sub>					
Option IS-protection						
' '	2-wire: 4 20 mA / $V_S = 14$ 28 $V_{DC}$					
Option 3-wire	3-wire: 0 10 V / V <sub>S</sub> = 12.5 32 V <sub>DC</sub>					
Performance						
Accuracy 1	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO					
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$					
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 – limi	it point adjustment (non-linearity, hysteresis, repeatability)					
Thermal effects (Offset and Span						
Thermal error	≤ ± 0.1 % FSO / 10 K in compensated range 0 70 °C					
Permissible temperatures						
Permissible temperatures	medium: -25 125 °C electronic / environment: -25 125 °C storage: -40 125 °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					
. ,	on 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 PUR (-25 70 °C) black FEP⁴ (-25 70 °C) black TPE (-25 125 °C) blue					
<sup>3</sup> shielded cable with integrated air tube t <sup>4</sup> do not use freely suspended probes wit						
Materials (media wetted)						
Housing	stainless steel 1.4404 (316L)					
Seals	FKM 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 %					
Nose cone	POM					
Explosion protection (only for 4.						
Approval DX14-LMK 358	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	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i = 27 \text{ nF}, L_i = 5 \mu\text{H}$					
Permissible temperature	-25 70 °C					
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m					
<sup>5</sup> for optional stainless steel pipe following	g designation is valid: "Il 1G Ex ia IIC T4 Ga" (zone 0)					
Miscellaneous						
Current consumption	max. 21 mA					
Weight	approx. 650 g (without cable)					
Ingress protection	IP 68					
CE-conformity						
- · · · · · · · · · · · · · · · · · · ·						



### Ordering code

LMK 358		<b></b>
Pressure		
in bar	4 4 5 4 6	
in mH₂O	4 4 6	
Input [mH <sub>2</sub> O] [bar]		
0.40 0.04	0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
0.60 0.06 1.0 0.10	0 6 0 0 1 0 0 0	
1.6 0.16	1 0 0 0 1 6 0 0	
2.5 0.25	2 5 0 0	
4.0 0.40	2 5 0 0 4 0 0 0	
6.0 0.60	6 0 0 0	
10 1.0	6 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 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 9 9 9 9	
customer	9 9 9 9	consult
Housing		
Stainless steel 1.4404 (316L)	1	
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%	С	
customer	9	consult
Output		
4 20 mA / 2-wire	1	
0 10 V / 3-wire	3	
Intrinsic safety 4 20 mA / 2-wire customer	E	appoult
Seals	9	consult
FKM	1	
EPDM	3	
customer	9	consult
Electrical connection	3	Consuit
PVC-cable <sup>1</sup>	1	
PUR-cable <sup>1</sup>	2	
FEP-cable <sup>1</sup>	2 3	
TPE-cable <sup>1</sup>	4	
customer	9	consult
Accuracy		
standard 0.35 %	3	
option 0.25 %	2	
customer	9	consult
Cable length		
in m	9	9 9
Special version		
standard		0 0 0
prepared for mounting 2		1 0 6 consult
with stainless steel pipe		
cable protection with stainless steel corrugated pipe		1 0 3 9 9 9 consult
		1 0 3 9 9 9 consult
with pipe length in m customer		9 9 9 consult
Customer		J J J J Collsuit

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

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





### Separable Plastic Probe

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 %

#### **Nominal pressure**

from  $0 \dots 1 \text{ mH}_2\text{O}$  up to  $0 \dots 100 \text{ mH}_2\text{O}$ 

#### **Output signals**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

#### **Special characteristics**

- diameter 35 mm
- cable and sensor section separable
- excellent linearity
- small thermal effect

#### **Optional versions**

- SIL 2 (Safety Integrity Level) according to IEC 61508 / 61511
- mounting accessories as screw fitting and terminal clamp of stainless steel
- different kinds of cables and elastomers
- customer specific versions
   e. g. special pressure ranges

The separable plastic probe is designed for level measurement of water, waste water as well as fuels and oils. Basic element is a piezoresistive stainless steel sensor.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembl with a connector and can be changed easily.

#### Preferred areas of use are

Water / filtrated sewage

ground water level measurement storm water systems

drinking water system water treatment plants

Fuel / Oil

fuel storage tank farm

biogas plants process water recycling





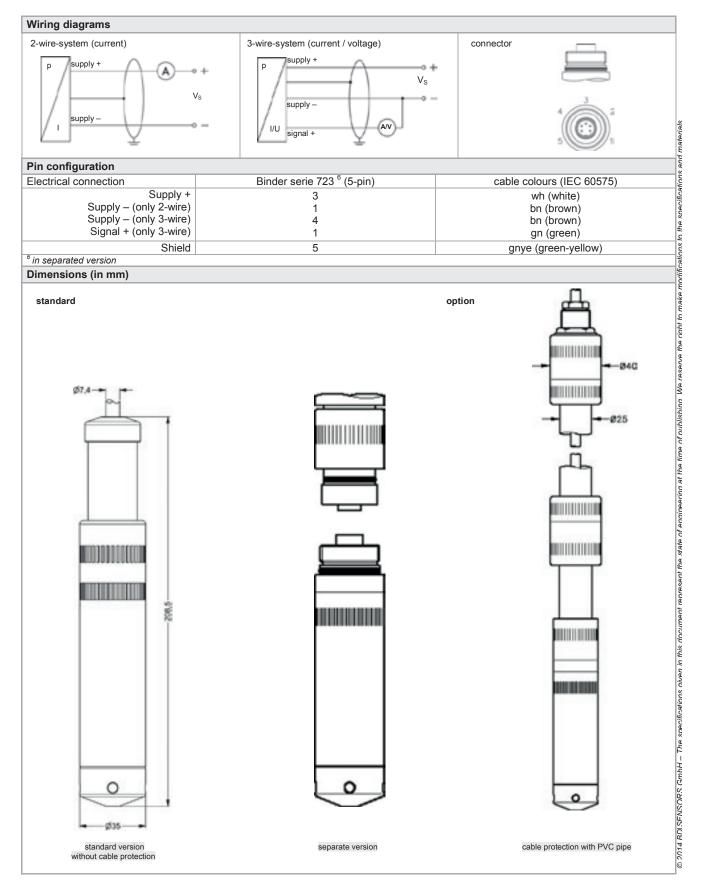
## 70 LMP 808

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 <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	0.5	1	1	2	5	5	10	10	20	40	40
Burst pressure ≥	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50

Output signal / Supply							
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 8 32 V <sub>DC</sub>	SIL-version: V <sub>S</sub> = 14 28 V <sub>DC</sub>					
Options 3-wire	3-wire: 0 20 mA / $V_S = 14$ 30 $V_{DC}$						
<u> </u>	0 10 V / V <sub>S</sub> = 14 30 V <sub>DC</sub>						
Performance							
Accuracy		£ 0.5 % FSO					
	· ·	nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO					
	option 1: nominal pressure ≥ 0.4 bar: ≤ ±	± 0.25 % FSO					
Permissible load	current 2-wire: $R_{max} = [(V_S - V_S min) / 0.02 A] \Omega$						
	current 3-wire: $R_{\text{max}} = 500 \Omega$						
	voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$						
Influence effects	supply: 0.05 % FSO / 10 V						
Lawrence at als 926		load: $0.05 \%$ FSO / k $\Omega$					
Long term stability	≤ ± 0.1 % FSO / year at reference conditions						
Response time	< 10 msec	A					
	limit point adjustment (non-linearity, hysteresis, repeatability	"					
Thermal effects (Offset and Sp		> 2.42					
	er] < 0.40	≥ 0.40					
Tolerance band [% FS		≤ ± 0.75					
	°C] 0	50					
Permissible temperatures							
Permissible temperatures	medium: 0 50 °C storage: -10 50 °C	medium: 0 50 °C storage: -10 50 °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 prot	ection unit in terminal box KL 1 or KL 2 with atmospheric pre	ssure reference available on request					
Electrical connection							
Cable with sheath material <sup>3</sup>	PVC (0 50 °C) grey						
	PUR (0 50 °C) black						
	FEP⁴ (0 50 °C) black						
Cable protection	standard: without cable protection						
3 6 1 : 46 : 4 4 - 1 - : 4 6 4	optional: prepared for mounting of a PVC pipe	e with diameter 25 mm					
<sup>3</sup> cable with integrated air tube for ati <sup>4</sup> do not use freely suspended probes	nospitenc pressure reference with an FEP cable if effects due to highly charging processe	es are expected					
Materials (media wetted)	with any 2. Casis is choose and to mg/m, changing process.	30 4.0 6.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Housing	PVC grey						
Seals	FKM						
Cais	EPDM						
Diaphragm	stainless steel 1.4435 (316L)						
Protection cap	POM	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					
Miscellaneous							
Option SIL <sup>5</sup> 2 application	according to IEC 61508 / IEC 61511						
Connecting cables	cable capacitance: signal line/shield also signal	line/signal line: 160 nF/m					
(by factory)	cable inductance: signal line/shield also signal						
Current consumption	signal output current: max. 25 mA	3 · · · · · · · · · · · · · · · · · · ·					
,	signal output voltage: max. 7 mA						
Weight	approx. 400 g (without cable)						
Ingress protection	IP 68						
CE-conformity	EMC Directive: 2004/108/EC						
5 only for 420mA / 2-wire							

## LMP 808

#### Technical Data



This document contains product specifications; properties are not guaranteed. Subject to change without notice.

# 72 LMP 808 Ordering code

LMP 808	<u> </u>		-0-0-0	-Ш-Ц	
Pressure in bar	4 1 0				
in mH <sub>2</sub> O	4 1 1				
Input [mH <sub>2</sub> O] [bar]					
1.0 0.10	1 0 0 0 1 6 0 0				
1.6 0.16 2.5 0.25	1 6 0 0 2 5 0 0				
4.0 0.40	2 5 0 0 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 9 9 9				
customer	9 9 9 9				consult
Housing		,			
PVC		A			
Diaphragm customer		9			consult
Stainless steel 1.4435 (316L)		1			
customer		9			consult
Output		3			Concar
4 20 mA / 2-wire		1			
0 20 mA / 3-wire		2			
0 10 V / 3-wire		3			
SIL2 4 20 mA / 2-wire		1S			
customer		9			consult
Seals					
FKM			1		
EPDM			3		
customer			9		consult
Electrical connection  PVC-cable <sup>1</sup>			1		
PUR-cable 1			2		
FEP-cable <sup>1</sup>			3		
customer			9		consult
Accuracy					30113411
standard for P <sub>N</sub> ≥ 0.4 bar 0.35 %			3		
standard for $P_N < 0.4$ bar $0.5 \%$			5		
option 1 for $P_N \ge 0.4$ bar 0.25 %			2		
customer			9		consult
Cable length					
in m				9 9 9	
Special version					
standard				0 0	0
prepared for mounting with PVC pipe <sup>2</sup> customer				1 0 9 9	6 consult
customer				9 9	9 consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference

<sup>&</sup>lt;sup>2</sup> PVC pipe is not part of the supply





## Plastic Probe for Aggressive Media

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

from 0 ... 6 mH<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 21 mm
- suitable for hydrostatic level measurement e.g. 3/4" pipes
- excellent linearity
- excellent long term stability

#### **Optional versions**

- ▶ different cable materials
- customer specific versionse.g. special pressure ranges

The LMK 806 with ceramic sensor and diameter from only 21 mm has been especially designed for the continuous level measurement at confined space conditions. Permissible media are waste water and different aggressive media.

Basic element of the plastic submersible probe is the flush mounted ceramic sensor, which makes cleaning easier when solid parts of the medium deposit on it. Different cable and elastomer materials are available in order to achieve maximum media compatibility.

#### Preferred areas of use are



#### <u>Sewage</u>

waste water treatment water recycling dumpsite



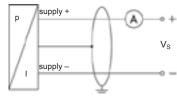
#### Aggressive media

level measurement in most of acids and lyes



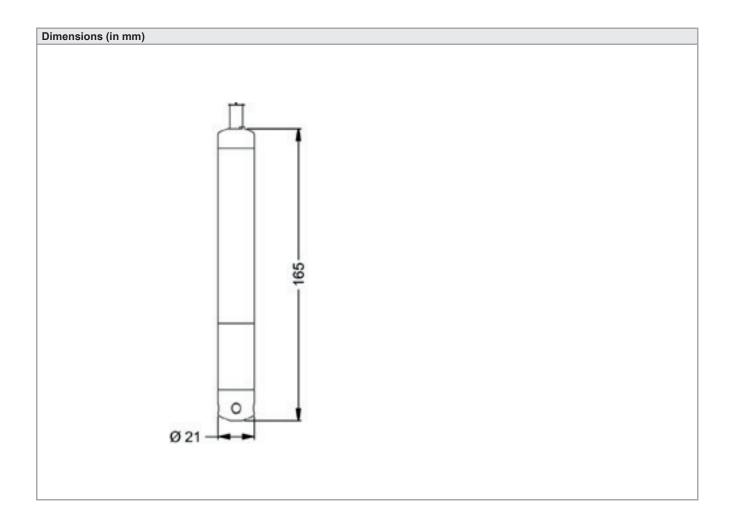
Input pressure range										
Nominal pressure gauge	[bar]	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	10	10	20	40	40
Burst pressure ≥	[bar]	4	4	5	5	12	12	25	50	50

2-wire	4 20 mA /	$V_S = 12 32 V_{DC}$	
Performance		5 - 50	
Accuracy <sup>1</sup>	≤ ± 0.5 % FSO		
Permissible load	$R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02]$	410	
Influence effects	supply: 0.05 % FSO /		
	load: 0.05 % FSO /		
Response time	≤ 10 msec	· <del>··</del>	
<sup>1</sup> accuracy according to IEC 60770 –	limit point adjustment (non-linearity,	hysteresis, repeatability)	
Thermal effects (Offset and Sp			
Thermal error	≤ ± 0.4 % FSO / 10 K		
	in compensated range -25	70 °C	
Permissible temperatures	medium: -10 50 °C		
·	storage: -25 50 °C		
Electrical protection <sup>2</sup>			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no fur	nction	
Electromagnetic protection	emission and immunity acc		
<sup>2</sup> additional external overvoltage prote	ection unit in terminal box KL 1 or K	L 2 with atmospheric pressure reference available on request	
Electrical connection			
Cable with sheath material <sup>3</sup>	PVC (-5 50 °C) grey		
	PUR (-10 50 °C) black		
	FEP⁴ (-10 50 °C) black		
3 shielded cable with integrated air tu	be for atmospheric pressure referen	ce	
	with an FEP cable if effects due to	highly charging processes are expected	
Materials (media wetted)			
Housing	PVC		
Seals	FKM		
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %		
Protection cap	POM		
Miscellaneous			
Connecting cables		l line/shield also signal line/signal line: 160 pF/m	
(by factory)		l line/shield also signal line/signal line: 1 μH/m	
Current consumption	max. 25 mA		
Weight	approx. 100 g (without cab	le)	
Ingress protection	IP 68		
CE-conformity	EMC Directive: 2004/108/E	EC .	
Wiring diagram			



Pin configuration	
Electrical connection	cable colours (IEC 60575)
1 11 2	wh (white) bn (brown)
Shield	gnye (green-yellow)

#### Technical Data



#### Accessories

Terminal clamp			
Technical Data		175—	
Suitable for	all probes with cable Ø 5.5 10.5 mm		74
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)		1 A N A N A N A N A N A N A N A N A N A
Weight	approx. 160 g		~/ <sub>78</sub>
Ordering type		Ordering code	
Terminal clamp, steel, zinc plated		Z100528	
Terminal clamp, sta	inless steel 1.4301 (304)	Z100527	

This document contains product specifications; properties are not guaranteed. Subject to change without notice.

LMK 806		<u> </u>	]-[]-[	]-[]-[]	- 🗆 - 🗆	Ш	-□	Ι	]
Pressure									
in bar	3 7 5							т	
in mH <sub>2</sub> O	3 7 5 3 7 6								
Input [mH₂O] [bar]									
6 0.60	6	0 0 0							
10 1.0	1								
16 1.6	1	6 0 1							
25 2.5 40 4.0	2	5 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	0 0 2 6 0 2 2 0 0 2 9 9 9							consult
Housing		,   0   0   0							Conduc
PVC		, , , , , , , , , , , , , , , , , , ,	Α					Т	
customer			9						consult
Diaphragm									
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%			9						
customer			9						consult
Output									
4 20 mA / 2-wire			1						
customer			9						consult
Seals									
FKM				1					
customer				9					consult
Accuracy 0.5 %				E				-	
customer				5					consult
Electrical connection		_	_	9					Consuit
PVC-cable <sup>1</sup>					1			_	
PUR-cable <sup>1</sup>					2				
FEP-cable <sup>1</sup>					3				
customer					9				consult
Cable length					<u> </u>				
in m					9	9 9			
Special version									
standard							0 (	0 0	
customer							9 9	9 9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



## Plastic Probe for Aggressive Media

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

from 0 ... 4 mH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

#### **Output signals**

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

#### **Special characteristics**

- diameter 35 mm
- excellent long term stability
- easy handling

#### **Optional versions**

- SIL 2 (Safety Integrity Level) according to IEC 61508 / IEC 61511
- different kinds of cables and elastomers
- customer specific versione. g. special pressure ranges

The plastic submersible probe LMK 807 is designed for continous level measurement for waste water or and different aggressive media.

Basic element of the plastic submersible probe is the flush mounted ceramic sensor, which makes cleaning easier when solid parts of the medium deposit on it. Different cable and elastomer materials are available in order to achieve maximum media compatibility.

#### Preferred areas of use are



#### <u>Sewage</u> waste water treatment

water recycling dumpsite



#### Aggressive media

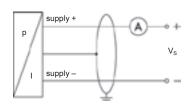
level measurement in most of acids and lyes



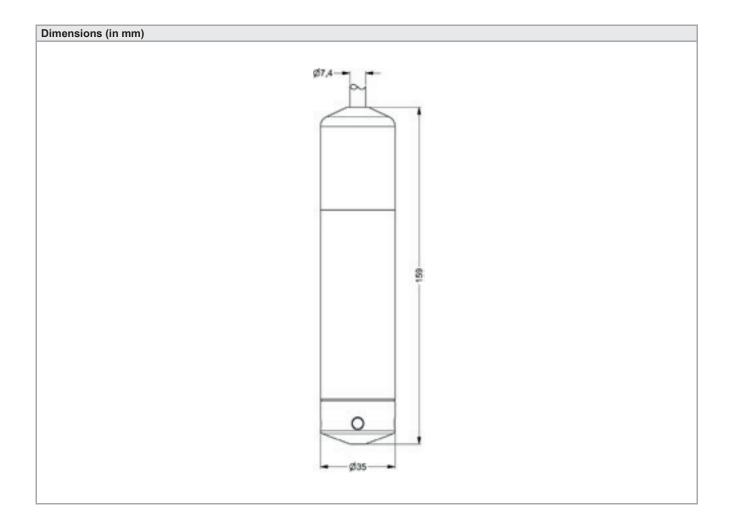


Input pressure range									
Nominal pressure gauge	[bar]	0.4	0.6	1	1.6	2.5	4	6	10
Level	[mH <sub>2</sub> O]	4	6	10	16	25	40	60	100
Overpressure	[bar]	1	2	2	4	4	10	10	20
Burst pressure ≥	[bar]	2	4	4	5	5	12	12	25

Output signal / Supply								
Standard	2-wire: $4 \dots 20 \text{ mA} / V_S = 8 \dots 32 V_{DC}$ SIL-version: $V_S = 14 \dots 28$							
Performance								
Accuracy <sup>1</sup>	≤±0.5 % FSO							
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$							
nfluence effects	supply: 0.05 % FSO / 10 V							
	load: 0.05 % FSO / kΩ							
ong term stability	≤ ± 0.1 % FSO / year at reference conditions							
Response time	< 10 msec							
accuracy according to IEC 60770 - I	imit point adjustment (non-linearity, hysteresis, repeatability)							
Thermal effects (Offset and Sp	an)							
Thermal error	≤ ± 0.2 % FSO / 10 K							
	in compensated range -25 70 °C							
Permissible temperatures								
Permissible temperatures	medium: 0 50 °C							
· ·	storage: -10 50 °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 prote	ction unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on req							
Electrical connection								
Cable with sheath material <sup>3</sup>	PVC (0 50 °C) grey							
	PUR (0 50 °C) black							
	FEP <sup>4</sup> (0 50 °C) black							
cable with integrated air tube for atm								
<u> </u>	with an FEP cable if effects due to highly charging processes are expected							
Materials (media wetted)								
Housing	PVC grey							
Seals	FKM / EPDM / FFKM							
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %							
Miscellaneous								
Option SIL 2 application	according to IEC 61508 / IEC 61511							
Connecting cables	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m							
(by factory)	cable inductance: signal line/shield also signal line/signal line: 1µH/m							
Current consumption	max. 25 mA							
Weight	approx. 200 g (without cable)							
Ingress protection	IP 68							
CE-conformity	EMC Directive: 2004/108/EC							
Wiring diagram								
2-wire-system (current)								



Pin configuration	
Electrical connection	cable colours (IEC 60575)
	wh (white) bn (brown)
117	gnye (green-yellow)



## Ordering code

LMK 807				<b>]</b> - [[[]	-	
Pressure						
in bar in mH₂O	3 9 0 3 9 1					
Input [mH <sub>2</sub> O] [bar]	3 9 1					
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 4 0 0 1					
40 4.0	4 0 0 1 6 0 0 1					
60 6.0	6 0 0 1					
100 10	1 0 0 2 9 9 9 9					
customer	9 9 9 9					consult
Housing PVC		^				
customer		A 9				consult
Diaphragm		9				Consuit
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%		2				
customer		9				consult
Output						Sonidan
4 20 mA / 2-wire		1				
SIL2 4 20 mA / 2-wire		18				
customer		9				consult
Seals						
FKM			1			
EPDM			3			
FFKM			7			
customer			9			consult
Accuracy 0.5 %			5			
customer			9			consult
Electrical connection			9			Consuit
PVC-cable <sup>1</sup>				1		
PUR-cable <sup>1</sup>						
FEP-cable <sup>1</sup>				2 3		
customer				9		consult
Cable length						
in m				9 9 9		
Special version						
standard					0 0 0	
customer					9 9 9	consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



### Plastic Probe For Aggressive Media

High Purity Ceramic Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

#### **Nominal pressure**

from 0 ... 0.4 mH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

#### **Output signals**

2-wire: 4 ... 20 mA 3-wire: 0 ... 10 V others on request

#### **Special characteristics**

- diameter 45 mm
- chemical resistance
- high overpressure resistance
- especially for tank level measurement of viscous and aggressive media
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- housing material PP or PVDF

#### **Optional versions**

- different kinds of cable and seal materials
- prepared for mounting with pipe

The plastic submersible probe LMK 809 is designed for continous level measurement in waste water or in most of aggressive media. Basic element is a capacitiv ceramic sensor.

Basic element of the plastic probe is the flush mounted ceramic sensor, which makes cleaning easier when solid parts of the medium deposit on it. Different cable and seal materials are available in order to achieve maximum media compatibility.

#### Preferred areas of use are



#### Sewage

waste water treatment water recycling dumpsite



#### Aggressive media

level measurement in most of acids and lyes

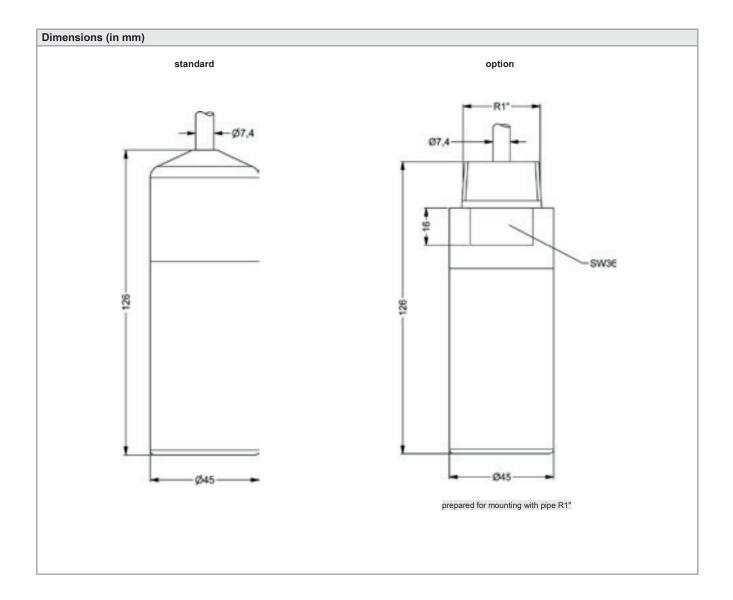


### Technical Data

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
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35

Outrost simulated Committee								
Output signal / Supply								
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9 32 V <sub>DC</sub>							
Option 3-wire	3-wire: 0 10 V / $V_S$ = 12.5 32 $V_{DC}$							
Performance								
Accuracy <sup>1</sup>	standard: ≤±0.35 % FSO							
	option: ≤ ± 0.25 % FSO							
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$							
Influence effects	supply: 0.05 % FSO / 10 V							
Long torm etability	load: 0.05 % FSO / kΩ $\leq \pm$ 0.1 % FSO / year at reference conditions							
Long term stability Turn-on time	700 msec							
Mean response time	< 200 msec measuring rate: 5/sec							
Max. response time	380 msec							
	t point adjustment (non-linearity, hysteresis, repeatability)							
Thermal effects (Offset and Span								
Thermal error	≤±0.1 % FSO / 10 K							
	in compensated range 0 70 °C							
Permissible temperatures								
Permissible temperatures	medium: -25 100 °C electronic / environment: -25 100 °C storage: -25 100 °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	on 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 FEP⁴ (-25 70 °C) black TPE (-25 100 °C) blue							
Materials (media wetted)								
Housing	standard: PP							
	option: PVDF							
Seals	FKM / EPDM / FFKM							
Diaphragm  Miscellaneous	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %							
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: 1µH/m							
Current consumption	max. 21 mA							
Weight	approx. 320 g (without cable)							
Ingress protection	IP 68							
CE-conformity	EMC Directive: 2004/108/EC							
Wiring diagram								
2-wire-system (current)	3-wire-system (voltage)							
p supply +	p supply + V <sub>s</sub>							
supply –	U signal +							
Pin configuration								
Electrical connection	cable colours (IEC 60575)							
Supply +	wh (white)							
Supply –	bn (brown)							
Signal + (only for 3-wire)	gn (green) gnye (green-yellow)							
Shield	LUIVE TUTELL-VEIIOWI							

Shield gnye (green-yellow)



# 84 LMK 809 Ordering code

LMK 809	<u> </u>	<b>—</b> -—
$\begin{array}{c c} \textbf{Pressure} & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & \\ & & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & & \\ & & & \\ &$	3 9 5 3 9 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
100 10 customer	1 0 0 2 9 9 9 9	consult
Housing PP PVDF customer Diaphragm	E B 9	consult
Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9% customer	C 9	consult
Output 4 20 mA / 2-wire 0 10 V / 3-wire	1 3	
Seals	9	consult
FKM EPDM FFKM	1 3 7	
customer Accuracy	9	consult
standard 0.35 % option 0.25 % customer	3 2 9	consult
Electrical connection  PUR-cable <sup>1</sup> FEP-cable <sup>1</sup> TPE-cable <sup>1</sup>	2 3 4	Genaux
Cable length in m	9	consult
Special version standard		0 0 0
pipe R1" customer		6 1 0 9 9 9 consult

<sup>&</sup>lt;sup>1</sup> cable with integrated air tube for atmospheric pressure reference



## Separable Plastic Submersible 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 ... 100 mH<sub>2</sub>O

#### **Output signals**

2-wire: 4 ... 20 mA 3-wire: 0 ... 10 V others on request

#### **Special characteristics**

- diameter 45 mm
- cable and probe separable
- chemical resistance
- housing PVC

#### **Optional versions**

- cable protection via PVC pipe
- diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- different kinds of cable
- ▶ different kinds of seal materials

The separable plastic submersible probe LMK 858 is designed for level measurement in most aggressive media. Usage in more viscous media as for example sludge is possible because of the semiflush diaphragm.

In order to facilitate stock-keeping and maintenance the transmitter head is plugged to the cable assembly with a connector and can be changed easily.

#### Preferred areas of use are



#### Sewage

waste water treatment water recycling dumpsite



#### Aggressive media

level measurement in most of acids and lyes



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
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35

Output signal / Supply Standard	2	4 20 m ( ) ( = 0 0)	2.1/	antion 2irr	0 40 1/ 1/ = 40 5 20 1/
	2-wire:	4 20 mA / V <sub>S</sub> = 9 32	∠ V <sub>DC</sub>	option 3-wire:	0 10 V / V <sub>S</sub> = 12.5 32 V <sub>DC</sub>
Performance			IEC 00:	770 1	
Accuracy			IEC 607		
	standard	i:		5 % FSQ 5 % FSO	
Permissible load	option:	V V \/ 0.02.41.0	⊒ ± 0.2;	7,0100	
		$V_S - V_{S min}$ / 0.02 A] $\Omega$			
Influence effects	load:	0.05 % FSO / 10 V 0.05 % FSO / kΩ			
Long term stability		% FSO / year at reference c	ondition	9	
Turn-on time	700 mse	•	Oriditions	3	
Mean response time	< 200 m			measurin	g rate 5/sec
Max. response time	380 mse	eC			-
<sup>1</sup> accuracy according to IEC 60770 – lin	nit point adju	stment (non-linearity, hysteresis	s, repeata	bility)	
Thermal effects (Offset and Spa	n)				
Thermal error	≤ ± 0.1 %	6 FSO / 10 K			
	in compe	ensated range 0 50 °C			
Permissible temperatures					
Permissible temperatures	medium:				
		c / environment: -10 50			
	storage:	-10 50	) °C		
Electrical protection <sup>2</sup>					
Short-circuit protection	permane				
Reverse polarity protection		age, but also no function	EN 040	20	
Electromagnetic compatibility  2 additional external overvoltage protect		n and immunity according to			se available on request
Electrical connection	ion unit in te	THIIITAI DOX NE T OF NE 2 WILL AL	позрпенс	, pressure referenc	e available on request
Cable with sheath material <sup>3</sup>	DVC ( 5	50 °C) grey			
Cable with sheath material		0 50 °C) black			
		0 50 °C) black			
Cable protection		l: without cable protection			
3	optional:		f a PVC	pipe with diamet	ter 25 mm
<ul> <li>cable with integrated air tube for atmo</li> <li>do not use freely suspended probes w</li> </ul>			raina prov	sesses are expecte	d
Materials (media wetted)	illi all i Li C	able if effects due to flightly cha	rgirig proc	esses are expecte	· ·
Housing	PVC gre	AV			
Seals		PDM / others on request			
Diaphragm		d: ceramics Al <sub>2</sub> O <sub>3</sub> 96 %			
apag	option:	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %			
Miscellaneous					
Connecting cables	cable ca	pacitance: signal line/shield	l also sig	nal line/signal lin	ne: 160 pF/m
(by factory)		ductance: signal line/shield			
Current consumption	max. 25	mA			
Weight		400 g (without cable)			
Ingress protection	IP 68				
CE-conformity	EMC Dir	rective: 2004/108/EC			
Wiring diagram					
2-wire-system (current)		3-wire-system (voltage)		T	connector
•		· · · · · · · · · · · · · · · · · · ·			
n supply +		supply +			
р /зарру .	-o +	p / Y		+	
	.	/ <del>     </del>		Vs	
/	Vs	supply –		-0 -	3
/		1 /			4 6 5
/	-	1/ 1 1 1	$\sim$	I	4 / 6 - 4
I supply –	o	U signal +	-(V)		
I supply –	-0 -	U signal +	-V)		

n configuration			
Electrical connection	Binder series	3 723 <sup>5</sup> (5-pin)	cable colours (IEC 60575)
	2 - wire	3 - wire	· · · · · · · · · · · · · · · · · · ·
Supply +	3	3	wh (white)
Supply -	1	4	bn (brown)
Signal + (only for 3-wire)	-	1	gn (green)
Shield	5	5	gnye (green-yellow)
n separated version			,
mensions (in mm)			
			Pg 16
standard			045

### Ordering code

LMK 858		<b>—</b> -—
Pressure in bar	4 1 5	
in mH <sub>2</sub> O	4 1 6	
Input [mH <sub>2</sub> O] [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 0 0 0 1 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 4 0 0 1	
40 4.0	4 0 0 1	
60 6.0	6 0 0 1	
100 10 customer	1 0 0 2 9 9 9	consult
Housing	9 9 9 9	Consuit
PVC	A	
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%	С	
customer	9	consult
Output		
4 20 mA / 2-wire	1	
0 10 V / 3-wire customer	3	annult.
Seals	9	consult
FKM	1	
EPDM	3	
customer	9	consult
Electrical connection		33001
PVC-cable		
PUR-cable	1 2	
FEP-cable	3	
customer	9	consult
Accuracy		
standard 0.35 %	3	
option 0.25 % customer	2 9	acroult.
Cable length	9	consult
in m		9 9 9
Special version		
standard		0 0 0
prepared for mounting with PVC pipe	2	0 0 0 1 0 6 9 9 9 consult
customer		9 9 9 consult

 $<sup>^{\</sup>mbox{\scriptsize 1}}$  cable with integrated  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left$ 

<sup>&</sup>lt;sup>2</sup> PVC pipe is not part of the supply



## **LMP 331**

#### Screw-In Transmitter

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % / 0.1 % FSO

#### Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

#### **Output signals**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

#### **Special characteristics**

- pressure port G 3/4" flush
- excellent accuracy
- small thermal effect
- excellent long term stability

#### **Optional versions**

- accuracy 0.1% FSO IEC 60770
- IS-version: Ex ia = intrinsically safe for gases and dusts
- SIL 2 application according to IEC 61508 / IEC 61511
- different electrical connections
- customer specific versions e. g. special pressure ranges

The screw-in transmitter LMP 331 has been designed for continuous level measurement and is characterized by an excellent performance and a robust construction. The modular construction allows the user the highest possible flexibility in the adaption of LMP 331.

Optional features like e.g. an intrinsically safe version or a functionally safe version (SIL 2) increase the advantages when launching and realizing projects for plants and systems.

#### Preferred areas of use are



Plant and Machine Engineering



**Energy Industry** 



**Environmental Engineering** (water - sewage - recycling)











## LMP 331

Input pressure range															
Nominal pressure gauge	[bar]	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400
Overpressure	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		P <sub>N</sub> ≥ 1	bar: ur	limited	vacuur	n resista	ance								
		$P_N < 1$	bar: or	reque	st										

Output signal / Supply						
Standard		2-wire: 4	. 20 mA / V <sub>S</sub> = 8	32 V <sub>20</sub>	SII -version:	V <sub>S</sub> = 14 28 V <sub>DC</sub>
Option IS-version			$\frac{20 \text{ mA}}{100 \text{ mA}} = \frac{100 \text{ mA}}{100 \text{ mA}} = \frac$			V <sub>S</sub> = 14 28 V <sub>DC</sub>
Options 3-wire		3-wire: 0	$\frac{120 \text{ mA}}{10 \text{ V}} / \frac{\text{V}_S - 10}{\text{V}_S} = \frac{14}{10 \text{ V}} / \frac{10 \text{ V}_S}{10 \text{ V}_S} = \frac{14}{10 \text{ V}} = 1$	30 V <sub>DC</sub>	SIL-VEISIOII.	VS - 14 20 VDC
Performance		<b>0</b>	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	00 100		
Accuracy1		standard: no	minal pressure < 0.4	har: <	± 0.5 % FSO	
Accuracy i		no option 1: no	minal pressure < 0.4 minal pressure ≥ 0.4 minal pressure ≥ 0.4 all nominal pressure	bar: ≤ bar: ≤	± 0.35 % FSO ± 0.35 % FSO ± 0.25 % FSO ± 0.1 % FSO	
Permissible load		current 2-wire: current 3-wire: voltage 3-wire:	$R_{max} = [(V_S - V_S)]$ $R_{max} = 500 \Omega$ $R_{min} = 10 k\Omega$	' <sub>S min</sub> ) / 0.02	Α] Ω	
Influence effects		supply: load:	0.05 % FSO / 0.05 % FSO /	kΩ		
Long term stability			/ year at reference of	onditions		
Response time <sup>2</sup>		2-Leiter: ≤ 10 i 3-Leiter: ≤ 3 i	msec			
<sup>1</sup> accuracy according to IEC 6 <sup>2</sup> with optional accuracy 0,1 %	% FSO the I	response time is 20		is, repeatabili	ty)	
Thermal effects (Offset		,				
Nominal pressure P <sub>N</sub>	[bar]		≤ 0.40			> 0.40
Tolerance band	[% FSO]		≤±1			≤ ± 0.75
in compensated range	[°C]		0 70			-20 85
Permissible temperature	es					
Permissible temperatures	•	medium: electronics / en storage:	vironment: -40	125 °C 85 °C 100 °C		
Electrical protection						
Short-circuit protection		permanent				
Reverse polarity protectio	n	no damage, bu	t also no function			
Electromagnetic compatib	oility		mmunity according to	EN 61326		
Mechanical stability						
Vibration		10 g RMS (25.	2000 Hz)	according	to DIN EN 60068-2-6	
Shock		500 g / 1 msec			to DIN EN 60068-2-27	7
Explosion protection (or	nly for 4.					
Approvals			X 1068 X / IECE>	IBE 12.002	27X	
DX19-LMP 331		zone 0:	1G Ex ia IIC T4 Ga 1D Ex ia IIIC T 85°C			
Safety technical maximun	n values		$P3 \text{ mA}$ , $P_i = 660 \text{ mW}$		$_{i}$ ≈ 0 μH, of max. 27 nF opposite	e the housing
Permissible temperature f	for	in zone 0:			bar bis 1.1 bar	
medium			gher: -20 70 °C		112 / 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100 5/
Conneting cables (by factory)		cable capacita	nce: signal line/shie ce: signal line /shi		al line / signal line: nal line / signal line:	160 pF/m 1 μH/m
Materials						
Pressure port		stainless steel	1.4404 (316L)			
Housing		stainless steel	1.4404 (316L)			
Seals		standard: option: others on reque	FKM EPDM est			
Diaphragm		stainless steel				
Media wetted parts			seals, diaphragm			
1			, , ,			

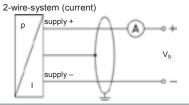
according to IEC 61508 / IEC 61511 signal output current: max. 25 mA	
signal output current: max 25 mA	
Jugilai Galpat Garretti. Illax. 20 Illx	signal output voltage: max. 7 mA
approx. 200 g	
any 3	
> 100 x 10 <sup>6</sup> cycles	
EMC Directive: 2004/108/EC	
94/9/EG	
	approx. 200 g any <sup>3</sup> > 100 x 10 <sup>6</sup> cycles EMC Directive: 2004/108/EC

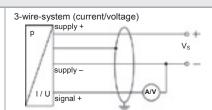
<sup>&</sup>lt;sup>3</sup> Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges  $P_N \le 1$  bar.

#### Pin configuration

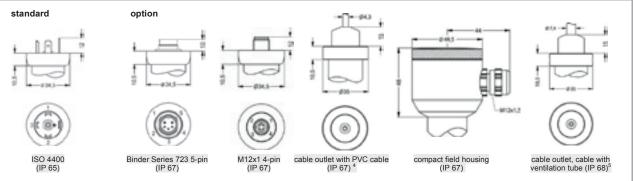
Electrical connections	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (IEC 60575)
Supply +	1	3	1	IN +	wh (white)
Supply –	2	4	2	IN –	bn (brown)
Signal + (only for 3-wire)	3	1	3	OUT +	gn (green)
Shield	ground pin	5	4	1	gnye (green-yellow)

#### Wiring diagrams

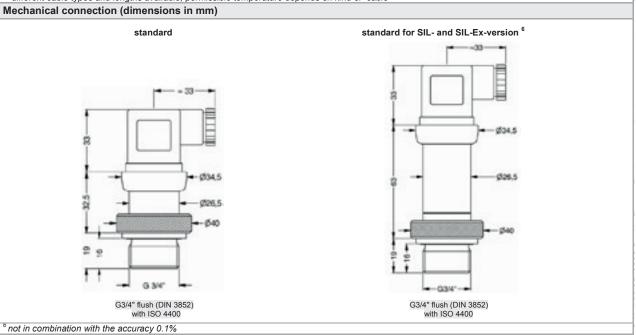




#### Electrical connections (dimensions in mm)



standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)
 different cable types and lengths available, permissible temperature depends on kind of cable



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### Ordering code

LMP 331	[	<u> </u>			]-[	]-	- 🗌	-	-	-[		П	-	]- <u></u>				
Pressure in	bar	4 3 0																
in m	H <sub>2</sub> O	4 3 1				_												_
Input [mH <sub>2</sub> O] [bare 1 0.			1 0	0 (														
1.6 0.			1 6	0	)													
2.5 0.3			2 5		0													
4 0.4			4 0	0 (	)													
6 0.0			6 0	0	0													
10 1.			1 0	0	1													
16 1. 25 2.			1 6		1													
25 2 40 4			2 5 4 0	0	1													
60 6					1													
100 1				0	2													
160 1			1 6	0	2													
250 2		:	2 5 4 0	0	2													
400 4 custo			4 0 9 9	0	2													.14.
Pressure port	mer		9   9	9	9			-		-			-				const	JIL
Stainless steel 1.4404 (31	(6L)			-		1												
custo						9											consu	ult
Diaphragm																		
Stainless steel 1.4435 (31							1											
custo	mer						9										consi	ılt
Output	!																	
4 20 mA / 2- 0 20 mA / 3-								1										
0 10 V / 3-								3										
Intrinsic safety 4 20 mA / 2-								Ē										
SIL2 4 20 mA / 2-								1S										
SIL2 with Intrinsic saf								ES										
4 20 mA / 2- custo								9										.14
Seals	IIIei	_						9									const	אונ
	KM		_		_		_	_	1	_			_					
EF	MDM								3									
custo	mer								9								consu	ult
Electrical connection																		
Male and female plug ISO 4										1		0						
Male plug Binder series 723 (5- Cable outlet with PVC ca										2 T	A	0						
Cable outlet with F v C Ca	ıtlet <sup>2</sup>									Ť		0						
Male plug M12x1 (4-pin) / m										M		0						
Compact field hous	ing									8								
stainless steel 1.4																		
custo	mer									9	9	9					const	ılt
Accuracy standard for $P_N \ge 0.4$ bar 0.3	5 %												3					
standard for $P_N < 0.4$ bar 0	5 % 5 %												5					
option 1 for $P_N \ge 0.4$ bar 0.2	5 %												2					
option 2 0.	1 % <sup>3</sup>												1					
custo	mer												9				const	ult
Special version	1														_			
stand														0	9	0	consi	dŧ
Cusio														9	9	J	CONST	art.
			_	_	_	_	_				_	_	_					

Prices EXW Thierstein, excluding package

 $<sup>^{1}</sup>$  standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request

<sup>&</sup>lt;sup>2</sup> cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

<sup>&</sup>lt;sup>3</sup> not in combination with SIL



#### Screw-In Transmitter

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

from 0 ... 400 mbar up to 0 ... 60 bar

#### **Output signals**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

#### **Special characteristics**

- pressure port G 3/4" flush for pasty and impuritied media
- pressure port PVDF for aggressive media

#### **Optional versions**

- **IS-version** (only for 4 ... 20mA / 2-wire): Ex ia = intrinsically safe for gases and dusts
- SIL 2 application according to IEC 61508 / IEC 61511
- customer specific versions

The screw-in transmitter LMK 331 has been especially designed for level and process measurement and is suitable for pressure measurement of liquids, oils and gases. Usage in more viscous or polluted media is possible because of the semi-flush pressure sensor.

For the usage in aggressive media we recommended the version with PVDF pressure port. Additional features like e.g. an intrinsically safe version or a functionally safe version (SIL 2) complete the range of possibilities.

#### Preferred areas of use are



Plant and Machine Engineering



**Energy Industry** 



**Environmental Engineering** (water – sewage – recycling)



Medical Technology







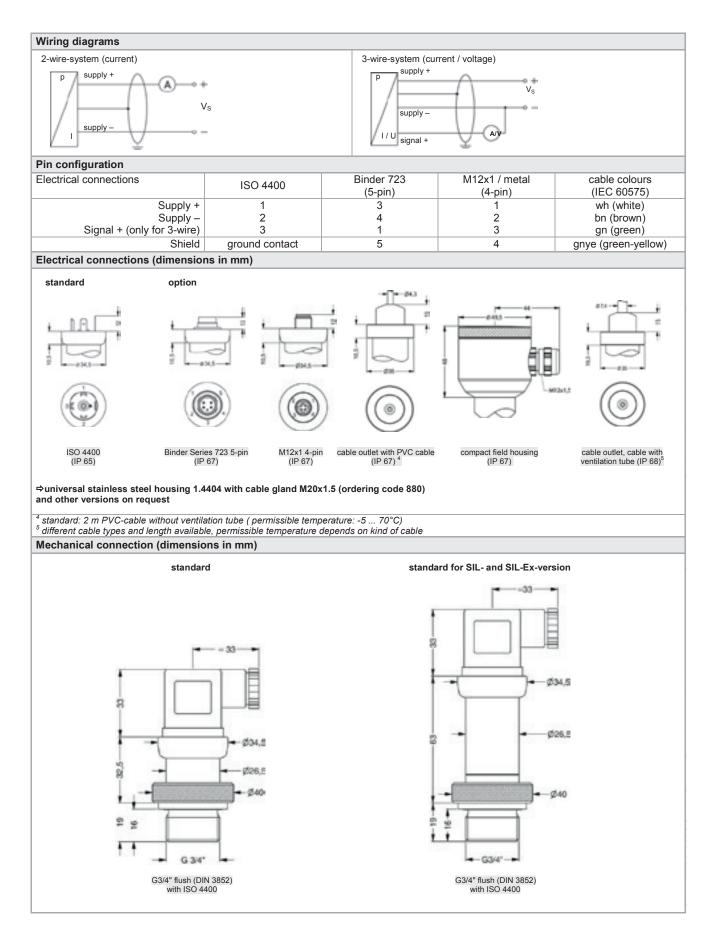






Input pressure range													
Nominal pressure gauge	[bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40 <sup>1</sup>	60 <sup>1</sup>
Level	[mH <sub>2</sub> O]	4	6	10	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	1	2	2	4	4	10	20	20	40	40	100	200
Burst pressure	[bar]	2	4	4	5	7,5	12	25	30	50	50	120	250
Vacuum resistance	[bar]	P <sub>N</sub> ≥ 1	bar: unli	mited va	cuum res	istance							
		$P_N < 1$	bar: on i	equest									
<sup>1</sup> only possible with stainless steel pressure port													

Output signal / Supply			
Standard	2-wire: 4 20 mA / V <sub>S</sub>	= 8 32 Vpc SII -version: \	/ <sub>S</sub> = 14 28 V <sub>DC</sub>
Option IS-protection <sup>2</sup>	2-wire: 4 20 mA / V <sub>S</sub>		/ <sub>S</sub> = 14 28 V <sub>DC</sub>
Optionen 3-wire	3-wire: 0 20 mA / V <sub>S</sub>		75 14 20 VDC
	0 10 V / Vs		
<sup>2</sup> IS-protection not possible with plastic	pressure port		
Performance			
Accuracy <sup>3</sup>	≤ ± 0.5 % FSO		
Permissible load	current 2-wire: R <sub>max</sub>	$_{ax} = [(V_S - V_{S min}) / 0.02 A] \Omega$	
	current 3-wire: R <sub>max</sub>	$_{\rm ax}$ = 500 $\Omega$	
	voltage 3-wire: R <sub>min</sub>	$_{\rm n}$ = 10 k $\Omega$	
nfluence effects	supply: 0.05 % FSO / 10 load: 0.05 % FSO / kg		
Response time	2-wire: ≤ 10 msec 3-wire: ≤ 3 msec		
Long term stability	≤ ± 0,3 % FSO / year at refe		
<sup>3</sup> accuracy according to IEC 60770 – lii			
Thermal effects (Offset and Spa			
Thermal error	≤ ± 0.2 % FSO / 10 K		
in compensated range	-25 85 °C		
Permissible temperatures	medium:	-40 125 °C	
·	electronics / environment:	-25 85 °C	
	storage:	-40 100 °C	
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no fund	ction	
Electromagnetic compatibility	emission and immunity acco	ording to EN 61326	
Mechanical stability	-	_	
Vibration	10 g RMS (25 2000 Hz)	according to DIN EN 60068-2-6	
Shock	500 g / 1 msec	according to DIN EN 60068-2-27	
Materials	- coo g / 1 moso	according to Birt Err cocco 2 27	
		nraccius nort	havaina
Pressure port / housing	standard:	pressure port stainless steel 1.4404 (316L)	housing stainless steel 1.4404 (316L)
	options for P <sub>N</sub> ≤ 25 bar:	PVDF	PVDF
Option compact field housing		cable gland brass nickel plated othe	I .
Seals	standard: FKM	cable giand brass flicker plated - other	ers on request
Seals	options: EPDM		others on request
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %		others on request
Media wetted parts	pressure port, seals, diaphra	agm	
Explosion protection (only for 4		~ <del>_</del>	
Approval DX19-LMK 331 only for	IBExU 10 ATEX 1068 X /	IECE IRE 12 0027Y	
stainless steel pressure port	zone 0: II 1G Ex ia IIC		
otalillede eteci presedre port	zone 20: II 1D Ex ia III		
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 60	60 mW, $C_i \approx 0$ nF, $L_i \approx 0$ $\mu$ H, e an inner capacity of max. 27 nF to	the housing
Permissible temperatures for		60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 ba	
environment	in Zone 1 or higher: -25		
Connecting cables		line/shield also signal line / signal line	e: 160 pF/m
(by factory)		line /shield also signal line / signal lin	
Miscellaneous		· ·	
	according to IEC 61508 / IE	C 61511	
Option SIL 2 application			ΙΔ
	signal output current: ma	ax. 25 mA signal output vo	ltage: max. 7 mA
Option SIL 2 application Current consumption Weight	signal output current: ma	ax. 25 mA signal output vo	itage: max. / mA
Current consumption Weight	1	ax. 25 mA signal output vo	itage: max. / ma
Current consumption Weight Installation position	approx. 150 g	Ţ,	itage: max. / mA
	approx. 150 g	3	itage: max. / mA



This document contains product specifications; properties are not guaranteed. Subject to change without notice.

### Ordering code

LMK 331	ш-ш	]-
Pressure		
gauge in bar	4 6 0	
gauge in mH <sub>2</sub> O	4 6 1	
Input [mH <sub>2</sub> O] [bar]		
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 2 5 0 2	
250 25	2 5 0 2	
400 40 1	4 0 0 2	
600 60 <sup>1</sup>	6 0 0 2	
customer	4 0 0 2 6 0 0 2 9 9 9 9	consult
Analogue output		
4 20 mA / 2-wire	1	
0 20 mA / 3-wire	2	
0 10 V / 3-wire	3	
Intrinsic safety 4 20 mA / 2-wire <sup>2</sup>	E	
SIL2 4 20 mA / 2-wire	1S	
SIL2 with Intrinsic safety <sup>2</sup>	ES	
4 20 mA / 2-wire		
customer	9	consult
Accuracy		
0.5 %	5	
customer	9	consult
Electrical connection		
Male and female plug ISO 4400	1 0 0 2 0 0	
Male plug Binder series 723 (5-pin)	2 0 0	
Cable outlet with PVC cable <sup>3</sup>	T A 0	
Cable outlet <sup>4</sup>	T R 0	
Male plug M12x1 (4-pin) / metal	M 1 0	
compact field housing	8 5 0	
stainless steel 1.4305		
customer	9 9 9	consult
Mechanical connection		
G3/4" DIN 3852 with	κ ο ο	
flush sensor		
customer	9 9 9	consult
Seals		
FKM		1
EPDM		3
customer		9 consult
Pressure port		
Stainless steel 1.4404 (316L)		1
for $P_N \le 25$ bar PVDF <sup>5</sup>		В
customer		9 consult
Diaphragm		
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%		2
customer		9 consult
Special version		
standard		0 0 0
customer		9 9 9 consult

 <sup>1</sup> only possible for pressure port of stainless steel
 2 Ex-protection not possible with plastic pressure port
 3 standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)
 4 cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable
 5 min. permissible temperature -30 °C



#### **Screw-in Transmitter**

Ceramic Sensor

accuracy according to IEC 60770: standard: 0.35% FSO option: 0.25% FSO

#### **Nominal pressure**

from 0 ... 40 mbar up to 0 ... 20 bar

#### **Output signal**

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

#### **Product characteristics**

- pressure port PVDF-version for aggressive media
- pressure port G 1 ½" for pasty and polluted media

#### **Optional versions**

- ► IS-version
  Ex ia = intrinsically safe for gases and dust
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- customer specific versions

The screw-in transmitter LMK 351 has been designed for measuring small system pressure and level measurement in container. The LMK 351 is based on an own-developed capacitive ceramic sensor element. Usage in viscous and pasty media is possible because of the flush mounted sensor.

For the usage in aggressive media a pressure port in PVDF and the diaphragm in  $Al_2O_3$  99.9 % is available. An intrinsically safe version complete the range of possibilities.

#### Preferred areas of use are



Plant and Machine Engineering



Environmental Engineering (water – sewage – recycling)

#### Preferred used for



Fuel and Oil



Viscous and Pasty Media

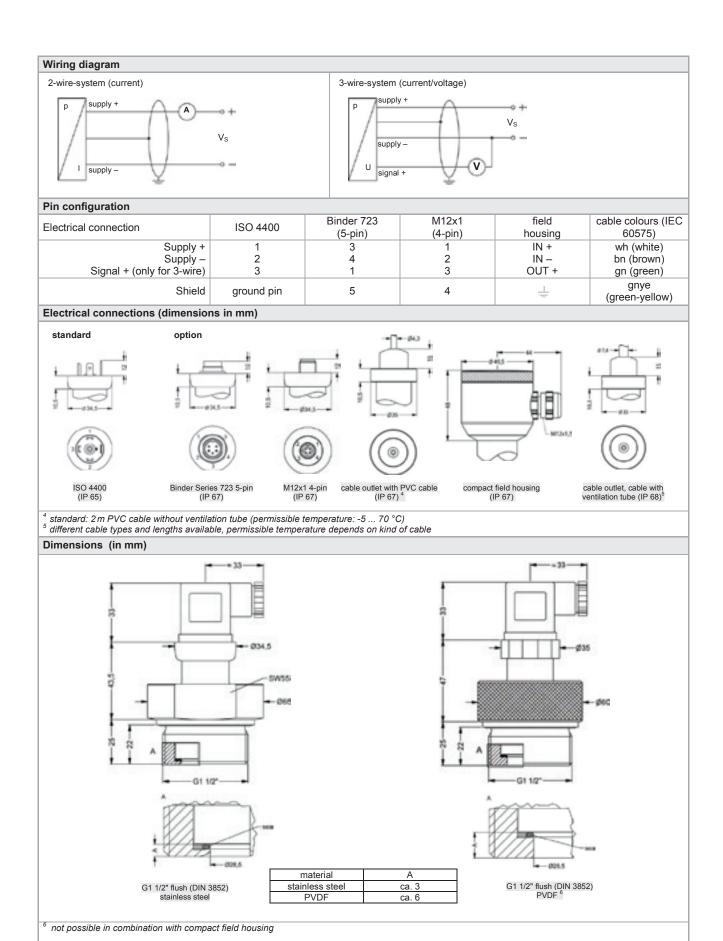






Pressure ranges																
Nominal pressure	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Low pressure	[bar]	-0	.2	-0	).3		-0	.5					-1			

Output signal / Supply		
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9 32 V <sub>DC</sub>	
Option Ex-version	2-wire: 4 20 mA / V <sub>S</sub> = 14 28 V <sub>DC</sub>	
Option 3-wire	3-wire: $0 \dots 10 \text{ V} / \text{V}_S = 12.5 \dots 32 \text{ V}_{DC}$	
Performance	3-WIIC. 0 10 V 7 Vg = 12.3 32 VDC	
Accuracy <sup>1</sup>	standard: $\leq \pm 0.35 \%$ FSO option for $P_N \geq 0.6$ bar: $\leq \pm 0.25 \%$ FSO	
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S min}) / 0.02 \text{ A}] \Omega$ voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$	2
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 measuring time	5/sec	
Response time		max. response time: 380 msec
	imit point adjustment (non-linearity, hysterisis, repeatability)	max. response time. oco moco
	an) / -Permissible temperatures	
	· · · · · · · · · · · · · · · · · · ·	00 00 00
Tolerance band	≤ ±0.1 % FSO / 10 K in compensated ran	ige - 20 80 °C
Permissible temperatures <sup>2</sup>	medium: -40 125 °C electronics / environ	ment:-40 85 °C storage: -40 100 °C
·	num permissible temperature is -30 °C	
Electrical protection		
Short-circuit protection	permanent	
Reverse polarity protection	no damage, but also no function	
Electromagnetic compatibility	emission and immunity according to EN 61326	
Mechanical stability		
Vibration	10 g RMS (20 2000 Hz)	according to DIN EN 60068-2-6
Shock		according to DIN EN 60068-2-27
	100 g / Tillsec	according to DIN LN 00000-2-27
Materials (media wetted)		
Pressure port		option: PVDF
Housing	, ,	option: PVDF
Seals	FKM -40 125 °C FFKM -15 125 °C EPDM -40 125 °C	
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 96 % options: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %	
Media wetted parts	pressure port, seals, diaphragm	
IS-protection (only for 4 20 r	mA / 2-wire)	
Approval DX14-LMK 351	IBExU05ATEX1070 X	
	stainless steel-pressure port with male (connector): Zone 0: II 1G Ex ia IIC T4 Ga Zone 20: II 1D Ex ia IIIC T85 °C Da plastic-pressure port with male (connector): Zone 0/1 <sup>3</sup> : II 1/2G Ex ia IIC T4 Ga/Gb Zone 20/21 <sup>4</sup> : II 1/2D Ex ia IIIC T85 °C Da/Db	
Safety technical maximum values	$U_i$ = 28 V, $I_i$ = 93 mA, $P_i$ = 660 mW, $C_i$ = 27 nF , $L_i$ =	<u> </u>
Max. permissible temperature for environment	in zone 0: -20 60 °C for p <sub>atm</sub> 0.8 bar u zone 1 and higher: -25 70 °C	p to 1.1 bar
Connecting cables	capacity: signal line / shield also signal line / signal	gnal line: 160 pF/m
(by factory)	inductance: signal line / shield also signal line / sig	
3 The designation depends on the use	ed pressure range. With nominal pressure ranges $\leq$ 60 mbar the mbar and $\leq$ 10 bar (see item 17 of the type-examination certific	e designation is "2G". ate) must be attended!
Miscellaneous		
Current consumption	signal output current: max. 21 mA s	ignal output voltage: max. 5 mA
Weight	approx. 200 g	ignal output voltage. Illax. 3 IIIA
Installation position	any	
Operational life	> 100 x 10 <sup>6</sup> loading cycles	
CE-conformity	EMV-directive: 2004/108/EC	
ATEX Directive	94/9/EC	
ATEX DIRECTIVE	37/3/LU	



### Ordering code

LMK 351		- 🗆 - 🔲	
Pressure			
in bar	4 7 0		
in mH₂O	4 7 0 4 7 1		
Input [mH <sub>2</sub> O] [bar]			
0.4 0.04	0 4 0 0		
0.6 0.06 1.0 0.10	0 6 0 0 1 0 0 0		
1.0 0.10 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 60 6.0	4 0 0 1 6 0 0 1		
60 6.0 100 10	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		
160 16	1 0 0 2 1 6 0 2 2 0 0 2		
200 20	2 0 0 2		
customer	9 9 9 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
Accuracy standard 0.35 %	3		
option for $P_N \ge 0.6$ bar: 0.25 %	2		
customer	9		consult
Electrical connection			
Male and female plug ISO 4400	1 0 0		
Male plug Binder series 723 (5-pin)	2 0 0		
Cable outlet with PVC- cable 1	T A 0		
Cable outlet <sup>2</sup>	T R 0		
Male plug M12x1 (4-pin) / metal	M 1 0		
compact field housing	8 5 0 9 9 9		
customer	9 9 9		consult
Mechanical connection G1 1/2" DIN 3852 with			
flush sensor	M 0 0		
customer	9 9 9		consult
Seals			
FKM	1		
EPDM	3 7		
FFKM customer	7 9		consult
Pressure port	9		consult
Stainless steel 1.4404 (316L)	1		
PVDF <sup>3</sup>	В		
customer	B 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%		С	
customer Special version		9	consult
Special version standard		0 0 0	
customer		0 0 0 9 9	consult
22.50		-1-1-1	

 $<sup>^{\</sup>rm 1}$  standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70  $^{\rm o}\text{C})$ 

<sup>&</sup>lt;sup>2</sup> cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

 $<sup>^3</sup>$  not possible in combination witn compact field housing; min. permissible temperature -30  $^\circ$ C



## **EP 500**

### **Pressure Transmitter**

Special application: level measurement via air bubbling

#### Characteristics:

- capacitive ceramic sensor
- nominal pressure range from 0 ... 60 mbar up to 0 ... 20 bar
- output signal 4 ... 20 mA / 2-wire
- hat rail housing
- programming via integrated interface









Input pressure range								
Nominal pressure P <sub>N</sub> gauge [bar]	0.06	0.16	0.4	1	2	5	10	20
Nominal pressure P <sub>N</sub> abs. [bar]				on re	quest			
Permissible overpresure [bar]	2	4	6	8	15	25	35	40
Permissible vacuum for P <sub>N</sub> gauge [bar]	-0.2	-0.3	-C	.5		-	1	

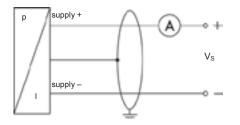
Output signal / Supply		
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9 32 V <sub>DC</sub> ; V <sub>S Nom.</sub> = 24 V	DC
Current consumption	max. 21 mA	
Performance		
Accuracy 1	IEC 60770 <sup>2</sup> : ≤ ± 0.2 % FSO	BFSL: ≤ ± 0.1 % FSO
Turn-on time	700 msec	
Permissible load	$R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02 \text{ A}] \Omega$	
Long term stability	≤ ± 0.1 % FSO / year at reference conditions	
Response time (10 90 %)	120 msec – without consideration of electronic damp	ping
Measuring rate	8/sec	
for nominal pressure ranges ≤0.4 ba	r the accuracy is calculated as follows: ≤ ± [0.2 + 0.04 x(nomi	nal pressure range / adjusted range)] % FSO
<sup>2</sup> accuracy according to IEC 60770 –	limit point adjustment (non-linearity, hysteresis, repeatability)	
Thermal errors (Offset and Spa	n)/ Permissible temperatures	
Thermal error	≤ ± (0.02 x nominal range / adjusted range) % FSO	/ 10 K
	in compensated range 0 80°C	
Permissible temperatures	medium: -40 125°C electronics / environment /	storage: -40 85°C

### Technical Data

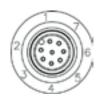
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no fur	nction	
Electrical connection			
Input	terminal clamps (3-pin)		
Communication connector	M12x1 (8-pin), metal		
Materials			
Pressure port	standard: stainless stee on request: brass	l 1.4301	
Housing	version EP 500: varsion EP 500 - 500:	PA6 (housing foot: PA66) ABS	
Seals (media wetted)	FKM		
Diaphragm	ceramic Al <sub>2</sub> O <sub>3</sub> 96 %		
Media wetted parts	pressure port, seals of sens	sor, diaphragm	
Category of the environment	·		
Lloyd's Register (LR)	EMV1, EMV2, EMV3	number	of certificate: 13/20056
Germanischer Lloyd (GL)	C, EMC1	number	of certificate: 86 482 - 09 HH
Miscellaneous			
Ingress protection	IP 00		
Function display	green SMD-LED - lights by	information flow through the tran	smitter
Installation position	any		
Operational life	> 100 x 10 <sup>6</sup> pressure cycles	5	
Weight	approx. 200 g		
Adjustability	- electronic damping: 0 offset: 0 67 % FSO - turn down of span: ma - configuration of pressulum - calibration via connected.	x. 1:20 re unit ed pressure reference	
	I separately (software appropriate fo	r Windows <sup>®</sup> 95, 98, 2000, NT Version	4.0 or higher, and XP)
Pin configuration			
Floridad compositions		As weed as a language of	M404 (0

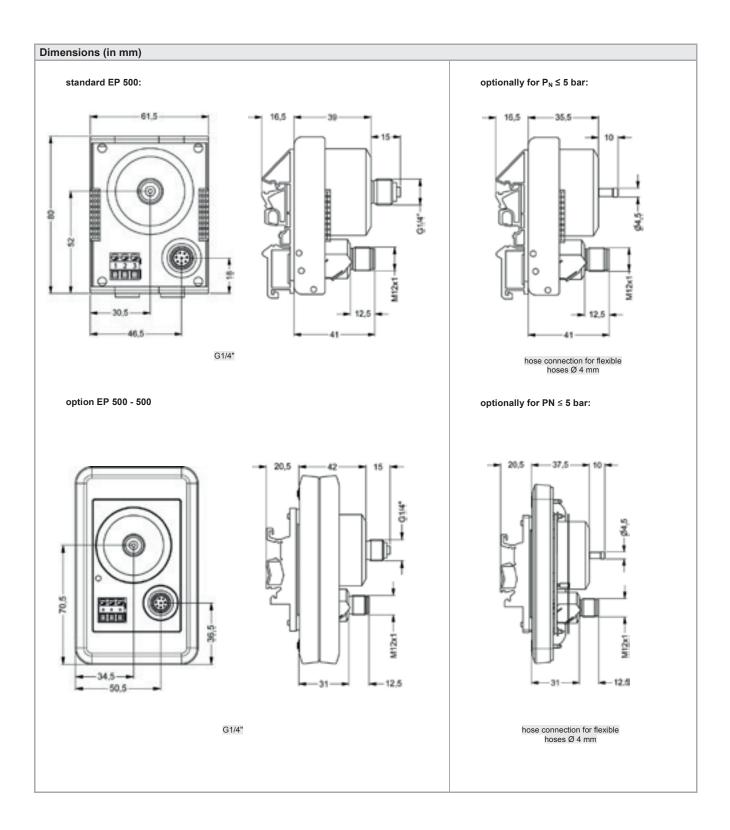
terminal clamps	M12x1 (8-polig), metal
1	-
-	4
2	2
-	5
-	6
-	7
-	1
3	3
	terminal clamps  1 - 2 3

#### Wiring diagram









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# 104 EP 500 Ordering code

EP 500	<u> </u>	]-[]-		- 🗌 - 🔲 -		
Ducacing						
Pressure gauge	UP 5					
absolute	U P 5 U P 6					consult
Input [bar]						
0.06	0 6 0 0	0				
0.16	1 6 0 0	0				
0.4	4 0 0 0	0				
1.0	1 0 0	1				
2.0	2 0 0	1				
5.0 10	2 0 0 7 5 0 0 7 1 0 0 2	1				
20	1 0 0 2	2				
customer	5 0 0 1 1 0 0 2 2 0 0 2 9 9 9 9	9				consult
Output	٥١٥١٥١					CONSUIT
4 20 mA / 2-wire		1				
customer		9				consult
Accuracy						
0.2 %		В				
customer		9				consult
Mechanical connection						
hose connection Ø 4.5 mm <sup>1</sup>			Y 0 2			
G1/4" EN 837 customer			4 0 0 9 9 9			
Seal			9 9 9	_		consult
FKM			1			
customer			9			consult
Pressure port			-			Conodic
stainless steel 1.4301 (304)				2		
brass				M		consult
customer				9		consult
Diaphragm						
ceramics Al <sub>2</sub> O <sub>3</sub> 96%				2		
customer				9		consult
Special version standard					0 0 0	
option					0 0 0 5 0 0	consult
customer					9 9 9	consult
Customer					0 0 0	Consult

<sup>1</sup> hose connection only up to 5 bar



## KL 1

### **Terminal Box**

#### **Aluminium**

#### **Product characteristics**

- aluminium die cast case
- for connecting 2-wire submersible transmitters
- integrated pressure balance item
- 2 signal lines

#### **Optional versions**

- overvoltage protection with nominal discharge current of 10 kA
- Pt 100 temperature sensor for submersible pressure transmitters with built in Pt 100 sensor

The terminal box KL 1 is intended for the professional electrical connection of 2-wire transmitters.

It offers integrated atmospheric pressure compensation. Optionally with overvoltage protection and Pt 100 temperatur sensor for BD|SENSORS devices.

The terminal box KL 1 is equipped with a pressure balance item for equalization of atmospheric reference, therefore a cable without ventilation tube can be used on the supply side.

Vertical terminal clamps enable easy connection of cables inside. The terminal box has to be mounted with two fastening screws.

CE

### Technical Data

General specifications	
Number of signal lines	2-wire (4 20 mA)
Housing	aluminium die cast case, grey powder-coating
ngress protection	IP 66
Cable entries	cable gland M16x1.5 Polyamide, seals NBR, IP 68,
	diameter range: standard 5 10 mm
	others on request
Atmospheric pressure	
compensation	pressure balance item with PTFE filter
Ferminal clamps	vertical clamps for stranded and solid wires up to 2.5 mm <sup>2</sup>
Weight	approx. 550 g
Optional overvoltage protection	
Series resistance	10 $\Omega$ for each wire
Nominal discharge current	10 kA (8/20 μs)
Max. rated current	30 mA
Optional Pt 100 temperature ser	nsor 1
	standard: 0 70 °C
emperature range	option: T <sub>min</sub> T <sub>max</sub> can be in range from -40 °C up to 400 °C
Connection towners ture conser	3-wire
Connection temperature sensor	
Output signal / Supply	
Accuracy	< 0.15 %
inearity	< 0.1 %
Thermal effects	< 0.01 % / K
only necessary if the transmitter is equ Viring diagram	uipped with a Pt 100 temperature sensor
R supply + supply -	* The supply V <sub>S</sub> has to be chosen according to needs of the used transmitter.
Dimensions (in mm)	
Pt 100 transmitter (equipped only with Pt 100 version)	equipped only with Pt 100 version  mounting hole  depth of housing: 58 mm
1	

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KL 1 - ZB.601	-[			-[		I			
Version							i		
standard	1	0	0				T		
over voltage protection	1	0	1						
thermo element Pt 100	1	Т	0						
thermo element Pt 100 and over voltage protection 1	1	Т	1						
Special version									
standard				0	0 9	(	)		
customer				9	9	9	9		

<sup>&</sup>lt;sup>1</sup> only necessary if the submersible transmitter is equipped with a Pt 100 temperature sensor



## KL<sub>2</sub>

#### **Terminal Box**

**Plastics** 

#### **Product characteristics**

- ▶ cost-efficient ABS case
- for connecting 2-wire submersible transmitters
- ▶ integrated pressure balance item
- 2 signal lines

#### **Optional versions**

- Version for two independent2 wire circuits
- overvoltage protection
- ► HART® connection

The terminal box KL 2 is intended for the professional electrical connection of submersible level transmitters. Thus, it is a cost-effective alternative to our well proven aluminium terminal box KL 1.

A pressure balance item is responsible for the compensation of atmospheric pressure variations. On the supply side a cable without ventilation tube can be used.

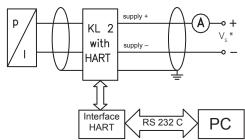
Vertical terminal clamps enable easy connection of cables inside the case.

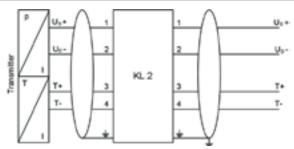
The KL 2 with optional overvoltage protection is additionally equipped with surge arresters with a nominal discharge current of 10 kA.

As a further option the KL 2 is available with a  $\mathsf{HART}^{@}$  connection.



General specifications	
Number of signal lines	2-wire (4 20 mA)
Housing material	plastic ABS, grey
Ingress protection	IP 66
Cable entries	cable gland M16x1.5 Polyamide, seals NBR, IP 68, diameter range: standard 5 10 mm
	others on request
Atmospheric pressure compensation	pressure balance item with PTFE filter
Terminal clamps	vertical clamps for stranded and solid wires up to 2.5 mm <sup>2</sup>
Weight	approx. 220 g
Optional overvoltage protection	n
Series resistance	10 $\Omega$ for each wire
Nominal discharge current	10 kA (8/20 μs)
Max. rated current	30 mA
Optional HART® connection	
Connections	terminal clamp connection
Wiring diagram	
supply +	





Version with 2 channels, eg. LMK 307T, LMP 307T

 $^{\star}~$  The supply V  $_{\rm S}$  has to be chosen according to needs of the used transmitter. The ground wires of all components have to be connected!

### Dimensions (in mm) standard version with 2 channels 123 equipped only with HART®version Mounting hole Ø 4.2 Cable gland Pressure Cable gland Pressure M16x1.5 balance item M16x1.5 balance item depth of housing: Version for two independent 2 wire circuits and over voltage protection, eg. for LMK 307T, LMP 307T 55 mm HART® is a registered trade mark of HART Communication Foundation

This document contains product specifications; properties are not guaranteed. Subject to change without notice.

KL 2 - ZB.601	- [			].	-[		
Version							
standard		2 0	0	)			
over voltage protection		2 0	1				
version with 2 channels <sup>1</sup>		2 2	0	)			
version with 2 channels and over voltage protection 1		2 2	1				
HART® communication interface		2 H	0	)			
HART <sup>®</sup> communication interface and over voltage protection		2 H	1				
Special version							
standard					0	0	0
customer					9	9	9

<sup>&</sup>lt;sup>1</sup> Version for 2 independent 2 wire circuits

HART® is a registered trade mark of HART Communication Foundation

Mounting flange	with cable gland		
Technical data			cable gland M16x1.5 with
Suitable for	all probes		seal insert (for cable-Ø 4 11 mm)
Flange material	stainless steel 1.4404 (316L)		
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305; plastic		nx8d
Seal insert	material: TPE (ingress protection IP 68)		
Hole pattern	according to DIN 2507		L
Version	Size (in mm)	Weight	@k
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d= 14	1.4 kg	
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d= 18	3.2 kg	
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d= 18	4.8 kg	
Ordering type		Ordering code	
DN25 / PN40 with cable	e gland brass, nickel plated	ZMF2540	
DN50 / PN40 with cable	e gland brass, nickel plated	ZMF5040	
DN80 / PN16 with cable	e gland brass, nickel plated	ZMF8016	

Terminal clamp				
Technical Data			175	
Suitable for	all probes with cable $\varnothing$ 5.5 10.5 mm		A10	
Material	standard: steel, zinc plated optionally: stainless steel 1.4301			
Weight	approx. 160 g			
Ordering type		Ordering code		
Terminal clamp, steel, zinc plated		Z100528		
Terminal clamp, stainl	ess steel 1.4301	Z100527		

probe flange		
Technical data		
Suitable for	LMK 382, LMK 382H, LMK 458, LMK 45	8H
Flange material	stainless steel 1.4404 (316L)	
Hole pattern	according to DIN 2507	
Version	Size (in mm)	Weight
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d= 14	1.2 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d= 18	2.6 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d= 18	4.1 kg
Ordering type		Ordering code
Transmitter flange DN	25 / PN40	ZSF2540
Transmitter flange DN	50 / PN40	ZSF5040
Transmitter flange DN	80 / PN16	ZSF8016

	Description	Display	Input
PA 430	Plug-on Display self powered with Contacts and Ex-approval	4-digit LED-display 4 x 7 mm, rotatable	4 20 mA, 0 10 V
PA 440	Field Display with Contacts and Ex-approval	4-digit LED-display 4 x 10 mm 4-digit LCD-display 4 x 18 mm	4 20 mA
PA 450	Field Display for Difference Formation	4-digit LED-display 4 x 10 mm	2 inputs: 4 20 mA
CIT 200	Process Display	4-digit LED-display 4 x 13 mm	0/4 20 mA, 0/1 5 V, 0/2 10 V, PT100 / PT500 / PT1000
CIT 250	Process Display with Contacts	4-digit LED-display 4 x 13 mm	0/4 20 mA, 0/1 5 V, 0/2 10 V, PT100 / PT500 / PT1000
CIT 300	Process Display with Contacts and Analogue Output	4-digit LED-display 4 x 20 mm	0/4 20 mA, 0/1 5 V, 0/2 10 V, PT100 / PT500 / PT1000
CIT 350	Process Display with Bargraph, Contacts and Analogue Output	4-digit LED-display 4 x 9 mm + 20-segment-Bargraph	0/4 20 mA, 0/1 5 V, 0/2 10 V
CIT 400	Process Display with Contacts, Analogue Output and Ex-approval	4-digit LED-display 4 x 10 mm	4 20 mA
CIT 600	Multichannel Process Display (LCD)	graphic LC-display 128 x 64 pixel	2 / 4 / 8 inputs: 0/4 20 mA, PT100 / PT500 / PT1000
CIT 650	Multichannel Process Display (LCD) with Datalogger	graphic LC-display 128 x 64 pixel	1 / 4 / 8 inputs: 0/4 20 mA, PT100 / PT500 / PT1000
CIT 700	Mulitchannel Process Display (TFT) with Contacts, Analogue Outputs and Datalogger	graphic 3,5" TFT- monitor, touchscreen	max. 48 inputs: 0 20 mA, 0 10 V max. 12 inputs: PT 100 / PT 500 / PT 1000 (Ω) max. 24 inputs: thermocouple (mV)
CIT 750	Mulitchannel Process Display (TFT) with Contacts, Analogue Outputs and Datalogger	graphic 5,7" TFT- monitor, touchscreen	max. 72 inputs: 0 20 mA, 0 10 V max. 18 inputs: PT 100 / PT 500 / PT 1000 (Ω) max. 36 inputs: thermocouple (mV)

Output	Housing Dimensions (B x H x T) in mm	Interface	
0 / 1 / 2 PNP-outputs 4 20 mA, 0 10 V	plastic, rotatable 47 x 47 x 68	-	
0 / 1 / 2 PNP- outputs 4 20 mA	plastic 120 x 80 x 57 aluminium 125 x 80 x 57	-	12.86
0 / 1 / 2 PNP- outputs 4 20 mA	plastic 120 x 80 x 57	-	3300
	front panel 72 x 36 x77 (95)	RS 485 Modbus RTU	1648
0 / 1 / 2 relay- outputs	front panel 72 x 36 x 77	RS 485 Modbus RTU	1648
0 / 2 / 4 relay- outputs 0/4 20 mA	front panel 96 x 48 x 98	RS 485 Modbus RTU	1648
0 / 2 / 4 relay- outputs 0/4 20 mA	front panel 48 x 96 x 98	RS 485 Modbus RTU	
2 / 4 relay- outputs 0/4 20 mA	front panel 72 x 72 x 110 hat rail 70 x 75 x 110	-	
2 OC- outputs	front panel 96 x 96 x 100	RS 485 Modbus RTU	88.9
2 OC- outputs	front panel 96 x 96 x 100	RS 485 Modbus RTU USB-Host Port	889
max. 16 relay- outputs, max. 24 SSR-ouputs, max. 8 outputs 4 20 mA	front panel 96 x 96 x 100	RS 485 Modbus RTU, RS 232, Ethernet (Modbus TCP, Java Applets) USB Host Port	
max. 36 relay- outputs, max. 72 SSR-outputs, max. 24 outputs 4 20 mA	front panel 144 x 144 x 100	RS 485 Modbus RTU, RS 232, Ethernet (Modbus TCP, Java Applets) USB Host Port	-

#### **COMPETENCE**

## Industrial pressure measurement technology from 0.1 mbar up to 6000 bar

#### → pressure transmitters, electronic pressure switches or hydrostatic level probes

- → OEM or high-end products
- → standard products or customized solutions

BDISENSORS has the right pressure measuring device at the right price.

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pressure measurement at the highest level

The concentration on electronic pressure transmitter has led to extraordinary efficiency and economical pricing.

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## projectable delivery times and strict observance of deadlines

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hydraulics



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calibration techniques



laboratory techniques



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aggressive media



colours



gases



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pasty and viscous media



oxygen



water



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