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LMP 307

Stainless Steel Probe

Stainless Steel Sensor

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

Nominal pressure

from 0 ... 1 mH_2O up to 0 ... 250 mH_2O

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
- high accuracy
- good long term stability

Optional versions

- IS-version
  Ex ia = intrinsically safe for gas and dust
- SIL 2 (Safety Integrity Level)
- drinking water certificate
  according to DVGW and KTW
- different kinds of cables
  and elastomers

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

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

Preferred areas of use are

Water / filtrated sewage
drinking water systems
ground water level measurement
rain spillway basins
pump and booster stations
level measurement in containers
water treatment plants
water recycling

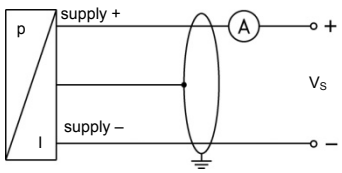
Fuel and oil
fuel storage
tank farms

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_2O]	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

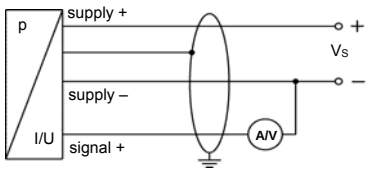
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 8 ... 32 V_{DC}	SIL-version: V_S = 14 … 28 V_{DC}
Option IS-version	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}	SIL-version: V_S = 14 … 28 V_{DC}
Options 3-wire	3-wire: 0 ... 20 mA / V_S = 14 ... 30 V_{DC}	0 ... 10 V / V_S = 14 ... 30 V_{DC}
Performance		
Accuracy [1]	standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 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: $R_{max} = [(V_S - V_{S\ min}) / 0.02\ A]\ \Omega$ current 3-wire: R_{max} = 500 Ω	voltage 3-wire: R_{min} = 10 kΩ
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
[1] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)		
Thermal effects (Offset and Span)		
Nominal pressure P_N [bar]	< 0.40	≥ 0.40
Tolerance band [% FSO]	≤ ± 1	≤ ± 0.75
in compensated range [°C]	0 ... 70	
Permissible temperatures		
Permissible temperatures	medium: -10 ... 70 °C	storage: -25 ... 70 °C
Electrical protection [2]		
Short-circuit protection	permanent	
Reverse polarity protection	no damage, but also no function	
Electromagnetic compatibility	emission and immunity according to EN 61326	
[2] additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request		
Electrical connection		
Cable with sheath material [3]	PVC (-5 … 70 °C) grey Ø 7.4 mm PUR (-10 … 70 °C) black Ø 7.4 mm FEP [4] (-10 … 70 °C) black Ø 7.4 mm TPE-U (-10 … 70 °C) blue Ø 7.4 mm	(without / with drinking water certificate)
Bending radius	static installation: 10-fold cable diameter	dynamic application: 20-fold cable diameter
[3] shielded cable with integrated ventilation tube for atmospheric pressure reference *[4] do not use freely suspended probes 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 (without / with drinking water certificate)	others on request
Diaphragm	stainless steel 1.4435 (316L)	
Protection cap	POM-C	
Cable sheath	PVC, PUR, FEP, TPE-U	
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approvals DX19-LMP 307	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 ≈ 0 nF, L_i ≈ 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_{atm} 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: 1 µH/m	
Miscellaneous		
Option SIL 2 version [5]	according to IEC 61508 / IEC 61511	
Drinking water certificate [6]	according to DVGW W 270 and UBA KTW (with order the indication "with drinking water certificate" is necessary)	
Current consumption	signal output current: max. 25 mA	signal output voltage: max. 7 mA
Weight	approx. 200 g (without cable)	
Ingress protection	IP 68	
CE-conformity	EMC Directive: 2014/30/EU	
ATEX Directive	2014/34/EU	
[5] not in combination with the accuracy 0.1 %, only for 4...20 mA / 2-wire *[6] only possible with EPDM seal in combination with TPE-U cable; not possible with IS-version (explosion protection)*		

Wiring diagrams

2-wire-system (current)



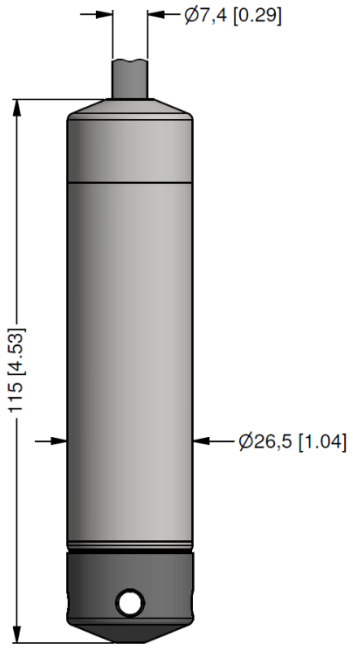
3-wire-system (current / voltage)

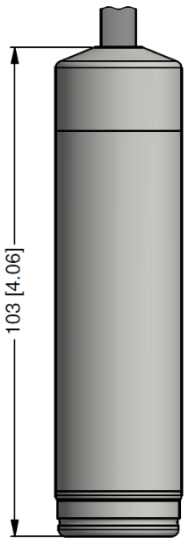


Pin configuration

Electrical connection	cable colours (IEC 60757)
Supply +	WH (white)
Supply –	BN (brown)
Signal + (only 3-wire)	GN (green)
Shield	GNYE (green-yellow)

Dimensions (mm / in)

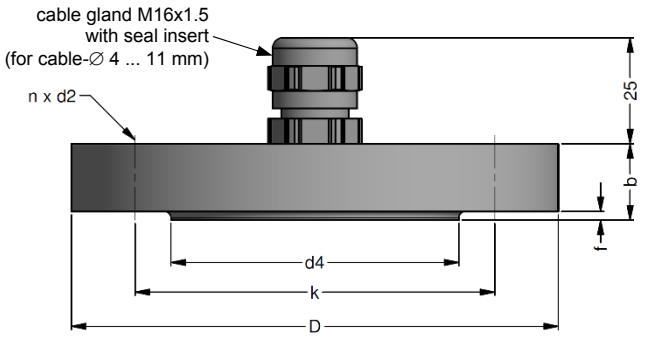




protection cap removable

⇨ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 35 mm!

Mounting flange with cable gland



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

Technical data		
Suitable for	all probes	
Flange material	stainless steel 1.4404 (316L)	
Material of cable gland	standard: brass, nickel plated	on request: stainless steel 1.4305 (303); plastic
Seal insert	material: TPE (ingress protection IP 68)	
Hole pattern	according to DIN 2507	

Ordering type	**Ordering code**	**Weight**
DN25 / PN40 with cable gland brass, nickel plated	ZMF2540	1.4 kg
DN50 / PN40 with cable gland brass, nickel plated	ZMF5040	3.2 kg
DN80 / PN16 with cable gland brass, nickel plated	ZMF8016	4.8 kg

Terminal clamp

Technical data		
Suitable for	all probes with cable ∅ 5.5 ... 10.5 mm	
Material of housing	standard: steel, zinc plated	optionally: stainless steel 1.4301 (304)
Material of clamping jaws and positioning clips	PA (fibre-glass reinforced)	
Dimensions (mm)	174 x 45 x 32	
Hook diameter	20 mm	

Ordering type	**Ordering code**	**Weight**
Terminal clamp, steel, zinc plated	Z100528	approx. 160 g
Terminal clamp, stainless steel 1.4301 (304)	Z100527	

Display program

CIT 200 Process display with LED display

CIT 250 Process display with LED display and contacts

CIT 300 Process display with LED display, contacts and analogue output

CIT 350 Process display with LED display, bargraph, contacts and analogue output

CIT 400 Process display with LED display, contacts, analogue output and Ex-approval

CIT 600 Multichannel process display with graphics-capable LC display

CIT 650 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

Ordering code LMP 307

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Pressure			
in bar		4 5 0	
in mH_2O		4 5 1	
Input	**[mH_2O]** / **[bar]**		
	1.0 / 0.10	1 0 0 0	
	1.6 / 0.16	1 6 0 0	
	2.5 / 0.25	2 5 0 0	
	4.0 / 0.40	4 0 0 0	
	6.0 / 0.60	6 0 0 0	
	10 / 1.0	1 0 0 1	
	16 / 1.6	1 6 0 1	
	25 / 2.5	2 5 0 1	
	40 / 4.0	4 0 0 1	
	60 / 6.0	6 0 0 1	
	100 / 10	1 0 0 2	
	160 / 16	1 6 0 2	
	250 / 25	2 5 0 2	
	customer	9 9 9 9	consult
Housing			
	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	
	0 … 20 mA / 3-wire	2	
	0 … 10 V / 3-wire	3	
	intrinsic safety 4 … 20 mA / 2-wire	E	
	SIL2 4 … 20 mA / 2-wire	1S	
	SIL 2 with Intrinsic safety 4 … 20 mA / 2-wire	ES	
	customer	9	consult
Seals			
	FKM	1	
	EPDM	3	
DVGW/KTW:	EPDM [1]	3T	
	customer	9	consult
Accuracy			
standard for $P_N \geq 0.4$ bar	0.35 % FSO	3	
standard for $P_N < 0.4$ bar	0.5 % FSO	5	
option 1 for $P_N \geq 0.4$ bar	0.25 % FSO	2	
option 2	0.1 % FSO [2]	1	
	customer	9	consult
Electrical connection			
	PVC-cable (grey, Ø 7.4 mm) [3]	1	
	PUR-cable (black, Ø 7.4 mm) [3]	2	
	FEP-cable (black, Ø 7.4 mm) [3]	3	
	TPE-U-cable (blue, Ø 7.4 mm) [3]	4	
DVGW/KTW:	TPE-U-cable (blue, Ø 7.4 mm) [1,3]	F	
	customer	9	consult
Cable length			
	in m		
standard: 3 m	PVC	0 0 3	
standard: 5 m	PVC	0 0 5	
standard: 10 m	PVC	0 1 0	
standard: 15 m	PVC	0 1 5	
standard: 20 m	PVC	0 2 0	
special length	**PVC**	**9 9 9**	
standard: 3 m	PUR	0 0 3	
standard: 5 m	PUR	0 0 5	
standard: 10 m	PUR	0 1 0	
standard: 15 m	PUR	0 1 5	
standard: 20 m	PUR	0 2 0	
special length	**PUR**	**9 9 9**	
standard: 5 m	FEP	0 0 5	
standard: 10 m	FEP	0 1 0	
special length	**FEP**	**9 9 9**	
special length	**TPE-U**	**9 9 9**	
Special version			
	standard	0 0 0	
	customer	9 9 9	consult

[1] drinking water certification only possible with EPDM seal (code 3T) in combination with TPE-U cable (code F); not possible with IS version (explosion protection)
[2] not in combination with SIL
[3] shielded cable with integrated ventilation tube for atmospheric pressure reference

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

11.03.2019