

# **LMP 308**i

Separable Precision Stainless Steel Probe with Stainless Steel Sensor

▶ diameter: 35 mm

- transmitter head and cable assembly plugged
- nominal pressure ranges from 0...1.7 mWC up to 0...170 mWC (0...170 mbar up to 0...17 bar)

The precision stainless steel submersible transmitter LMP 308i is suited for continuous level measurement of fluids compatible with stainless steel.

The LMP 308i based on a piezoresistive stainless steel sensor and features a high accuracy (0.05 % FSO BFSL) and a small thermal effect. The signal processing of the sensor signal is done via a digital amplifier with 16-bit A/D and D/A conversion. Now it's possible to compensate actively the sensor specific deviations like nonlinearity and thermal effects. 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.

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

Preferred areas of use are:

- environmental engineering: water supply, sewage treatment
- depth or level measurement in wells and open waters
- ground water level measurement
- level monitoring in open tanks

- output signal
   4 ... 20 mA / 2-wire or
   0 ... 10 V / 3-wire
   with communication
   interface for adjusting of
   offset, span, and damping
- accuracy0.05 % FSO BFSL(0.1 % FSO IEC 60770)
- thermal error for offset and span in temperature range -20 ... 80 °C: 0.2 % FSO, average TC 0.02 % FSO / 10 K
- good long term stability
- option Ex version (only for 4 ... 20 mA / 2-wire) TÜV 03 ATEX 2006 X
- option cable protection with corrugated pipe



LMP 308i Smart Stainless Steel Level Transmitter



Characteristics

Input pressure range						
Nominal pressure gauge [bar]	0.17	0.35	1	2	7	17
Level [mWC]	1.7	3.5	10	20	70	170
Permissible overpressure [bar]	1	1	3	6	20	60

Output signal / Supply					
Standard	2-wire: $4 \dots 20 \text{ mA} / V_s = 12 \dots 36 V_{DC}$	Ex-protection: $V_s = 14 \dots 28 V_{DC}$			
Option	3-wire: $0 \dots 10 \text{ V} / \text{V}_s = 14 \dots 36 \text{ V}_{DC}$				

Performance			
Accuracy performance after turn-down (TD)	IEC 60770 ¹: ≤± 0.1 % FSO	BFSL: ≤± 0.05 % F	SO
- TD ≤ 1:5	no change of accuracy 2		
- TD > 1:5	for calculation use the following form $\leq \pm [0.1 + 0.015 \text{ x} \text{ (nominal range / ade.g. with a turn-down of 1:10 following } \pm (0.1 + 0.015 \text{ x 10}) \% \text{ FSO i.e. acculation}$	justed range)] % FSO ng accuracy is calculated:	ges ≤ 0,35 bar see note ²):
Permissible load	current 2-wire: $R_{max} = [(V_s - V_{s min}) / 0.00]$ voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$	02] Ω	
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / $k\Omega$		
Long term stability	≤ ± 0.1 % FSO / year		
Response time	200 ms - without consideration of th	e electronical damping	measuring rate 5/s
Adjustability	configuration of following parameter - electronical damping: 0 100 s - offset: 0 90 % FSO - turn down of span: max. 1:10	s possible (interface / softwar	e necessary ³):

Thermal errors (Offset and Span)				
Tolerance band	[% FSO]	≤ ± (0.2 x nominal range / adjusted range)		
TC, average	[% FSO / 10 K]	± (0.02 x nominal range / adjusted range)		
in compensated range		-20 70 °C		

Electrical protection <sup>4</sup>				
Short-circuit protection	permanent			
Reverse polarity protection	no damage, but also no function			
Electromagnetic compatibility	emission and immunity according to EN 61326			
Option Ex protection only with 4 20 mA / 2-wire DX13 - LMP 308i	zone 0 $^5$ : II 1 G EEx ia IIC T4 safety technical maximum values: U $_i$ = 28 V, I $_i$ = 93 mA, P $_i$ = 660 mW, C $_i$ $\leq$ 1nF, L $_i$ $\leq$ 10 $\mu$ H			

Permissible temperatures				
Medium	-20 70 °C	Ex-protection:	application in zone 0: application in zone 1 or higher	-20 60 °C : -20 70 °C
Storage	-25 70 °C			

<sup>&</sup>lt;sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>&</sup>lt;sup>2</sup> except nominal pressure ranges ≤ 0.35 bar; for these calculation of accuracy is as follows: ≤± (0.1 + 0.02 x nominal range / adjusted range) % FSO e.g. turn-down of 1:3: ≤± (0.1 + 0.02 x 3) % FSO i.e. accuracy is ≤± 0.16 % FSO

<sup>8.</sup>g. turn-down of 1.3. \$\sim \( \text{total } \), \$\sim \( \text{total } \)

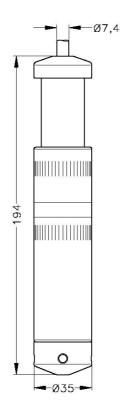
<sup>&</sup>lt;sup>4</sup> additional external overvoltage protection unit in terminal box KL 1 and KL 2 with atmospheric pressure reference available on request

 $<sup>^{\</sup>rm 5}$  approved for atmospheric pressure from 0.8 bar up to 1.1 bar

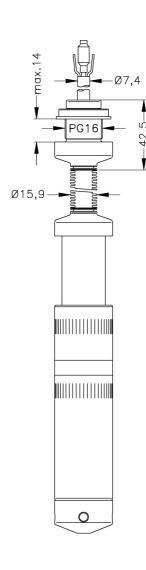
Option

### Dimensions

#### Standard







separability of transmitter head and cable assembly version with corrugated pipe

# Electrical connection

Cable with sheath material <sup>6</sup> PV

PVC grey PUR black FEP black others on request

<sup>&</sup>lt;sup>6</sup> cable with integrated air tube for atmospheric pressure reference

Materials	
Housing	stainless steel 1.4571 (316Ti)
Seals	FKM / EPDM / others on request
Diaphragm	stainless steel 1.4435 (316L)
Cable sheath	PVC / PUR / FEP / others on request

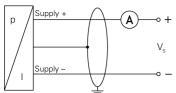
Miscellaneous		
Cable capacitance	signal line/shield: 150 pF/m	signal line/signal line: 100 pF/m
Cable inductance	signal line/shield: 1.0 μH/m	signal line/signal line: 1.0 μH/m
Current consumption	signal output current: max. 25 mA	
Weight	approx. 250 g (without cable)	
Ingress protection	IP 68	

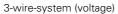
Mounting accessories (not part of delivery)
Screw fitting, stainless steel 1.4571 (316Ti)
Terminal clamp, stainless steel 1.4301 (304) or steel, zinc plated

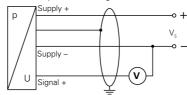
Pin configuration				
Electrical connection	on	Binder Series 723 <sup>7</sup> (7-pin)	cable colours (DIN 47100)	
2-wire-system	Supply + Supply -	3 1	white brown	
	Ground	2	yellow / green (shield)	
3-wire-system	Supply + Supply - Signal +	3 1 6	white brown green	
	Ground	2	yellow / green (shield)	
Communication interface 8	RxD TxD GND	4 5 7	- - -	

# Wiring diagram

2-wire-system (current)







connector 7



<sup>&</sup>lt;sup>7</sup> in separated version

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BD SENSORS
pressure measurement

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

 $<sup>^{\</sup>rm 8}$  may not be transmitted directly with the PC (the suitable adapter "Adapt 1" is available as accessory)



#### Ordering Code LMP 308i **LMP 308i** Pressure in bar 4 4 0 mWC 4 4 1 in mWC Input [bar] 1 7 0 0 3 5 0 0 1 0 0 1 2 0 0 1 7 0 0 1 0,17 1,7 3,5 0,35 10 1,0 2,0 20 70 7,0 1 7 0 2 9 9 9 9 170 customer Housing Stainless steel 1.4571 (316Ti) customer Diaphragm Stainless steel 1.4435 (316L) customer 9 Output 4 ... 20 mA / 2-wire 1 Intrinsic safety 4 ... 20 mA / 2-wire 0 ... 10 V / 3-wire Ε 3 customer 1 **EPDM** customer Electrical connection PVC-cable 1 1 PUR-cable 1 FEP-cable 1 3 customer Accuracy 1 X 9 0,1 % 2 customer Cable length 9 9 9 in m standard (with communication interface) 3 1 2 1 prepared for mounting 4 2 6 with stainless steel pipe cable protection with stainless steel corrugated pipe 2 3 9 9 9 with pipe length in m 9 9 9 customer

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

<sup>&</sup>lt;sup>2</sup> available on request: calibration of individual pressure range higher than 100 mbar with accuracy 0.1 % <sup>3</sup> Software, interface and cable have to be order separately (Order.-Nr.: I-232; Software appropriate for Windows\*\* 95, 98, 2000, NT Version 4.0 or newer and XP)

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