

# 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

### 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 conditions 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



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Technical Data

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> with RS-232 communication interface						
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>						
Options	3-wire: 0 ... 10 V / V <sub>S</sub> = 14 ... 36 V <sub>DC</sub>						
Performance							
Accuracy	IEC 60770 <sup>2</sup> : ≤ ± 0.1 % FSO						
Performance after turn-down (TD)	no change of accuracy <sup>3</sup> formula for accuracy calculating (for nominal pressure gauge ≤ 0.40 bar see note 3): ≤ ± [0.1 + 0.015 x turn-down] % FSO with turn-down = nominal pressure range / adjusted range e.g. following accuracy can be calculated for turn-down 1:10: ≤ ± (0.1 + 0.015 x 10) % FSO viz. the accuracy is ≤ ± 0.25 % FSO						
- TD ≤ 1:5							
- TD > 1:5							
Permissible load	current 2-wire: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω voltage 3-wire: R <sub>min</sub> = 10 kΩ						
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ						
Long term stability	≤ ± (0.1 x turn-down) % FSO / year						
Response time	ca. 200 msec						
Adjustability	following parameters can be adjusted (interface / software needed <sup>4</sup> ) electronic damping: 0 ... 100 sec offset: 0 ... 90 % FSO turn-down of span: max. 1:10						
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)							
<sup>3</sup> nominal pressure gauges ≤ 0.40 bar are excluded; for these the calculation of accuracy is as follows: ≤ ± (0.1 + 0.02 x turn-down) % FSO e.g. turn-down 1:3: ≤ ± (0.1 + 0.02 x 3) % FSO viz. the accuracy is ≤ ± 0.16 % FSO							
<sup>4</sup> software, interface and cable must separate be ordered (software is compatible with Windows <sup>®</sup> 95, 98, 2000, NT from version 4.0 or higher and XP)							
Thermal effects (Offset and Span)							
Tolerance band	[% FSO]	≤ ± (0.2 x turn-down)		in compensated range -20 ... 70 °C			
TC	[% FSO / 10 K]	± (0.2 x turn-down)		in compensated range -20 ... 70 °C			
Permissible temperatures	medium: -20 ... 70 °C		storage: -25 ... 70 °C		electronics / environment: -25 ... 65 °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 protection 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 (-20 ... 70 °C) black FEP (-20 ... 70 °C) black others on request						
<sup>6</sup> cable with integrated air tube for atmospheric pressure reference							
Materials (media wetted)							
Housing	stainless steel 1.4404 (316L)						
Seals	FKM, EPDM, others on request						
Diaphragm	stainless steel 1.4435 (316L)						
Protection cap	POM						
Explosion protection (only for 4 ... 20 mA / 2-wire)							
Approvals DX19-LMP 308 i	<b>IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X</b> 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 <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈ 0 μH, the supply connections have an inner capacity of max. 27 nF to the housing						
Permissible media temperature	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	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	94/4/EG						

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Accessories

Wiring diagram / connector				
<p>2-wire-system (current)</p>	<p>3-wire-system (voltage)</p>	<p>Binder series 723<sup>7</sup> (5-pin)</p>	<p>Binder series 723<sup>7</sup> (7-pin)</p>	
Pin configuration				
Electrical connection	Binder series 723 <sup>7</sup> (5-pin) / 2-wire	Binder series 723 <sup>7</sup> (5-pin) / 3-wire	Binder series 723 <sup>7</sup> (7-pin) / 2-wire with communication interface	cable colours (DIN 47100)
Supply +	3	3	3	wh (white)
Supply -	1	4	1	bn (brown)
Signal + (for 3-wire)	-	1	(6)	gn (green)
RxD	-	-	4	-
TxD	-	-	5	-
GND	-	-	7	-
Shield	5	5	2	gn/ye (green / yellow)
<sup>7</sup> in separated version				
Dimensions (in mm)				
standard		option		
		<p>separated version</p>	<p>version with corrugated pipe</p>	

Mounting flange with cable gland		
<b>Technical data</b>		
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	
<b>Version</b>	<b>Size (in mm)</b>	<b>Weight</b>
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
<b>Ordering type</b>		<b>Ordering code</b>
DN25 / PN40 with cable gland brass, nickel plated		ZMF2540
DN50 / PN40 with cable gland brass, nickel plated		ZMF5040
DN80 / PN16 with cable gland brass, nickel plated		ZMF8016
<b>Terminal clamp</b>		
<b>Technical data</b>		
Suitable for	all probes with cable $\varnothing$ 5.5 ... 10.5 mm	
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)	
Weight	approx. 160 g	
<b>Ordering type</b>		<b>Ordering code</b>
Terminal clamp, steel, zinc plated		Z100528
Terminal clamp, stainless steel 1.4301 (304)		Z100527
<b>Display program</b>		
<b>CIT 200</b> Process display with LED display		
<b>CIT 250</b> Process display with LED display and contacts		
<b>CIT 300</b> Process display with LED display, contacts and analogue output		
<b>CIT 350</b> Process display with LED display, bargraph, contacts and analogue output		
<b>CIT 400</b> Process display with LED display, contacts, analogue output and Ex-approval		
<b>CIT 600</b> Multichannel process display with graphics-capable LC display		
<b>CIT 650</b> Multichannel process display with graphics-capable LC display and datalogger		
<b>CIT 700</b> Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts		
<b>PA 440</b> Field display with 4-digit LC display		
For further information please contact our sales department or visit our homepage: <a href="http://www.bdsensors.com">http://www.bdsensors.com</a>		

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## Ordering code LMP 308i

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Option	Description	Digit 1	Digit 2	Digit 3	Digit 4	Digit 5	Digit 6	Digit 7	Digit 8	Digit 9	Digit 10	Digit 11	Digit 12	Digit 13	Digit 14	Digit 15	Digit 16	Notes
<b>Pressure</b>	in bar	4	4	0														
	in mH <sub>2</sub> O	4	4	1														
<b>Input</b>	[mH <sub>2</sub> O]																	
	[bar]																	
	4.0				4	0	0	0										
	10				1	0	0	1										
	20				2	0	0	1										
	40				4	0	0	1										
	100				1	0	0	2										
	200				2	0	0	2										
	customer				9	9	9	9										consult
<b>Housing</b>	Stainless steel 1.4404 (316L)								1									
	customer								9									consult
<b>Diaphragm</b>	Stainless steel 1.4435 (316L)									1								
	customer									9								consult
<b>Output</b>	4 ... 20 mA / 2-wire														1			
	Intrinsic safety 4 ... 20 mA / 2-wire														E			
	0 ... 10 V / 3-wire														3			
	customer														9			consult
<b>Seals</b>	FKM														1			
	EPDM														3			
	customer														9			consult
<b>Electrical connection</b>	PVC-cable <sup>1</sup>														1			
	PUR-cable <sup>1</sup>														2			
	FEP-cable <sup>1</sup>														3			
	customer														9			consult
<b>Accuracy</b>	0.1 % <sup>2</sup>														1			
	customer														9			consult
<b>Cable length</b>	in m														9	9	9	
																		consult
<b>Version</b>	standard														1	1	1	
	with communication interface <sup>3</sup>														1	2	1	
	prepared for mounting <sup>4</sup>														1	2	6	
	with stainless steel pipe														1	2	6	
	cable protection with stainless steel corrugated pipe with pipe length in m														1	2	3	9
	customer														9	9	9	

<sup>1</sup> cable with integrated air tube for atmospheric pressure reference  
<sup>2</sup> available on request: calibration of individual pressure range higher than 400 mbar with accuracy 0.1 %  
<sup>3</sup> Software, interface and cable have to be order separately (Ordering code: CIS-Set 510; 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

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