

# LMP 307

## 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 ... 1 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 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

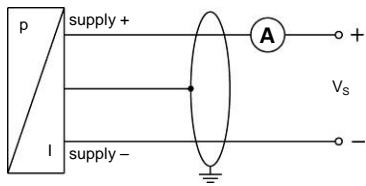
tank farm



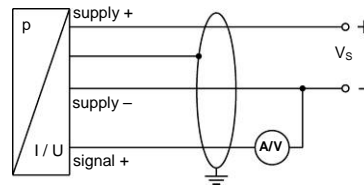
Input pressure range																
Nominal pressure gauge	[bar]	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25		
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250		
Overpressure	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80		
Burst pressure $\geq$	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120		
Output signal / Supply																
Standard		2-wire: 4 ... 20 mA / $V_S = 8 \dots 32 V_{DC}$						SIL-version: $V_S = 14 \dots 28 V_{DC}$								
Option Ex-protection		2-wire: 4 ... 20 mA / $V_S = 10 \dots 28 V_{DC}$						SIL-version: $V_S = 14 \dots 28 V_{DC}$								
Options 3-wire		3-wire: 0 ... 20 mA / $V_S = 14 \dots 30 V_{DC}$ 0 ... 10 V / $V_S = 14 \dots 30 V_{DC}$														
Performance																
Accuracy		standard: nominal pressure < 0.4 bar:			$\leq \pm 0.5\%$ FSO											
		option 1: nominal pressure $\geq$ 0.4 bar:			$\leq \pm 0.35\%$ FSO											
		option 2: for all nominal pressures:			$\leq \pm 0.25\%$ FSO											
		option 2: for all nominal pressures:			$\leq \pm 0.1\%$ FSO											
Permissible load		current 2-wire: $R_{max} = [(V_S - V_S \text{ min}) / 0.02 \text{ A}] \Omega$														
		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 / k $\Omega$														
Long term stability		$\leq \pm 0.1\%$ FSO / year at reference conditions														
Response time		2-wire: $\leq 10$ msec;						3-wire: $\leq 3$ msec								
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																
Thermal effects (Offset and Span)																
Nominal pressure $P_N$	[bar]	< 0.40						$\geq 0.40$								
Tolerance band	[% FSO]	$\leq \pm 1$						$\leq \pm 0.75$								
in compensated range	[°C]	0 ... 70														
Permissible temperatures																
Permissible temperatures		medium: -10 ... 70 °C						storage: -25 ... 70 °C								
Electrical protection <sup>2</sup>																
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 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				FEP <sup>4</sup> (-10 ... 70 °C) black						
<sup>3</sup> cable with integrated air tube for atmospheric pressure reference																
<sup>4</sup> 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 others on request														
Diaphragm		stainless steel 1.4435 (316L)														
Protection cap		POM														
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		$U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i \approx 0 \text{ nF}$ , $L_i \approx 0 \mu\text{H}$ , the supply connections have an inner capacity of max. 27 nF to the housing														
Ambient temperature range		in zone 0: -20 ... 60 °C with $p_{atm}$ 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 $\mu\text{H}/\text{m}$														
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														
CE-conformity		EMC Directive: 2004/108/EC														
ATEX Directive		94/9/EG														
<sup>5</sup> not in combination with the accuracy 0.1%, only for 4...20mA / 2-wire																

### Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

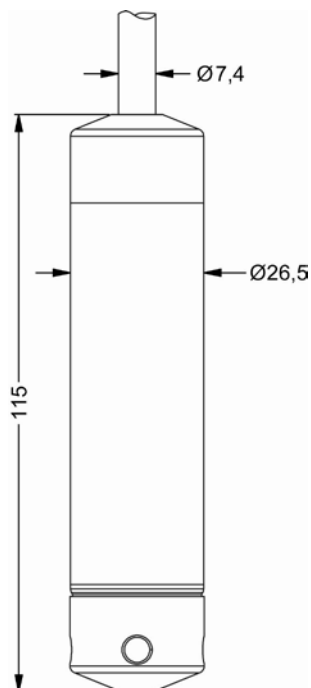


### Pin configuration

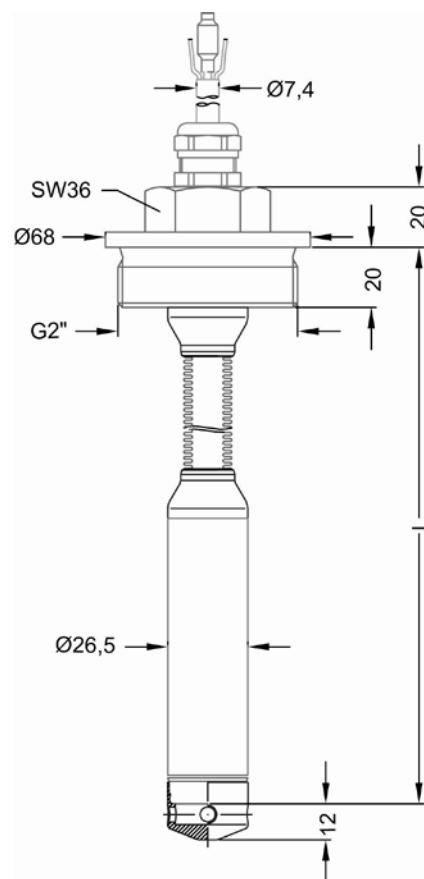
Electrical connection	cable colours (DIN 47100)
Supply +	wh (white)
Supply -	bn (brown)
Signal + (only 3-wire)	gn (green)
Shield	ye/gn (yellow / green)

### Dimensions (in mm)

standard

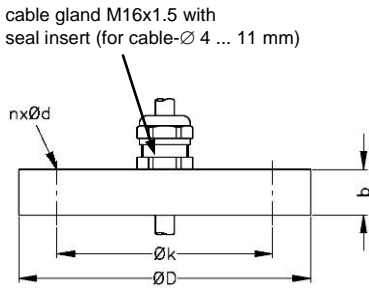
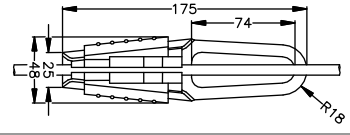



option



cable protection  
with corrugated pipe

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

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 307

### LMP 307

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Pressure		in bar	4	5	0																								
		in mH <sub>2</sub> O	4	5	1																								
Input	[mH <sub>2</sub> O]	[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																							
Housing																													
	Stainless steel 1.4404 (316L)																												
	customer	1																											
		9																											
Diaphragm																													
	Stainless steel 1.4435 (316L)																												
	customer	1																											
		9																											
Output																													
	4 ... 20 mA / 2-wire																												
	0 ... 20 mA / 3-wire	1																											
	0 ... 10 V / 3-wire	2																											
	Intrinsic safety 4 ... 20 mA / 2-wire	3																											
	SIL2 4 ... 20 mA / 2-wire	E																											
	SIL2 with Intrinsic safety	1S																											
	4 ... 20 mA / 2-wire	ES																											
	customer	9																											
Seals																													
	FKM																												
	customer	1																											
		9																											
Accuracy																													
	standard for P <sub>N</sub> ≥ 0.4 bar	0.35 %																											
	standard for P <sub>N</sub> < 0.4 bar	0.5 %	3																										
	option 1 for P <sub>N</sub> ≥ 0.4 bar	0.25 %	5																										
	option 2	0.1 % <sup>1</sup>	2																										
	customer		1																										
			9																										
Electrical connection																													
	PVC-cable <sup>2</sup>																												
	PUR-cable <sup>2</sup>	1																											
	FEP-cable <sup>2</sup>	2																											
	customer	3																											
		9																											
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																								
	<b>special length</b>	<b>PVC</b>	<b>9</b>	<b>9</b>	<b>9</b>																								
	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																								
	<b>special length</b>	<b>PUR</b>	<b>9</b>	<b>9</b>	<b>9</b>																								
	standard: 5 m	FEP	0	0	5																								
	standard: 10 m	FEP	0	1	0																								
	<b>special length</b>	<b>FEP</b>	<b>9</b>	<b>9</b>	<b>9</b>																								
Special version																													
	standard																												
	cable protection with																												
	stainless steel corrugated pipe																												
	with pipe length in m	0	0	0																									
	customer	1	0	3	9	9	9																						
		9	9	9																									

<sup>1</sup> not in combination with SIL

<sup>2</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).

