LMP 308i

Separable Precision Stainless Steel Probe

Stainless Steel Sensor

accuracy according to IEC 60770: 0.1 % FSO

Nominal pressure

from 0 ... 4 mH_2O up to 0 ... 200 mH_2O

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

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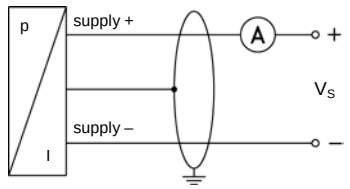
Input pressure range [1]						
Nominal pressure gauge [bar]	0.40	1	2	4	10	20
Level [mH_2O]	4	10	20	40	100	200
Overpressure [bar]	2	5	10	20	40	80
Burst pressure [bar]	3	7.5	15	25	50	120
[1] On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.						

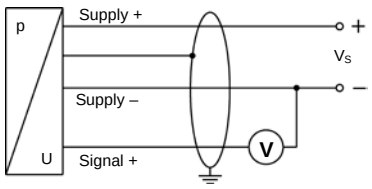
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 12 ... 36 V_{DC} with RS-232 communication interface
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}
Options	3-wire: 0 ... 10 V / V_S = 14 ... 36 V_{DC}
Performance	
Accuracy Performance after turn-down (TD) - TD ≤ 1:5 - TD > 1:5	IEC 60770 [2]: ≤ ± 0.1 % FSO no change of accuracy [3] 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. follwing accuracy can be calculated for turn-down 1:10: ≤ ± (0.1 + 0.015 x 10) % FSO viz. the accuracy is ≤ ± 0.25 % FSO
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ voltage 3-wire: $R_{min} = 10\ k\Omega$
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 [4]) electronic damping: 0 ... 100 sec offset: 0 ... 90 % FSO turn-down of span: max. 1:10
[2] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability) *[3] 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. torn-down 1:3: ≤ ± (0.1 + 0.02 x 3) % FSO viz. the accuracy is ≤ ± 0.16 % FSO* *[4] software, interface and cable must separate be ordered (software is compatible with Windows® 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 / enviroment: -25 ... 65 °C
Electrical protection [5]	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
[5] 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 [6]	PVC (-5 … 70 °C) grey PUR (-20 … 70 °C) black FEP (-20 … 70 °C) black others on request
[6] 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	**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
Permissible media temperature	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: 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

Wiring diagram / connector

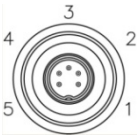
2-wire-system (current)



3-wire-system (voltage)



Binder series 723 [7] (5-pin)



Binder series 723 [7] (7-pin)

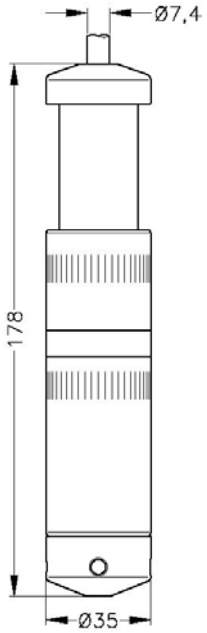
Pin configuration

Electrical connection	Binder series 723 [7] (5-pin) / 2-wire	Binder series 723 [7] (5-pin) / 3-wire	Binder series 723 [7] (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)

[7] *in separated version*

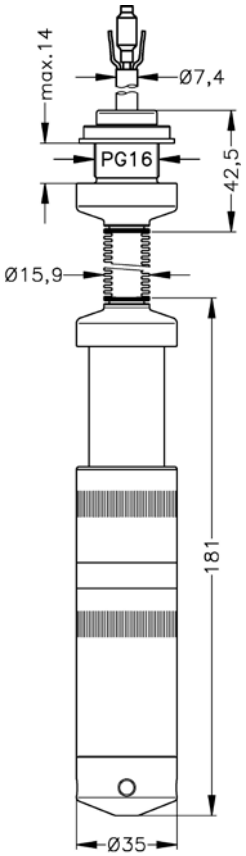
Dimensions (in mm)

standard



separated version

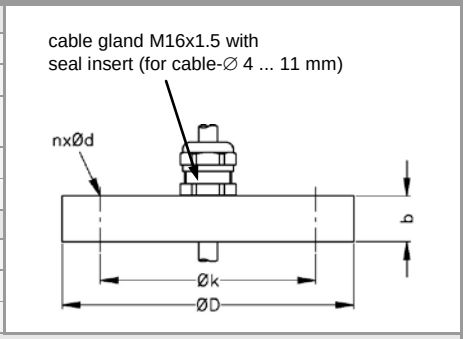
option



version with corrugated pipe

Mounting flange with cable gland

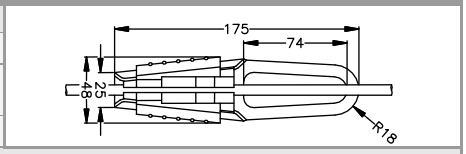
Technical data		
Suitable for	all probes	
Flange material	stainless steel 1.4404 (316L)	
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic	
Seal insert	material: TPE (ingress protection IP 68)	
Hole pattern	according to DIN 2507	
Version	**Size (in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

Terminal clamp

Technical data	
Suitable for	all probes with cable ∅ 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

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
Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts

PA 440
Field display with 4-digit LC display

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pressure measurement

Ordering code LMP 308i

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Pressure		
in bar	4 4 0	
in mH_2O	4 4 1	
Input [mH_2O] / [bar]		
4.0 / 0.40	4 0 0 0	
10 / 1.0	1 0 0 1	
20 / 2.0	2 0 0 1	
40 / 4.0	4 0 0 1	
100 / 10	1 0 0 2	
200 / 20	2 0 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	
Intrinsic safety 4 … 20 mA / 2-wire	E	
0 … 10 V / 3-wire	3	
customer	9	consult
Seals		
FKM	1	
EPDM	3	
customer	9	consult
Electrical connection		
PVC-cable [1]	1	
PUR-cable [1]	2	
FEP-cable [1]	3	
customer	9	consult
Accuracy		
0.1 % [2]	1	
customer	9	consult
Cable length		
in m	9 9 9	consult
Version		
standard	1 1 1	
with communicaton interface [3]	1 2 1	
prepared for mounting with stainless steel pipe [4]	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

[1] cable with integrated air tube for atmospheric pressure reference

[2] available on request: calibration of individual pressure range higher than 400 mbar with accuracy 0.1 %

[3] 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)

[4] stainless steel pipe is not part of the supply

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