



LMP 331

Screw-In Transmitter with piezoresistive Stainless Steel Sensor

- ▶ flush diaphragm
- ▶ hydrostatic level measurement
- ▶ nominal pressure ranges from 0 ... 100 mbar up to 0 ... 40 bar (0 ... 1 mH₂O up to 0 ... 400 mH₂O)

The screw-in transmitters LMP 331 are suited for continuous level measurement.

Due to the high-quality piezoresistive stainless steel sensor the submersible screw-in transmitter LMP 331 features an excellent linearity and good long term stability. The diaphragm in stainless steel 1.4435 is flush with a G3/4" pressure port. It is sealed with an O-ring in FKM as standard; other materials on request. Possible media are non-abrasive lubricants, oils, sewage, diesel etc. if compatible with the media wetted materials.

A variety of standard output signals as well as mechanical and electrical connections make the LMP 331 covering a wide field of applications. Additional it is possible to use the screw-in transmitter LMP 331 in explosive area (zone 0).

Preferred areas of use are:

- ▶ ground water level measurement
- ▶ level measurement in tanks

- ▶ small thermal effect
- ▶ excellent linearity
- ▶ good long term stability
- ▶ option Ex-version (only for 4 ... 20 mA / 2-wire) TÜV 03 ATEX 2006 X
- ▶ accuracy: 0.175 / 0.125 / 0.05% FSO BFSL (0.35 / 0.25 / 0.1% FSO IEC 60770)
- ▶ customer specific versions:
 - special pressure ranges

Characteristics



LMP 331
Stainless Steel Screw-In Transmitter

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Technical Data

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	40	
Level [mH ₂ O]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	
Permissible overpressure [bar]	1	1	1	1	3	3	6	6	20	20	60	60	60	100	

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V _S = 12 ... 36 V _{DC} Ex-protection: V _S = 14 ... 28 V _{DC}
Optional	3-wire: 0 ... 20 mA / V _S = 14 ... 36 V _{DC} 0 ... 10 V / V _S = 14 ... 36 V _{DC}

Performance			
Accuracy	standard: nominal pressure > 0.4 bar	IEC 60770 ¹	BFSL
	nominal pressure ≤ 0.4 bar	≤ ± 0.35 % FSO	≤ ± 0.175 % FSO
	option 1: nominal pressure > 0.4 bar	≤ ± 0.50 % FSO	≤ ± 0.250 % FSO
	option 2: nominal pressure ≥ 0.16 bar	≤ ± 0.25 % FSO	≤ ± 0.125 % FSO
Permissible load	current 2-wire: R _{max} = [(V _S - V _{Smin}) / 0.02] Ω	≤ ± 0.10 % FSO	≤ ± 0.050 % FSO
	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		
Response time ²	< 5 msec.		

Thermal errors (Offset and Span - standard)					
Nominal pressure gauge P _N [bar]	≤ 0.1	≤ 0.25	≤ 0.4	≤ 1	> 1
Tolerance band [% FSO]	≤ ± 2	≤ ± 1.5	≤ ± 1	≤ ± 1	≤ ± 0.75
TC, average [% FSO / 10 K]	± 0.3	± 0.2	± 0.14	± 0.1	± 0.07
in compensated range [°C]	0 ... 50			0 ... 70	

Thermal errors (Offset and Span - optional for -20 ... 50 °C)					
Nominal pressure gauge P _N [bar]	≤ 0.25	≤ 0.4	≤ 1.0	> 1.0	
Tolerance band [% FSO]	≤ ± 2	≤ ± 1.5	≤ ± 1	≤ ± 0.75	
TC, average [% FSO / 10 K]	± 0.3	± 0.2	± 0.1	± 0.07	
in compensated range [°C]	-20 ... 50				

Electrical protection	
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 331	zone 0 ³ : II 1 G Ex ia IIC T4 zone 20: II 1 D Ex tD A20 IP 65 T 85°C safety technical maximum values: V _i = 28 V, I _i = 93 mA, P _i = 660 mW; C _i ≤ 1nF, L _i ≤ 10 μH

Permissible temperatures	
Medium	-25 ... 125 °C
Electronics / environment	-25 ... 85 °C Ex-protection: application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C

¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

² with optional accuracy 0.1 % FSO the response time is 200 msec

³ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

LMP 331

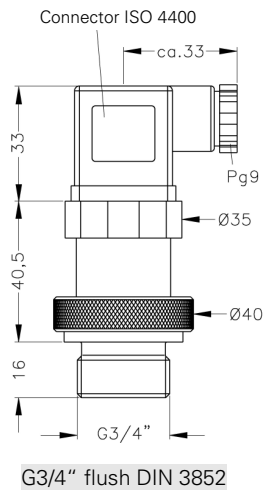
Stainless Steel Screw-In Transmitter

Technical Data

Mechanical stability

Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec

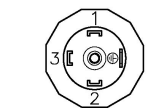
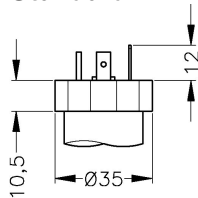
Mechanical connection (dimensions in mm)



- ⇒ Total length of devices with Ex-protection and SIL-version increases by 16 mm!
- ⇒ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 42.5 mm! (standard, Ex-protection and SIL-version)

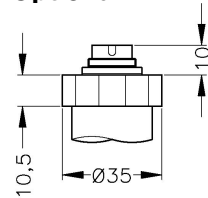
Electrical connection (dimensions in mm)

Standard

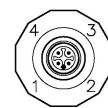
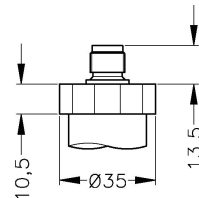


ISO 4400 (IP 65)

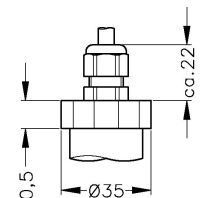
Optional



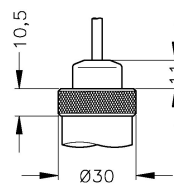
Binder Series 723 (IP 67)



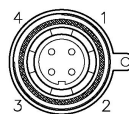
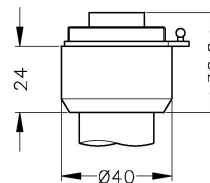
M12x1 4-pin (IP 67)



Cable gland (IP 67)^{4,5}



Cable outlet (IP 68)⁴



Buccaneer (IP 68)⁶

⁴ different cable types and lengths available

⁵ standard: 2m PVC cable (without ventilation tube), optionally cable with ventilation tube

⁶ cable with ventilation tube required

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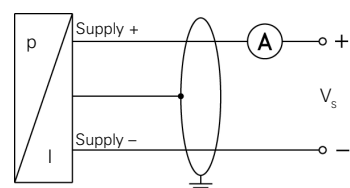
Materials	
Pressure port	stainless steel 1.4571 (316Ti) / others on request
Housing	stainless steel 1.4301 (304)
Seals (media wetted)	FKM / EPDM / others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous	
Optionally SIL 2 application	according to IEC 61508 / IEC 61511
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
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 200 g
Installation position	any ⁷
Operational life	> 100 x 10 ⁶ cycles

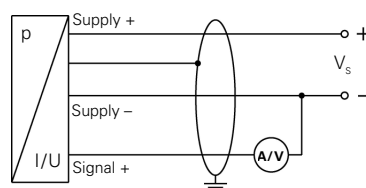
Pin configuration						
Electrical connection		ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Cable colours (DIN 47100)
2-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown
	Signal +	3	1	3	3	green
	Ground	ground pin	5	4	4	yellow / green (shield)

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)



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

⁷ Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $P_N \leq 1$ bar.

