LMP 331

Stainless Steel Screw-In Transmitter

- piezoresistive stainless steel sensor
- flush diaphragm
- hydrostatic level measurement of clean, thin fluid media
- nominal pressure ranges from 0 ... 40 mbar up to 0 ... 40 bar (0 ...0.4 mWC up to 0 ... 400 mWC)

The screw-in transmitters LMP 331 are suited for continuous level measurement of liquids in open tanks. They are being used preferrably for level measurement in clean, thin fluid media.

By the liquid column above the submersed transmitter a pressure is generated that is transmitted via a stainless steel isolation diaphragm and inert oil filling onto the semiconductor sensor element. An amplifier circuit supplies the sensor and transforms the temperature compensated sensor output, which is proportional to the liquid level, into standard current and voltage output signals.

The diaphragm is flush with a G3/4" pressure port; an O-ring behind the thread provides sealing of the transmitter.

A variety of standard output signals as well as mechanical and electrical connections make the LMP 331 covering a wide field of applications.

Preferred areas of use are:

- tank level measurement of neutral media
- water and sewage treatment plants

Characteristics

- small thermal effect
- excellent linearity
- good long term stability
- option Ex: II 1 G EEx ia IIC T4 (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

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Technical Data

Input pressure range

Nominal pressure gauge [bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40
Level [mWC]	-	-	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400
Permissible overpressure [bar]	0.2	0.2	0.5	0.5	1	1	3	3	6	6	20	20	20	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 [1]	standard:	nominal pressure > 0.4 bar:	≤ ± 0.35 % FSO	(BFSL: ≤ ± 0.175 % FSO)
		nominal pressure ≤ 0.4 bar:	≤ ± 0.5 % FSO	(BFSL: ≤ ± 0.25 % FSO)
	optional:	nominal pressure > 0.4 bar:	≤ ± 0.25 % FSO	(BFSL: ≤ ± 0.125 % FSO)
		nominal pressure ≥ 0,16 bar:	≤ ± 0.1 % FSO	(BFSL: ≤ ± 0.05 % FSO)
Permissible load	current 2-wire:	$R_{max} = [(V_S - V_{S\,min}) / 0.02]\ \Omega$		
	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			

Thermal errors (Offset and Span)

Nominal pressure gauge P_N	≤ 0.1 bar	≤ 0.25 bar	≤ 0.4 bar	≤ 1 bar	> 1 bar
Tolerance band	≤ ± 2 % FSO	≤ ± 1.5 % FSO	≤ ± 1 % FSO	≤ ± 1 % FSO	≤ ± 0.75 % FSO
TC, average [% FSO / 10 K]	± 0.3	± 0.2	± 0.14	± 0.1	± 0.07
in compensated range	0 ... 50 °C			0 ... 70 °C	

Electrical protection

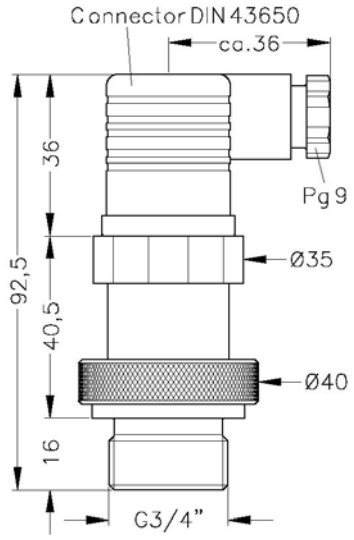
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Option Ex-protection DX13-LMP 331	II 1 G EEx ia IIC T4 (only with 4 ... 20 mA / 2-wire) safety technical maximum values: V_i = 28 V, I_i = 93 mA, P_i = 660 mW

Permissible temperatures

Medium	-25 ... 125 °C
Electronics / environment	-25 ... 85 °C
Storage	-40 ... 125 °C

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

Mechanical connection

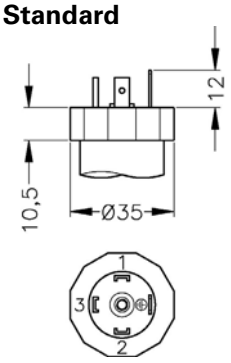


G3/4“ DIN 3852

➪ Total length of devices with Ex-protection increases by 16 mm!
➪ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 34,5 mm! (standard and Ex-protection)

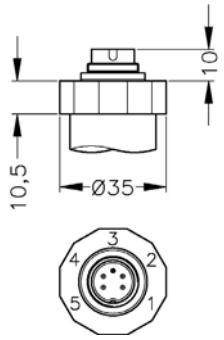
Electrical connection

Standard

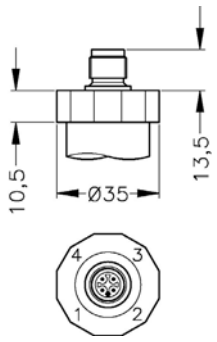


DIN 43650 (IP 65)

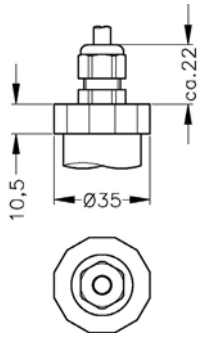
Optional



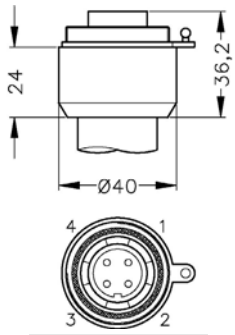
Binder Series 723 (IP 67)



M12x1 4pin (IP 67)



Cable (IP 67) [2]



Buccaneer (IP 68) [3]

[2] different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube
[3] for gauge pressure cable with ventilation tube required

Materials

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

Miscellaneous

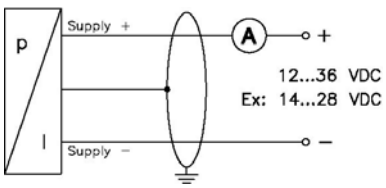
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 200 g
Installation position	any [4]
Operational life	> 100 x 10^6 cycles

Pin configuration

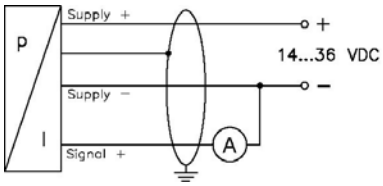
Electrical connection		DIN 43650	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Cable colours (DIN 47100)
2-wire-system	Supply + Supply –	1 2	3 4	1 2	1 2	white brown
	Ground	ground pin	5	4	4	yellow / black
3-wire-system	Supply + Supply – Signal +	1 2 3	3 4 1	1 2 3	1 2 3	white brown green
	Ground	ground pin	5	4	4	yellow / black

Wiring diagrams

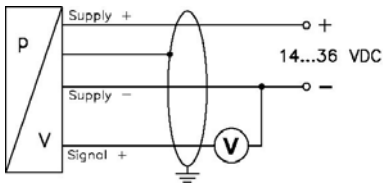
2-wire-system (current)



3-wire-system (current)



3-wire-system (voltage)



[4] 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.

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

Ordering code LMP 331

LMP 331 ☐☐☐-☐☐☐☐-☐-☐-☐-☐-☐☐☐-☐-☐☐☐

Pressure

	Code
in bar	4 3 0
in mWC	4 3 1

Input

[mWC]	[bar]	Code
0,4	0,04	0 4 0 0
0,6	0,06	0 6 0 0
1	0,10	1 0 0 0
1,6	0,16	1 6 0 0
2,5	0,25	2 5 0 0
4	0,40	4 0 0 0
6	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
400	40	4 0 0 2
customer		X X X X

Pressure port

	Code
Stainless steal 1.4571 (316Ti)	1
customer	X

Diaphragm

	Code
Stainless steel 1.4435 (316L)	1
customer	X

Output

	Code
4 ... 20 mA / 2-wire	1
0 ... 10 V / 3-wire	3
Intrinsic safety for zone 0 / 4 ... 20 mA / 2-wire	E
customer	X

Seals

	Code
FKM	1
EPDM	3
customer	X

Electrical Connection

	Code
Male and female plug DIN 43650	1 0 0
Binder series 723 (5-pin)	2 0 0
Cable gland incl. Cable [1]	4 0 0
Buccaneer IP68 [2]	5 0 0
M12x1 (4-pin)	M 0 0
customer	X X X

Accuracy

		Code
standard for $P_N > 0{,}4$ bar	0,35 %	3
standard for $P_N \leq 0{,}4$ bar	0,5 %	5
option for $P_N > 0{,}4$ bar	0,25 %	2
option for $P_N \geq 0{,}16$ bar	0,1 %	1
customer		X

Special version

	Code
standard	0 0 0
customer	X X X

[1] different cable types and lengths deliverable, standard: 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube

[2] for gauge pressure cable with ventilation tube required

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