

LMP 331

Screw-In Transmitter

Stainless Steel Sensor

accuracy according to IEC 60770:
Standard: 0.35 % FSO
Option: 0.25 % / 0.1 % FSO

LMP 331
Stainless Steel
Screw-In Transmitter

Nominal pressure

- ▶ from 0 ... 100 mbar
up to 0 ... 40 bar

Special characteristics

- ▶ pressure port G 3/4" flush
- ▶ excellent accuracy
- ▶ small thermal effect
- ▶ excellent long term stability

Optional versions

- ▶ accuracy 0.1% FSO IEC 60770
- ▶ IS-version:
Ex ia = intrinsically safe for
gases and dusts
- ▶ SIL 2 application
according to IEC 61508 / IEC 61511
- ▶ different electrical connections
- ▶ customer specific versions
e. g. special pressure ranges

The screw-in transmitter LMP 331 has been designed for continuous level measurement and is characterized by an excellent performance and a robust construction.

The modular construction allows the user the highest possible flexibility in the adaption of LMP 331.

Optional features like e.g. an intrinsically safe version or a functionally safe version (SIL 2) increase the advantages when launching and realizing projects for plants and systems.

Preferred areas of use are



Plant and Machine Engineering



Energy Industry



Environmental Engineering
(water – sewage – recycling)



LMP 331

Stainless Steel Screw-In Transmitter

Technical Data

| Input pressure range | | | | | | | | | | | | | | | |
|--|---|------|------|------|------|-----|-----|-----|----|----|--------------------------------|-----|-----|-----|--|
| Nominal pressure gauge [bar] | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 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 | |
| Overpressure [bar] | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 | 40 | 80 | 80 | 105 | |
| Burst pressure [bar] | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 | 50 | 120 | 120 | 210 | |
| Vacuum resistance | $P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request | | | | | | | | | | | | | | |
| Output signal / Supply | | | | | | | | | | | | | | | |
| Standard | 2-wire: 4 ... 20 mA / $V_S = 8 \dots 32 V_{DC}$ | | | | | | | | | | | | | | |
| Option IS version | 2-wire: 4 ... 20 mA / $V_S = 10 \dots 28 V_{DC}$ | | | | | | | | | | | | | | |
| 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 nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO option 1: nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO option 2: for all nominal pressures: $\leq \pm 0.1$ % FSO | | | | | | | | | | | | | | |
| Permissible load | current 2-wire: $R_{max} = [(V_S - V_{Smin}) / 0.02] \Omega$ current 3-wire: $R_{max} = 500 \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$ | | | | | | | | | | | | | | |
| Influence effects | supply: 0.05 % FSO / 10 V load: 0.05 % FSO / k Ω | | | | | | | | | | | | | | |
| Long term stability | $\leq \pm 0.1$ % FSO / year | | | | | | | | | | | | | | |
| Response time ² | 2-Leiter: ≤ 10 msec 3-Leiter: ≤ 3 msec | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | |
| Thermal effects (Offset and Span) | | | | | | | | | | | | | | | |
| Nominal pressure P_N [bar] | ≤ 0.40 | | | | | | | | | | > 0.40 | | | | |
| Tolerance band [% FSO] | $\leq \pm 1$ | | | | | | | | | | $\leq \pm 0.75$ | | | | |
| in compensated range [°C] | 0 ... 70 | | | | | | | | | | -20 ... 85 | | | | |
| Permissible temperatures | | | | | | | | | | | | | | | |
| Permissible temperatures | medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °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 | | | | | | | | | | | | | | |
| Mechanical stability | | | | | | | | | | | | | | | |
| Vibration | 10 g RMS (25 ... 2000 Hz) | | | | | | | | | | according to DIN EN 60068-2-6 | | | | |
| Shock | 500 g / 1 msec | | | | | | | | | | according to DIN EN 60068-2-27 | | | | |
| Explosion protection (only for 4 ... 20 mA / 2-wire) | | | | | | | | | | | | | | | |
| Approval DX19-LMP 331 | IExU10ATEX1068X Zone 0: II 1 G Ex ia IIC T4 Ga Zone 20: II 1 D Ex iaD 20 T 85°C | | | | | | | | | | | | | | |
| Safety technical maximum values | $U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ μ H | | | | | | | | | | | | | | |
| Permissible temperature for medium | in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar bis 1.1 bar in zone 1 or higher: -20 ... 70 °C | | | | | | | | | | | | | | |
| Conneting 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 μ H/m | | | | | | | | | | | | | | |
| Materials | | | | | | | | | | | | | | | |
| Pressure port | stainless steel 1.4404 (316L) | | | | | | | | | | | | | | |
| Housing | stainless steel 1.4404 (316L) | | | | | | | | | | | | | | |
| Seals (media wetted) | standard: FKM option: EPDM NBR others on request | | | | | | | | | | | | | | |
| Diaphragm | stainless steel 1.4435 (316L) | | | | | | | | | | | | | | |
| Media wetted parts | pressure port, seals, diaphragm | | | | | | | | | | | | | | |

LMP 331

Stainless Steel Screw-In Transmitter

Technical Data

| Miscellaneous | |
|------------------------------|---|
| Optionally SIL 2 application | according to IEC 61508 / IEC 61511 |
| Current consumption | signal output current: max. 25 mA signal output voltage: max. 5 mA |
| Weight | approx. 200 g |
| Installation position | any ³ |
| Operational life | > 100 x 10 ⁶ cycles |
| CE-conformity | EMC Directive: 2004/108/EC |

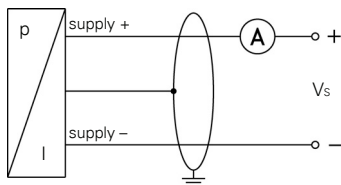
³ Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $P_N \leq 1$ bar.

Pin configuration

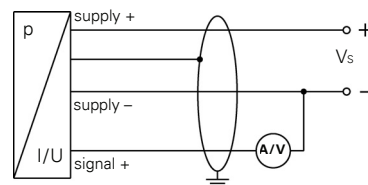
| Electrical connections | ISO 4400 | Binder 723 (5-pin) | M12x1 / metal (4-pin) | field housing | cable colours (DIN 47100) |
|----------------------------|------------|--------------------|-----------------------|---------------|---------------------------|
| Supply + | 1 | 3 | 1 | IN + | wh (white) |
| Supply - | 2 | 4 | 2 | IN - | bn (brown) |
| Signal + (only for 3-wire) | 3 | 1 | 3 | OUT + | gn (green) |
| Shield | ground pin | 5 | 4 | ⊥ | gn/ye (green / yellow) |

Wiring diagrams

2-wire-system (current)

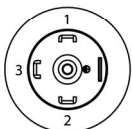
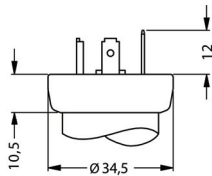


3-wire-system (current/voltage)



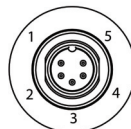
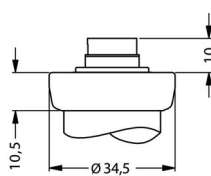
Electrical connections (dimensions in mm)

standard

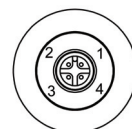
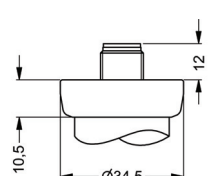


ISO 4400 (IP 65)

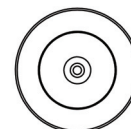
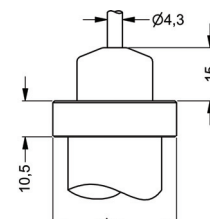
option



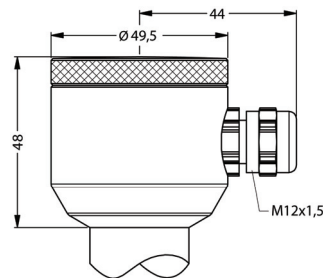
Binder Series 723 5-pin (IP 67)



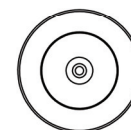
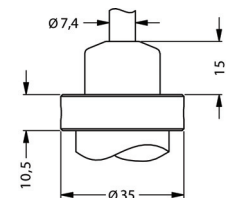
M12x1 4-pin (IP 67)



cable outlet with PVC cable (IP 67)⁴



compact field housing (IP 67)



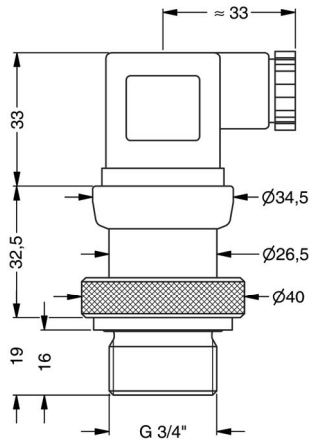
cable outlet, cable with ventilation tube (IP 68)⁵

⁴ standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

⁵ different cable types and lengths available, permissible temperature depends on kind of cable

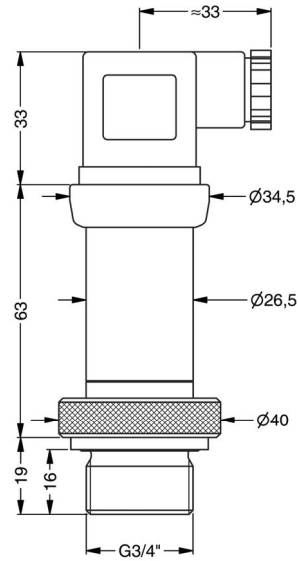
Mechanical connection (dimensions in mm)

standard



G3/4" flush (DIN 3852)
with ISO 4400

standard for SIL- and SIL-Ex-version



G3/4" flush (DIN 3852)
with ISO 4400

Screw-In Transmitter

LMK 331



Characteristics

- ▶ ceramic sensor
- ▶ accuracy according to IEC 60770:
0.5 % FSO
- ▶ nominal pressure ranges
from 0 ... 400 mbar
up to 0 ... 60 bar
- ▶ different electrical and
mechanical connections
- ▶ option SIL 2 application
according to IEC 61508 / IEC 61511



Screw-In Transmitter

LMK 351



Characteristics

- ▶ capacitive ceramic sensor
optionally with diaphragm
Al₂O₃ 99.9 %
- ▶ accuracy according to IEC 60770:
0.35 % / 0.25 % FSO
- ▶ nominal pressure ranges
from 0 ... 40 mbar
up to 0 ... 10 bar
- ▶ option IS-version



Ordering code LMP 331

LMP 331

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| | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|----------------------|----|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|---------|---------|
| Pressure | | in bar | 4 | 3 | 0 | | | | | | | | | | | | | | | | |
| | | in mH ₂ O | 4 | 3 | 1 | | | | | | | | | | | | | | | | |
| Input | [mH ₂ O] | [bar] | | | | | | | | | | | | | | | | | | | |
| | 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 | | 9 | 9 | 9 | 9 | | | | | | | | | | | | | | consult | |
| Pressure port | | | | | | | | | | | | | | | | | | | | | |
| | 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 | | | | | | | | | | | | | | | | | | |
| | 0 ... 20 mA / 3-wire | | 2 | | | | | | | | | | | | | | | | | | |
| | 0 ... 10 V / 3-wire | | 3 | | | | | | | | | | | | | | | | | | |
| | Intrinsic safety 4 ... 20 mA / 2-wire | | E | | | | | | | | | | | | | | | | | | |
| | SIL2 4 ... 20 mA / 2-wire | | 1S | | | | | | | | | | | | | | | | | | |
| | SIL2 with Intrinsic safety | | ES | | | | | | | | | | | | | | | | | | |
| | 4 ... 20 mA / 2-wire | | | | | | | | | | | | | | | | | | | | |
| | customer | | 9 | | | | | | | | | | | | | | | | | | consult |
| Seals | | | | | | | | | | | | | | | | | | | | | |
| | FKM | | 1 | | | | | | | | | | | | | | | | | | |
| | EPDM | | 3 | | | | | | | | | | | | | | | | | | |
| | NBR | | 5 | | | | | | | | | | | | | | | | | | |
| | customer | | 9 | | | | | | | | | | | | | | | | | | consult |
| Electrical connection | | | | | | | | | | | | | | | | | | | | | |
| | Male and female plug ISO 4400 | | 1 | 0 | 0 | | | | | | | | | | | | | | | | |
| | Male plug Binder series 723 (5-pin) | | 2 | 0 | 0 | | | | | | | | | | | | | | | | |
| | Cable outlet with PVC cable ¹ | | T | A | 0 | | | | | | | | | | | | | | | | |
| | Cable outlet ² | | T | R | 0 | | | | | | | | | | | | | | | | |
| | Male plug M12x1 (4-pin) / metal | | M | 1 | 0 | | | | | | | | | | | | | | | | |
| | Compact field housing | | | | | | | | | | | | | | | | | | | | |
| | stainless steel 1.4305 | | 8 | 5 | 0 | | | | | | | | | | | | | | | | |
| | customer | | 9 | 9 | 9 | | | | | | | | | | | | | | | | consult |
| Accuracy | | | | | | | | | | | | | | | | | | | | | |
| | standard for P _N ≥ 0.4 bar | | | | | | | | | | | | | | | | | | | | |
| | standard for P _N < 0.4 bar | | | | | | | | | | | | | | | | | | | | |
| | option 1 for P _N ≥ 0.4 bar | | | | | | | | | | | | | | | | | | | | |
| | option 2 | | | | | | | | | | | | | | | | | | | | |
| | customer | | | | | | | | | | | | | | | | | | | | consult |
| Special version | | | | | | | | | | | | | | | | | | | | | |
| | standard | | | | | | | | | | | | | | | | | | | | |
| | customer | | | | | | | | | | | | | | | | | | | | consult |

standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request
 cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

