



# LMK 331

## Screw-in Transmitter with Ceramic Sensor

- ▶ flush diaphragm
- ▶ pressure ports in stainless steel, PVC or PVDF
- ▶ accuracy:  
0.25 % FSO BFSL  
(0.5 % FSO IEC 60770)
- ▶ nominal pressure ranges  
from 0 ... 400 mbar  
up to 0 ... 60 bar

The screw-in transmitter LMK 331 has been specially designed for level and process measurement. Due to the semi-flush mounted pressure sensors the LMK 331 can also be used in viscous or contaminated media.

The ceramic sensors feature high compatibility against aggressive media. The sensor is sealed against the pressure port with a FKM seal as standard. Other elastomers are available.

Pressure port material is alternatively stainless steel 1.4571 (316Ti), or, for particularly aggressive media, PVDF or PVC. For process measurement applications different process connections are available on request. Additionally it is possible to use the screw-in transmitter LMK 331 in explosive area (zone 0).

Preferred areas of use are:

- ▶ tank level measurement
- ▶ water and sewage treatment
- ▶ paper industry
- ▶ chemical industry

- ▶ ceramic sensor without oil-filling with high resistance against aggressive media, e.g. acids and lyes
- ▶ small thermal effects
- ▶ good long term stability
- ▶ option Ex-version:  
(only for 4 ... 20 mA / 2-wire)  
TÜV 03 ATEX 2006 X
- ▶ customer specific versions:  
- special pressure ranges

Characteristics

LMK 331  
Screw-in Transmitter



# LMK 331

Screw-in Transmitter

Technical Data

Input pressure range												
Nominal pressure gauge [bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40 <sup>1</sup>	60 <sup>1</sup>
Level [mH <sub>2</sub> O]	4	6	10	16	25	40	60	100	160	250	400	600
Permissible overpressure [bar]	1	3	3	7	7	12	12	25	50	50	120	120

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 12 ... 36 V <sub>DC</sub> Ex-protection <sup>2</sup> : V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>
Options	3-wire: 0 ... 20 mA / V <sub>S</sub> = 14 ... 36 V <sub>DC</sub> 0 ... 10 V / V <sub>S</sub> = 14 ... 36 V <sub>DC</sub>

Performance	
Accuracy <sup>3</sup>	IEC 60770: ≤ ± 0.5 % FSO      BFSL: ≤ ± 0.25 % FSO
Permissible load	current 2-wire: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>Smin</sub> ) / 0.02] Ω current 3-wire: R <sub>max</sub> = 500 Ω voltage 3-wire: R <sub>min</sub> = 10 kΩ
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Response time	< 10 msec.

Thermal effect	
Thermal error for offset and span in compensated range	≤ ± 0.2 % FSO / 10 K -25 ... 85 °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 only for stainless steel pressure port with 4 ... 20 mA / 2-wire DX13-LMK 331	zone 0 <sup>4</sup> : II 1 G EEx ia IIC T4 zone 20: II 1 D EEx tD A20 IP65 T 85°C safety technical maximum values: V <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW; C <sub>i</sub> ≤ 1 nF, L <sub>i</sub> ≤ 10 μH

Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

Permissible temperatures <sup>5</sup>	
Medium	-25 ... 135 °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

<sup>1</sup> only possible for pressure port in stainless steel

<sup>2</sup> Ex-protection not possible with plastic pressure port; not possible for G3/4" in combination with 0.4 bar / 4 mH<sub>2</sub>O

<sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>4</sup> approved for atmospheric pressure from 0.8 bar up to 1.1 bar

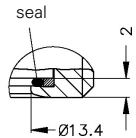
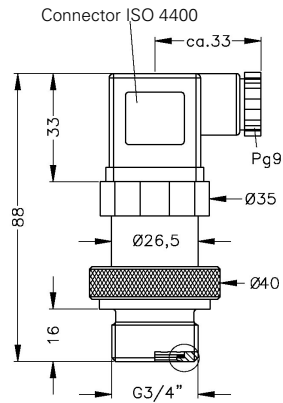
<sup>5</sup> for pressure port of PVC the maximum permissible temperature is 50 °C

# LMK 331

Screw-in Transmitter

Technical Data

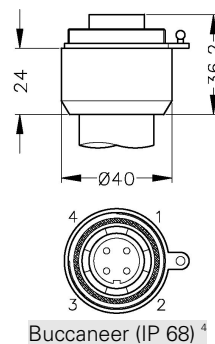
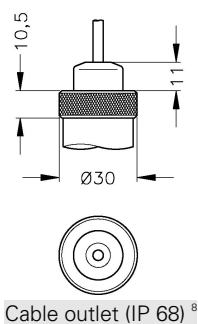
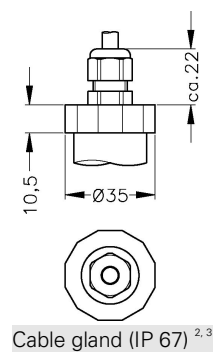
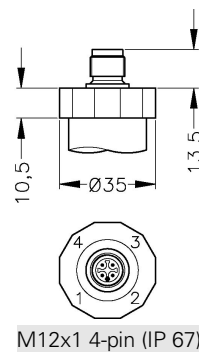
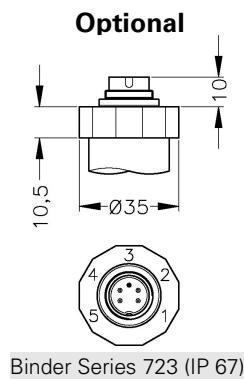
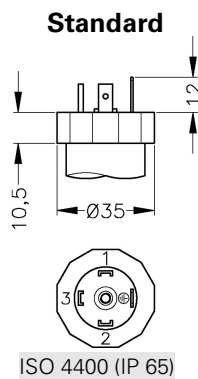
## Mechanical connection (dimensions in mm)



G3/4" flush (DIN 3852) <sup>1</sup>

- ⇒ With PVC and PVDF versions total length increases by 3 mm!
- ⇒ Ex-protection and SIL-version: total length increases by 17.5 mm!

## Electrical connection (dimensions in mm)



<sup>1</sup> nominal pressure ranges > 25 bar with Ø 40 and spanner flat SW 34 (without knurled ring)

<sup>2</sup> different cable types and lengths available

<sup>3</sup> standard: 2m PVC cable (without ventilation tube), optionally cable with ventilation tube

<sup>4</sup> for gauge pressure up to 40 bar cable with ventilation tube required

# LMK 331

## Screw-in Transmitter

## Technical Data

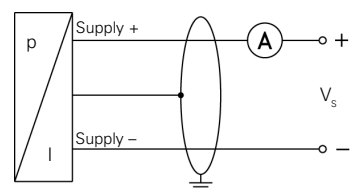
Materials	
Pressure port / housing	standard: stainless steel 1.4571 (316Ti) / stainless steel 1.4301 (304) options <sup>5</sup> : PVC grey / PVC grey PVDF / PVDF
Seals (media wetted)	standard: FKM options: NBR, EPDM; others on request
Diaphragm	ceramic Al <sub>2</sub> O <sub>3</sub> 96 %
Media wetted 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. 150 g
Installation position	any

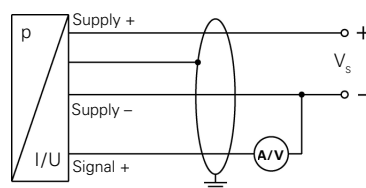
Pin configuration						
Electrical connection		ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	cable colours (DIN 47100)
2-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown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

<sup>5</sup> possible for nominal pressure ranges  $P_N \leq 25$  bar

Ordering code LMK 331

**LMK 331**

□□□ - □□□□ - □ - □ - □□□ - □□□ - □ - □ - □ - □□□

<b>Pressure</b>									
gauge in bar	4	6	0						
gauge in mH <sub>2</sub> O	4	6	1						
<b>Input</b>									
[mH <sub>2</sub> O]	[bar]								
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				
400	40	4	0	0	2				
600	60	6	0	0	2				
customer		9	9	9	9				consult
<b>Analogue output</b>									
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 <sup>2</sup>						E			
SIL2 4 ... 20 mA / 2-wire						1S			
SIL2 with Intrinsic safety <sup>2</sup>						ES			
4 ... 20 mA / 2-wire									
customer						9			consult
<b>Accuracy</b>									
0.5 %						5			
customer						9			consult
<b>Electrical connection</b>									
Male and female plug ISO 4400						1	0	0	
Male plug Binder series 723 (5-pin)						2	0	0	
Cable gland incl. cable <sup>3,4</sup>						4	0	0	
Cable outlet <sup>3</sup>						T	R	0	
Male plug Buccaneer IP68 <sup>5</sup>						5	0	0	
Male plug M12x1 (4-pin)						M	0	0	
customer						9	9	9	consult
<b>Mechanical connection</b>									
G3/4" DIN 3852 with flush sensor						K	0	0	
customer						9	9	9	consult
<b>Seals</b>									
FKM						1			
NBR						5			
EPDM						3			
customer						9			consult
<b>Pressure port</b>									
Stainless steel 1.4571 (316Ti)						1			
for P <sub>N</sub> ≤ 25 bar	PVC <sup>2</sup>					A			
for P <sub>N</sub> ≤ 25 bar	PVDF <sup>2</sup>					B			
customer						9			consult
<b>Diaphragm</b>									
Ceramics Al <sub>2</sub> O <sub>3</sub> 96%						2			
customer						9			consult
<b>Special version</b>									
standard						0	0	0	
customer						9	9	9	consult

<sup>1</sup> only possible for pressure port of stainless steel

<sup>2</sup> Ex-protection not possible with mech. connection G3/4" with plastic pressure port; not possible for G 3/4" in combination with 0.4 bar / 4 mH<sub>2</sub>O

<sup>3</sup> different cable types and lengths deliverable

<sup>4</sup> standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube

<sup>5</sup> cable with ventilation tube required

