



# LMK 331

## Screw-In Transmitter

### Ceramic Sensor

**accuracy according to IEC 60770:**  
**0.5 % FSO**

Screw-In Transmitter

LMK 331

#### **Nominal pressure**

from 0 ... 400 mbar  
up to 0 ... 60 bar

#### **Output signal**

2-wire: 4 ... 20 mA  
3-wire: 0 ... 20 mA / 0 ... 10 V  
others on request

#### **Special characteristics**

- ▶ pressure port G 3/4" flush for pasty and impurified media
- ▶ pressure port PVDF for aggressive media

#### **Optional versions**

- ▶ IS-version (only for 4 ... 20mA / 2 – wire):  
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2 application according to IEC 61508 / IEC 61511
- ▶ customer specific versions



The screw-in transmitter LMK 331 has been especially designed for level and process measurement and is suitable for pressure measurement of liquids, oils and gases. Usage in more viscous or polluted media is possible because of the semi-flush pressure sensor.

For the usage in aggressive media we recommended the version with PVDF pressure port.

Additional features like e.g. an intrinsically safe version or a functionally safe version (SIL 2) complete the range of possibilities.

#### **Preferred areas of use are**



Plant and Machine Engineering



Energy Industry



Environmental Engineering  
(water – sewage – recycling)

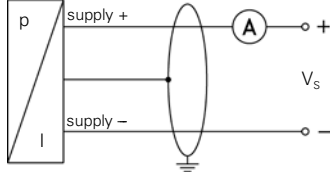


Medical Technology

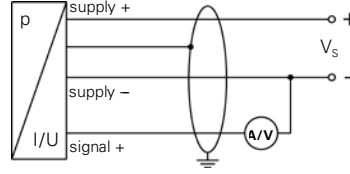
Input pressure range													
Nominal pressure gauge [bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40 <sup>1</sup>	60 <sup>1</sup>	
Level [mH <sub>2</sub> O]	4	6	10	16	25	40	60	100	160	250	400	600	
Overpressure [bar]	1	2	2	4	4	10	20	20	40	100	100	200	
Burst pressure [bar]	2	4	4	5	5	12	25	25	50	120	120	250	
Vacuum resistance [bar]	P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance P <sub>N</sub> < 1 bar: on request												
<sup>1</sup> only possible with stainless steel pressure port													
Output signal / Supply													
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 8 ... 32 V <sub>DC</sub>												
Option IS-protection <sup>2</sup>	2-wire: 4 ... 20 mA / V <sub>S</sub> = 10 ... 28 V <sub>DC</sub>												
Optionen 3-wire	3-wire: 0 ... 20 mA / V <sub>S</sub> = 14 ... 30 V <sub>DC</sub> 0 ... 10 V / V <sub>S</sub> = 14 ... 30 V <sub>DC</sub>												
<sup>2</sup> IS-protection not possible with plastic pressure port													
Performance													
Accuracy <sup>3</sup>	≤ ± 0.5 % FSO												
Permissible load	current 2-wire: R <sub>max</sub> = [(V <sub>S</sub> – V <sub>S min</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	2-wire: ≤ 10 msec 3-wire: ≤ 3 msec												
<sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)													
Thermal effects (Offset and Span) / Permissible Temperatures													
Thermal error	≤ ± 0.2 % FSO / 10 K												
in compensated range	-25 ... 85 °C												
Permissible temperatures	medium: -40 ... 125 °C electronics / environment: -25 ... 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												
Materials (media wetted)													
Pressure port / housing	standard: options for P <sub>N</sub> ≤ 25 bar:					pressure port stainless steel 1.4404 (316L) PVDF				housing stainless steel 1.4404 (316L) PVDF			
Option compact field housing	stainless steel 1.4305 with cable gland brass nickel plated others on request												
Seals (media wetted)	standard: FKM options: EPDM, NBR, others on request												
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %												
Media wetted parts	pressure port, seals, diaphragm												
Explosion protection (only for 4 ... 20 mA / 2-wire)													
Approval DX19-LMK 331 only for stainless steel pressure port	IBExU 10 ATEX 1068 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex iaD 20 T85°C												
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈ 0 μH												
Permissible temperatures for environment	in Zone 0: -20 ... 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar in Zone 1 or higher: -25 ... 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: 1 μH/m												
Miscellaneous													
Option 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. 150 g												
Installation position	any												
Operational life	> 100 x 10 <sup>6</sup> pressure cycles												
CE-conformity	EMC Directive: 2004/108/EC												

### Wiring diagrams

#### 2-wire-system (current)



#### 3-wire-system (current / voltage)

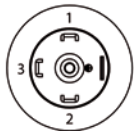
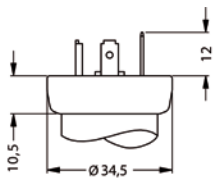


### Pin configuration

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

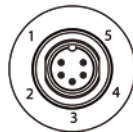
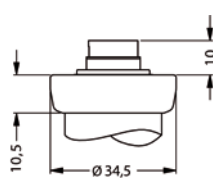
### Electrical connections (dimensions in mm)

#### standard

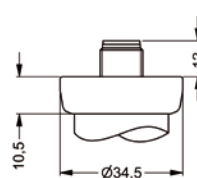


ISO 4400  
(IP 65)

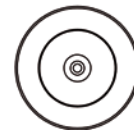
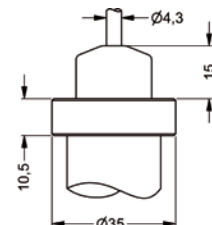
#### option



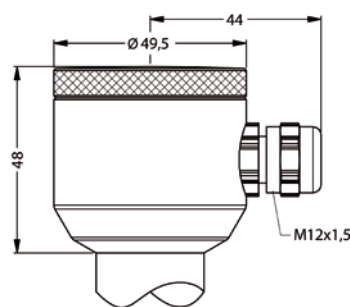
Binder Series 723 5-pin  
(IP 67)



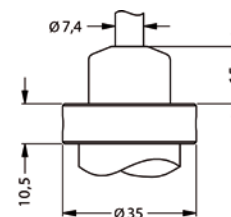
M12x1 4-pin  
(IP 67)



cable outlet with PVC cable  
(IP 67) <sup>4</sup>



compact field housing  
(IP 67)



cable outlet,  
cable with ventilation tube  
(IP 68) <sup>5</sup>

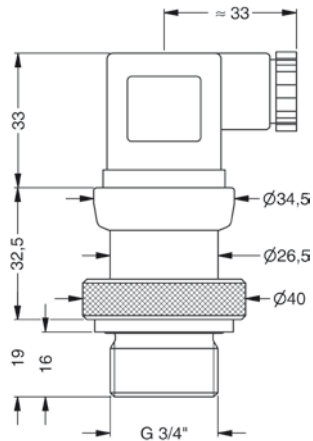
⇒ universal stainless steel housing 1.4404 with cable gland M20x1.5 (ordering code 880) and other versions on request

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

<sup>5</sup> different cable types and length available, permissible temperature depends on kind of cable

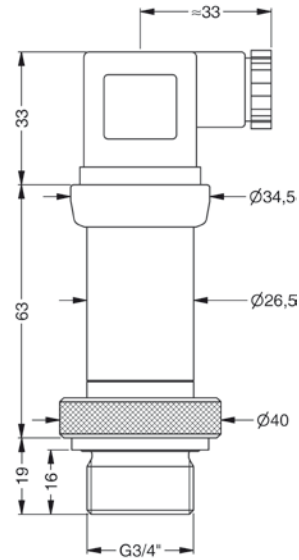
### Mechanical connection (dimensions in mm)

#### standard



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

#### standard for SIL- and SIL-Ex-version



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

### Further products:

#### Screw-In Transmitter

##### LMP 331



#### Characteristics

- ▶ piezoresistive stainless steel sensor
- ▶ accuracy according to IEC 60770:  
0.25 % / 0.1 % FSO
- ▶ nominal pressure ranges  
from 0 ... 100 mbar  
up to 0 ... 40 bar
- ▶ different electrical connections
- ▶ option SIL 2 application  
according to IEC 61508 / IEC 61511



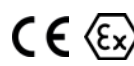
#### Screw-In Transmitter

##### LMK 351



#### Characteristics

- ▶ capacitive ceramic sensor  
optionally with diaphragm  
Al<sub>2</sub>O<sub>3</sub> 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



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

**Ordering code LMK 331**

## LMK 331

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Pressure					
	gauge in bar	4	6	0	
	gauge in mH <sub>2</sub> O	4	6	1	
Input	[mH <sub>2</sub> O]	[bar]			
	4.0	0.40	4	0	0
	6.0	0.60	6	0	0
	10	1.0	1	0	0
	16	1.6	1	6	0
	25	2.5	2	5	0
	40	4.0	4	0	0
	60	6.0	6	0	0
	100	10	1	0	0
	160	16	1	6	0
	250	25	2	5	0
	400	40	4	0	0
	600	60	6	0	0
	customer		9	9	9
Analogue 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	²	E		
SIL2	4 ... 20 mA / 2-wire		1S		
SIL2 with Intrinsic safety	4 ... 20 mA / 2-wire	²	ES		
	customer		9		consult
Accuracy					
	0.5 %		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 cable³		T	A	0
	Cable outlet with cable		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
Mechanical connection					
	G3/4" DIN 3852 with flush sensor		K	0	0
	customer		9	9	9
Seals					
	FKM			1	
	NBR			5	
	EPDM			3	
	customer			9	consult
Pressure port					
	Stainless steel 1.4404 (316L)			1	
for P <sub>N</sub> ≤ 25 bar	PVDF²	B			
	customer		9		consult
Diaphragm					
	Ceramics Al₂O₃ 96%			2	
	customer			9	consult
Special version					
	standard				0
	customer				0

<sup>1</sup> only possible for pressure port of stainless steel<sup>2</sup> Ex-protection not possible with plastic pressure port

<sup>3</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)