



# **LMK 331**

## Screw-In Transmitter

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

#### **Nominal pressure**

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

#### **Output signals**

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 impurity 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 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)

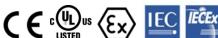


Medical technology



Tel.: +49 (0) 92 35 / 98 11- 0

Fax: +49 (0) 92 35 / 98 11- 11











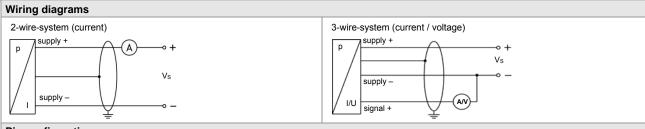




Screw-In Transmitter

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	40	100	200
Burst pressure	[bar]	2	4	4	5	7,5	12	25	30	50	50	120	250
Vacuum resistance	[bar]	p <sub>N</sub> ≥ 1	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													

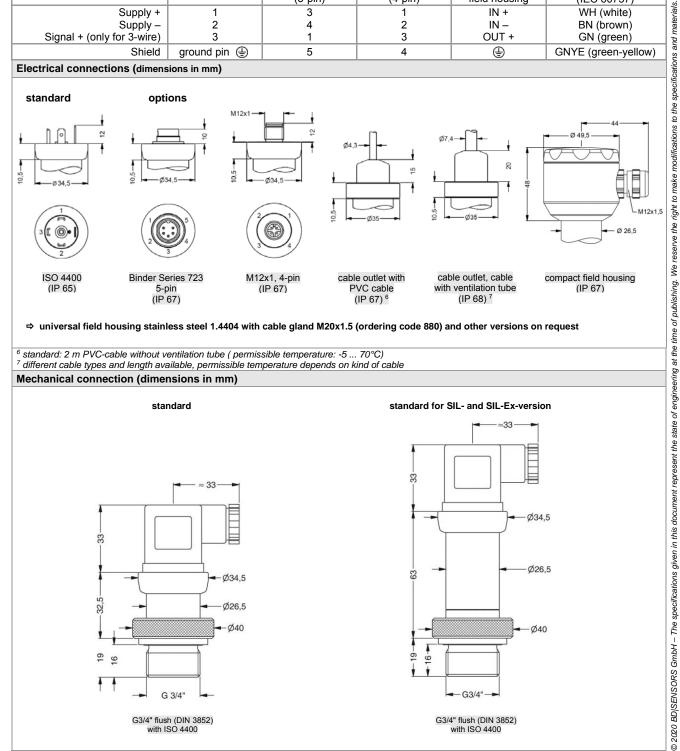
Output signal / Supply								
Standard	2-wire: 4 20 mA / V <sub>S</sub>		/ <sub>S</sub> = 14 28 V <sub>DC</sub>					
Option IS-version <sup>2</sup>	2-wire: 4 20 mA / V <sub>S</sub>	= 10 28 V <sub>DC</sub> SIL-version: V	/ <sub>S</sub> = 14 28 V <sub>DC</sub>					
Options 3-wire	3-wire: 0 20 mA / V <sub>S</sub> 0 10 V / V <sub>S</sub>							
<sup>2</sup> IS-version not possible with plastic pro								
Performance								
Accuracy <sup>3</sup>	≤ ± 0.5 % FSO							
Permissible load								
	current 3-wire: $R_{max} = 500 \Omega$ voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$							
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ							
Response time	2-wire: ≤ 10 msec 3-wire: ≤ 3 msec							
Long term stability	≤ ± 0,3 % FSO / year at reference conditions							
	to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)							
Thermal effects (Offset and Spa								
Thermal error	≤ ± 0.2 % FSO / 10 K							
in compensated range	0 85 °C							
Permissible temperatures <sup>4</sup>	medium: -40 125 °C							
<sup>4</sup> for pressure port in PVDF the medium			<u> </u>					
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	cinission and initiality asset	raing to EIV 0 1020						
	10 - DMO (05 0000 H=)	a a a a dia a ta DIN EN 00000 0 0						
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								
Pressure port / housing		pressure port	housing					
	standard: options for $p_N \le 25$ bar:	stainless steel 1.4404 (316L) PVDF	stainless steel 1.4404 (316L) PVDF					
Option compact field housing	stainless steel 1.4301 (304)	; cable gland M12x1.5, brass, nicke	I plated (clamping range 2 8 mm)					
Seals	standard: FKM options: EPDM others on request							
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %							
Media wetted parts	pressure port, seals, diaphra	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 / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da							
Safety technical maximum values	$U_i$ = 28 V, $I_i$ = 93 mA, $P_i$ = 660 mW, $C_i$ ≈ 0 nF, $L_i$ ≈ 0 μH, the supply connections have an inner capacity of max. 27 nF to the housing							
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: -40/-20 70 °C							
Connecting cables	cable capacitance: signal line/shield also signal line / signal line: 160 pF/m							
(by factory)	cable inductance: signal l	line /shield also signal line / signal lir	ne: 1 μH/m					
Miscellaneous								
Milocellaricous	according to IEC 61508 / IE	C 61511						
	according to IEC 013007 IE		signal output voltage: max. 7 mA					
Option SIL 2 version <sup>5</sup>		25 mA						
Option SIL 2 version <sup>5</sup> Current consumption	signal output current: max. 2	25 mA	signal output voltage. max. 7 max					
Option SIL 2 version <sup>5</sup> Current consumption Weight	signal output current: max. 2 approx. 150 g	25 mA	Signal output voltage. max. 7 max					
Option SIL 2 version <sup>5</sup> Current consumption Weight Installation position	signal output current: max. 2 approx. 150 g any	25 MA	Signal output voltage. Iliax. 7 IIIA					
Option SIL 2 version <sup>5</sup> Current consumption Weight Installation position Operational life	signal output current: max. 2 approx. 150 g any 100 million load cycles	25 mA	Signal output voltage. max. 7 max					
Option SIL 2 version <sup>5</sup> Current consumption Weight Installation position	signal output current: max. 2 approx. 150 g any	25 mA	Signal output voltage. max. 7 max					



#### Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	compact field housing	cable colour (IEC 60757)
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	<b>(</b>	GNYE (green-yellow)

#### Electrical connections (dimensions in mm)

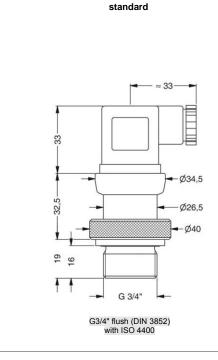


⇒ universal field housing stainless steel 1.4404 with cable gland M20x1.5 (ordering code 880) and other versions on request

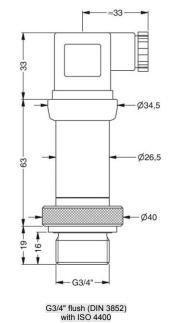
 $^6$  standard: 2 m PVC-cable without ventilation tube ( permissible temperature: -5 ... 70 °C)

7 different cable types and length available, permissible temperature depends on kind of cable

#### Mechanical connection (dimensions in mm)



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



LMK331\_E\_030720

+49 (0) 92 35 / 98 11- 0 Tel.: Fax: +49 (0) 92 35 / 98 11- 11

www.bdsensors.de info@bdsensors.de





#### Ordering code LMK 331 LMK 331 Pressure gauge in bar 4 6 0 4 6 1 gauge in mH<sub>2</sub>O Input [mH<sub>2</sub>O] [bar] 0 0 0 0 0 0 4 0.4 4 0.6 6 0 0 0 0 0 1 6 0 1 5 0 1 0 0 1 0 0 1 0 0 2 6 0 2 5 0 2 0 0 2 9 9 9 6 10 1.0 16 16 25 2.5 4 40 4.0 6 60 6.0 100 10 160 16 2 250 25 4 400 40 6 600 60 customer consult Analogue output 4 ... 20 mA / 2-wire 1 0 ... 20 mA / 3-wire 2 $\begin{array}{c} 0 \dots 10 \text{ V/ 3-wire} \\ \text{intrinsic safety 4} \dots 20 \text{ mA / 2-wire} \end{array}$ $\begin{array}{c} \text{SIL2 4} \dots 20 \text{ mA / 2-wire} \end{array}$ 3 Е 18 SIL2 with intrinsic safety <sup>2</sup> ES 4 ... 20 mA / 2-wire customer 9 consult Accuracy 0.5 % FSO customer consult Electrical connection male and female plug ISO 4400 0 0 male plug Binder series 723 (5-pin) 0 0 cable outlet with PVC cable (IP67) A 0 cable outlet, R 0 т cable with ventilation tube (IP68) 4 male plug M12x1 (4-pin) / metal 1 0 compact field housing 5 0 8 stainless steel 1.4301 (304) customer 9 9 9 consult © 2020 BD|SENSORS GmbH - The specifications given in this document represent the state of engineeringat the time of publishing. Mechanical connection G3/4" DIN 3852 with 0 Κ 0 flush sensor customer 9 9 9 consult FKM 1 EPDM 3 customer 9 consult Pressure port stainless steel 1.4404 (316L) 1 option for $p_N \le 25$ bar: PVDF В customer 9 consult Diaphragm ceramics Al<sub>2</sub>O<sub>3</sub> 96 % 2 customer 9 consult Special version 0 0 0 9 9 9 standard customer consult

16.04.2020

We reserve the right to make modifications to the specifications and materials

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

<sup>&</sup>lt;sup>2</sup> intrinsic safety not possible with plastic pressure port

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

<sup>&</sup>lt;sup>4</sup> code TR0 = PVC cable, cable with ventilation tube available in different types and lengths

 $<sup>^{\</sup>rm 5}$  permissible medium temperature: -30 ... 60 °C