



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 impuritied 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











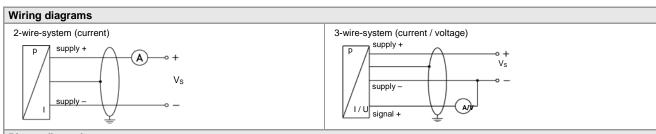






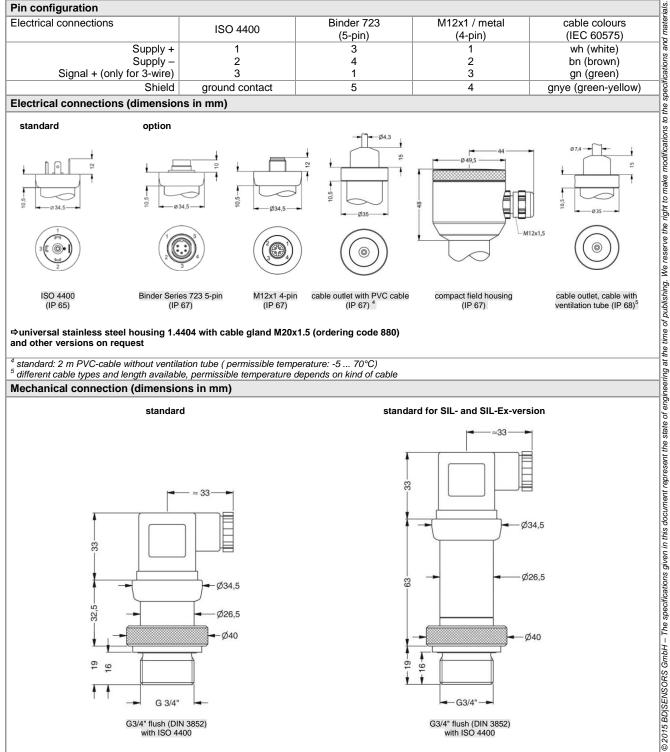
Input pressure range													
Nominal pressure gauge	[bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40 ¹	60 ¹
Level	[mH ₂ O]	4	6	10	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	1	2	2	4	4	10	20	20	40	40	100	200
Burst pressure	[bar]	2	4	4	5	7,5	12	25	30	50	50	120	250
Vacuum resistance	[bar]	P _N ≥ 1 bar: unlimited vacuum resistance											
P _N < 1 bar: on request													
¹ only possible with stainless steel pressure port													

Output signal / Supply	
Standard	2-wire: $4 \dots 20 \text{ mA} / V_S = 8 \dots 32 V_{DC}$ SIL-version: $V_S = 14 \dots 28 V_{DC}$
Option IS-protection ²	2-wire: $4 \dots 20 \text{ mA} / V_S = 10 \dots 28 V_{DC}$ SIL-version: $V_S = 14 \dots 28 V_{DC}$
Optionen 3-wire	3-wire: $0 \dots 20 \text{ mA} / V_S = 14 \dots 30 V_{DC}$
•	0 10 V / V _S = 14 30 V _{DC}
² IS-protection not possible with plastic	
Performance	
Accuracy ³	≤±0.5 % FSO
Permissible load	current 2-wire: $R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02 \text{ A}] \Omega$
Cimissible load	current 3-wire: $R_{\text{max}} = \frac{1}{16} (V_{\text{S}} - V_{\text{S} \text{min}}) / 0.02 \text{ A} \frac{1}{3} \Omega$
	voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$
Influence effects	supply: 0.05 % FSO / 10 V
Till de l'ille elle elle elle elle elle elle e	load: 0.05 % FSO / kΩ
Response time	2-wire: ≤ 10 msec
response time	3-wire: ≤ 3 msec
Long term stability	≤ ± 0,3 % FSO / year at reference conditions
· · · · · · · · · · · · · · · · · · ·	nit point adjustment (non-linearity, hysteresis, repeatability)
Thermal effects (Offset and Spa	
Thermal error	· · · · · · · · · · · · · · · · · · ·
in compensated range	≤ ± 0.2 % FSO / 10 K -25 85 °C
Permissible temperatures	medium: -40 125 °C
remissible temperatures	
	electronics / environment: -25 85 °C storage: -40 100 °C
Electrical protection	-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	
Pressure port / housing	pressure port housing
r rocourd porty riodollig	standard: stainless steel 1.4404 (316L) stainless steel 1.4404 (316L)
	options for $P_N \le 25$ bar: PVDF PVDF
Option compact field housing	stainless steel 1.4305 with cable gland brass nickel plated others on request
Seals	standard: FKM
Jeais	options: EPDM others on reques
Diaphragm	ceramics Al ₂ O ₃ 96 %
Media wetted parts	pressure port, seals, diaphragm
Explosion protection (only for 4	·······································
Approval DX19-LMK 331 only for stainless steel pressure port	IBEXU 10 ATEX 1068 X
stainless steel pressure port	zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ nF}, L_i \approx 0 \text{ μH},$
Carety technical maximum values	the supply connections have an inner capacity of max. 27 nF to the housing
Permissible temperatures for	in Zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar
environment	in Zone 1 or higher: -25 70 °C
Connecting cables	cable capacitance: signal line/shield also signal line / signal line: 160 pF/m
(by factory)	cable inductance: signal line /shield also signal line / signal line: 1 μH/m
Miscellaneous	- cable inequation. Signal line / sincle also signal line / signal line. Τ μι //πι
Option SIL 2 application	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 150 g
Installation position	any
Operational life	> 100 x 10 ⁶ pressure cycles
CE-conformity	EMC Directive: 2004/108/EC
ATEX Directive	94/9/EG



	Pin configuration					
Electrical connections		ISO 4400	Binder 723	M12x1 / metal	cable colours	
		130 4400	(5-pin)	(4-pin)	(IEC 60575)	
	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	gnye (green-yellow)	

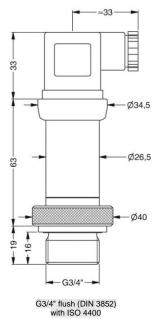
Electrical connections (dimensions in mm)



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

 4 standard: 2 m PVC-cable without ventilation tube (permissible temperature: -5 ... 70°C) 5 different cable types and length available, permissible temperature depends on kind of cable Mechanical connection (dimensions in mm)

standard standard for SIL- and SIL-Ex-version 33 Ø34,5 Ø26.5 19 G 3/4" G3/4" flush (DIN 3852) with ISO 4400





Ordering code LMK 331 LMK 331 Pressure gauge in bar 4 6 0 gauge in mH₂O 4 6 1 mH₂O] 0 0 0 4.0 0.40 0 0 0 0 0 0 0 0 0 0 1 6 0 0 1 1 0 0 0 1 0 0 0 2 6 0 0 2 5 0 0 0 2 0 9 9 9 9 0.60 6 6.0 10 1.0 16 1.6 25 2.5 40 4.0 60 6.0 100 10 160 16 250 25 4 400 40 60 ¹ 600 customer consult 4 ... 20 mA / 2-wire 1 0 ... 20 mA / 3-wire 2 0 ... 10 V / 3-wire Intrinsic safety 4 ... 20 mA / 2-wire ² 3 F SIL2 4 ... 20 mA / 2-wire 1S SIL2 with Intrinsic safety ² ES 4 ... 20 mA / 2-wire customer 9 consult Accuracy customer consult Male and female plug ISO 4400 0 0 Male plug Binder series 723 (5-pin) 0 0 Cable outlet with PVC cable 3 A 0 R 0 Т Cable outlet Т 0 Male plug M12x1 (4-pin) / metal Μ 1 0 compact field housing 5 8 0 stainless steel 1.4305 9 9 9 customer consult Mechanical connection G3/4" DIN 3852 with 0 0 Κ flush sensor customer 9 9 9 consult FKM EPDM customer consult Pressure port Stainless steel 1.4404 (316L) 1 for P_N ≤ 25 bar customer 9 consult Diaphragm Ceramics Al₂O₃ 96% customer consult Special version standard 0 0 0 customer 9 9 9 consult

con

the right to

We

of publishing.

time

the

state of

only possible for pressure port of stainless steel

² Ex-protection not possible with plastic pressure port
3 standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)
4 cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable
5 min. permissible temperature -30 °C