

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 impuritized 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)



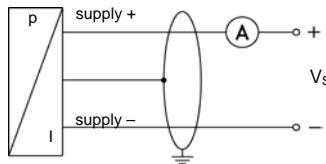
Medical Technology



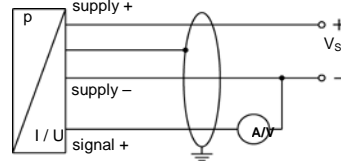
Input pressure range													
Nominal pressure gauge	[bar]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40 ¹	60 ¹
Level	[mH ₂ O]	4	6	10	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	1	2	2	4	4	10	20	20	40	40	100	200
Burst pressure	[bar]	2	4	4	5	7,5	12	25	30	50	50	120	250
Vacuum resistance	[bar]	P _N ≥ 1 bar: unlimited vacuum resistance P _N < 1 bar: on request											
¹ only possible with stainless steel pressure port													
Output signal / Supply													
Standard		2-wire: 4 ... 20 mA / V _S = 8 ... 32 V _{DC}											
Option IS-protection ²		2-wire: 4 ... 20 mA / V _S = 10 ... 28 V _{DC}											
Optionen 3-wire		3-wire: 0 ... 20 mA / V _S = 14 ... 30 V _{DC} 0 ... 10 V / V _S = 14 ... 30 V _{DC}											
² IS-protection not possible with plastic pressure port													
Performance													
Accuracy ³		≤ ± 0.5 % FSO											
Permissible load		current 2-wire: R _{max} = [(V _S – V _{S min}) / 0.02 A] Ω current 3-wire: R _{max} = 500 Ω voltage 3-wire: R _{min} = 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											
Long term stability		≤ ± 0,3 % FSO / year at reference conditions											
³ 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													
Pressure port / housing		standard:	pressure port				housing						
		options for P _N ≤ 25 bar:	stainless steel 1.4404 (316L)				stainless steel 1.4404 (316L)						
			PVDF				PVDF						
Option compact field housing		stainless steel 1.4305 with cable gland brass nickel plated others on request											
Seals		standard:	FKM										
		options:	EPDM, NBR, others on request										
Diaphragm		ceramics Al ₂ O ₃ 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 / IECEx IBE 12.0027X 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 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 _{atm} 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. 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		94/4/EG											

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

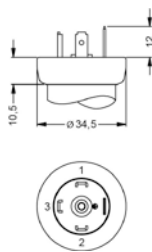


Pin configuration

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)

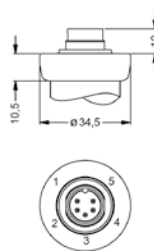
Electrical connections (dimensions in mm)

standard

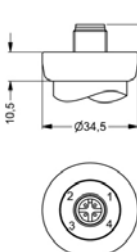


ISO 4400 (IP 65)

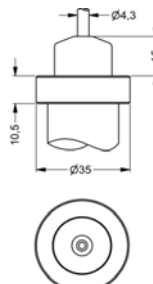
option



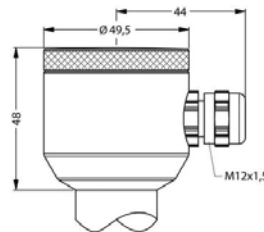
Binder Series 723 5-pin (IP 67)



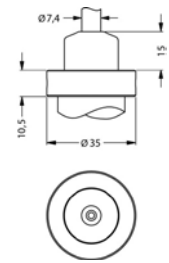
M12x1 4-pin (IP 67)



cable outlet with PVC cable (IP 67) ⁴



compact field housing (IP 67)



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

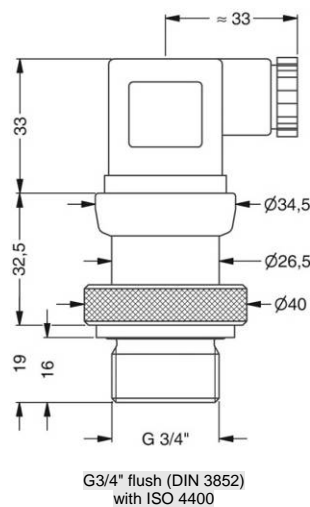
⇒ universal stainless steel housing 1.4404 with cable gland M20x1.5 (ordering code 880) and other versions on request

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

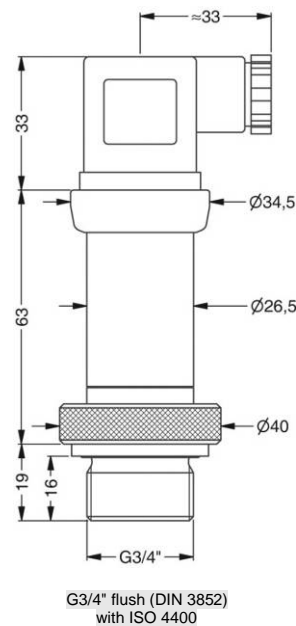
⁵ different cable types and length available, permissible temperature depends on kind of cable

Mechanical connection (dimensions in mm)

standard



standard for SIL- and SIL-Ex-version



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 ₂ O		4	6	1														
Input	[mH ₂ 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 ¹				4	0	0	2										
	600	60 ¹				6	0	0	2										
	customer					9	9	9	9										consult
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 cable ³								T	A	0								
	Cable outlet with cable								T	R	0								
	Male plug M12x1 (4-pin) / metal compact field housing stainless steel 1.4305								M	1	0								
	customer								9	9	9								consult
Mechanical connection																			
	G3/4" DIN 3852 with flush sensor									K	0	0							
	customer									9	9	9							consult
Seals																			
	FKM											1							
	NBR											5							
	EPDM											3							
	customer											9							consult
Pressure port																			
	Stainless steel 1.4404 (316L)											1							
for P _N ≤ 25 bar	PVDF ⁴											B							
	customer											9							consult
Diaphragm																			
	Ceramics Al ₂ O ₃ 96%												2						
	customer												9						consult
Special version																			
	standard															0	0	0	
	customer															9	9	9	consult

¹ 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 min. permissible temperature -30 °C