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

BD SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein

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

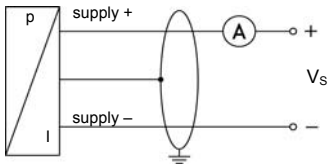
www.bdsensors.com
info@bdsensors.de

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_2O]	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]	$P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request											
[1] *only possible with stainless steel pressure port*													

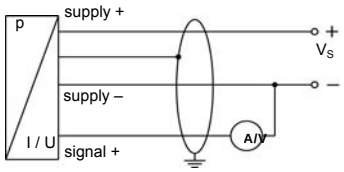
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 8 ... 32 V_{DC}	SIL-version: V_S = 14 … 28 V_{DC}
Option IS-protection [2]	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}	SIL-version: V_S = 14 … 28 V_{DC}
Optionen 3-wire	3-wire: 0 ... 20 mA / V_S = 14 ... 30 V_{DC} 0 ... 10 V / V_S = 14 ... 30 V_{DC}	
[2] *IS-protection not possible with plastic pressure port*		
Performance		
Accuracy [3]	≤ ± 0.5 % FSO	
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ current 3-wire: $R_{max} = 500\ \Omega$ voltage 3-wire: $R_{min} = 10\ k\Omega$	
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	
[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		pressure port / housing
	standard:	stainless steel 1.4404 (316L) / stainless steel 1.4404 (316L)
	options for $P_N \leq 25$ bar:	PVDF / PVDF
Option compact field housing	stainless steel 1.4305 with cable gland brass nickel plated others on request	
Seals	standard: FKM options: EPDM others on request	
Diaphragm	ceramics Al_2O_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, $C_i \approx 0$ nF, $L_i \approx 0$ 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: 2014/30/EU	
ATEX Directive	2014/34/EU	

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

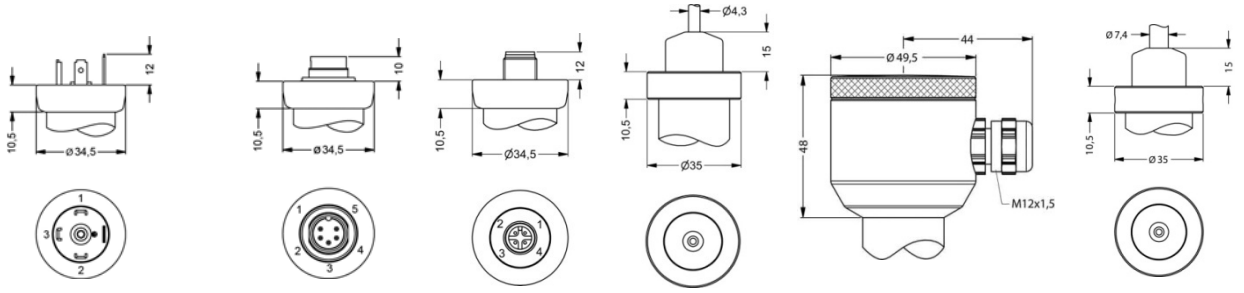


Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	cable colours (IEC 60757)
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)

standard **option**



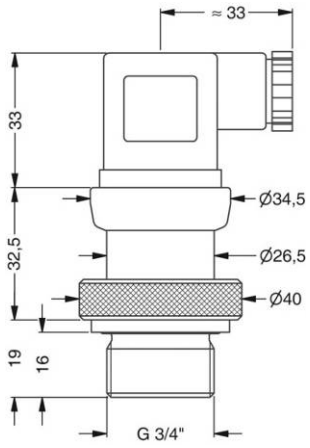
ISO 4400 (IP 65) | Binder Series 723 5-pin (IP 67) | M12x1 4-pin (IP 67) | cable outlet with PVC cable (IP 67) [4] | compact field housing (IP 67) | cable outlet, cable with ventilation tube (IP 68)[5]

⇨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*

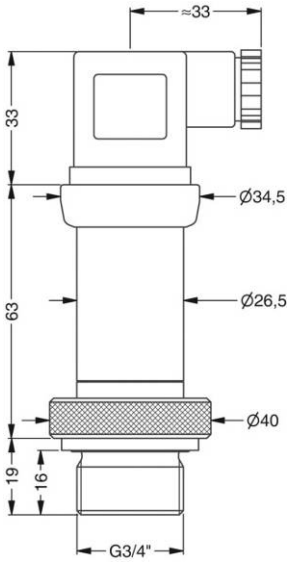
Mechanical connection (dimensions in mm)

standard



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

standard for SIL- and SIL-Ex-version



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

Tel +49 (0) 92 35 / 98 11- 0
Fax +49 (0) 92 35 / 98 11- 11
www.bdsensors.com
info@bdsensors.de
BD|SENSORS pressure measurement

Ordering code LMK 331

LMK 331 ☐☐☐-☐☐☐☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

		Code	
Pressure			
gauge in bar		4 6 0	
gauge in mH_2O		4 6 1	
Input [mH_2O]	[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 [2] 4 … 20 mA / 2-wire		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 [4]		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	consult
Mechanical connection			
G3/4" DIN 3852 with flush sensor		K 0 0	
customer		9 9 9	consult
Seals			
FKM		1	
EPDM		3	
customer		9	consult
Pressure port			
Stainless steel 1.4404 (316L)		1	
for $P_N \leq 25$ bar	PVDF [5]	B	
customer		9	consult
Diaphragm			
Ceramics Al_2O_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] cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable
[5] min. permissible temperature -30 °C

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D - 95199 Thierstein

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Fax +49 (0) 9235 / 98 11 - 11

www.bdsensors.de
www.bdsensors.com
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