

IMK 331



Industrial Pressure Transmitter

Ceramic Sensor

accuracy according to IEC 60770:
0.5 % FSO

Nominal pressure

from 0 ... 400 mbar up to 0 ... 600 bar

Output signals

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- ▶ pressure port G 1/2" flush for pasty and polluted media
- ▶ pressure port G 1/2" open port PVDF for aggressive media
- ▶ oxygen application





Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2
according to IEC 61508 / IEC 61511
- ▶ customer specific versions

The industrial pressure transmitter IMK 331 with ceramic sensor has been especially designed for pasty, polluted or aggressive media and for oxygen applications at low pressure range.

As with all industrial pressure transmitters you may choose between various electrical and mechanical connections also on IMK 331.

Preferred areas of use are

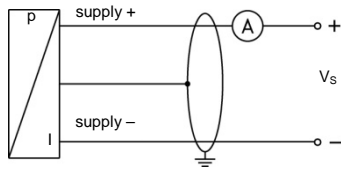
-  Plant and Machine Engineering
-  Energy Industry
-  Environmental Engineering
(water - sewage - recycling)
-  Medical Technology



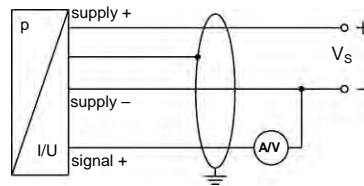
Input pressure range ¹																		
Nominal pressure gauge [bar]	-1...0	0.4	0.6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600 ²
Nominal pressure abs. [bar]	-	-	0.6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600 ²
Overpressure [bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	400	600	800
Burst pressure ≥ [bar]	7	2	4	4	5	5	12	12	25	50	50	120	120	250	500	500	650	880
Vacuum resistance	P _N ≥ 1 bar: unlimited vacuum resistance										P _N < 1 bar: on request							
¹ PVDF pressure port possible for nominal pressure ranges up to 60 bar																		
² nominal pressure 600 bar without UL certification																		
Output signal / Supply																		
Standard	2-wire: 4 ... 20 mA / V _S = 8 ... 32 V _{DC}																	
Option IS-protection	2-wire: 4 ... 20 mA / V _S = 10 ... 28 V _{DC}																	
Options 3-wire	3-wire: 0 ... 20 mA / V _S = 14 ... 30 V _{DC} 0 ... 10 V / V _S = 14 ... 30 V _{DC}																	
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								
Long term stability	≤ ± 0.3 % FSO / year at reference conditions																	
Response time	2-wire: ≤ 10 msec									3-wire: ≤ 3 msec								
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 ⁴	medium: -40 ... 125 °C						electronics / environment: -40 ... 85 °C						storage: -40 ... 100 °C					
⁴ for pressure port of PVDF the minimum temperature is -30 °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	standard: stainless steel 1.4404 (316 L) optional for G1/2" open port with nominal pressure range up to 60 bar: PVDF others on request																	
Housing	stainless steel 1.4404 (316 L)																	
Option compact field housing	stainless steel 1.4305 (303) with cable gland brass, nickel plated												others on request					
Seals (media wetted)	standard: FKM						options: EPDM (for P _N ≤ 160 bar), NBR						others on request					
Diaphragm	ceramic Al ₂ O ₃ 96 %																	
Media wetted parts	pressure port, seals, diaphragm																	
Explosion protection (only for 4 ... 20 mA / 2-wire)																		
Approval DX19-DMK 331	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X stainless steel pressure port: zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da plastic pressure port: zone 1: II 2G Ex ia IIC T4 Gb zone 21: II 2D Ex ia IIIC T 85°C Db																	
Safety technical maximum values	U _i = 28 V _{DC} , 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																	
Ambient temperature range	in zone 0: -20 ... 60 °C with p _{atm} 0.8 bar up to 1.1 bar in zone 1 or higher: -20 ... 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 ⁵ 2	according to IEC 61508 / IEC 61511																	
Option oxygen application	for P _N ≤ 15 bar: O-ring in 70 EPDM 281 (with BAM-approval); permissible maximum values are 15 bar / 60° C and 10 bar / 90° C for P _N ≤ 25 bar: O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C																	
Current consumption	signal output current: max. 25 mA									signal output voltage: max. 7 mA								
Weight	approx. 140 g																	
Installation position	any																	
Operational life	> 100 x 10 ⁶ pressure cycles																	
CE-conformity	EMC Directive: 2004/108/EC									Pressure Equipment Directive: 97/23/EC (module A) ⁶								
ATEX Directive	94/4/EG																	
⁵ only for 4 ... 20 mA / 2-wire																		
⁶ This directive is only valid for devices with maximum permissible overpressure > 200 bar																		

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

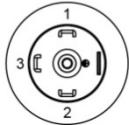
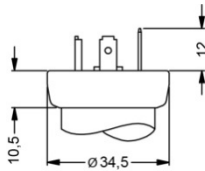


Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (DIN 47100)
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	⏏	ye/gn (yellow / green)

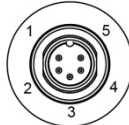
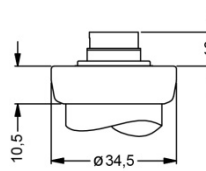
Electrical connections (dimensions in mm)

standard

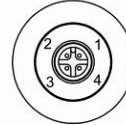
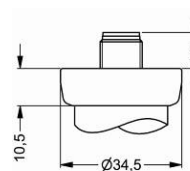


ISO 4400 (IP 65)

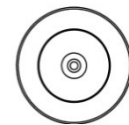
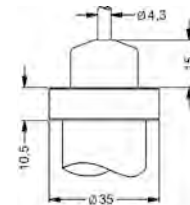
option



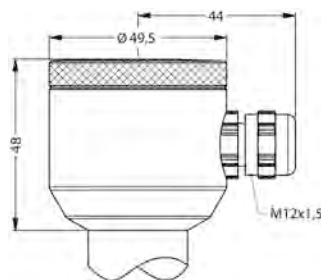
Binder Series 723 5-pin (IP 67)



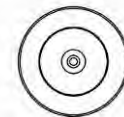
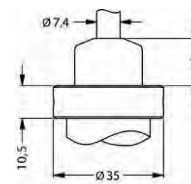
M12x1 4-pin (IP 67)



cable outlet with PVC cable (IP 67)⁷



compact field housing (IP 67)



cable outlet, cable with ventilation tube (IP 68)⁸

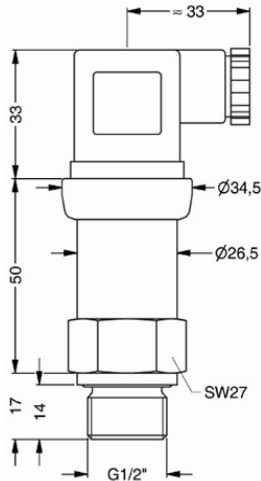
⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request

⁷ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

⁸ different cable types and lengths available, permissible temperature depends on kind of cable

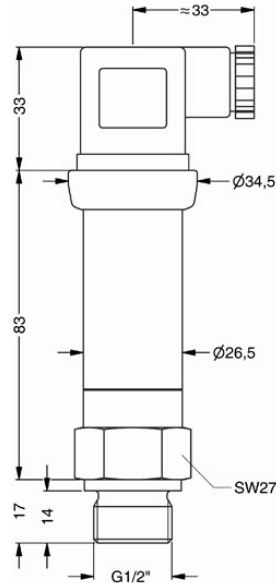
Mechanical connection (dimensions in mm)

standard



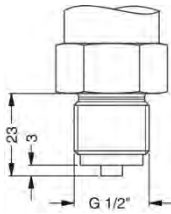
G1/2" DIN 3852
with ISO 4400

standard for SIL- and SIL-IS-version

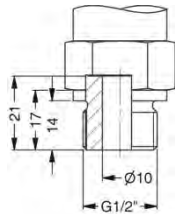


G1/2" DIN 3852
with ISO 4400

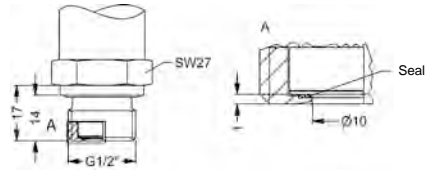
option



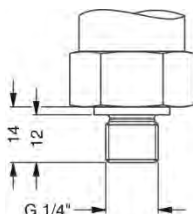
G1/2" EN 837



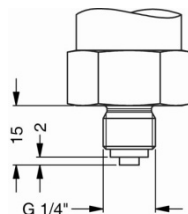
G1/2" open port



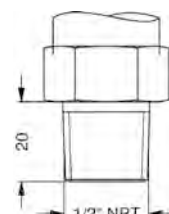
G1/2" semi-flush DIN 3852; M20x1.5⁹



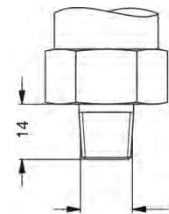
G1/4" DIN 3852



G1/4" EN 837



1/2" NPT



1/4" NPT

⇒ **metric threads and other versions on request**

⁹ possible for nominal pressure ranges $P_N \leq 25$ bar; absolute pressure ranges on request

Ordering code IMK 331

IMK 331

- - - - - - - -

Pressure									
gauge	2	5	0						
absolute	2	5	1						
Input [bar]									
0.40	4	0	0	0					
0.60	6	0	0	0					
1.0	1	0	0	1					
1.6	1	6	0	1					
2.5	2	5	0	1					
4.0	4	0	0	1					
6.0	6	0	0	1					
10	1	0	0	2					
16	1	6	0	2					
25	2	5	0	2					
40	4	0	0	2					
60	6	0	0	2					
100	1	0	0	3					
160	1	6	0	3					
250	2	5	0	3					
400	4	0	0	3					
600	6	0	0	3					
-1 ... 0	X	1	0	2					
customer	9	9	9	9					consult
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					E				
SIL2 4 ... 20 mA / 2-wire					1S				
SIL2 with Intrinsic safety 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 ¹					T	A	0		
Cable outlet with cable					T	R	0		
Male plug M12x1 (4-pin) / metal compact field housing stainless steel 1.4404 (316L)					8	5	0		
customer	9	9	9						consult
Mechanical connection									
G1/2" DIN 3852					1	0	0		
G1/2" EN 837					2	0	0		
G1/4" DIN 3852					3	0	0		
G1/4" EN 837					4	0	0		
G1/2" DIN 3852 with ³ semi-flush sensor					F	0	0		
G1/2" DIN 3852 open pressure port					H	0	0		
1/2" NPT					N	0	0		
1/4" NPT					N	4	0		
customer	9	9	9						consult
Seals									
FKM					1				
EPDM ⁴					3				
NBR					5				
customer	9								consult
Pressure port									
Stainless steel 1.4404 (316L)							1		
PVDF ⁵							B		
customer	9								consult
Diaphragm									
Ceramics Al ₂ O ₃ 96%							2		
customer	9								consult
Special version									
standard							0	0	0
oxygen application ⁶							0	0	7
customer	9	9	9						consult

¹ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

² metric threads and others on request

³ possible for nominal pressure ranges $P_N \leq 25$ bar; absolute pressure ranges on request

⁴ possible for nominal pressure range $P_N \leq 160$ bar

⁵ PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar), minimum permissible temperature is -30 °C

⁶ oxygen application with FKM-seal up to 25 bar and with EPDM-seal up to 15 bar possible