DMK 331P

Industrial Pressure Transmitter

Pressure Ports with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 61298-2:
0.5 % FSO

Nominal pressure

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

Output signals

2-wire: 4 ... 20 mA
3-wire: 0 … 20 mA / 0 … 10 V
others on request

Special characteristics

- suited for viscous and pasty media

Optional versions

- IS-version
  Ex ia = intrinsically safe for gases and dusts
- SIL 2
  according to IEC 61508 / IEC 61511
- food compatible filling fluid with FDA approval
- cooling element for media temperatures up to 300 °C
- customer specific versions

The pressure transmitter DMK 331P is suitable for measuring the pressure of viscous and pasty media, where a totally flush pressure port is required.

As on all industrial pressure transmitters available at Omni Instruments Ltd, you may choose between various electrical and mechanical connections also on DMK 331P.

Preferred areas of use are

- Plant and machine engineering
- Food industry

Preferred used for

- Viscous and pasty media

For pricing or any further information, please contact Omni Instruments Ltd.

Measurement and data acquisition solutions

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Input pressure range					
Nominal pressure gauge/abs. [bar]	60	100	160	250	400
Overpressure [bar]	100	200	400	400	600
Burst pressure ≥ [bar]	180	300	500	750	1000

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-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}	SIL-version: V_S = 14 … 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 [1]	≤ ± 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 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

[1] accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (offset and span) [2]	
Thermal error	≤ ± 0.2 % FSO / 10 K
In compensated range	0 ... 85°C

[2] an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

Permissible temperatures		
Filling fluid	silicone oil	food compatible oil
Medium [3]	-40 ... 125 °C	-10 ... 125 °C
Medium with cooling element [4]	overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C	overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C
Electronics / environment	-40 ... 85 °C	
Storage	-40 ... 100 °C	

[3] max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C
[4] max. temperature depends on the used sealing material, type of seal and installation

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	20 g RMS / 10 … 2000 Hz according to DIN EN 60068-2-6 10 g RMS / 10 ... 2000 Hz according to DIN EN 60068-2-6 (with cooling element)
Shock	500 g / 1 msec half sine according to DIN EN 60068-2-27

Filling fluids	
Standard	silicone oil
Options	food compatible oil (with FDA approval) (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request

Materials	
Pressure port / housing	stainless steel 1.4404 (316 L)
Option compact field housing	stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 … 8 mm)
Seals	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM [5] (recommended for medium temperatures < 260 °C) others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

[5] for pressure ranges p_N ≤ 100 bar

Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX19-DMK 331P	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_{atm} 0.8 bar up to 1.1 bar in zone 1 or higher: -40/-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: 1µH/m

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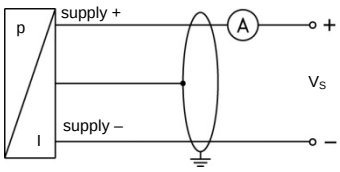
Miscellaneous		
Option SIL 2 version [6]	according to IEC 61508 / IEC 61511	
Current consumption	signal output current: max. 25 mA	signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)	
Installation position	any (standard calibration in a vertical position with the pressure port connection down)	
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) [7]
ATEX Directive	2014/34/EU	

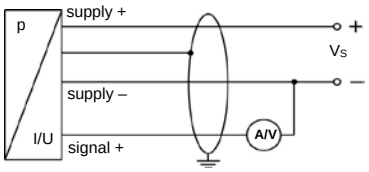
[6] *only for 4 … 20 mA / 2-wire*
[7] *this directive is only valid for devices with maximum permissible overpressure > 200 bar*

Wiring diagrams

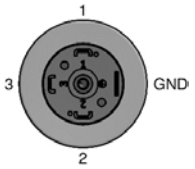
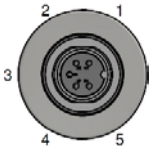
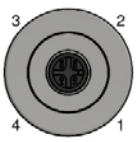
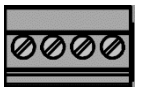
2-wire-system (current)



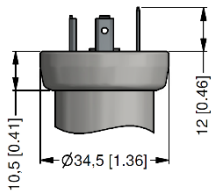
3-wire-system (current / voltage)



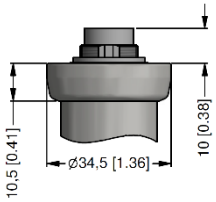
Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	compact field housing	cable colours (IEC 60757)
					
supply +	1	3	1	V_S+	WH (white)
supply –	2	4	2	V_S-	BN (brown)
signal + (only 3-wire)	3	1	3	S+	GN (green)
Shield	ground pin ⏚	5	4	GND	GNYE (green-yellow)

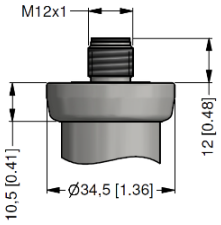
Electrical connections (dimensions mm / in)



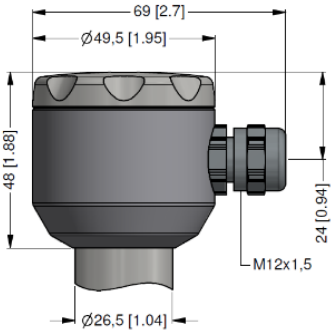
ISO 4400
(IP 65)



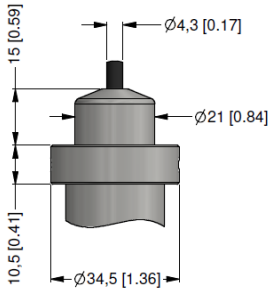
Binder series 723, 5-pin
(IP 67)



M12x1, 4-pin
(IP 67)



compact field housing
(IP 67)



cable outlet
with PVC-cable (IP 67) [8]

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

[8] *standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)*

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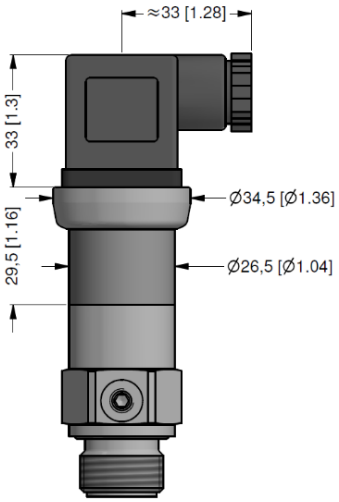
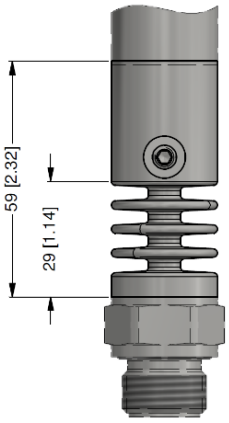
Dimensions (mm / in)



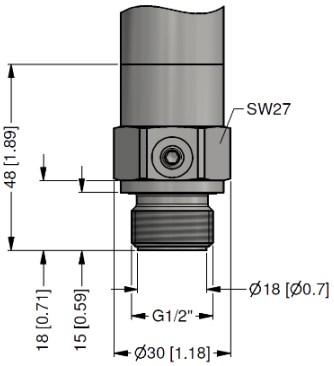
cooling element up to 300 °C [4] (optionally)



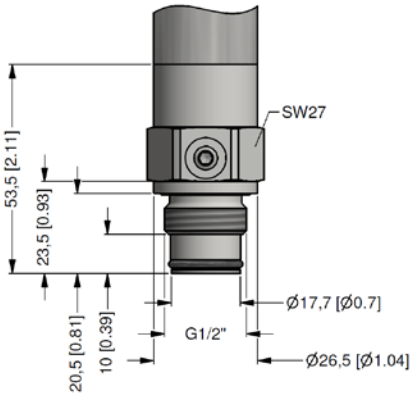
possible for $p_N \leq 160$ bar

[4] *max. temperature depends on the used sealing material, type of seal and installation*

Mechanical connections (dimensions mm / in)



G1/2" flush DIN 3852



G1/2" flush with radial o-ring [9]

⇨ SIL- and SIL-Ex version: total length increases by 26.5 mm!
⇨ metric threads and other versions on request

[9] *not possible in combination with cooling element*

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Ordering code DMK 331P

DMK 331P ☐☐☐-☐☐☐☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

Option	Code	
Pressure		
gauge	5 0 5	
absolute	5 0 6	
Input [bar]		
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	
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 % FSO	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 (IP67) [1]	T A 0	
male plug M12x1 (4-pin) / metal	M 1 0	
compact field housing stainless steel1.4301 (304)	8 5 0	
customer	9 9 9	consult
Mechanical connection		
G1/2" DIN 3852 with flush diaphragm	Z 0 0	
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm [2]	Z 6 1	
customer	9 9 9	consult
Diaphragm		
stainless steel 1.4435 (316L)	1	
customer	9	consult
Seal		
FKM	1	
FFKM [3]	7	
customer	9	consult
Filling fluid		
silicone oil	1	
food compatible oil	2	
customer	9	consult
Special version		
standard	0 0 0	
with cooling element up to 300°C [4]	2 0 0	
customer	9 9 9	consult

[1] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request
[2] not possible in combination with cooling element
[3] only for $p_N \leq 100$ bar possible
[4] only for $p_N \leq 160$ bar possible

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