



Option: PVDF

DMK 331

Industrial Pressure Transmitter for Aggressive Media

- ▶ ceramic sensor
- ▶ accuracy:
0.25 % FSO BFSL
(0.5 % FSO IEC 60770)
- ▶ nominal pressure ranges
from 0 ... 0.6 bar
up to 0 ... 600 bar

The DMK 331 is a pressure transmitter for universal applications in the industry as well as for especially viscous, pasty or highly contaminated media.

Basic element is a mechanical and chemical robust ceramic sensor.

A variety of standard output signals as well as mechanical and electrical connections make the DMK 331 covering a wide field of applications. The customer has the possibility to use by highly contaminated media a semi-flush ceramic sensor with pressure port G 1/2". The version with PVDF pressure port is used for many aggressive media. The DMK 331 is suited for explosive area (zone 0).

Preferred areas of use are:

- ▶ medical technology
- ▶ environmental technology
- ▶ galvanic coating
- ▶ chemical and pharmaceutical industries
- ▶ oxygen applications

- ▶ small thermal effect
- ▶ good long term stability
- ▶ option Ex version:
(only for 4 ... 20 mA / 2-wire)
TÜV 03 ATEX 2006 X
- ▶ option: oxygen application
- ▶ customer specific versions:
 - special pressure ranges
 - variety of electrical and mechanical connections
 - other versions on request

Characteristics

**DMK 331**
Industrial Pressure Transmitter

| Input pressure range ¹ | | | | | | | | | | | | | | | | | |
|-----------------------------------|--------|-----|---|-----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| Nominal pressure gauge [bar] | -1...0 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Nominal pressure abs. [bar] | - | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Permissible overpressure [bar] | 3 | 3 | 3 | 7 | 7 | 12 | 12 | 25 | 50 | 50 | 120 | 120 | 250 | 500 | 500 | 600 | 750 |

| Output signal / Supply | |
|------------------------|---|
| Standard | 2-wire: 4 ... 20 mA / $V_S = 12 \dots 36 V_{DC}$ Ex-protection: $V_S = 14 \dots 28 V_{DC}$ |
| Optional | 3-wire: 0 ... 20 mA / $V_S = 14 \dots 36 V_{DC}$ 0 ... 10 V / $V_S = 14 \dots 36 V_{DC}$ |

| Performance | |
|-------------------|--|
| Accuracy | IEC 60770 ² : $\leq \pm 0.5 \% \text{ FSO}$ BFSL: $\leq \pm 0.25 \% \text{ FSO}$ |
| Permissible load | current 2-wire: $R_{max} = [(V_S - V_{Smin}) / 0.02] \Omega$ current 3-wire: $R_{max} = 500 \Omega$ voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$ |
| Influence effects | supply: 0.05 % FSO / 10 V load: 0.05 % FSO / $\text{k}\Omega$ |
| Response time | < 10 msec |

| Thermal effects | |
|--|---|
| Thermal error for offset and span in compensated range | $\leq \pm 0.2 \% \text{ FSO} / 10 \text{ K}$ -25 ... 85 °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 |
| Option Ex-protection only with 4 ... 20 mA / 2-wire DX13-DMK 331 | stainless steel pressure port: zone 0 ³ : II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C plastic pressure port: zone 1: II 2 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: $V_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C_i \leq 1 \text{ nF}$, $L_i \leq 10 \mu\text{H}$ |

| Mechanical stability | |
|----------------------|---------------------------|
| Vibration | 10 g RMS (20 ... 2000 Hz) |
| Shock | 100 g / 11 ms |

| Permissible temperatures | |
|---------------------------|--|
| Medium | -25 ... 135 °C |
| Electronics / environment | -25 ... 85 °C Ex-protection: application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C |
| Storage | -40 ... 100 °C |

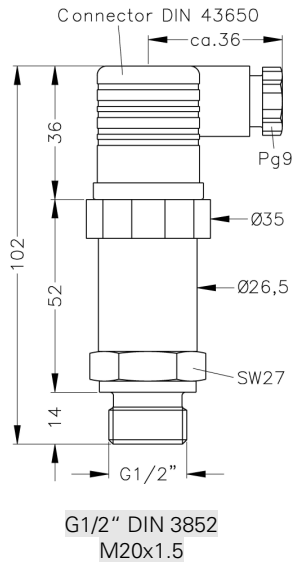
¹ PVDF pressure port possible for nominal pressure ranges up to 60 bar

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

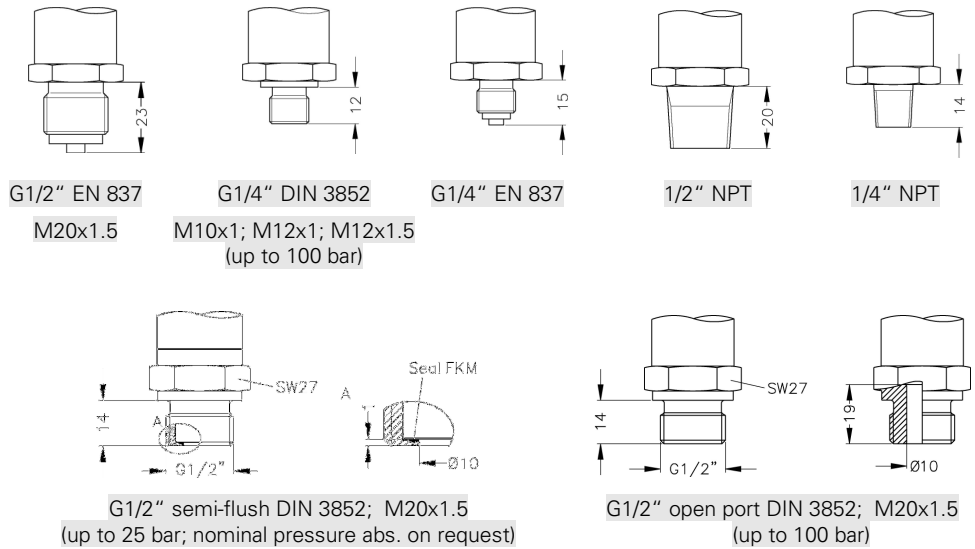
³ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

Mechanical connection

Standard



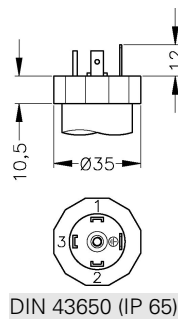
Optional



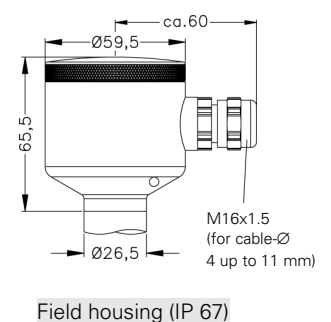
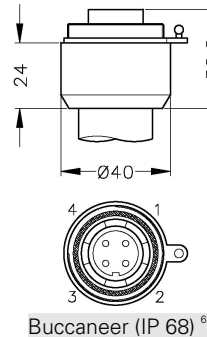
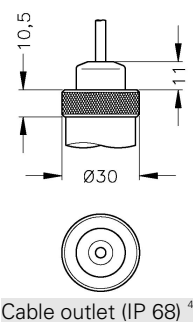
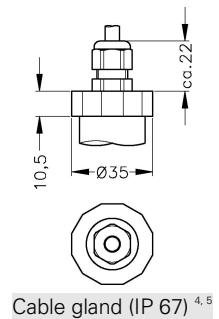
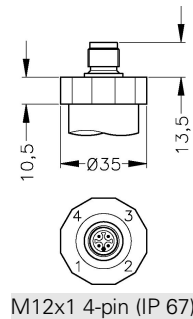
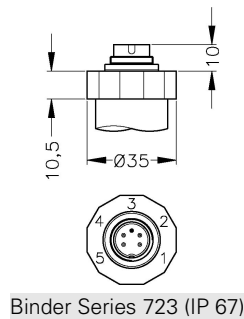
⇒ Ex-protection: total length increases by 10 mm!

Electrical connection

Standard



Optional



⁴ different cable types and lengths available

⁵ standard: 2m PVC cable without ventilation tube, optionally cable with ventilation tube

⁶ for gauge pressure up to 40 bar cable with ventilation tube required

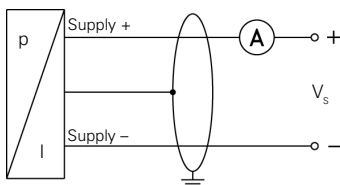
| Materials | |
|----------------------|---|
| Pressure port | standard: stainless steel 1.4571 (316 Ti) optional for G1/2" open port with nominal pressure range up to 60 bar: PVDF others on request |
| Housing | standard: stainless steel 1.4301 (304) field housing: stainless steel 1.4305 (303), cable gland: brass, nickel plated |
| Seals (media wetted) | $P_N < 100$ bar: FKM / $P_N \geq 100$ bar: NBR / others on request |
| Diaphragm | ceramic Al_2O_3 96 % |
| Media wetted parts | pressure port, seals, diaphragm |

| Miscellaneous | |
|--|--|
| Optionally up to 160 bar: oxygen application | for $P_N \leq 50$ bar: O-ring in V747-75 (with BAM-approval); permissible maximum values are 40 bar / 130° C and 50 bar / 100° C for $P_N > 50$ bar: O-ring in FKM 90 (approved by the scientific coal research institute in Ostrava – CZ up to max. 95 °C and 215 bar) |
| Cable capacitance ⁷ | cable without air tube: signal line/shield: 160 pF/m cable with air tube: signal line/shield: 150 pF/m signal line/signal line: 120 pF/m signal line/signal line: 100 pF/m |
| Cable inductance ⁷ | cable without air tube: signal line/shield: 0.65 µH/m cable with air tube: signal line/shield: 1.0 µH/m signal line/signal line: 0.65 µH/m signal line/signal line: 1.0 µH/m |
| 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 cycles |

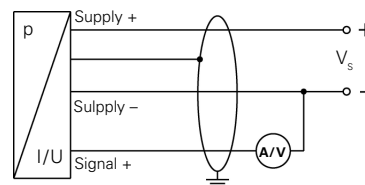
| Pin configuration | | DIN 43650 | Binder 723 (5-pin) | M12x1 (4-pin) | Buccaneer (4-pin) | cable colours ⁷ (DIN 47100) |
|-------------------|----------|------------|--------------------|---------------|-------------------|--|
| 2-wire-system | Supply + | 1 | 3 | 1 | 1 | white |
| | Supply - | 2 | 4 | 2 | 2 | brown |
| | Ground | ground pin | 5 | 4 | 4 | yellow / green (shield) |
| 3-wire-system | Supply + | 1 | 3 | 1 | 1 | white |
| | Supply - | 2 | 4 | 2 | 2 | brown |
| | Signal + | 3 | 1 | 3 | 3 | green |
| | Ground | ground pin | 5 | 4 | 4 | yellow / green (shield) |

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)



⁷ if the electrical connection is a mounted cable by factory

Ordering Code DMK 331

DMK 331

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| | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|
| Pressure | | | | | | | | | | | |
| gauge | 2 | 5 | 0 | | | | | | | | |
| absolute | 2 | 5 | 1 | | | | | | | | |
| Input [bar] | | | | | | | | | | | |
| 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 | | | | |
| 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 | | | |
| customer | | | | | | | | 9 | | | |
| Accuracy | | | | | | | | | | | |
| 0,5 % | | | | | | | | 5 | | | |
| customer | | | | | | | | 9 | | | |
| Electrical connection | | | | | | | | | | | |
| Male and female plug DIN 43650 | | | | | | | | 1 | 0 | 0 | |
| Binder series 723 (5-pin) | | | | | | | | 2 | 0 | 0 | |
| Cable gland incl. cable ^{1,2} | | | | | | | | 4 | 0 | 0 | |
| Cable outlet ¹ | | | | | | | | T | R | 0 | |
| Male plug Buccaneer IP68 ³ | | | | | | | | 5 | 0 | 0 | |
| M12x1 (4-pin) | | | | | | | | M | 0 | 0 | |
| Field housing stainless steel | | | | | | | | 8 | 0 | 0 | |
| customer | | | | | | | | 9 | 9 | 9 | |
| 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 ⁴ | | | | | | | | F | 0 | 0 | |
| semi-flush sensor | | | | | | | | | | | |
| G1/2" DIN 3852 open pressure port ⁵ | | | | | | | | H | 0 | 0 | |
| 1/2" NPT | | | | | | | | N | 0 | 0 | |
| 1/4" NPT | | | | | | | | N | 4 | 0 | |
| customer | | | | | | | | 9 | 9 | 9 | |
| Seals | | | | | | | | | | | |
| for P _N < 100 bar | | | | | | | | | 1 | | |
| for P _N ≥ 100 bar | | | | | | | | | 5 | | |
| customer | | | | | | | | | 9 | | |
| Pressure port | | | | | | | | | | | |
| Stainless steel 1.4571 (316Ti) | | | | | | | | | 1 | | |
| PVDF ⁶ | | | | | | | | | B | | |
| customer | | | | | | | | | 9 | | |
| Diaphragm | | | | | | | | | | | |
| Ceramics Al ₂ O ₃ 96% | | | | | | | | | 2 | | |
| customer | | | | | | | | | 9 | | |
| Special version | | | | | | | | | | | |
| standard | | | | | | | | | 0 | 0 | 0 |
| oxygen application ⁷ | | | | | | | | | 0 | 0 | 7 |
| customer | | | | | | | | | 9 | 9 | 9 |

¹ different cable types and lengths deliverable
² standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
³ for gauge pressure up to 40 bar cable with ventilation tube required
⁴ semi-flush diaphragm only up to 25 bar; nominal pressure abs. on request
⁵ open port possible up to 100 bar
⁶ PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar)
⁷ oxygen application possible up to 160 bar

