



# DM 200

## Digital Pressure Gauge

- ▶ piezoresistive stainless steel sensor
- ▶ optional:
  - analogue output
  - Ex-protection (for 2-wire)
  - flush diaphragm
- ▶ nominal pressure range  
from 0 ... 100 mbar  
up to 0 ... 600 bar

### Description

The digital pressure gauge is suitable for universal usage. Permissible media are gases or liquids, compatible with the media wetted parts; with flush diaphragm clean fluids and viscous or pasty media are possible.

### Operation

The rotatable display module shows the system pressure and allows programming. The device can be operated menu-driven via two push buttons. Beside the possibility to configure the display parameters (decimal point position, damping, etc.) the measured minimum and maximum values can be indicated. Furthermore, an access protection can be activated in the menu system.

### Applications

- ▶ pneumatics / hydraulics
- ▶ machine and plant engineering
- ▶ test benches
- ▶ environmental engineering

- ▶ option analogue output:
  - 4 ... 20 mA / 2-wire
  - 4 ... 20 mA / 3-wire  
**with turn-down 1:5**
  - 0 ... 10 V / 3-wire
- ▶ indication of measured values on a 4-digit LED display
- ▶ rugged, rotatable plastic housing
- ▶ easy configuration via two push buttons
- ▶ ingress protection IP 65
- ▶ variety of mechanical connections
- ▶ industrial standard in view of accuracy, thermal behaviour and long term stability

Characteristics



**DM 200**  
Digital Pressure Gauge

# DM 200

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## Technical Data

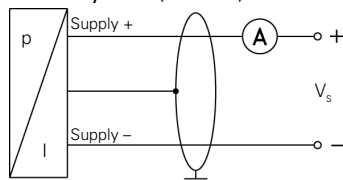
| Input pressure range <sup>1</sup>                                                                                            |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|------|-----|---------|----|-----|------------------------|----|----|-----------------|-----|------|----------|--|
| Nominal pressure gauge / abs. [bar]                                                                                          | -1 ... 0                                                                                                                                                                                                                  | 0.1 | 0.16     | 0.25 | 0.4 | 0.6     | 1  | 1.6 | 2.5                    | 4  | 6  | 10              | 16  | 25   | 40       |  |
| Level gauge [mWC]                                                                                                            | -                                                                                                                                                                                                                         | 1   | 1.6      | 2.5  | 4   | 6       | 10 | 16  | 25                     | 40 | 60 | 100             | 160 | 250  | 400      |  |
| Permissible overpressure [bar]                                                                                               | 3                                                                                                                                                                                                                         | 1   | 1        | 1    | 1   | 3       | 3  | 6   | 6                      | 20 | 20 | 60              | 60  | 60   | 100      |  |
| Nominal pressure gauge / abs. [bar]                                                                                          | 60                                                                                                                                                                                                                        |     | 100      |      |     | 160     |    |     | 250                    |    |    | 400             |     | 600  |          |  |
| Permissible overpressure [bar]                                                                                               | 140                                                                                                                                                                                                                       |     | 340      |      |     | 340     |    |     | 600                    |    |    | 600             |     | 1000 |          |  |
| <sup>1</sup> nominal pressure range abs. from 0.1 bar; measurement for pressure ranges ≥ 60 bar starts with ambient pressure |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Analogue output (optionally) / Supply                                                                                        |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| 2-wire current signal                                                                                                        | 4 ... 20 mA / V <sub>S</sub> = 18 ... 41 V <sub>DC</sub><br>permissible load: R <sub>max</sub> = [(V <sub>S</sub> – V <sub>Smin</sub> ) / 0.02] Ω<br>response time: < 5 ms                                                |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| 2-wire current signal with Ex-protection                                                                                     | 4 ... 20 mA / V <sub>S</sub> = 17 ... 28 V <sub>DC</sub><br>permissible load: R <sub>max</sub> = [(V <sub>S</sub> – V <sub>Smin</sub> ) / 0.02] Ω<br>response time: < 5 ms                                                |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| 3-wire current signal                                                                                                        | 4 ... 20 mA / V <sub>S</sub> = 19 ... 30 V <sub>DC</sub> adjustable (turn-down of span 1:5) <sup>2</sup><br>permissible load: R <sub>max</sub> = 500 Ω<br>response time: < 1 s                                            |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| 3-wire voltage signal                                                                                                        | 0 ... 10 V / V <sub>S</sub> = 15 ... 36 V <sub>DC</sub> permissible load: R <sub>min</sub> = 10 kΩ<br>response time: < 5 ms                                                                                               |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| without analogue output                                                                                                      | V <sub>S</sub> = 15 ... 36 V <sub>DC</sub>                                                                                                                                                                                |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Accuracy                                                                                                                     |                                                                                                                                                                                                                           |     |          |      |     |         |    |     | IEC 60770 <sup>3</sup> |    |    | BFSL            |     |      |          |  |
|                                                                                                                              | standard: nominal pressure > 0.4 bar:                                                                                                                                                                                     |     |          |      |     |         |    |     | ≤ ± 0.35 % FSO         |    |    | ≤ ± 0.175 % FSO |     |      |          |  |
|                                                                                                                              | nominal pressure ≤ 0.4 bar:                                                                                                                                                                                               |     |          |      |     |         |    |     | ≤ ± 0.50 % FSO         |    |    | ≤ ± 0.250 % FSO |     |      |          |  |
|                                                                                                                              | option: nominal pressure > 0.4 bar:                                                                                                                                                                                       |     |          |      |     |         |    |     | ≤ ± 0.25 % FSO         |    |    | ≤ ± 0.125 % FSO |     |      |          |  |
| Measuring rate of display                                                                                                    | approx. 10/s                                                                                                                                                                                                              |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| <sup>2</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range                 |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| <sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)             |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Thermal errors (offset and span) / Permissible temperatures                                                                  |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Nominal pressure P <sub>N</sub> [bar]                                                                                        | -1 ... 0                                                                                                                                                                                                                  |     | 0.1      |      |     | ≤ 0.25  |    |     | 0.4                    |    |    | ≤ 1             |     |      | > 1      |  |
| Tolerance band [% FSO]                                                                                                       | ≤ ± 0.75                                                                                                                                                                                                                  |     | ≤ ± 2    |      |     | ≤ ± 1.5 |    |     | ≤ ± 1                  |    |    | ≤ ± 1           |     |      | ≤ ± 0.75 |  |
| TC, average [% FSO / 10 K]                                                                                                   | ± 0.07                                                                                                                                                                                                                    |     | ± 0.3    |      |     | ± 0.2   |    |     | ± 0.14                 |    |    | ± 0.1           |     |      | ± 0.07   |  |
| in compensated range [°C]                                                                                                    | 0 ... 70                                                                                                                                                                                                                  |     | 0 ... 50 |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Permissible temperatures                                                                                                     | medium: -25 ... 125 °C electronics / environment: -25 ... 85 °C storage: -40 ... 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                                                                                                                                                                               |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Mechanical stability                                                                                                         |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Vibration                                                                                                                    | 5 g RMS (20 ... 2000 Hz)                                                                                                                                                                                                  |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Shock                                                                                                                        | 100 g / 11 msec.                                                                                                                                                                                                          |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Materials                                                                                                                    |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Pressure port                                                                                                                | stainless steel 1.4571 (316Ti)                                                                                                                                                                                            |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Housing                                                                                                                      | stainless steel 1.4301 (304)                                                                                                                                                                                              |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Display housing                                                                                                              | PA 6.6, polycarbonate                                                                                                                                                                                                     |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Seals (media wetted)                                                                                                         | standard: P <sub>N</sub> ≤ 40 bar: FKM / P <sub>N</sub> > 40 bar: NBR<br>option: welded version for pressure ports according to EN 837 with pressure ranges P <sub>N</sub> between 0.25 bar and 40 bar; others on request |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Diaphragm                                                                                                                    | stainless steel 1.4435 (316L)                                                                                                                                                                                             |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Media wetted parts                                                                                                           | pressure port, seals, diaphragm                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Explosion protection (for 2-wire current signal with Ex-protection)                                                          |                                                                                                                                                                                                                           |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Approval AX11-DM 200                                                                                                         | zone (0) 1: II (1) 2 G Ex ia IIC T4                                                                                                                                                                                       |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Safety technical maximum values                                                                                              | U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW                                                                                                                                                    |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Permissible temperatures for environment                                                                                     | -20 ... 70 °C                                                                                                                                                                                                             |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |
| Connecting cables (by factory)                                                                                               | cable capacitance: signal line/shield also signal line/signal line: 160 pF/m<br>cable inductance: signal line/shield also signal line/signal line: 1 µH/m                                                                 |     |          |      |     |         |    |     |                        |    |    |                 |     |      |          |  |

| Miscellaneous         |                                                                                                                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display               | 4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % $\pm$ 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable) |
| Current consumption   | 2-wire signal output current: max. 25 mA<br>3-wire signal output current: approx. 45 mA + signal current<br>3-wire signal output voltage: approx. 45 mA                                                                      |
| Data storage          | EEPROM (non-volatile)                                                                                                                                                                                                        |
| Ingress protection    | IP 65                                                                                                                                                                                                                        |
| Installation position | any <sup>4</sup>                                                                                                                                                                                                             |
| Weight                | min. 160 (depending on mechanical connection)                                                                                                                                                                                |
| Operational life      | > 100 x 10 <sup>6</sup> cycles                                                                                                                                                                                               |

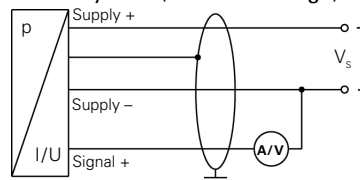
<sup>4</sup> Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges  $\leq 1$  bar.

### Wiring diagrams

#### 2-wire-system (current) <sup>5</sup>



#### 3-wire-system (current / voltage)

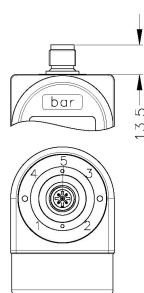


<sup>5</sup> for devices with Ex-protection the operating manual has to be considered

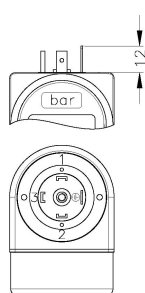
### Pin configuration

| Electrical connection  | M12x1 plastic (5-pin) | M12x1 metal (5-pin)          | ISO 4400       | cable colours (DIN 47100) |
|------------------------|-----------------------|------------------------------|----------------|---------------------------|
| Supply +               | 1                     | 1                            | 1              | white                     |
| Supply -               | 3                     | 3                            | 2              | brown                     |
| Signal + (only 3-wire) | 2                     | 2                            | 3              | green                     |
| Ground                 | via pressure port     | plug housing / pressure port | ground contact | yellow / green (shield)   |

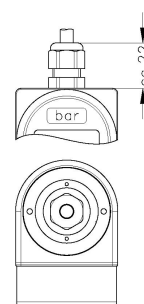
### Electrical connection



M12x1 (5-pin)



ISO 4400



Cable gland <sup>6</sup>

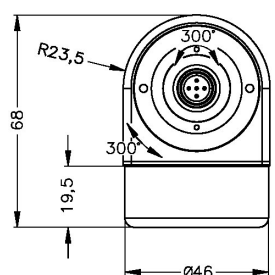
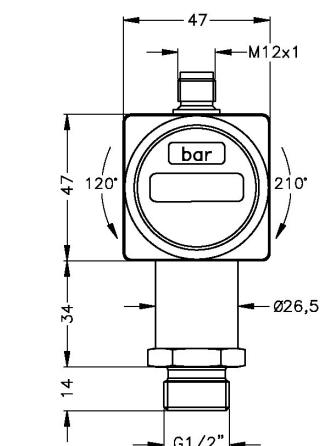
<sup>6</sup> different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube)

# DM 200

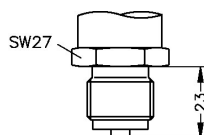
Digital Pressure Gauge

Technical Data

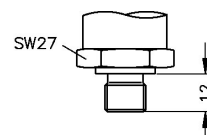
## Mechanical connections



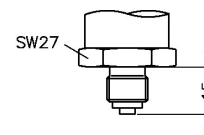
G1/2" DIN 3852  
M20x1.5



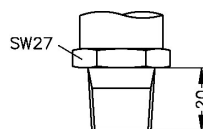
G1/2" EN 837  
M20x1.5



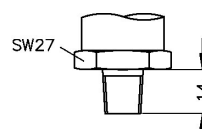
G1/4" DIN 3852  
M10x1; M12x1; M12x1.5  
(only up to 100 bar)



G1/4" EN 837

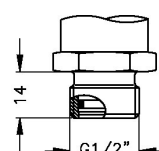


1/2" NPT

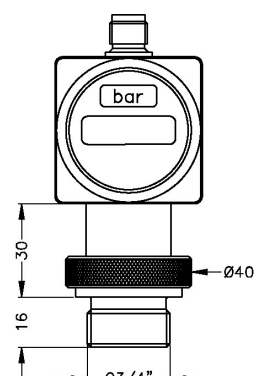


1/4" NPT

Optionally for  $P_n$  from 0.1 up to 40 bar



G1/2" flush DIN 3852  
M20x1.5



G3/4" flush DIN 3852  
(nominal pressure abs. on request)

- ⇒ With pressure ranges  $P_n > 40$  bar total length increases by 14 mm!
- ⇒ With Ex-protection total length increases by 20 mm

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

DM200\_E\_010707

|     |     |     |   |     |     |     |   |     |   |   |   |     |   |     |     |     |   |     |     |     |   |     |     |     |
|-----|-----|-----|---|-----|-----|-----|---|-----|---|---|---|-----|---|-----|-----|-----|---|-----|-----|-----|---|-----|-----|-----|
| [ ] | [ ] | [ ] | - | [ ] | [ ] | [ ] | - | [ ] | - | 0 | - | [ ] | - | [ ] | [ ] | [ ] | - | [ ] | [ ] | [ ] | - | [ ] | [ ] | [ ] |
|-----|-----|-----|---|-----|-----|-----|---|-----|---|---|---|-----|---|-----|-----|-----|---|-----|-----|-----|---|-----|-----|-----|

1 measurement starts with ambient pressure  
2 with Ex version max. 1 contact is possible  
3 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible  
4 different cable types and lengths deliverable, standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube  
5 not possible for nominal pressure  $P_N > 40$  bar; also not possible for vacuum ranges; for G3/4" flush nominal pressure abs. on request  
6 welded version only with pressure ports according to EN 837; not available with pressure ranges  $\leq 0.16$  bar and  $> 40$  bar