

Data sheet

Pressure transmitters for industrial applications

MBS 32 and MBS 33



The standard pressure transmitters MBS 32 and MBS 33 are designed for use in almost all industrial applications, and offer reliable pressure measurements, even under harsh environmental conditions.

The flexible pressure transmitter programme covers different output signals, absolute or gauge (relative) versions, measuring ranges from 0-1 to 0-600 bar and a wide range of pressure and electrical connections.

Excellent vibration stability, robust construction, and a high degree of EMC / EMI protection equip the pressure transmitter to meet the most stringent industrial requirements.

Features

- Designed for use in severe industrial environments
- CE-marked: EMC protected in accordance with EU EMC Directive
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- Temperature compensated, linearized and laser adjusted
- Output signals:
 - MBS 32: 0 – 5 V, 1 – 5 V, 1 – 6 V or 0 – 10 V DC
 - MBS 33: 4 – 20 mA
- A wide range of pressure connections
- Electrical connection: plug or cable
- For use in Zone 2 explosive atmospheres

Technical data
Performance (EN 60770)

| | |
|--|--|
| Accuracy (incl. non-linearity, hysteresis and repeatability) | $\leq \pm 0.3\%$ FS (typ.) |
| | $\leq \pm 0.8\%$ FS (max.) |
| Non-linearity BFSL (conformity) | $\leq \pm 0.2\%$ FS |
| Hysteresis and repeatability | $\leq \pm 0.1\%$ FS |
| Thermal zero point shift | $\leq \pm 0.1\%$ FS / 10K (typ.) |
| | $\leq \pm 0.2\%$ FS / 10K (max.) |
| Thermal sensitivity (span) shift | $\leq \pm 0.1\%$ FS / 10K (typ.) |
| | $\leq \pm 0.2\%$ FS / 10K (max.) |
| Response time | Liquids with viscosity < 100 cSt < 4 ms |
| Overload pressure (static) | 6 × FS (max. 1500 bar) |
| Burst pressure | 6 × FS (max. 2000 bar) |
| Durability, P: 10 – 90% FS | > 10 × 10 ⁶ cycles |

Electrical specifications

| | | | |
|--|----------------------------------|------------------------------|--------------------------|
| Nom. output signal (short-circuit protected) | 4 – 20 mA | 0 – 5 V, 1 – 5 V, 1 – 6 V | 0 – 10 V, |
| Supply voltage [U _B], polarity protected | 10 – 30 V | 9 – 30 V | 15 – 30 V |
| Supply – current consumption | – | ≤ 5 mA | ≤ 8 mA |
| Supply voltage dependency | $\leq \pm 0.05\%$ FS / 10 V | | |
| Current limitation | 28 mA (typ.) | – | |
| Output impedance | – | ≥ 25 k Ω | |
| Load [R _L] (load connected to 0 V) | $R_L \leq (U_B - 10 V) / 0.02$ A | $R_L \geq 10$ k Ω | $R_L \geq 15$ k Ω |

Environmental conditions

| | | |
|--|------------------------------|-------------------------------------|
| Sensor temperature range | Normal | -40 – 85 °C |
| | ATEX Zone 2 | -10 – 85 °C |
| Media temperature range | 115 - (0.35 × Ambient temp.) | |
| Ambient temperature range (depending on electrical connection) | See page 5 | |
| Compensated temperature range | 0 – 80 °C | |
| Transport / storage temperature range | -50 – 85 °C | |
| EMC – Emission | EN 61000-6-3 | |
| EMC – Immunity | EN 61000-6-2 | |
| Insulation resistance | > 100 M Ω at 100 V | |
| Mains frequency test | Based on SEN 361503 | |
| Vibration stability | Sinusoidal | 15.9 mm-pp, 5 Hz – 25 Hz |
| | | 20 g, 25 Hz – 2 kHz |
| Shock resistance | Random | 7.5 g _{rms} , 5 Hz – 1 kHz |
| | Shock | 500 g / 1 ms |
| Shock resistance | Free fall | 1 m |
| | Free fall | 1 m |
| Enclosure (depending on electrical connection) | See page 5 | |

Technical data
(continued)
Explosive atmospheres

| | | |
|---------------------|---|-----------------------|
| Zone 2 applications | II 3G Ex na IIA T3 Gc -20C<Ta<+85C | EN60079-0; EN60079-15 |
|---------------------|---|-----------------------|

When used in ATEX Zone 2 areas at temperatures <-10 °C the cable and plug must be protected against impact.

Mechanical characteristics

| | | |
|---|------------------------|---------------------------------|
| Materials | Wetted parts | EN 10088-1; 1.4404 (AISI 316 L) |
| | Enclosure | EN 10088-1; 1.4404 (AISI 316 L) |
| | Electrical connections | See page 5 |
| Net weight (depending on pressure connection and electrical connection) | | 0.2 – 0.3 kg |

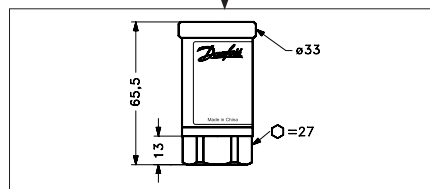
Ordering standard

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|----|----------------------------|----|------------------------------|----|-----------------------|----|-----------------------|----|------------------------|----|------------|----|------------|----|------------|----|------------|----|-------------|----|-------------|----|-------------|----|-------------|----|-------------|----|---|---------|----------------|---------|----------------|---------|------------|---------|--|---------|---------------------------------|---------|-----------------------------------|
| MBS 32 MBS 33 | | Pressure connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measuring range | <table border="1"> <tr><td>0 – 1.0 bar</td><td style="text-align: center;">10</td></tr> <tr><td>0 – 1.6 bar</td><td style="text-align: center;">12</td></tr> <tr><td>0 – 2.5 bar</td><td style="text-align: center;">14</td></tr> <tr><td>0 – 4.0 bar</td><td style="text-align: center;">16</td></tr> <tr><td>0 – 6.0 bar</td><td style="text-align: center;">18</td></tr> <tr><td>0 – 10 bar</td><td style="text-align: center;">20</td></tr> <tr><td>0 – 16 bar</td><td style="text-align: center;">22</td></tr> <tr><td>0 – 25 bar</td><td style="text-align: center;">24</td></tr> <tr><td>0 – 40 bar</td><td style="text-align: center;">26</td></tr> <tr><td>0 – 60 bar</td><td style="text-align: center;">28</td></tr> <tr><td>0 – 100 bar</td><td style="text-align: center;">30</td></tr> <tr><td>0 – 160 bar</td><td style="text-align: center;">32</td></tr> <tr><td>0 – 250 bar</td><td style="text-align: center;">34</td></tr> <tr><td>0 – 400 bar</td><td style="text-align: center;">36</td></tr> <tr><td>0 – 600 bar</td><td style="text-align: center;">38</td></tr> </table> | 0 – 1.0 bar | 10 | 0 – 1.6 bar | 12 | 0 – 2.5 bar | 14 | 0 – 4.0 bar | 16 | 0 – 6.0 bar | 18 | 0 – 10 bar | 20 | 0 – 16 bar | 22 | 0 – 25 bar | 24 | 0 – 40 bar | 26 | 0 – 60 bar | 28 | 0 – 100 bar | 30 | 0 – 160 bar | 32 | 0 – 250 bar | 34 | 0 – 400 bar | 36 | 0 – 600 bar | 38 | <table border="1"> <tr><td>A B 0 4</td><td>G ¼ A (EN 837)</td></tr> <tr><td>A B 0 8</td><td>G ½ A (EN 837)</td></tr> <tr><td>A C 0 4</td><td>¼ – 18 NPT</td></tr> <tr><td>B A 1 2</td><td>DIN 3852/3; M18 × 1.5 – 6 g NBR O-ring</td></tr> <tr><td>B A 1 6</td><td>DIN 3852-E-M22 × 1.5 NBR gasket</td></tr> <tr><td>G B 0 4</td><td>DIN 3852-E-G ¼ gasket DIN 3869-14</td></tr> </table> | A B 0 4 | G ¼ A (EN 837) | A B 0 8 | G ½ A (EN 837) | A C 0 4 | ¼ – 18 NPT | B A 1 2 | DIN 3852/3; M18 × 1.5 – 6 g NBR O-ring | B A 1 6 | DIN 3852-E-M22 × 1.5 NBR gasket | G B 0 4 | DIN 3852-E-G ¼ gasket DIN 3869-14 |
| 0 – 1.0 bar | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 1.6 bar | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 2.5 bar | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 4.0 bar | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 6.0 bar | 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 10 bar | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 16 bar | 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 25 bar | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 40 bar | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 60 bar | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 100 bar | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 160 bar | 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 250 bar | 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 400 bar | 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 – 600 bar | 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A B 0 4 | G ¼ A (EN 837) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A B 0 8 | G ½ A (EN 837) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A C 0 4 | ¼ – 18 NPT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B A 1 2 | DIN 3852/3; M18 × 1.5 – 6 g NBR O-ring | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B A 1 6 | DIN 3852-E-M22 × 1.5 NBR gasket | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G B 0 4 | DIN 3852-E-G ¼ gasket DIN 3869-14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure reference | <table border="1"> <tr><td>Gauge (relative)</td><td style="text-align: center;">1</td></tr> <tr><td>Absolute</td><td style="text-align: center;">2</td></tr> </table> | Gauge (relative) | 1 | Absolute | 2 | Electrical connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gauge (relative) | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Absolute | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <tr><td>1</td><td>Plug Pg 9 (EN175301-803-A)</td></tr> <tr><td>3</td><td>Screened cable, 2 m</td></tr> </table> | 1 | Plug Pg 9 (EN175301-803-A) | 3 | Screened cable, 2 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Plug Pg 9 (EN175301-803-A) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Screened cable, 2 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Output signal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <tr><td>1</td><td>4 – 20 mA ¹⁾</td></tr> <tr><td>2</td><td>0 – 5 V ²⁾</td></tr> <tr><td>3</td><td>1 – 5 V ²⁾</td></tr> <tr><td>4</td><td>1 – 6 V ²⁾</td></tr> <tr><td>5</td><td>0 – 10 V ²⁾</td></tr> </table> | 1 | 4 – 20 mA ¹⁾ | 2 | 0 – 5 V ²⁾ | 3 | 1 – 5 V ²⁾ | 4 | 1 – 6 V ²⁾ | 5 | 0 – 10 V ²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 4 – 20 mA ¹⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 – 5 V ²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 – 5 V ²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 – 6 V ²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 – 10 V ²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>¹⁾ MBS 33 only ²⁾ MBS 32 only</p> | | Preferred version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Non-standard build-up combinations may be selected. However, minimum order quantities may apply. Please contact your local Danfoss office for further information or request on other versions.

Dimensions / Combinations

| Type code | 1 | 3 |
|-----------|----------------------|--------------------|
| | EN175301-803-A, Pg 9 | 2 m screened cable |
| | | |



| | | | | | | |
|----------------------------------|-------------|-------------|-------------|------------------------------------|-------------|-------------|
| | | | | | | |
| Type code | AB04 | AB12 | AB08 | AC04 | BA16 | GB04 |
| Recommended torque ¹⁾ | 30 – 35 Nm | 30 – 35 Nm | 30 – 35 Nm | 2 – 3 turns after finger tightened | 30 – 35 Nm | 30 – 35 Nm |

¹⁾ Depends of different parameters as packing material, mating material, thread lubrication and pressure level.

Electrical connections

| Type code | 1 | 3 |
|--|--|--|
| | <p>EN 175301-803-A, Pg 9</p> | <p>2 m screened cable</p> |
| Ambient temperature | -40 – 85 °C | -40 – 85 °C |
| Enclosure (IP protection fulfilled together with mating connector) | IP65 | IP67 |
| Material | Glass filled polyamide, PA 6.6 | Polyolefin cable with PE shrinkage tubing |
| Electrical connection, 4 – 20 mA output (2 wire) | Pin 1: + supply Pin 2: ÷ supply Pin 3: not used Earth: Connected to MBS enclosure | Brown wire: + supply Black wire: ÷ supply Red wire: not used Orange: not used Screen: not connected to MBS enclosure |
| Electrical connection, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V output | Pin 1: + supply Pin 2: ÷ supply ¹⁾ Pin 3: + output Earth: Connected to MBS enclosure | Brown wire: + output Black wire: ÷ supply ¹⁾ Red wire: + supply Orange: not used Screen: not connected to MBS enclosure |

¹⁾ Common