

## Data Sheet

Pressure transmitter  
Type **MBS 4010**

For use in non-uniform, high viscous or crystallizing media within industrial applications



The high accuracy flush diaphragm pressure transmitter MBS 4010 is designed for use in non-uniform, high viscous or crystallizing media within industrial applications, and offers a reliable pressure measurement, even under harsh environmental conditions.

The flexible pressure transmitter programme covers a 4 – 20 mA output signal, absolute or gauge (relative) versions, measuring ranges from 0 – 0.25 to 0 – 60 bar.

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

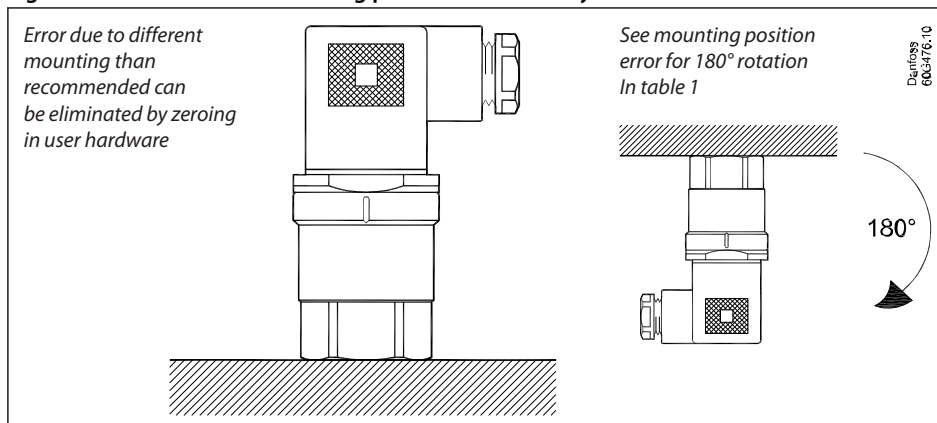
**Features**

- Designed for use in severe industrial environments
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- Pressure ranges in relative (gauge) or absolute up to 60 bar
- Output signal: 4 – 20 mA
- Fully digitally compensated
- Accuracy 0.8% FS max
- USDA-H1 approved oil filling
- For use in ATEX Zone 2 explosive atmosphere
- UL approved

## Applications

### **Recommended mounting position**

**Figure 1: Recommended mounting position for G1A only**



## Product specification

### Technical data

**Table 1: Performance (EN 60770)**

|                                                              |                                                |
|--------------------------------------------------------------|------------------------------------------------|
| Accuracy (incl. non-linearity, hysteresis and repeatability) | ≤ ± 0.3% FS (typ.)                             |
|                                                              | ≤ ± 0.8% FS (max.) See Accuracy overview below |
| Non-linearity BFSL (conformity)                              | ≤ ± 0.2% FS                                    |
| Hysteresis and repeatability                                 | ≤ ± 0.1% FS                                    |
| Response time                                                | < 4 ms                                         |
| Power-up time                                                | < 50 ms                                        |
| Durability, P: 10 – 90% FS                                   | > 10 × 10 <sup>6</sup> cycles                  |

**Table 2: Available measuring ranges**

| Pressure range [bar] | G1/2               |                              |                      | G1A                               |                                                       |                              |                      |
|----------------------|--------------------|------------------------------|----------------------|-----------------------------------|-------------------------------------------------------|------------------------------|----------------------|
|                      | Accuracy FS (max.) | Max. Overload pressure [bar] | Burst pressure [bar] | Accuracy FS (max.) <sup>(1)</sup> | Mounting influence for 180 °C rotation <sup>(2)</sup> | Max. Overload pressure [bar] | Burst pressure [bar] |
| -0.25 – 0.50         | -                  | -                            | -                    | ≤ ± 1.0%                          | + 1.2%                                                | 2                            | 50                   |
| 0.00 – 0.25          | -                  | -                            | -                    | ≤ ± 1.0%                          | + 2.4%                                                | 2                            | 50                   |
| 0.00 – 0.40          | -                  | -                            | -                    | ≤ ± 1.0%                          | + 1.2%                                                | 2                            | 50                   |
| 0.00 – 0.60          | -                  | -                            | -                    | ≤ ± 1.0%                          | + 1.2%                                                | 2                            | 50                   |
| 0.00 – 1.00          | -                  | -                            | -                    | ≤ ± 1.0%                          | + 0.6%                                                | 2                            | 50                   |
| 0.00 – 1.60          | -                  | -                            | -                    | ≤ ± 0.8%                          | + 0.4%                                                | 8                            | 50                   |
| 0.00 – 2.50          | -                  | -                            | -                    | ≤ ± 0.8%                          | + 0.3%                                                | 8                            | 50                   |
| 0.00 – 4.00          | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | ≤ ± 0.8%                          | -                                                     | 8                            | 50                   |
| 0.00 – 6.00          | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | ≤ ± 0.8%                          | -                                                     | 20                           | 50                   |
| 0.00 – 10.00         | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | ≤ ± 0.8%                          | -                                                     | 20                           | 50                   |
| 0.00 – 16.00         | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | ≤ ± 0.8%                          | -                                                     | 100                          | 100                  |
| 0.00 – 25.00         | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | ≤ ± 0.8%                          | -                                                     | 100                          | 100                  |
| 0.00 – 40.00         | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | -                                 | -                                                     | -                            | -                    |
| 0.00 – 60.00         | ≤ ± 0.8%           | 2 x FS                       | 4 x FS               | -                                 | -                                                     | -                            | -                    |

<sup>(1)</sup> At recommended mounting position

<sup>(2)</sup> For other mounting angles please contact Danfoss for detailed calculations

**Table 3: Electrical specifications**

|                                                                  |                                                      |
|------------------------------------------------------------------|------------------------------------------------------|
| Nom. output signal (short-circuit protected)                     | 4 – 20 mA                                            |
| Supply voltage [U <sub>B</sub> ], polarity protected             | 9 - 32 V DC                                          |
| Supply voltage dependency                                        | 4 - 20 mA: < 0.1% FS / 10 V                          |
| Output limitation (linear output signal up to 1.5 × rated range) | 22.4 mA (typ.)                                       |
| Load [R <sub>L</sub> ] (load connected to 0 V)                   | R <sub>L</sub> ≤ (U <sub>B</sub> - 9 V) / 0.02 A [Ω] |

**Table 4: Environmental conditions**

|                                       |             |                                     |
|---------------------------------------|-------------|-------------------------------------|
| Sensor operating temperature          | Normal      | -40 – 85 °C                         |
|                                       | ATEX Zone 2 | -10 – 85 °C                         |
| Media temperature                     |             | -40 – 85 °C                         |
| Ambient temperature range             |             | -10 – 85 °C                         |
| Compensated temperature range         |             | 0 – 80 °C                           |
| Transport / Storage temperature range |             | -25 – 85 °C                         |
| EMC – Emission                        |             | EN 61000-6-3                        |
| EMC – Immunity                        |             | EN 61000-6-2                        |
| Insulation resistance                 |             | > 100 MΩ at 500 V                   |
| Mains frequency test                  |             | Based on SEN 361503                 |
| Vibration stability                   | Sinusoidal  | 15.9 mm-pp, 5 Hz – 25 Hz            |
|                                       | Random      | 20 g, 25 Hz – 2 kHz                 |
|                                       |             | 7.5 g <sub>rms</sub> , 5 Hz – 1 kHz |
|                                       |             | IEC 60068-2-64                      |

## Pressure transmitter, type MBS 4010

|                                                |           |              |                |
|------------------------------------------------|-----------|--------------|----------------|
| Shock resistance                               | Shock     | 500 g / 1 ms | IEC 60068-2-27 |
|                                                | Free fall | 1 m          | IEC 60068-2-32 |
| Enclosure (depending on electrical connection) |           |              | IP65           |

**Table 5: Explosive atmospheres**

|                                    |                                                                       |                      |
|------------------------------------|-----------------------------------------------------------------------|----------------------|
| Zone 2 applications <sup>(3)</sup> | <b>II 3G</b><br><b>Ex ec IIA T3 Gc</b><br><b>-10°C&lt;Ta&lt;+85°C</b> | EN60079-0; EN60079-7 |
|------------------------------------|-----------------------------------------------------------------------|----------------------|

<sup>(3)</sup> When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact

**Table 6: Mechanical characteristics**

|                                                                         |                        |                                 |
|-------------------------------------------------------------------------|------------------------|---------------------------------|
| Materials                                                               | Wetted parts           | EN 10088-1; 1.4404 (AISI 316 L) |
|                                                                         | Enclosure              | EN 10088-1; 1.4404 (AISI 316 L) |
|                                                                         | Electrical connections | Glass filled polyamid PA 6.6    |
| Gasket (above thread)                                                   |                        | DIN 3869-33-NBR                 |
| Net weight (depending on pressure connection and electrical connection) |                        | 0.4 kg                          |

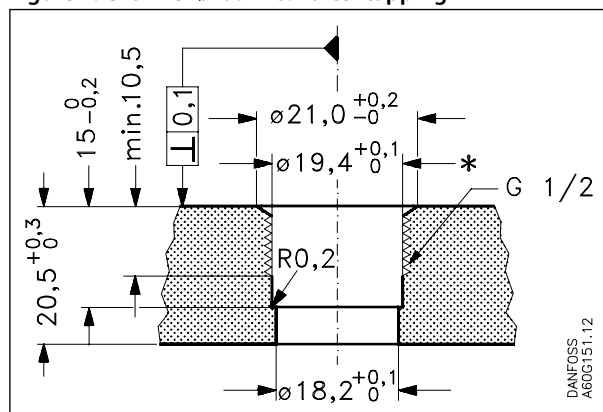
## Dimensions/Combinations

**Table 7: Dimensions/Combinations**

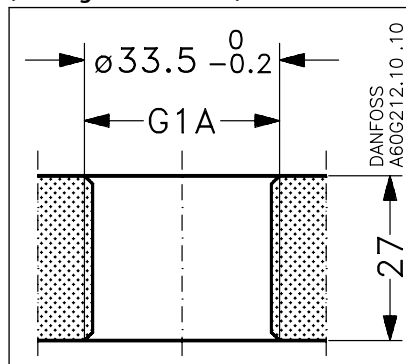
| Type code          | A1                          | A3                    |
|--------------------|-----------------------------|-----------------------|
|                    | EN175301-803-A,<br>Pg 9<br> | Screened cable 2m<br> |
|                    |                             |                       |
|                    |                             |                       |
| <b>Type code</b>   | <b>CB12</b>                 | <b>CB11</b>           |
| Recommended torque | 60 Nm <sup>(1)</sup>        | 60 Nm <sup>(1)</sup>  |

<sup>(1)</sup> Zero deviation of approx. 3 mbar can occur.

**Figure 2: Chamfer  $\varnothing 19.4 +0.1$  after tapping**

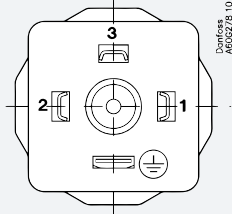
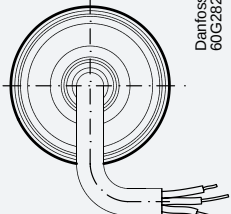


**Figure 3: Thread hole for G 1A  
(Sealing above thread)**



## Electrical connections

### Table 8: Electrical connections

| Type code                                                          | A1                                                                                                                                                                                          | A3                                                                                                                                          |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    |  <p>EN 175301-803-A</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 polyamid, PA 6.6                                                                                                                                                               | Poliufin cable with PE shrinkage tubing                                                                                                     |
| Electrical connection, 4 – 20 mA output (2 wire)                   | <p>Pin 1: + supply<br/>Pin 2: ÷ supply<br/>Pin 3: not used</p>  <p>Earth: Connected to MBS enclosure</p> | <p>Brown wire: + supply<br/>Black wire: ÷ supply<br/>Red wire: not used<br/>Orange: not used<br/>Screen: not connected to MBS enclosure</p> |

## Ordering

### Ordering standard

**MBS 4010**

| Measuring range         |     |
|-------------------------|-----|
| 0.25 – 0.5 bar Only G1A | A 4 |
| 0 – 0.25 bar Only G1A   | 0 4 |
| 0 – 0.4 bar Only G1A    | 0 6 |
| 0 – 0.6 bar Only G1A    | 0 8 |
| 0 – 1.0 bar Only G1A    | 1 0 |
| 0 – 1.6 bar Only G1A    | 1 2 |
| 0 – 2.5 bar Only G1A    | 1 4 |
| 0 – 4.0 bar             | 1 6 |
| 0 – 6.0 bar             | 1 8 |
| 0 – 10 bar              | 2 0 |
| 0 – 16 bar              | 2 2 |
| 0 – 25 bar              | 2 4 |
| 0 – 40 bar Only G½A     | 2 6 |
| 0 – 60 bar Only G½A     | 2 8 |

**Pressure reference**

|                  |   |
|------------------|---|
| Gauge (relative) | 1 |
| Absolute         | 2 |

1 –

**Pressure connection**

|        |                            |
|--------|----------------------------|
| CB 1 2 | G½A, ISO 228-1, Flush male |
| CB 1 1 | G1A, ISO 228-1, Flush male |

**Electrical connection**

|    |                                 |
|----|---------------------------------|
| A1 | Plug Pg9 (EN 175301-803-A)      |
| A3 | Screened cable, 2 m, Only G1/2A |

**Output signal**

|   |           |
|---|-----------|
| 1 | 4 – 20 mA |
|---|-----------|

Preferred version

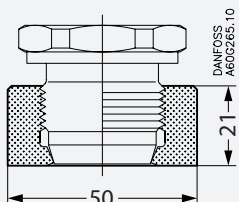
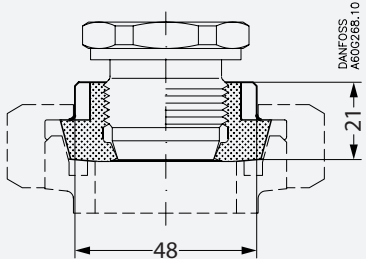
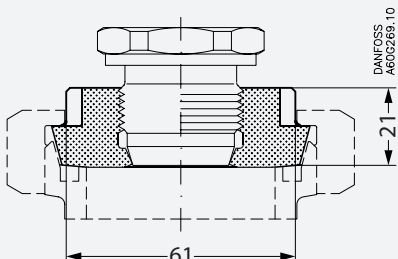
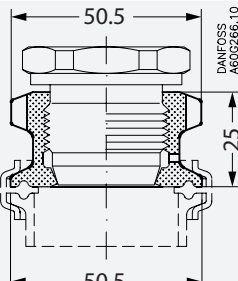
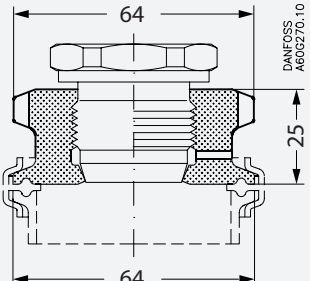
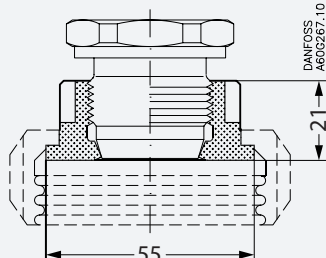
#### NOTE:

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.

## Accessories

### Accessories for G 1A, ISO 228-1

Table 9: Accessories

|                                                                                                                                                                  |                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Welding nipple for conic metal/metal seal<br/><b>Code no.: 060G2501</b></p>  | <p>DIN 11851 (dairy connection), DN40<br/><b>Code no.: 060G2505</b></p>  |
| <p>DIN 11851 (dairy connection), DN50<br/><b>Code no.: 060G2506</b></p>        | <p>Clamp, ISO 2852, 1½ in.<br/><b>Code no.: 060G2502</b></p>            |
| <p>Clamp, ISO 2852, 2 in.<br/><b>Code no.: 060G2510</b></p>                   | <p>SMS 1145 connection, 1½ in.<br/><b>Code no.: 060G2503</b></p>       |

## Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at [danfoss.com](https://danfoss.com) or contact your local Danfoss representative if you have any questions.

### Valid certificates and declarations

Table 10: Certificates and declarations

| File name             | Document type                   | Document topic      | Approval authority |
|-----------------------|---------------------------------|---------------------|--------------------|
| 1786330               | Explosive - Safety Certificate  | Explosive           | CSA                |
| 064R9402.00           | Manufacturers Declaration       | PED                 | Danfoss            |
| 064G9615.06           | EU Declaration                  | ATEX/EMCD/RoHS      | Danfoss            |
| 060R3160.00           | Manufacturers Declaration       | China RoHS          | Danfoss            |
| Д-ДК.Б/108.В.00302_18 | EAC RU                          | EAC Declaration     | EAC RU             |
| DK.C.30.018.A 31316   | -                               | -                   | GOST               |
| E311982               | Electrical - Safety Certificate | -                   | UL                 |
| E494625               | Electrical - Safety Certificate | -                   | UL                 |
| E227388               | Electrical - Safety Certificate | Hazardous Locations | UL                 |

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