Mounting proposal for Ø18 mm ceramic pressure sensors

This document must be considered a valid but not exhaustive guideline about mounting in a housing an 18 mm diameter ceramic pressure sensor produced by Metallux SA. Proper housing dimensioning and gasket selection remain the customer’s responsibility, depending on the final application. Please observe the O-ring / kantseal suppliers recommendations, in addition with the sealing areas indicated in all Metallux SA product datasheets.

<table>
<thead>
<tr>
<th>Metallux pressure sensor families</th>
<th>Sensor type</th>
<th>Mounting Type A</th>
<th>Mounting Type B</th>
<th>Mounting Type C</th>
<th>Mounting Type D</th>
<th>Mounting Type E</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME501</td>
<td>Flush diaphragm</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME504</td>
<td>Flush diaphragm</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME505</td>
<td>Flush diaphragm</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME600</td>
<td>Monolithic reduced cavity</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME651</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME662</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME663</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME667</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME670 ≤ 50 bar</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME670 ≥ 100 bar</td>
<td>Monolithic reduced cavity</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME75x ≤ 50 bar</td>
<td>Monolithic large cavity</td>
<td>○</td>
<td></td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME75x ≥ 100 bar</td>
<td>Monolithic reduced cavity</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ME77x</td>
<td>Flush diaphragm</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME78x</td>
<td>Flush diaphragm</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME790</td>
<td>Monolithic reduced cavity</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

- ● Recommended
- ○ Possible alternative

Pressure sensors family tree

1 ME600 available only for a pressure range greater or equal than 100 bar
2 also available in not thermally compensated version
3 digitally trimmed offset, also available not thermally compensated

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Mounting proposal for Ø18 mm ceramic pressure sensors

Mounting proposal type A: face sealing, diaphragm

[Diagram of Mounting proposal type A]

1. KANTSEAL used by Metallux SA for testing with air (Trelleborg DKAR00013, material FKM 90 shore).
   Different types of kantseal can be used according to specific applications.
   * The gap "L" depends on kantseal compression values. See “Use of kantseal” section for further details.

Mounting proposal type B: face sealing, large diameter cavity

[Diagram of Mounting proposal type B]

2. KANTSEAL used by Metallux SA for testing with air (Trelleborg DKAR00014, material FKM 90 shore).
   Different types of kantseal can be used according to specific applications.
   * The gap "L" depends on kantseal compression values. See “Use of kantseal” section for further details.

Mounting proposal type C: face sealing, reduced diameter cavity

[Diagram of Mounting proposal type C]

3. KANTSEAL used by Metallux SA for testing with air (Trelleborg DKAR00011, material FKM 90 shore).
   Different types of kantseal can be used according to specific applications.
   * The gap "L" depends on kantseal compression values. See “Use of kantseal” section for further details.

Mounting proposal type D: radial sealing, large diameter cavity

[Diagram of Mounting proposal type D]

4. O-RING used by Metallux SA for testing with air (dimension: 6.30 x 2.0, material FKM 70 shore).
   Different types of O-ring can be used according to specific applications.

Mounting proposal type E: radial sealing, reduced diameter cavity

[Diagram of Mounting proposal type E]

5. O-RING used by Metallux SA for testing with air (dimension: 2.5 x 1.5, material: FKM 70 shore).
   Different types of O-ring can be used according to specific applications.
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**Housing design general guidelines**

### Upper closing area

The upper retaining area is indicated in the product datasheet, shaded in green as in the image on the right.

The housing’s closing cap must not get in contact with the sensor outside the indicated area.

### Use of kantseal for face sealing

Kantseals are less compressible than O-ring counterparts, therefore it is also possible to design a torque-controlled screwing system to fix the sensor in the housing.

Metallux recommends not exceeding the torque or the kantseal compression values shown in the table.

The gap “L” between the sensor and the housing depends from the kantseal compression. In any case the diaphragm of sensors or the lower part of the body of the monolithic sensors must not be in contact with the housing.

(L > 0).

Recommendation from the kantseal suppliers in terms of compatible media must be respected at all time.

<table>
<thead>
<tr>
<th>Pressure [bar]</th>
<th>Tight Torque [Nm]</th>
<th>90 shore DKAR00013 compression values [mm]</th>
<th>L values [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 to 5</td>
<td>0.9</td>
<td>≈ 0.07</td>
<td>≈ 0.16</td>
</tr>
<tr>
<td>5.001 to 20</td>
<td>1.1</td>
<td>≈ 0.10</td>
<td>≈ 0.13</td>
</tr>
<tr>
<td>20.001 to 100</td>
<td>1.6</td>
<td>≈ 0.13</td>
<td>≈ 0.10</td>
</tr>
<tr>
<td>100.001 to 600</td>
<td>1.8</td>
<td>≈ 0.15</td>
<td>≈ 0.08</td>
</tr>
<tr>
<td>600.1 to 1000</td>
<td>2.1</td>
<td>≈ 0.17</td>
<td>≈ 0.06</td>
</tr>
</tbody>
</table>

**L evaluation:**

L = kantseal height – compression (see table) – gasket seat height

In the example, referring to mounting proposal type A:

L = 1.68 – compression – 1.45 ≈ 0.16…0.06 mm

(depending from pressure range)

### Use of the O-ring for face sealing

It’s also possible to use O-ring for face sealing.

The O-ring compression after tightening the sensor has to be about 20% of its cross-section.

However, recommendation from the O-ring suppliers in terms of compression and compatible media take precedence and must be respected at all time.

The flush diaphragm of the sensors or the lower part of the monolithic sensors body **must not** be in contact with the housing.

Always keep a minimum distance of 0.05-0.10 mm considering the gasket already compressed. (See the highlighted dimensions in the image on the right).