Operating instructions
Electronic pressure sensor
PM16xx
PM17xx
Contents

1 Preliminary note ................................................................. 3
  1.1 Symbols used .............................................................. 3

2 Safety instructions ............................................................ 4

3 Functions and features ....................................................... 4
  3.1 Detection zone ............................................................ 5

4 Function ............................................................................. 6
  4.1 IO-Link ........................................................................... 7
    4.1.1 General information ................................................. 7
    4.1.2 Functions only available via IO-Link communication .... 7
    4.1.3 Set-up via IO-Link .................................................... 7
    4.1.4 Process data via IO-Link .......................................... 7
  4.2 Defined state in case of a fault ....................................... 8
  4.3 Operating modes ........................................................... 8
    4.3.1 2-wire operation ..................................................... 8
    4.3.2 3-wire operation ..................................................... 8
  4.4 Analogue output ............................................................ 8

5 Installation ........................................................................... 10
  5.1 G1A Aseptoflex Vario adaptation (PM17xx) ....................... 11
  5.2 Use in hygienic areas to 3-A ......................................... 12
  5.3 Use in hygienic areas to EHEDG .................................... 13
  5.4 G1A sealing cone connection (PM16xx) .......................... 14
  5.5 Protective cover .......................................................... 15
    5.5.1 Function ventilation diaphragm ................................. 15
    5.5.2 Orientation of the filter cover .................................. 15
  5.6 Filter cover .................................................................... 16

6 Electrical connection .......................................................... 18

7 Parameter setting ................................................................... 19
  7.1 Parameter setting via PC ............................................... 19
  7.2 Parameter setting via the memory plug ............................ 19
  7.3 Teach offset with the teach button .................................. 20
    7.3.1 Scale analogue value .............................................. 21
    7.3.2 Select the standard unit of measurement (option) ....... 21
  7.4 User settings (optional) .................................................. 21
1 Preliminary note

1.1 Symbols used

► Instruction
>
Reaction, result

[...] Designation of keys, buttons or indications
→ Cross-reference

⚠ Important note

⚠ Non-compliance may result in malfunction or interference.

Information

Supplementary note
2 Safety instructions

- The device described is a subcomponent for integration into a system.
  - The manufacturer is responsible for the safety of the system.
  - The system manufacturer undertakes to perform a risk assessment and to create a documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the manufacturer of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Functions and features).
- Only use the product for permissible media (→ Technical data).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.
- Protect units and cables against damage.

3 Functions and features

The unit measures and monitors the system pressure of machines and installations.

2 outputs are available:
  - OUT1: Measured pressure value via IO-Link.
    More information → 4.1 and → 7.
  - OUT2: Analogue signal proportional to pressure 4...20 mA
## 3.1 Detection zone

Type of pressure: relative pressure

<table>
<thead>
<tr>
<th>Order number</th>
<th>Measuring range (bar)</th>
<th>Measuring range (psi)</th>
<th>Pressure rating (max. permissible pressure) *</th>
<th>Bursting pressure (bar)</th>
<th>Bursting pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM1703</td>
<td>-1...25</td>
<td>-14.6...362.6</td>
<td>100</td>
<td>350</td>
<td>5075</td>
</tr>
<tr>
<td>PM1714</td>
<td>-1...16</td>
<td>-14.6...232</td>
<td>75</td>
<td>250</td>
<td>3625</td>
</tr>
<tr>
<td>PM1704</td>
<td>-1...10</td>
<td>-14.5...145</td>
<td>50</td>
<td>150</td>
<td>2175</td>
</tr>
<tr>
<td>PM1715</td>
<td>-1...6</td>
<td>-14.5...87</td>
<td>30</td>
<td>100</td>
<td>1450</td>
</tr>
<tr>
<td>PM1705</td>
<td>-1...4</td>
<td>-14.5...58</td>
<td>30</td>
<td>100</td>
<td>1450</td>
</tr>
<tr>
<td>PM1706</td>
<td>-125...2500</td>
<td>-1.82...36.26</td>
<td>20000</td>
<td>50</td>
<td>725</td>
</tr>
<tr>
<td>PM1717</td>
<td>-100...1600</td>
<td>-1.45...23.21</td>
<td>15000</td>
<td>40</td>
<td>580</td>
</tr>
<tr>
<td>PM1709</td>
<td>-1000...1000</td>
<td>-14.5...14.5</td>
<td>10000</td>
<td>30</td>
<td>435</td>
</tr>
<tr>
<td>PM1707</td>
<td>-50...1000</td>
<td>-0.73...14.5</td>
<td>10000</td>
<td>30</td>
<td>435</td>
</tr>
<tr>
<td>PM1708</td>
<td>-12.5...250</td>
<td>-0.182...3.626</td>
<td>6000</td>
<td>30</td>
<td>435</td>
</tr>
<tr>
<td>PM1789</td>
<td>-5...100</td>
<td>-0.073...1.450</td>
<td>4000</td>
<td>30</td>
<td>435</td>
</tr>
</tbody>
</table>

Pressure sensors with G1 Aseptoflex Vario are certified in accordance with the hygienic regulations 3-A and EHEDG.

<table>
<thead>
<tr>
<th>Order number</th>
<th>Measuring range (bar)</th>
<th>Measuring range (mbar)</th>
<th>Measuring range (psi)</th>
<th>Pressure rating (max. permissible pressure) *</th>
<th>Bursting pressure (bar)</th>
<th>Bursting pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM1602</td>
<td>-1...100</td>
<td>-15...1450</td>
<td>200</td>
<td>650</td>
<td>9425</td>
<td></td>
</tr>
<tr>
<td>PM1603</td>
<td>-1...25</td>
<td>-14.6...362.6</td>
<td>100</td>
<td>350</td>
<td>5075</td>
<td></td>
</tr>
<tr>
<td>PM1614</td>
<td>-1...16</td>
<td>-14.6...232</td>
<td>75</td>
<td>250</td>
<td>3625</td>
<td></td>
</tr>
<tr>
<td>PM1604</td>
<td>-1...10</td>
<td>-14.5...145</td>
<td>50</td>
<td>150</td>
<td>2175</td>
<td></td>
</tr>
<tr>
<td>PM1615</td>
<td>-1...6</td>
<td>-14.5...87</td>
<td>30</td>
<td>100</td>
<td>1450</td>
<td></td>
</tr>
<tr>
<td>PM1605</td>
<td>-1...4</td>
<td>-14.5...58</td>
<td>30</td>
<td>100</td>
<td>1450</td>
<td></td>
</tr>
<tr>
<td>PM1606</td>
<td>-125...2500</td>
<td>-1.82...36.26</td>
<td>20000</td>
<td>50</td>
<td>725</td>
<td></td>
</tr>
<tr>
<td>PM1617</td>
<td>-100...1600</td>
<td>-1.45...23.21</td>
<td>15000</td>
<td>40</td>
<td>580</td>
<td></td>
</tr>
</tbody>
</table>

Pressure sensors with G1 A sealing cone.

* With static overload pressure.

MPa = (measured value in bar) ÷ 10
kPa = (measured value in bar) x 100
<table>
<thead>
<tr>
<th>Order number</th>
<th>Measuring range</th>
<th>Pressure rating (max. permissible pressure) *)</th>
<th>Bursting pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM1609</td>
<td>-1000...1000</td>
<td>10000</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>-14.5...14.5</td>
<td>145</td>
<td>435</td>
</tr>
<tr>
<td>PM1607</td>
<td>-50...1000</td>
<td>10000</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>-0.73...14.5</td>
<td>145</td>
<td>435</td>
</tr>
<tr>
<td>PM1608</td>
<td>-12.5...250</td>
<td>6000</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>-0.182...3.626</td>
<td>84</td>
<td>435</td>
</tr>
<tr>
<td>PM1689</td>
<td>-5...100</td>
<td>4000</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>-0.073...1.450</td>
<td>58</td>
<td>435</td>
</tr>
</tbody>
</table>

*) With static overload pressure.

MPa = (measured value in bar) ÷ 10
kPa = (measured value in bar) x 100

Not suitable for systems that have to meet the criteria of E1.2 / 63-03 of the 3-A standard 63-03.

The units are only permitted in gas applications with pressures >25 bar if no elastomer sealing material is used for the adaptation of the sensor or if a metal seal is used.

Avoid static and dynamic overpressure exceeding the indicated pressure rating by taking appropriate measures.

The indicated bursting pressure must not be exceeded.

Even if the bursting pressure is exceeded only for a short time, the unit may be destroyed.

CAUTION: Risk of injury!

The units are vacuum resistant.

### 4 Function

- The system pressure is detected by a ceramic-capacitive measuring system, the measured signals are evaluated electronically.
- The unit converts the system pressure into an analogue output signal (4...20 mA).
- The unit has an IO-Link interface which allows to provide additional values:
  - OUT1: Measured pressure value via IO-Link.
    - Measured pressure value (cyclic output mode)
    - Unit temperature (A-cyclic output mode)
    - Diagnostic values
  - OUT2: Analogue signal proportional to pressure 4...20 mA
4.1 IO-Link

4.1.1 General information
This unit has an IO-Link communication interface which requires an IO-Link capable module (IO-Link master) for operation. The IO-Link interface enables direct access to the process and diagnostic data and provides the possibility to set the parameters of the unit during operation. In addition, communication is possible via a point-to-point connection with a USB adapter cable.

The IODDs necessary for the configuration of the unit, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required IO-Link hardware and software can be found at www.ifm.com.

4.1.2 Functions only available via IO-Link communication
- Device temperature: The internal temperature of the sensor can be read via the A-cyclic IO-Link channel.
- Application-specific tag: freely definable text assigned to the unit.
- Function tag: freely definable text describing the device function in the plant.
- Location tag: freely definable text describing the installation location in the plant.

For more detailed information refer to the device-specific IO Device Description PDF at www.ifm.com.

4.1.3 Set-up via IO-Link
The device parameters can be set via IO-Link:
- The device parameters are set via the IO-Link interface (→ 4.1 and → 7).
- All settings can also be carried out before installation of the device.

4.1.4 Process data via IO-Link
All process data is available via IO-Link:
- The unit is designed for fully bidirectional communication.
- The following options are available:
  - Remote display: reading and displaying the current system pressure.
  - Remote parameter setting: reading and changing the current parameters via IO-Link parameter setting (→ 4.1).
4.2 Defined state in case of a fault

- If a fault is detected, the analogue output passes into a defined state (= 21.5 mA).

In case of a fault indication (= 21.5 mA):

- Read parameters via IO-Link or contact the manufacturer

4.3 Operating modes

The operating mode is defined by the wiring (→ 6 Electrical connection) and automatically recognised by the unit.

4.3.1 2-wire operation

| OUT2 (pin 2) | Analogue signal proportional to pressure 4…20 mA |

4.3.2 3-wire operation

| OUT1 (pin 4) | Communication via IO-Link |
| OUT2 (pin 2) | Analogue signal proportional to pressure 4…20 mA |

4.4 Analogue output

The device provides an analogue signal proportional to the pressure. Within the measuring range the analogue signal is between 4 and 20 mA.

The measuring range is scalable:

- [ASP2] defines at which measured value the output signal is 4 mA.
- [AEP2] defines at which measured value the output signal is 20 mA.

Minimum distance between [ASP2] and [AEP2] = 20 % of the final value of the measuring range.

If the measured value is outside the measuring range or in the event of an internal error, the current signal indicated in figure 1 is provided.
Fig. 1: Output characteristics of the analogue output to Namur

1. Analogue signal
2. Measured value
3. Measuring range
4. Scaled measuring range
5. Signalling fault 21.5 mA (→ 9 Error correction)

P: Pressure
MAW: Initial value of the measuring range for non-scaled measuring range
MEW: Final value of the measuring range with non-scaled measuring range
ASP: Analogue start point with scaled measuring range
AEP: Analogue end point with scaled measuring range
UL: Below the display range
OL: Above the display range
5 Installation

► Before installing and removing the unit make sure that no pressure is applied to the system and there is no medium in the pipe.

► Note dangers related to extreme machine / medium temperatures.

► In case of a recessed sensor installation, please use an open ring spanner or a hexagon socket with the corresponding inside contour.

► During sensor installation, do not exert any axial leverage with the tool (1) on the rotatable filter cover (2) (→ Fig. 1).

► In case of installation by means of a hexagon socket (3), make sure that the tool's spanner flat has an inner height of at least 30 mm (→ Fig. 2).

Align the rotatable filter cover so that it is flush with one of the spanner flats.

► Insert the unit in a process connection.

► Tighten firmly. Recommended tightening torque:

<table>
<thead>
<tr>
<th>Process connection</th>
<th>Tightening torque in Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1A Aseptoflex Vario</td>
<td>35</td>
</tr>
<tr>
<td>G1A sealing cone</td>
<td>20</td>
</tr>
</tbody>
</table>

Depends on the sealing type, the pressure load and the lubrication!

► A zero-point calibration of the measured value is possible via the teach function (→ 7.3 Teach offset with the teach button)
### 5.1 G1A Aseptoflex Vario adaptation (PM17xx)

- Insert the unit with process adapter into the process connection and tighten using a spanner.

**Information about available adapters at www.ifm.com.**

- Observe the instructions of the adapter.
- Use a lubricating paste which is suitable and approved for the application.

The unit can be fixed to different process connections. Options are as follows:

<table>
<thead>
<tr>
<th></th>
<th><strong>Installation using an adapter with sealing ring (hygiene-compliant)</strong></th>
</tr>
</thead>
</table>
| 1 | Order no. E332xx / E333xx.  
   | - To meet the hygiene regulations use a process adapter with leakage port.  
   | The adapters are supplied with EPDM O-ring (order no. E30054).  
   | More sealing rings are available as accessories:  
   |   • FKM O-ring (order no. E30123)  
   |   • PEEK sealing ring (order no. E30124). The PEEK sealing ring is long-term stable and maintenance-free.  
   |   - When you replace the PEEK sealing ring or change from a PEEK sealing ring to an O-ring, the process adapter also needs to be replaced with a new equivalent adapter. |

<table>
<thead>
<tr>
<th>2</th>
<th><strong>Installation using a welding adapter with sealing ring (hygiene-compliant)</strong></th>
</tr>
</thead>
</table>
|   | - To meet the hygiene regulations use a process adapter with leakage port.  
   | - Make sure that the process adapter does not warp during welding. Use welding mandrel E30452.  
   | - The sealing edge must not be damaged by subsequent surface treatment. (→ Instructions in operating instructions of the adapter).  
   | The adapter is supplied with EPDM O-ring (order no. E30054).  
   | Another sealing ring is available as accessory:  
   |   • FKM O-ring (order no. E30123). |
3 Installation using a process adapter with metal-to-metal seal

Order no. E337xx / E338xx

A long-term stable and maintenance-free fitting without bug traps in the metal-to-metal seal is only valid for once-only mounting.

► If the sealing has to be installed several times, use a new adapter.

4 Installation to G 1 flange / G 1 bush

The sensor is sealed with the sealing ring at the back of the process connection.

► The sealing area at the flange / bush must be flush with the tapped hole and have a surface characteristic of min. Rz = 6.3.

5.2 Use in hygienic areas to 3-A

The following applies to units with 3-A certification:

► Only use adapters with 3-A certification for the process connection.

► Do not install the unit at the lowest point of the pipe or tank (→ position 5) in order that the medium can run off the area of the measuring element.
5.3 Use in hygienic areas to EHEDG

The sensor is suited for CIP (cleaning in process) when installed correctly.

► Observe the application limits (temperature and material resistance) according to the data sheet.

► Make sure that the sensor is integrated into the system according to EHEDG:
  ► Use self-draining installation.
  ► Only use process adapters permitted according to EHEDG with special seals required by the EHEDG position paper.
  ► The gasket of the system interface must not be in contact with the sealing point of the sensor.

► In case of structures in a tank, the installation must be flush mount. If not possible then direct water jet cleaning and cleaning of dead spaces must be possible.

► Leakage ports must be clearly visible and must be installed facing downwards for vertical pipes.

► To avoid dead space adhere to the dimensions:
  \( L < (D) \).

1: Leakage port
5.4 G1A sealing cone connection (PM16xx)

Information about available adapters at www.ifm.com.
  ► Observe the instructions of the adapter.

A guarantee for a long-term stable and maintenance-free fitting, with no bug traps in the sealing of the metal seal is only valid for once-only mounting.

The unit can be fixed to different process connections.
Options are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Installation using a clamp adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Order no. E3360x</td>
</tr>
<tr>
<td></td>
<td>Information about available adapters at <a href="http://www.ifm.com">www.ifm.com</a>.</td>
</tr>
<tr>
<td></td>
<td>► Observe the instructions of the adapter.</td>
</tr>
<tr>
<td></td>
<td>► Use a lubricating paste which is suitable and approved for the application.</td>
</tr>
<tr>
<td></td>
<td>► Recommended tightening torque 35 Nm.</td>
</tr>
</tbody>
</table>

The adapter E33602 is supplied with an EPDM-O-ring (order no. E30438) and an FKM O-ring (order no. E30437).

<table>
<thead>
<tr>
<th></th>
<th>Installation using a welding adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Order no. E30013 sealing: metal to metal</td>
</tr>
<tr>
<td></td>
<td>order no. E30072 sealing: with sealing ring</td>
</tr>
<tr>
<td></td>
<td>Information about available adapters at <a href="http://www.ifm.com">www.ifm.com</a>.</td>
</tr>
<tr>
<td></td>
<td>► Observe the instructions of the adapter.</td>
</tr>
<tr>
<td></td>
<td>► Make sure that the process adapter does not warp during welding.</td>
</tr>
<tr>
<td></td>
<td>► Use a lubricating paste which is suitable and approved for the application.</td>
</tr>
</tbody>
</table>

The adapter E30072 is supplied with an EPDM-O-ring (order no. E30438) and an FKM O-ring (order no. E30437).
3 Installation using an adapter G 1 to G ½

Order no. E30116

Information about available adapters at www.ifm.com.
► Observe the instructions of the adapter.
► Use a lubricating paste which is suitable and approved for the application.
► Recommended tightening torque 20 Nm.

5.5 Protective cover

5.5.1 Function ventilation diaphragm

The ventilation diaphragm enables the relative pressure measurement since barometric and temperature-dependent pressure fluctuations between the measuring cell and the environment are compensated for.

The ventilation diaphragm is protected against damage by a screwed cap with circumferential ports.

⚠️ For a correct functioning of the diaphragm please take the following into account:
► Remove soiling and cleaning agents immediately using plenty of lime-deficient splash water.

⚠️ If the sensor is in a cooling stage:
► Avoid contact of the diaphragm with liquids:
  > Avoids negative pressure in the measuring system resulting in a slightly falsified measured value and additional strain on the diaphragm.

5.5.2 Orientation of the filter cover

The filter cover is freely rotatable around the sensor's axis and thus adaptable to the environmental conditions.

When the sensor is mounted in a vertical position, the condensate escapes through the ports in the protective cap due to gravity.

When the sensor is mounted in a horizontal position or similar, the filter protection cap must be rotated towards one of the two lateral faces to bring the GORE diaphragm into a vertical position. This guarantees the optimum drainage for liquids.
To ensure an optimum function of the pressure compensation element, align the filter cover as shown in Fig. 1.

► Ideal orientation (1): Filter cover in horizontal position. The ventilation diaphragm (2) in the filter cover is in a vertical position.
► Maximum inclination: 30° (3)

Fig. 1: Orientation

5.6 Filter cover

Replace filter cover:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Exchange the filter cover incl. GORE diaphragm (E30142).</td>
</tr>
<tr>
<td>2</td>
<td>Replace the filter cover with a closed version (E30148) (*)</td>
</tr>
</tbody>
</table>

Improve the protection of the filter cover:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Replace the filter cover with a version with a tube fitting and a vent tube that ends in a protected and dry area (E30139).</td>
</tr>
<tr>
<td>4</td>
<td>Set of accessories (E30467) with integrated replacement diaphragm (GORE) for high degree of soiling and / or high climate pollution. Function: (→ Installation instructions E30467)</td>
</tr>
</tbody>
</table>

► Avoid soiling and moisture during the exchange
► Clean the thread carefully and without residues
► Do not damage the adhesive area of the sensor
► Observe the orientation of the filter cover
   (→ Installation instructions E30139 / 30467)
When using the closed cover cap, there is no pressure compensation of the measuring cell any more. This results in measurement deviations caused by:

- fluctuations of the atmospheric pressure
- pressure fluctuations inside the unit in case of temperature changes (Δ 10 K ≤ 30 mbar).
6 Electrical connection

The unit must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply according to EN 50178, SELV, PELV.

► Disconnect power.
► Connect the unit as follows:

<table>
<thead>
<tr>
<th>Core colours</th>
<th>2-wire operation (2w)</th>
<th>3-wire operation (3w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BN brown</td>
<td><img src="image" alt="2-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
<tr>
<td>2 WH white</td>
<td><img src="image" alt="2-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
<tr>
<td>3 BU blue</td>
<td><img src="image" alt="2-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
<tr>
<td>4 BK black</td>
<td><img src="image" alt="2-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
</tbody>
</table>

OUT1: communication via IO-Link
OUT2: analogue output
Colours to DIN EN 60947-5-2

Wiring example

<table>
<thead>
<tr>
<th>(2w) 1 x analogue</th>
<th>(3w) 1 x analogue</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="2-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(3w) 1 x analogue / 1 x IO-Link</th>
<th>(3w) 1 x IO-Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="3-wire diagram" /></td>
<td><img src="image" alt="3-wire diagram" /></td>
</tr>
</tbody>
</table>
EMC test to EN 61000-4-5 Surge: 0.5 kV

7 Parameter setting

The unit can be configured via the IO-Link function.

► Prepare IO-Link hardware and software for parameter setting.
► Connect the unit with e.g. an IO-Link interface (→ 7.1) or a programmed memory plug (→ 7.2).
► Set the parameters.
► Put the unit into operation.

The parameters can be set before installation or during operation.

Changing parameters during operation can influence the function of the plant.

► Ensure that there will be no malfunctions in your plant.

7.1 Parameter setting via PC

For parameter setting, an IO-Link-capable software is necessary (e.g. LR DEVICE).

IO-Link interfaces from ifm are available for the connection of the unit via the USB interface of a computer → www.ifm.com.

► Prepare computer, software and interface.
► Connect the unit with the IO-Link interface.
► Follow the menu of the IO-Link software.
► Set the parameters.
► Put the unit into operation.

Adjustable parameters (→ 7.4.4).

7.2 Parameter setting via the memory plug

A parameter set can be written to the unit / can be recorded by the unit via a memory plug (ifm storage module) → www.ifm.com.

In order to allow for data to be written from the memory plug to the sensor, the sensor must have the factory setting.
If the sensor has been configured, the memory plug records the parameter set which can then be transferred to other sensors of the same type.

➤ Load a suitable parameter set (e.g. from a PC or from a sensor of the same type) to the memory plug.
➤ Connect the memory plug between sensor and socket.

> Sensor with factory setting:
  When voltage is supplied, the parameter set is transferred from the memory plug to the sensor.

> Sensor with changed settings:
  When voltage is supplied, the memory plug records the sensor's parameter set.
➤ Remove the memory plug.
➤ Put the unit into operation.

Adjustable parameters (→ 7.4.4).

You can find more information about the memory plug in the corresponding technical documentation → www.ifm.com.

### 7.3 Teach offset with the teach button

An external teach button (E30425) allows for a zero-point calibration (calibration offset). The current measured value is taken as internal zero point if this measured value lies within a range of +/- 3% of the measuring span.

For connection information see the data sheet of E30425

If a teach button is connected, no IO-Link communication is possible

➤ Integrate the teach button between the installed sensor and the supply cable.
➤ Maintain the plant pressure constantly at zero (configurable range = +/- 3% of the measuring span).
➤ Press the button for > 2 ... < 10 s.

> When voltage is supplied, the LED in the button flashes at 2 Hz and configures the zero point (calibration offset).
> In case of a fault, the LED flashes at 8 Hz.
7.3.1 Scale analogue value

- Select [ASP2] and set the value at which 4 mA is provided.
- Select [AEP2] and set the value at which 20 mA is provided.

Minimum distance between ASP2 and AEP2 = 20 % of the measuring span (scaling factor 5).

7.3.2 Select the standard unit of measurement (option)

- Select [uni.P] and set the unit of measurement:

The selectable units of measurement depend on the respective unit.

7.4 User settings (optional)

7.4.1 Set damping for the analogue output

- Select [dAA] and set the damping constant (rise time 10...90 %) in seconds. Setting range: 0.000...4.000 s.

Damping [dAA] only influences the analogue output / analogue signal path.

7.4.2 Set damping for the switching signal

- Select [dAP] and set the damping constant in seconds (t value: 63 %). Setting range: 0.000...4.000 s.

Damping [dAP] influences the process data flow (IO-Link communication).

7.4.3 Zero-point calibration

- Select [coF].

Compared to the real measured value, the internal measured value (operating value of the sensor) is shifted.

- Teach range: - 3...+ 3 % of the measuring span

Setting to zero is made with the command “Teach COF“. [coF] is reset with the command “Reset COF“.
### 7.4.4 List of the parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
</tr>
</thead>
</table>
| ASP2      | Analogue start point  
            Measured value at which 4 mA is provided. |
| AEP2      | Analogue end point  
            Measured value at which 20 mA is provided.  
            Minimum distance between ASP and AEP = 20 % of the measuring span |
| uni       | Standard unit of measurement for system pressure (display):  
            The selectable units of measurement depend on the respective unit. |
| coF       | Zero-point calibration (calibration offset)  
            Compared to the real measured value, the internal measured value (operating value of the sensor) is shifted.  
            • Teach range: -3...+3 % of the measuring span |
| dAA       | Damping for the analogue output  
            Pressure peaks of short duration or high frequency can be filtered out using this function. |
| dAP       | Damping of the process value (only applies to IO-Link evaluation) |
| Lo        | Minimum value memory for system pressure (irrespective of the set damping) |
| Hi        | Maximum value memory for system pressure (irrespective of the set damping) |

### 7.5 Diagnostic functions

#### 7.5.1 Read min/max values for the system pressure

- Select [Hi] or [Lo] to display the highest or lowest measured process value:  
  - [Hi] = Maximum value system pressure  
  - [Lo] = Minimum value system pressure  

The memory can be reset.
8 Operation
After power-on and expiry of the power-on delay time of approx. 0.5 s the unit is in the RUN mode (= normal operating mode). It carries out its measurement and evaluation functions and generates output signals according to the set parameters.

9 Error correction
The unit has many self-diagnostic options. It monitors itself automatically during operation. Warnings and faults are signalled via IO-Link. If a process value fails, the other process values are still available.

Additional diagnostic functions are available via IO-Link. → IODD interface description at www.ifm.com.

IO-Link error codes are contained in the IODD.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Output behaviour</th>
<th>Error correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>Unit faulty / malfunction</td>
<td>21.5 mA</td>
<td>Replace device.</td>
</tr>
<tr>
<td>Error</td>
<td>Supply voltage too low</td>
<td>off</td>
<td>Check supply voltage</td>
</tr>
<tr>
<td>Error</td>
<td>Parameter setting outside the valid range</td>
<td>21.5 mA</td>
<td>Repeat parameter setting.</td>
</tr>
<tr>
<td>Error</td>
<td>Error in pressure measurement</td>
<td>21.5 mA</td>
<td>Check pressure measurement.</td>
</tr>
<tr>
<td>Warning</td>
<td>Pressure range exceeded (&gt;= 105 % VMR*)</td>
<td>OU</td>
<td>Check pressure range.</td>
</tr>
<tr>
<td>Warning</td>
<td>Pressure range not reached (&gt;= -5 %MAW*)</td>
<td>OU</td>
<td>Check pressure range.</td>
</tr>
</tbody>
</table>

*MEW = final value of the measuring range, **MAW = initial value of the measuring range
In case of a warning the analogue signal is as defined in the parameters [OU].
10 Technical data and scale drawing

11 Maintenance, repair, disposal
► It is not possible to repair the unit.
► After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.
► In case of returns ensure that the unit is free from dangerous and toxic substances.

12 Factory setting

<table>
<thead>
<tr>
<th>Factory setting</th>
<th>User setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASP2 0% VMR*</td>
<td></td>
</tr>
<tr>
<td>AEP2 100% VMR*</td>
<td></td>
</tr>
<tr>
<td>uni bar / mbar</td>
<td></td>
</tr>
<tr>
<td>coF 0.0</td>
<td></td>
</tr>
<tr>
<td>dAA 0.1</td>
<td></td>
</tr>
<tr>
<td>dAP 0.06</td>
<td></td>
</tr>
</tbody>
</table>

VMR* = Final value of the measuring range
The indicated percentage of the final value of the measuring range (VMR) of the corresponding sensor in bar / mbar is set.
More information at www.ifm.com