Operating instructions
Electronic pressure sensor
PN3
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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

ℹ Information

ℹ 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, programming, configuration, operation
  and maintenance of the product must be carried out by personnel qualified and
  authorised for the respective activity.

• Protect units and cables against damage.

• If the devices are used in gas applications with pressures > 25 bar, the
  information in chapter 3.1 for devices with the marking **) must be absolutely
  observed!
3 Functions and features
The device monitors the system pressure of machines and installations.

3.1 Application area
Type of pressure: relative pressure

⚠️ Information on pressure rating and bursting pressure → data sheet.

⚠️ 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.

Pressure Equipment Directive (PED):
The units comply with the Pressure Equipment Directive and are designed and manufactured for group 2 fluids in accordance with the sound engineering practice.
   Use of media from group 1 fluids on request.

4 Function
- The unit displays the current system pressure.
- It generates output signals according to the operating mode and the parameter setting.
- It moreover provides the process data via IO-Link.
- The unit is designed for fully bidirectional communication.
   So, the following options are possible:
   - Remote display: reading and display of the current system pressure.
   - Remote parameter setting: reading and changing the current parameter setting.
   - IO-Link parameter setting (→ 4.5).
### 4.1 Operating modes

<table>
<thead>
<tr>
<th>Operating mode 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Application</strong></td>
</tr>
<tr>
<td><strong>Designation IO DD</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating mode 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Application</strong></td>
</tr>
<tr>
<td><strong>Designation IO DD</strong></td>
</tr>
</tbody>
</table>

4.2 Communication, parameter setting, evaluation

| OUT1 (pin 4) | • Switching signal for system pressure limit  
|             | • Communication via IO-Link
| OUT2 (pin 2) | • Analogue signal 4...20 mA / 0...10 V

4.3 Switching function

OUT1 changes its switching state if it is above or below the set switching limits (SP1, rP1). The following switching functions can be selected:

- Hysteresis function normally open: \([ou1] = [Hno]\) (→ Fig. 1).
- Hysteresis function normally closed: \([ou1] = [Hnc]\) (→ Fig. 1).

First set the set point (SP1), then the reset point (rP1).

The resulting hysteresis remains even if SP1 is changed again.

- Window function normally open: \([ou1] = [Fno]\) (→ Fig. 2).
- Window function normally closed: \([ou1] = [Fnc]\) (→ Fig. 2).

The width of the window can be set by means of the difference between FH1 and FL1. FH1 = upper value, FL1 = lower value.

\( \begin{align*} 
P & = \text{system pressure; HY = hysteresis; FE = window} \\
\end{align*} \)

When set to the window function, the set and reset points have a fixed hysteresis of 0.25 % of the measuring span.
### 4.4 Analogue function

OUT2 is an analogue output:

- [:math:`\text{[ou2]} \text{ defines whether the set measuring range is provided as } 4\ldots20 \text{ mA } (\text{[ou2]} = [I]) \text{ or as } 0\ldots10 \text{ V } (\text{[ou2]} = [U]).`]

**Information:**

PN3094 and PN3594:

Analogue signal 4...20 mA / 0...10 V corresponds with the measuring range of 0...10 bar.

Negative pressure values cannot be represented via the analogue output for the indicated units.

<table>
<thead>
<tr>
<th>Current output 4...20 mA</th>
<th>Voltage output 0 ... 10 V</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram of current output" /></td>
<td><img src="image" alt="Diagram of voltage output" /></td>
</tr>
</tbody>
</table>

- **P** = System pressure
- **MEW** = Final value of the measuring range

In the measuring range of the corresponding unit, the output signal is between 4 and 20 mA.

The green LED also indicates:

- System pressure above the measuring range: 20...20.5 mA
  - Fault indication from 21.5 mA.
- System pressure below the measuring range: 4...3.8 mA

In the measuring range of the corresponding unit, the output signal is between 0 and 10 V.

The green LED also indicates:

- System pressure above the measuring range: 10...10.3 V
  - Fault indication from 11 V.
4.5 IO-Link

4.5.1 General information

This device has an IO-Link communication interface that 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 are available at www.ifm.com.

4.5.2 Functions that are only available via IO-Link communication

• HIPC: number of overload processes (→ 9.6.2).
• HIPS: threshold for the overload counter (→ 9.6.2).
• Flashing: The sensor can be localised in the plant via this standard command. When the command is used, the switching status LEDs will flash and the device display will signal "IO-L".
  (Function is only available in operating mode [3]).
• Application Specific Tag: Freely definable text, assigned to the device.
• Plant identification code: Freely definable text, describes the device function in the plant. (Function is only available in operating mode [3]).
• Location identification code: Freely definable text, describes the installation location in the plant. (Function is only available in operating mode [3]).

For detailed information, please view the device-specific IO Device Description PDF at www.ifm.com.

5 Installation

⚠️ Before installing or removing the unit: Make sure that no pressure is applied to the system.

► Insert the unit in a G¼ process connection.
Tighten firmly. Recommended tightening torque:

<table>
<thead>
<tr>
<th>Pressure range in bar</th>
<th>Tightening torque in Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1...400</td>
<td>25...35</td>
</tr>
<tr>
<td>600</td>
<td>30...50</td>
</tr>
</tbody>
</table>

Depends on lubrication, seal and pressure load.

The sensor housing can be rotated by 345° with regard to the process connection.

Do not rotate past the end stop!

6 Electrical connection

The device 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 device as follows:

<table>
<thead>
<tr>
<th>Core colours</th>
<th>OUT1: switching output or IO-Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK</td>
<td>black</td>
</tr>
<tr>
<td>BN</td>
<td>brown</td>
</tr>
<tr>
<td>BU</td>
<td>blue</td>
</tr>
<tr>
<td>WH</td>
<td>white</td>
</tr>
<tr>
<td>OUT2</td>
<td></td>
</tr>
<tr>
<td>OUT1</td>
<td></td>
</tr>
</tbody>
</table>

Wiring example

1 x positive switching / 1 x analogue
7 Operating and display elements

1 to 8: Indicator LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED 1</td>
<td>Switching status OUT1 (on if output 1 is switched).</td>
</tr>
<tr>
<td>LED 8</td>
<td>No function</td>
</tr>
<tr>
<td>LEDs 2 - 7</td>
<td>System pressure in the indicated unit of measurement.</td>
</tr>
</tbody>
</table>

9: Enter button [●]
- Selection of the parameters and acknowledgement of the parameter values.

10 to 11: Arrow keys up [▲] and down [▼]
- Setting of the parameter values (scrolling by holding pressed, incrementally by pressing once).

12: Alphanumeric display, 4 digits
- Display of the current system pressure.
- Display of the parameters and parameter values.
8 Menu

8.1 Menu structure: Main menu

Menu items highlighted in grey e.g. [FH1] are only active if assigned parameters have been selected.
8.2 Explanation of the menu

8.2.1 Explanation of menu level 1

| SP1/rP1 | Upper / lower limit value for system pressure at which OUT1 switches with hysteresis setting. SP1/rP1 is displayed if the parameter [Hno] or [Hnc] was set for OUT1 in the menu Extended Functions "EF". |
| FH1/FL1 | Upper / lower limit for system pressure at which OUT1 switches with window setting. FH1/FL1 is displayed if the parameter [Fno] or [Fnc] was set for OUT1 in the menu Extended Functions "EF". |
| EF     | Extended functions / opening of menu level 2. |

8.2.2 Explanation of menu level 2

| rES    | Restore factory setting. |
| ou1    | Output function for OUT1:  
• Switching signal for the pressure limits: hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc].  
• Output off [OFF] (function is only available in operating mode [3]). |
| ou2    | Output function for OUT2:  
• Analogue signal for the current system pressure: 4…20 mA [I] or 0…10 V [U]  
• Output off [OFF] (function is only available in operating mode [3]). |
| dS1    | Switch-on delay for OUT1. |
| dr1    | Switch-off delay for OUT1. |
| uni    | Standard unit of measurement for system pressure (display):  
The selectable units of measurement depend on the respective unit.  
See table with setting ranges (→ 11.1.1). |
| Lo     | Minimum value memory for system pressure. |
| Hi     | Maximum value memory for system pressure. |
| dAP    | Damping of the switch point / process data flow (IO-Link communication) and the display. |
| dAA    | Damping of the analogue output. |
| coLr   | Assignment of the display colours "red" and "green" within the measuring range. |
| cFH / cFL | Upper / lower value for colour change.  
Parameter only active after selection of a freely definable colour window in the coLr parameter: [r-cF] or [G-cF]. |
| diS    | Update rate and orientation of the display. |
| CMPT   | Selection of the operating mode. |
9 Parameter setting

During parameter setting the unit remains in the operating mode. It continues its monitoring functions with the existing parameters until the parameter setting has been completed.

9.1 Parameter setting in general

3 steps must be taken for each parameter setting:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Select parameter</td>
<td>Press [●] to get to the menu. Press [▲] or [▼] until the required parameter is displayed.</td>
</tr>
<tr>
<td>2</td>
<td>Set parameter value</td>
<td>Press [●] to edit the selected parameter. Press [▲] or [▼] for at least 1 s. After 1 s: setting value can be changed: incrementally by pressing the button once or continuously by keeping the button pressed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numerical values can be incremented continuously with [▲] or decremented with [▼].</td>
</tr>
<tr>
<td>3</td>
<td>Acknowledge parameter value</td>
<td>Briefly press [●]. The parameter is displayed again. The new setting value is saved.</td>
</tr>
</tbody>
</table>

Set other parameters

Press [▲] or [▼] until the required parameter is displayed.

Finish parameter setting

Press [▲] or [▼] several times until the current measured value is displayed or wait for 30 s. The unit returns to the process value display.
If [C.Loc] is displayed when an attempt is made to modify a parameter value, IO-Link communication is active (temporary locking).

If [S.Loc] is displayed, the sensor is permanently locked via software. This locking can only be removed with a parameter setting software.

• Change from menu level 1 to menu level 2:

  ► Press [●] to get to the menu.
  ► Press [▼] until [EF] is displayed.
  ► Press [●]
  > The first parameter of the submenu is displayed (here: [rES]).

• Locking / Unlocking

  The unit can be locked electronically to prevent unintentional settings.

  ► Make sure that the unit is in the normal operating mode.
  ► Press [▲] + [▼] simultaneously for 10 s.
  > [Loc] is displayed.

  During operation: [Loc] is briefly displayed if you try to change parameter values.

  For unlocking:
  ► Make sure that the unit is in the normal operating mode.
  ► Press [▲] + [▼] simultaneously for 10 s.
  > [uLoc] is displayed.

  On delivery: not locked.
• **Timeout:**
  If no button is pressed for 30 s during parameter setting, the unit returns to the operating mode with unchanged values.

• **Exit parameter without applying the settings**
  To exit a parameter without applying the settings:
  ► [▲] + [▼] Press [▲] + [▼] simultaneously.
  > Return to the menu level.

• **Exit menu level**
  To exit the menu level:
  ► [▲] + [▼] Press [▲] + [▼] simultaneously.
  > Menu level 2 changes to level 1 or level 1 changes to display.

### 9.2 Define the operating mode (optional)

► Select [CMPT] and set the required operating mode
  - [2] = operating mode 2
  - [3] = operating mode 3

- **i** Description of the operating modes, see (→ 4.1)

- **i** If IO-Link is used, an IODD that corresponds with the operating mode must be used.

- **!** If the operating mode is changed, all parameters will be reset to factory settings.
9.3 Configure display (optional)

- Select [uni] and set the unit of measurement:
  - [bAr], [mbAr],
  - [MPA], [kPA],
  - [PSI],
  - [inHG]

The selectable units of measurement depend on the respective unit. See table with setting ranges (→ 11.1.1).

- Select [diS] and set the update rate and orientation of the display:
  - [d1]: update of the measured values every 50 ms.
  - [d2]: update of the measured values every 200 ms.
  - [d3]: update of the measured values every 600 ms.
  - [rd1], [rd2], [rd3]: display as for d1, d2, d3; rotated by 180°.
  - [OFF] = the measured value display is deactivated in the Run mode.

The LEDs remain active even if the display is deactivated. Error messages are displayed even if the display is deactivated.

Even with unsteady pressure characteristics [d1] provides optimum readability; the corresponding algorithms are stored.

9.4 Set output signals

9.4.1 Set output functions

- Select [ou1] and set the switching function:
  - [Hno] = hysteresis function/normally open
  - [Hnc] = hysteresis function / normally closed,
  - [Fno] = window function/NO,
  - [Fnc] = window function/NC.
  - [OFF] = output off.

Parameter [OFF] is only available in operating mode 3 ([CMPT] = [3]).

- Select [ou2] and set the analogue function:
  - [I] = current signal 4...20 mA,
  - [U] = voltage signal 0...10 V.
  - [OFF] = output off.

Parameter [OFF] is only available in operating mode 3 ([CMPT] = [3]).
### 9.4.2 Define switching limits for the hysteresis function
- [ou1] must be set as [Hno] or [Hnc].
- Select [SP1] and set the value at which the output is set.
- Select [rP1] and set the value at which the output is reset. rP1 is always lower than SP1. The unit only accepts values which are lower than SP1.

### 9.4.3 Set switching limits for the window function
- [ou1] must be set as [Fno] or [Fnc].
- Select [FH1] and set the upper limit.
- Select [FL1] and set the lower limit. FL1 is always lower than FH1. The device only accepts values that are lower than the value for [FH1].

### 9.5 User settings (optional)
#### 9.5.1 Defining the delay time for the switching output
- \([dS1] = \) on delay for OUT1.
- \([dr1] = \) off delay for OUT1.
- Select \([dS1]\) or \([dr1]\) and set a value between 0 and 50 s (at 0, the delay time is not active).

#### Diagram:
- Output function:
  - \([Hno] / [Hnc] \)
  - A: \(dS\)
  - B: \(dr\)
Output function:


P = system pressure; SP = set point; rP = reset point; HY = hysteresis; FE = window; FH = upper value; FL = lower value.

For this unit, the assignment of the parameters [dSx] and [drx] to the set and reset points is strictly designed according to the VDMA guideline.

9.5.2 Set damping for the switching signal

- Select [dAP] and set the damping constant in seconds (τ value 63 %); setting range 0.000...4.000 s.

Damping [dAP] affects the switch point / process data flow (IO-Link communication) and the display.

9.5.3 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.

9.5.4 Reset all parameters to factory setting

- Select [rES].
- Press [●].
- Press [▲] or [▼] and keep pressed until [----] is displayed.
- Briefly press [●].

We recommend noting down your own settings before carrying out a reset (→ 12 Factory setting).

Also the operating mode [CMPT] is reset to the factory setting ([CMPT]=[2]).
9.5.5 Set colour change of the display

► Select [coLr] and set the function:
  - [rEd] = display colour red (independent of the measured value).
  - [GrEn] = display colour green (independent of the measured value).
  - [r1ou] = display colour red when OUT1 switches.
  - [G1ou] = display colour green when OUT1 switches.
  - [r-cF] = display colour is red if the measured value is between the freely definable limits [cFH*] and [cFL]*).
  - [G-cF] = display colour is green if the measured value is between the freely definable limits [cFL]*) and [cFH]*).

*) The parameters [cFH] and [cFL] can only be selected in the menu tree if [r-cF] or [G-cF] has been activated.

► Select [cFL] and set the lower limit
  (only possible if [r-cF] or [G-cF] has been activated).
  > The setting range corresponds to the measuring range and its maximum limit is [cFH].

► Select [cFH] and set the upper limit
  (only possible if [r-cF] or [G-cF] has been activated).
  > The setting range corresponds to the measuring range and its minimum limit is [cFL].
### 9.5.6 Graphical depiction of the colour change of the display

<table>
<thead>
<tr>
<th>Display colour change with parameter ([r1ou]), mode hysteresis function</th>
<th>Display colour change with parameter ([G1ou]), mode hysteresis function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Graph 1" /></td>
<td><img src="image2" alt="Graph 2" /></td>
</tr>
<tr>
<td>Measured value &gt; switch point OUT1; Display = red</td>
<td>Measured value &gt; switch point OUT1; Display = green</td>
</tr>
<tr>
<td>Display colour change with parameter ([r1ou]), window function mode</td>
<td>Display colour change with parameter ([G1ou]), window function mode</td>
</tr>
<tr>
<td><img src="image3" alt="Graph 3" /></td>
<td><img src="image4" alt="Graph 4" /></td>
</tr>
<tr>
<td>Measured value between FL1 and FH1; Display = red</td>
<td>Measured value between FL1 and FH1; Display = green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour change display green</th>
<th>Colour change display red</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initial value of the measuring range</td>
</tr>
<tr>
<td>2</td>
<td>final value of the measuring range</td>
</tr>
</tbody>
</table>
Display colour change with parameter $[r-cF]$ independent of OUT1.

<table>
<thead>
<tr>
<th></th>
<th>Colour change display green</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colour change display red</td>
</tr>
<tr>
<td>1</td>
<td>Initial value of the measuring range</td>
</tr>
<tr>
<td>2</td>
<td>Final value of the measuring range</td>
</tr>
<tr>
<td>cFL</td>
<td>Lower limit (independent of the output function)</td>
</tr>
<tr>
<td>cFH</td>
<td>Upper limit (independent of the output function)</td>
</tr>
</tbody>
</table>

Measured value between cFL and cFH; Display = red

Measured value between cFL and cFH; Display = green

9.6 Diagnostic functions

9.6.1 Read min/max values for the system pressure

- Select [HI] or [Lo] and briefly press [●].
  [HI] = maximum value, [Lo] = minimum value.

Delete memory:
- Select [HI] or [Lo].
- Press [▲] or [▼] and keep pressed until [----] is displayed.
- Briefly press [●].
9.6.2 Reading the overload processes

- **HIPC**: Number of overload processes
  HIPC counts how often the HIPS threshold has been exceeded. The value must exceed the threshold for at least 0.5 ms.
- **HIPS**: Setting of the threshold for the overload counter.

⚠️ The parameters HIPC and HIPS are only available via IO-Link communication.

<table>
<thead>
<tr>
<th>HIPC</th>
<th>HIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 10 Operation

After power on, the unit is in the RUN mode (= normal operating mode). It carries out its measurement and evaluation functions and provides output signals according to the set parameters.

Operation indication (→ 7 Operating and display elements).

#### 10.1 Read the set parameters

- Press [●]
- Press [▲] or [▼] until the required parameter is displayed.
- Briefly press [●].

> The unit displays the corresponding parameter value for approx. 30 s; then it changes to the process value display.
## 10.2 Self-diagnostics / fault indications

The unit has many self-diagnostic options.
- It monitors itself automatically during operation.
- Warnings and faults are displayed (even if the display is deactivated), in addition they are available via IO-Link.

<table>
<thead>
<tr>
<th>Display</th>
<th>Status LED OUT1</th>
<th>Type of fault *</th>
<th>Fault / warning</th>
<th>Corrective measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td></td>
<td>F</td>
<td>Supply voltage too low.</td>
<td>▶ Check / correct the supply voltage.</td>
</tr>
<tr>
<td>SC1</td>
<td>flashing</td>
<td>F</td>
<td>Excessive current at switching output OUT1 **.</td>
<td>▶ Check switching output ou1 for short-circuit or excessive current; Remove the fault.</td>
</tr>
<tr>
<td>Loc</td>
<td></td>
<td>W</td>
<td>Parameter setting locked via pushbuttons.</td>
<td>▶ Unlock buttons (→ 9.1 Parameter setting in general) →&quot;Lock / unlock&quot;.</td>
</tr>
<tr>
<td>C.Loc</td>
<td></td>
<td>W</td>
<td>Parameter setting locked via pushbuttons, parameter setting is enabled via IO-Link communication (→ 9.1).</td>
<td>▶ Wait until parameter setting via IO-Link is finished.</td>
</tr>
<tr>
<td>S.Loc</td>
<td></td>
<td>W</td>
<td>Setting buttons locked via parameter software. Parameter change is rejected (→ 9.1).</td>
<td>▶ Unlocking only possible via IO-Link interface / parameter setting software.</td>
</tr>
<tr>
<td>OL</td>
<td></td>
<td>W</td>
<td>Process value too high (measuring range exceeded).</td>
<td>▶ Check / reduce system pressure / select unit with corresponding measuring range.</td>
</tr>
<tr>
<td>UL</td>
<td></td>
<td>W</td>
<td>Process value too low (value below measuring range).</td>
<td>▶ Check / increase system pressure / select unit with corresponding measuring range.</td>
</tr>
<tr>
<td>Err</td>
<td>flashing</td>
<td>F</td>
<td>Internal fault / malfunction.</td>
<td>▶ Contact the manufacturer.</td>
</tr>
</tbody>
</table>

*) F = fault
W = warning

***) The output remains deactivated as long as the excessive current / short circuit continues.
## 11 Technical data and scale drawing

### 11.1 Setting ranges

The setting ranges differ depending on the operating mode (→ 4.1).

#### 11.1.1 Setting ranges in operating mode 2

<table>
<thead>
<tr>
<th></th>
<th>rP / SP</th>
<th>cFL / cFH</th>
<th>ΔP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Setting range</td>
<td>min. distance</td>
<td>Setting range</td>
</tr>
<tr>
<td><strong>PN3160</strong></td>
<td>bar 2…600</td>
<td>2</td>
<td>0…600</td>
</tr>
<tr>
<td><strong>PN3560</strong></td>
<td>psi 20…8700</td>
<td>40</td>
<td>0…8700</td>
</tr>
<tr>
<td><strong>PN3070</strong></td>
<td>MPA 0.2…60</td>
<td>0.2</td>
<td>0…60</td>
</tr>
<tr>
<td><strong>PN3570</strong></td>
<td>bar 2…400</td>
<td>2</td>
<td>0…400</td>
</tr>
<tr>
<td><strong>PN3071</strong></td>
<td>psi 20…5800</td>
<td>40</td>
<td>0…5800</td>
</tr>
<tr>
<td><strong>PN3571</strong></td>
<td>MPA 0.2…40</td>
<td>0.2</td>
<td>0…40</td>
</tr>
<tr>
<td><strong>PN3092</strong></td>
<td>bar 1…250</td>
<td>2</td>
<td>0…250</td>
</tr>
<tr>
<td><strong>PN3592</strong></td>
<td>psi 20…3620</td>
<td>20</td>
<td>0…3620</td>
</tr>
<tr>
<td><strong>PN3071</strong></td>
<td>MPA 0.1…25</td>
<td>0.2</td>
<td>0…25</td>
</tr>
<tr>
<td><strong>PN3571</strong></td>
<td>bar 0.5…100</td>
<td>0.5</td>
<td>0…100</td>
</tr>
<tr>
<td><strong>PN3092</strong></td>
<td>psi 5…1450</td>
<td>10</td>
<td>0…1450</td>
</tr>
<tr>
<td><strong>PN3592</strong></td>
<td>MPA 0.05…10</td>
<td>0.05</td>
<td>0…10</td>
</tr>
<tr>
<td><strong>PN3093</strong></td>
<td>bar 0.1…25</td>
<td>0.2</td>
<td>0…25</td>
</tr>
<tr>
<td><strong>PN3593</strong></td>
<td>psi 2…362</td>
<td>2</td>
<td>0…362</td>
</tr>
<tr>
<td><strong>PN3093</strong></td>
<td>MPA 0.01…2.5</td>
<td>0.02</td>
<td>0…2.5</td>
</tr>
<tr>
<td><strong>PN3593</strong></td>
<td>bar -0.95…10</td>
<td>0.05</td>
<td>-1…10</td>
</tr>
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<td><strong>PN3094</strong></td>
<td>psi -14…145</td>
<td>1</td>
<td>-14.5…145</td>
</tr>
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<td><strong>PN3594</strong></td>
<td>MPA -0.095…1</td>
<td>0.005</td>
<td>-0.1…1</td>
</tr>
<tr>
<td><strong>PN3096</strong></td>
<td>bar 0.01…2.5</td>
<td>0.02</td>
<td>0…2.5</td>
</tr>
<tr>
<td><strong>PN3596</strong></td>
<td>psi 0.2…36.2</td>
<td>2</td>
<td>0…36.2</td>
</tr>
<tr>
<td><strong>PN3096</strong></td>
<td>kPA 1…250</td>
<td>2</td>
<td>0…250</td>
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ΔP = step increment
### 11.1.2 Setting ranges in operating mode 3

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<tbody>
<tr>
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<td>min. distance</td>
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<td>PN3097</td>
<td>mbar</td>
<td>5...1000</td>
</tr>
<tr>
<td>PN3597</td>
<td>psi</td>
<td>0.05...14.5</td>
</tr>
<tr>
<td></td>
<td>kPa</td>
<td>0.5...100</td>
</tr>
<tr>
<td></td>
<td>inHG</td>
<td>0.1...29.5</td>
</tr>
<tr>
<td>PN3129</td>
<td>mbar</td>
<td>-995...0</td>
</tr>
<tr>
<td>PN3529</td>
<td>psi</td>
<td>-14.45...0</td>
</tr>
<tr>
<td></td>
<td>kPa</td>
<td>-99.5...0</td>
</tr>
<tr>
<td></td>
<td>inHG</td>
<td>-29.4...0</td>
</tr>
</tbody>
</table>

ΔP = step increment
<table>
<thead>
<tr>
<th></th>
<th>rP / SP</th>
<th></th>
<th>cFL / cFH</th>
<th></th>
<th>( \Delta P )</th>
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<tr>
<td></td>
<td>Setting range</td>
<td>min. distance</td>
<td>Setting range</td>
<td>min. distance</td>
<td></td>
</tr>
<tr>
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<td>bar</td>
<td>-0.97...10</td>
<td>0.05</td>
<td>-1...10</td>
<td>0.05</td>
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<tr>
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<td>psi</td>
<td>-14...145</td>
<td>0.8</td>
<td>-14.5...145</td>
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<td>-0.097...1</td>
<td>0.005</td>
<td>-0.1...1</td>
<td>0.005</td>
</tr>
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<td><strong>PN3594</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PN3096</strong></td>
<td>bar</td>
<td>0.01...2.5</td>
<td>0.02</td>
<td>0...2.5</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>PN3596</strong></td>
<td>psi</td>
<td>0.1...36.3</td>
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<td>0...36.3</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>PN3096</strong></td>
<td>kPa</td>
<td>1...250</td>
<td>2</td>
<td>0...250</td>
<td>2</td>
</tr>
<tr>
<td><strong>PN3596</strong></td>
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<td><strong>PN3097</strong></td>
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<td>3...1000</td>
<td>5</td>
<td>0...1000</td>
<td>5</td>
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<tr>
<td><strong>PN3597</strong></td>
<td>psi</td>
<td>0.05...14.5</td>
<td>0.08</td>
<td>0...14.5</td>
<td>0.08</td>
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<tr>
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<td>0.3...100</td>
<td>0.5</td>
<td>0...100</td>
<td>0.5</td>
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<tr>
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<td>inHG</td>
<td>0.1...29.5</td>
<td>0.2</td>
<td>0...29.5</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>PN3129</strong></td>
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<td>5</td>
<td>-1000...0</td>
<td>5</td>
</tr>
<tr>
<td><strong>PN3529</strong></td>
<td>psi</td>
<td>-14.45...0</td>
<td>0.08</td>
<td>-14.5...0</td>
<td>0.08</td>
</tr>
<tr>
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<td>-99.7...0</td>
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<td>-100...0</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>PN3529</strong></td>
<td>inHg</td>
<td>-29.4...0</td>
<td>0.2</td>
<td>-29.5...0</td>
<td>0.2</td>
</tr>
</tbody>
</table>

\( \Delta P = \text{step increment} \)

### 11.2 Further technical data

Further technical data and scale drawings at: [www.ifm.com](http://www.ifm.com)
## 12 Factory setting

<table>
<thead>
<tr>
<th>Element</th>
<th>Factory setting</th>
<th>User setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1 / FH1</td>
<td>25 % MEW*</td>
<td></td>
</tr>
<tr>
<td>rP1 / FL1</td>
<td>23 % MEW*</td>
<td></td>
</tr>
<tr>
<td>ou1</td>
<td>Hno</td>
<td></td>
</tr>
<tr>
<td>ou2</td>
<td>I</td>
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<tr>
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<tr>
<td>dAA</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>uni</td>
<td>bAr / mbAr</td>
<td></td>
</tr>
<tr>
<td>coLr</td>
<td>rEd</td>
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</tr>
<tr>
<td>cFH</td>
<td>MEW</td>
<td></td>
</tr>
<tr>
<td>cFL</td>
<td>MAW</td>
<td></td>
</tr>
<tr>
<td>diS</td>
<td>d2</td>
<td></td>
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<tr>
<td>HIPS**</td>
<td>MEW</td>
<td></td>
</tr>
<tr>
<td>CMPT</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

* = The indicated percentage of the final value of the measuring range (MEW) of the respective sensor (for PN3xx9 the percentage of the measuring span) is set.

** = HIPS is only available via IO-Link communication

(MEW) = final value of the measuring range, (MAW) initial value of the measuring range
More information at www.ifm.com