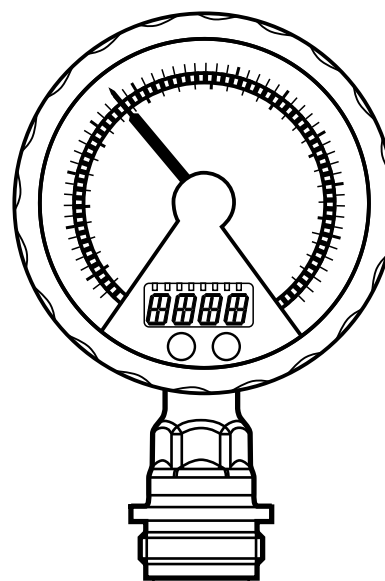


Operating instructions
Electronic manometer

PG27xx

UK

11433184 / 00 11 / 2022



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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.



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 monitors the system pressure in a plant.

3.1 Applications

Type of pressure: relative pressure

Order no.	Measuring range (in brackets: extended display range)		Permissible overload pressure		Bursting pressure	
	bar	PSI	bar	PSI	bar	PSI
PG2793	-1...25 (40)	-14.4...362.7 (580.2)	100	1450	350	5070
PG2794	-1...10 (16)	-14.5...145 (232)	50	725	150	2175
PG2795	-1...4 (6.4)	-14.5...58 (92.8)	30	435	100	1450
PG2796	-0.124...2.5 (4)	-1.8...36.27 (58.02)	20	290	50	725
PG2797	-0.05...1 (1.6)	-0.73...14.5 (23.21)	10	145	30	435
PG2799	-1...1 (1.6)	-14.5...14.5 (23.20)	10	145	30	435
	mbar	inH2O	bar	PSI	bar	PSI
PG2798	-12.4...250 (400)	-5.0...100.4 (160.6)	6	84	30	435
PG2789	-5...100 (160)	-2.0...40.15 (64.25)	4	58	30	435



Avoid static and dynamic overpressure exceeding the specified overload pressure 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. ATTENTION: Risk of injury!

Use in gases at pressures > 25 bar only on request.



The unit can be operated at media temperatures up to 145°C (max. 1h) / 125°C (permanently). Therefore it is suitable for all common cleaning and sterilisation processes (CIP, SIP).

Not suitable for use where the criteria for paragraph D10.1.2/74-03 of the 3A standard 74-03 have to be met.

4 Function

4.1 Process measured signals

- The unit generates 2 output signals according to the parameter setting.

OUT1	Switching signal for system pressure limit.
OUT2	Analogue signal (4...20 mA, 20...4 mA).

- The unit displays the current system pressure.

Analogue display: circular scale with pointer.
--

Digital display (alphanumeric display, 4 digits).

- In addition, an LED ring with one of the following display options is available:

Display of set point and reset point.

Trend display (rising pressure / falling pressure).

Lag indicator function for maximum value or minimum value.
--

Display of pulsating signals and pressure peaks.
--

4.2 Pressure monitoring / 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).

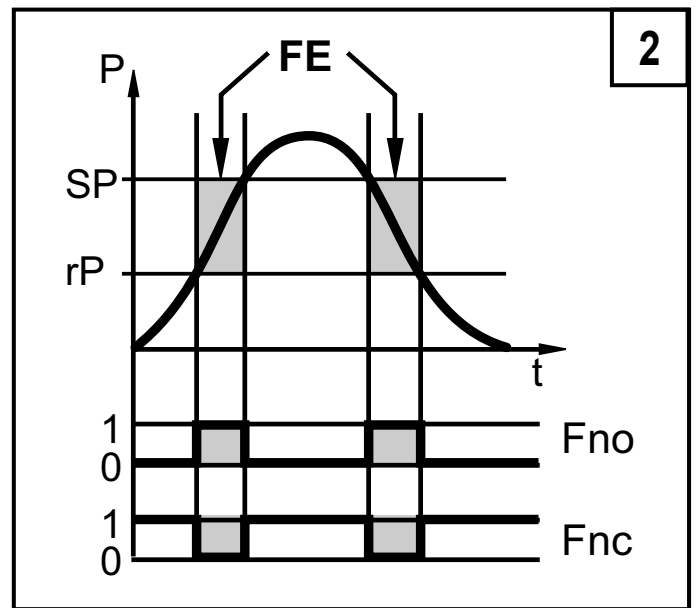
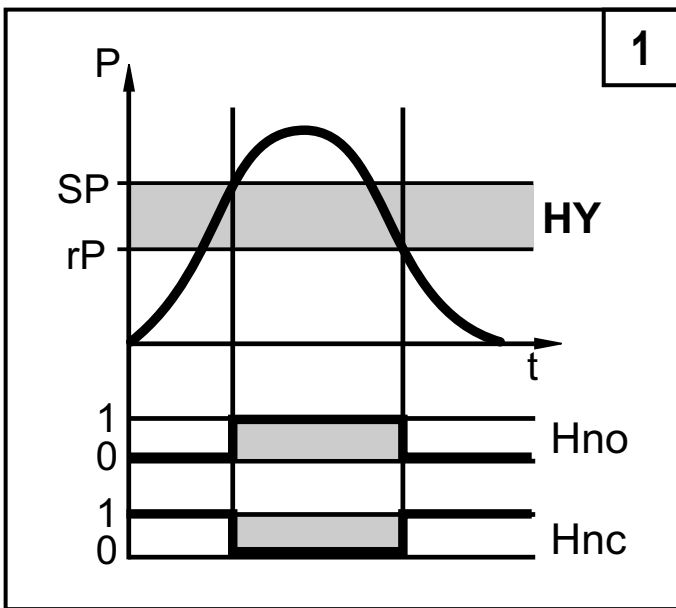
- Hysteresis function / normally closed: [OU1] = [Hnc] (→ fig. 1).

First the set point (SP1) is set, then the reset point (rP1) with the requested difference.

- 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 SP1 and rP1. SP1 = upper value, rP1 = lower value.



P = system pressure; HY = hysteresis; FE = window

4.3 Pressure monitoring / analogue function

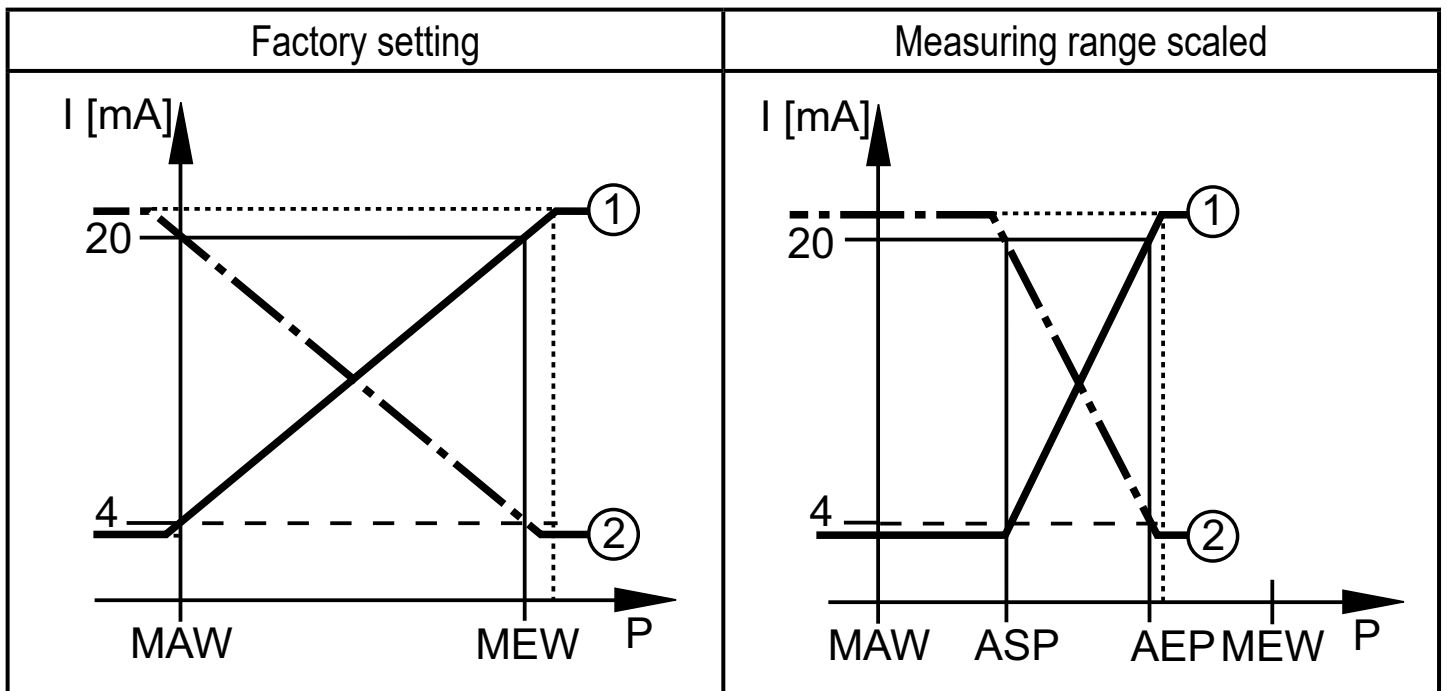
The analogue output can be configured.

- [OU2] defines whether the set measuring range is provided as 4...20 mA ([OU2] = [I]) or as 20...4 mA ([OU2] = [InEG]).

Scaling can be set by means of the teach process or by entering a value for the parameters ASP and AEP.

- Teaching the analogue start point [tASP] or setting the parameter [ASP] defines at which measured value the output signal is 4 mA (20 mA with [InEG]).
- Teaching the analogue end point [tAEP] or setting the parameter [AEP] defines at which measured value the output signal is 20 mA (4 mA with [InEG]).

Minimum distance between [ASP] and [AEP] = 25 % of the final value of the measuring range.



P = system pressure , MAW = initial value of the measuring range, MEW = final value of the measuring range

①: [OU2] = [I]; ②: [OU2] = [InEG]

In the set measuring range the output signal is between 4 and 20 mA ([OU2] = [I]) or between 20 and 4 mA ([OU2] = [InEG]).

It is also indicated:

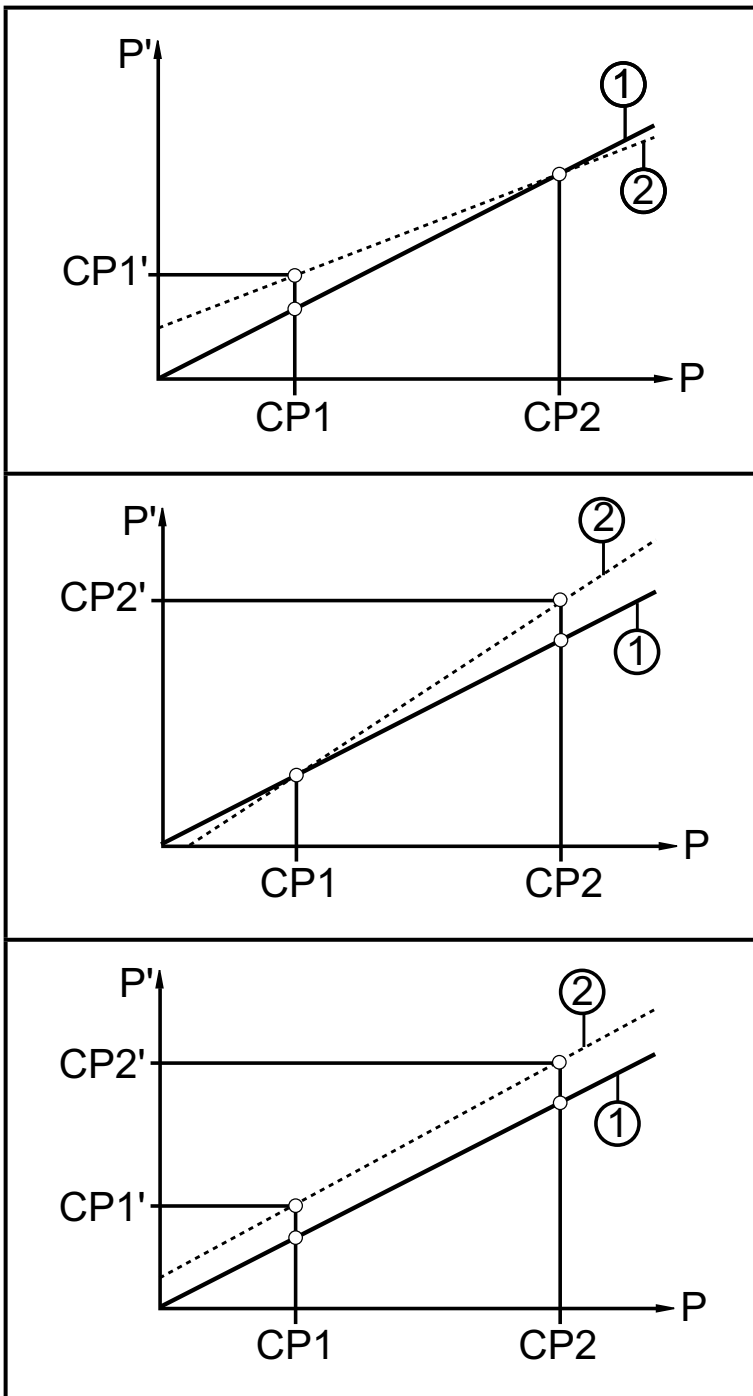
- System pressure above the measuring range:
 - Output signal 20 to 20.5 mA if [OU2] = [I].
 - Output signal 4 to 3.8 mA if [OU2] = [InEG].
- System pressure below the measuring range:
 - Output signal 4 to 3.8 mA if [OU2] = [I].
 - Output signal 20 to 20.5 mA if [OU2] = [InEG].

4.4 Customer-specific calibration

The customer-specific calibration changes the curve of measured values compared to the real measured values (shifting / change of the gradient, (→ 9.4.6) [CAL]).

- Two calibration points can be defined (CP1, CP2). The two points are independent of each other. They must be within the measuring range and not in the extended display range.
- The zero point calibration [COF] influences the calibration of the curve of measured values. Recommendation: set [COF] to 0 ((→ 9.4.1) [COF]), then calibrate the curve of measured values.

After a change the calibration can be reset to factory setting ((→ 9.5.2) [rES]).



- P = measured pressure; P' = modified measured value
- $CP1$ = calibration point 1; $CP1'$ = modified measured value for $CP1$
- $CP2$ = calibration point 2; $CP2'$ = modified measured value for $CP2$
- 1 = curve of measured values with factory setting
- 2 = curve of measured values after calibration

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: If „0%“ is displayed and no pointer is visible, this does not mean that no pressure is applied to the system!

- ▶ Note dangers related to extreme machine / medium temperatures.



We recommend horizontal installation for high medium temperatures. When installed near agitators or pumps, pulsation fluctuations may influence the function of the unit.

5.1 Units with G1 / Aseptoflex Vario process connection

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




Information about available adapters at www.ifm.com.

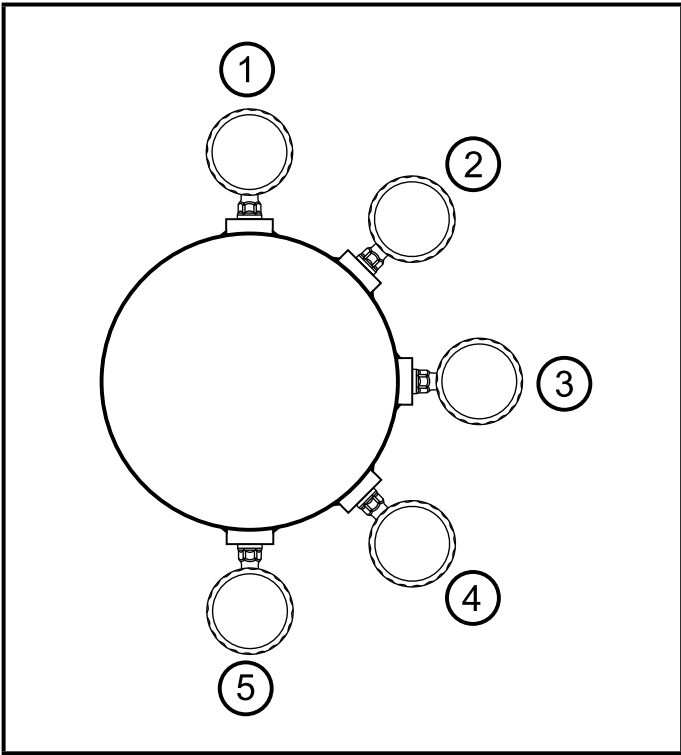
- ▶ Observe the instructions of the adapter.
- ▶ Use a lubricating paste which is suitable and approved for the application.
- ▶ Tighten firmly. Recommended tightening torque: 35 Nm
Depends on the sealing type, the pressure load and the lubrication!

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

1	Installation using an adapter with sealing ring (hygiene-compliant) Order no. E332xx / E333xx. <ul style="list-style-type: none">▶ 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: <ul style="list-style-type: none">• FKM O-ring (order no. E30123)• PEEK sealing ring (order no. E30124). The PEEK sealing ring is long-term stable and maintenance-free. <ul style="list-style-type: none">▶ 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.
----------	---

2	<p>Installation using a welding adapter with sealing ring (hygiene-compliant)</p> <ul style="list-style-type: none"> ▶ 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. (→ Details in operating instructions of the adapter). <p>The adapter is supplied with EPDM O-ring (order no. E30054). Another sealing ring is available as accessory:</p> <ul style="list-style-type: none"> • FKM O-ring (order no. E30123);
3	<p>Installation using a process adapter with metal-to-metal seal</p> <p>Order no. E337xx / E338xx</p> <p> A long-term stable, maintenance-free and gap-free fitting in the metal-to-metal seal is only valid for once-only mounting.</p> <ul style="list-style-type: none"> ▶ If the sealing has to be installed several times, use a new adapter.
4	<p>Installation to G 1 flange / G 1 bush</p> <p>The process is sealed with the sealing ring at the back of the sensor.</p> <ul style="list-style-type: none"> ▶ The sealing area on 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 3A



The following applies to units with 3A certification:

- ▶ Only use adapters with 3A qualification 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



In case welded adapters are used, the food contact surface must be smooth (surface roughness $R_a < 0.8 \mu\text{m}$) and the welding has to be done according to EHEDG Guideline 9 and 35.



The unit 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.

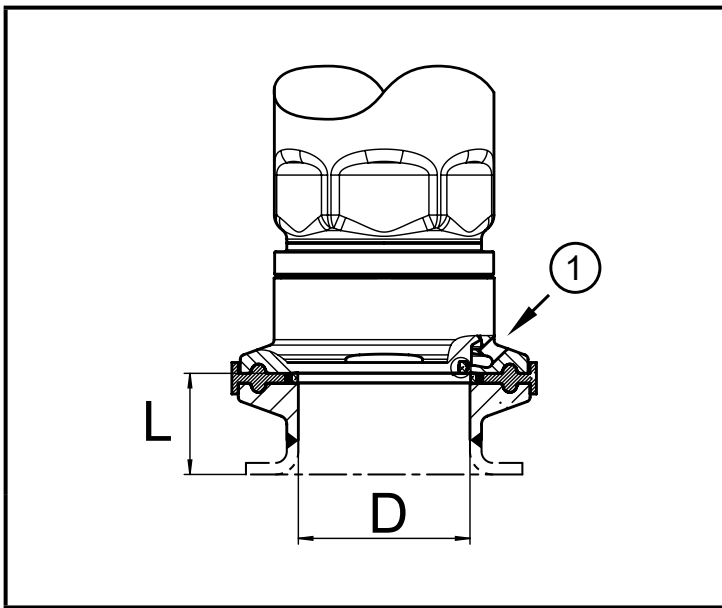
▶ Only use process adapters permitted according to EHEDG with special seals required by the EHEDG position paper.



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 Ventilation diaphragm

5.4.1 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 filter cover 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 Filter cover

Replace filter cover:

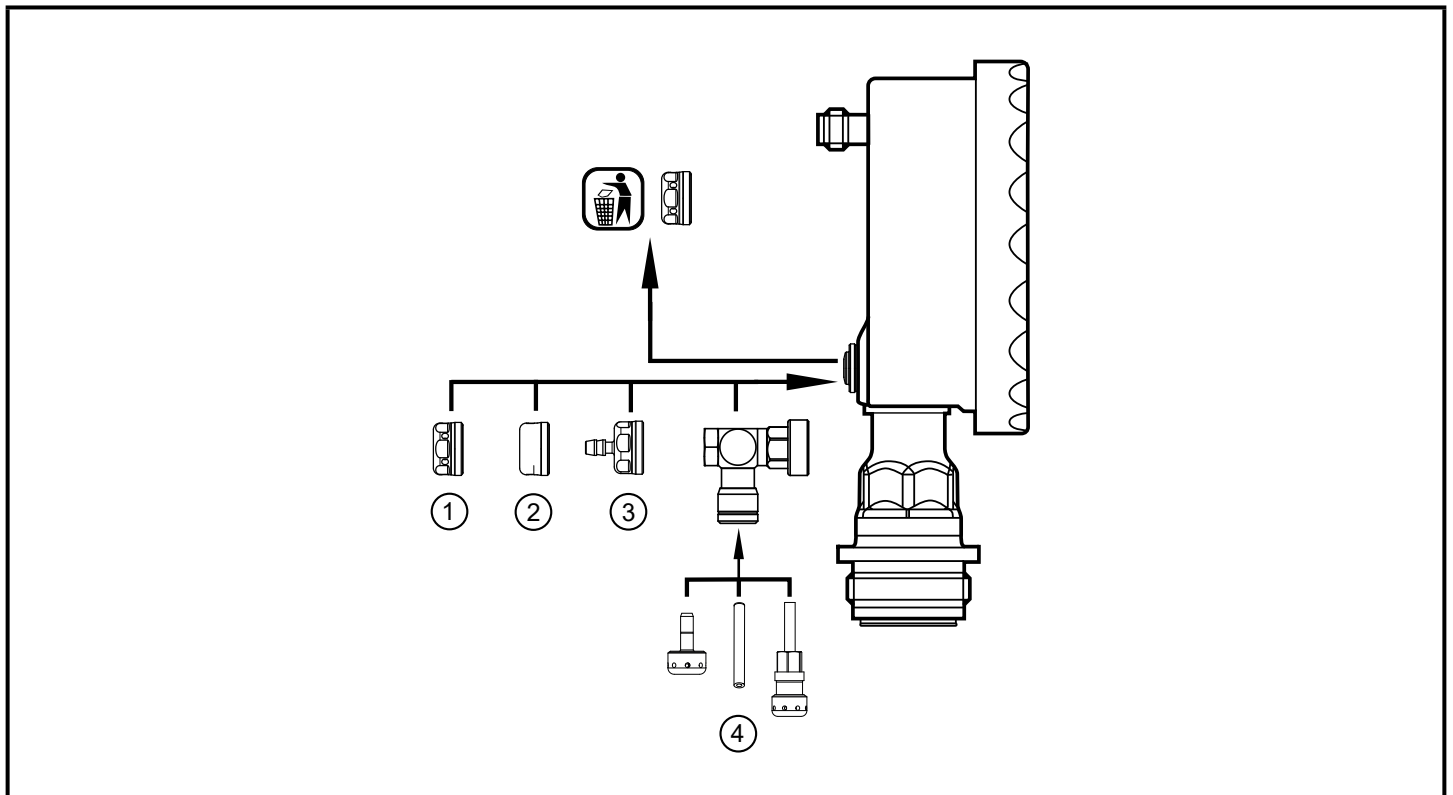
1	Exchange the filter cover incl. GORE diaphragm (E30142).
2	Replace the filter cover with a closed version (E30148) (*)

Improve the protection of the filter cover:

3	Replace the filter cover with a version with a tube fitting and a vent tube that ends in a protected and dry area (E30139)
4	Set of accessories (E30467) with integrated ventilation diaphragm, for high degree of soiling and / or high climate pollution. Function: (→ Installation instructions E30467)



- ▶ 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 fluctuations ($\Delta 10\text{ K} \leq 30\text{ mbar}$).

6 Electrical connection

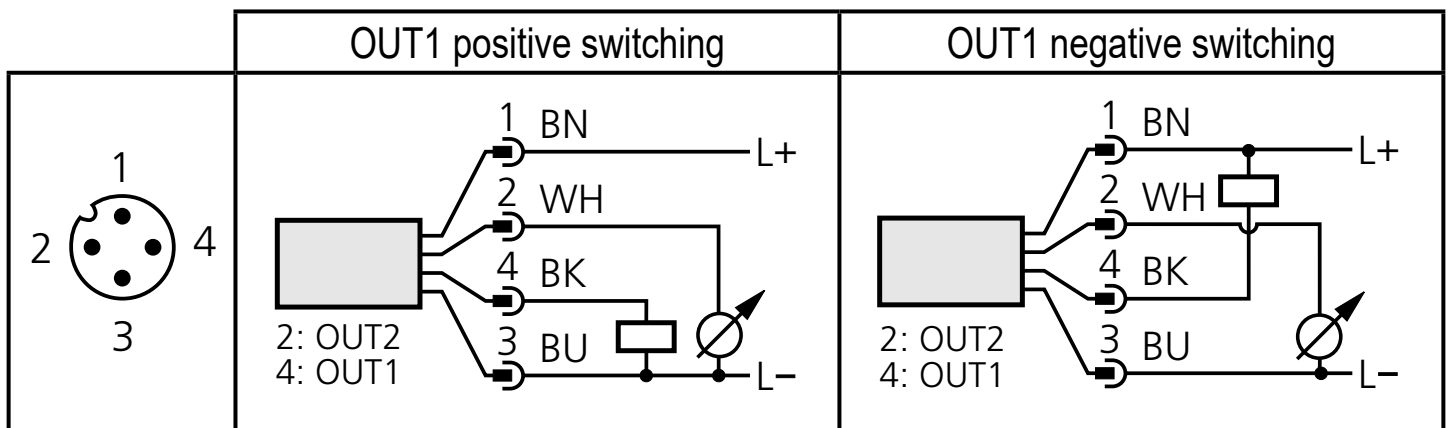


The unit must be connected by a qualified electrician.

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:

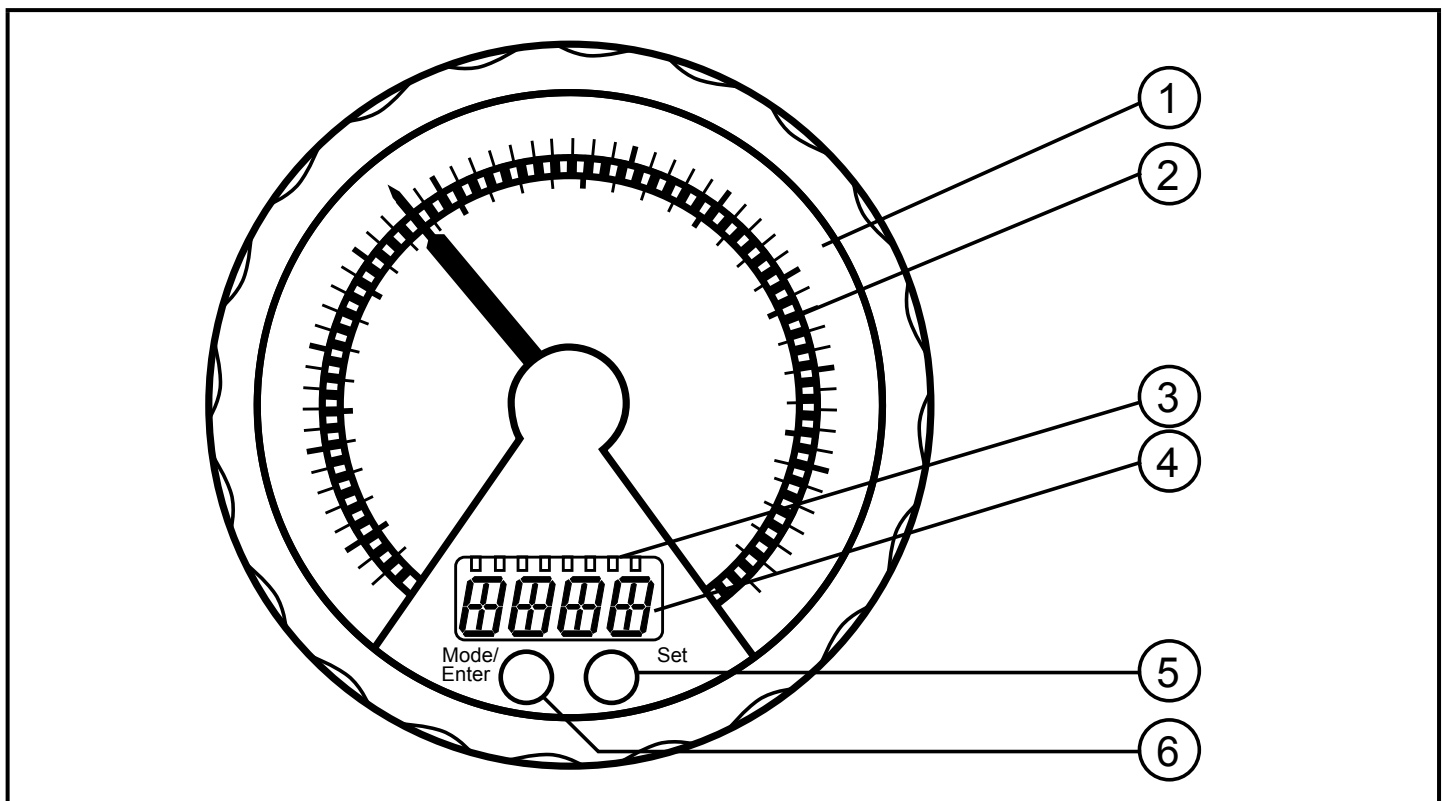


Pin 1	Ub+
Pin 3	Ub-
Pin 4 (OUT1)	• Binary switching output pressure monitoring
Pin 2 (OUT2)	• Analogue output for system pressure

Core colours of ifm sockets:

1 = BN (brown), 2 = WH (white), 3 = BU (blue), 4 = BK (black)

7 Operating and display elements



1: Analogue display

- Display of the current system pressure in bar and PSI or mbar and inH₂O.

2: LED ring

According to the setting of the parameter [LED] (→ 9.2):

- Display of set point and reset point.
- Lag indicator function for maximum value or minimum value.
- Display of pulsating signals and pressure peaks.
- Trend display: rising pressure or falling pressure.

3: Indicator LEDs

- LED 1 = system pressure of the digital display in bar.
- LED 2 = system pressure of the digital display in mbar.
- LED 3 = system pressure of the digital display in PSI.
- LED 4 = system pressure of the digital display in inH₂O.
- LED 6 = system pressure in % of the scaling (range ASP to AEP) or COF value in %.
- LEDs 5 and 7 = not used.
- LED 8 = switching status OUT1 (on if output 1 is switched).

4: Alphanumeric display, 4 digits

- Display of the current system pressure.
- Display of the parameters and parameter values

5: Touch button Set*

- Setting of the parameter values (continuously by touching permanently; step by step by touching briefly several times).

6: Touch button Mode/Enter*

- Selection of the parameters and acknowledgement of the parameter values.

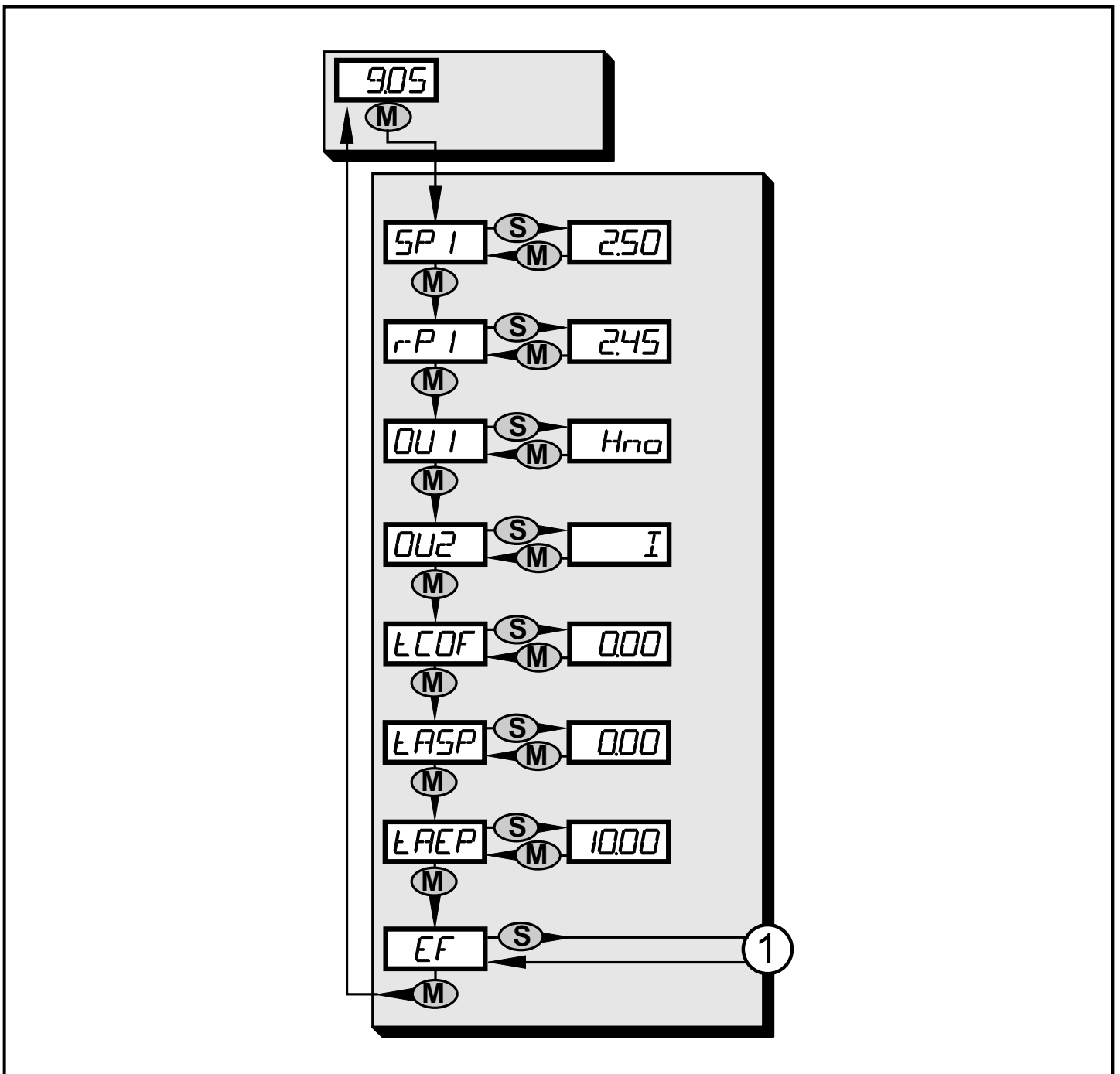
* The two touch buttons are activated simply by touching / deactivated by releasing the touch button.

The touch button must be completely covered to be activated.

Slow covering (e.g. liquid flows over the display) does not activate the touch button.

8 Menu

8.1 Menu structure: Main menu

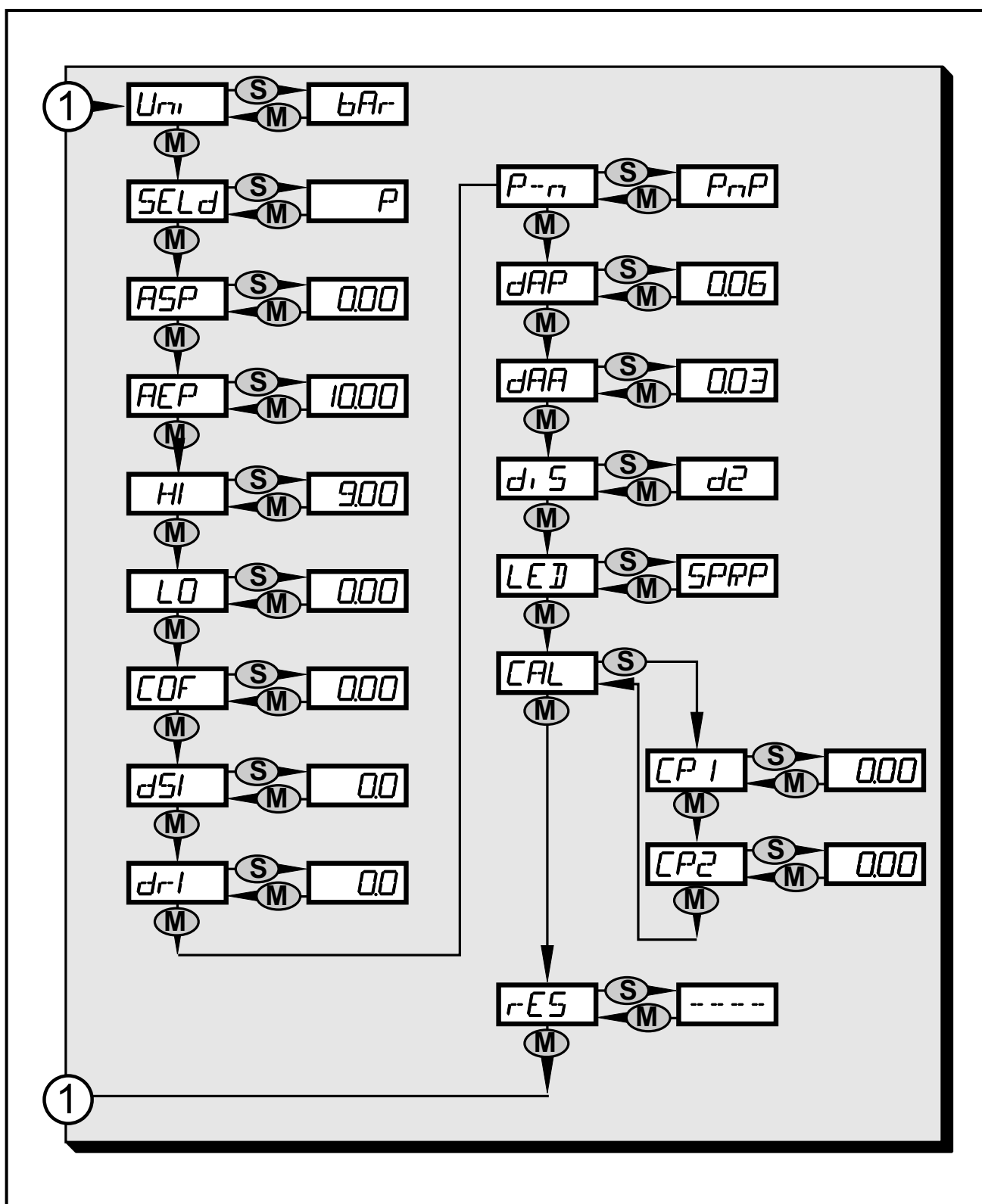


1: Change to menu level 2 (extended functions)

8.2 Explanation of the main menu

SP1/rP1	Upper / lower limit for system pressure at which OUT1 switches.
OU1	Output function for OUT1: <ul style="list-style-type: none">• Switching signal for the pressure limits: hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc].
OU2	Output function for OUT2: <ul style="list-style-type: none">• Analogue signal for the current system pressure: 4...20 mA [I], 20...4 mA [InEG].
tCOF	Teach zero-point calibration.
tASP	Teach analogue start point for system pressure: set measured value at which 4 mA is provided (20 mA if [OU2] = [InEG]).
tAEP	Teach analogue end point for system pressure: set measured value at which 20 mA is provided (4 mA if [OU2] = [InEG]).
EF	Extended functions / opening of menu level 2.

8.3 Menu structure: level 2 (extended functions)



1: Change to the main menu

8.4 Explanation of menu level 2

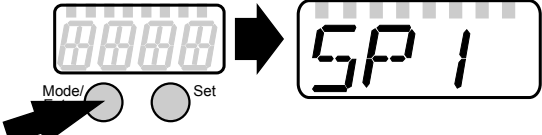
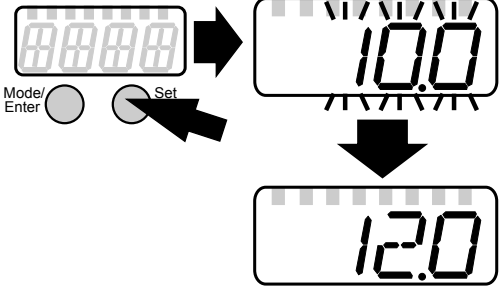
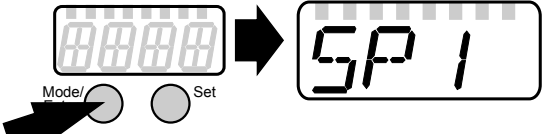
Uni	Standard unit of measurement for system pressure.
SELd	Display mode: <ul style="list-style-type: none">• Pressure in the unit set in [Uni].• Pressure in % of the set scaling of the analogue output.
ASP	Analogue start point for system pressure: measured value at which 4 mA is provided (20 mA if [OU2] = [InEG]).
AEP	Analogue end point for system pressure: measured value at which 20 mA is provided (4 mA if [OU2] = [InEG]).
HI	Maximum value memory for system pressure.
LO	Minimum value memory for system pressure.
COF	Zero-point calibration.
dS1	Switch-on delay for OUT1.
dr1	Switch-off delay for OUT1.
P-n	Switching logic for OUT1: pnp or npn.
dAP	Damping for switching outputs and display.
dAA	Damping for analogue output (OUT2).
diS	Update rate and orientation of the display.
LED	Setting for the LED ring.
CAL	Calibration function (setting the curve of measured values).
CP1	Calibration point 1
CP2	Calibration point 2
rES	Restore factory setting.

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

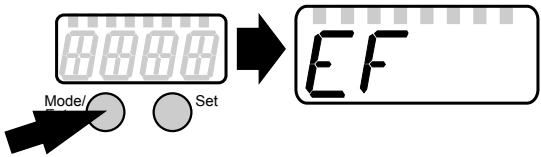
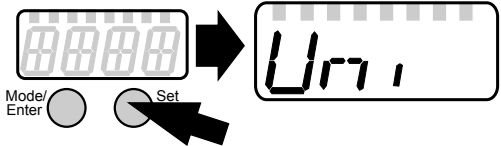
3 steps must be taken for each parameter setting:

<p>1</p>	<p>Select parameter</p> <ul style="list-style-type: none"> ▶ Touch [Mode/Enter] until the requested parameter is displayed. 	
<p>2</p>	<p>Set parameter value</p> <ul style="list-style-type: none"> ▶ Touch [Set] and keep it touched. > Current setting value of the parameter flashes for 5 s. > After 5 s: setting value is changed: step by step by touching briefly several times or continuously by touching permanently. 	
<p>Numerical values are incremented continuously. For reducing the value: let the display move to the maximum setting value. Then the cycle starts again at the minimum setting value.</p>		
<p>3</p>	<p>Acknowledge parameter value</p> <ul style="list-style-type: none"> ▶ Touch [Mode/Enter] briefly. > The parameter is displayed again. The new setting value is saved. 	
<p>Set other parameters</p> <ul style="list-style-type: none"> ▶ Start again with step 1. 		
<p>Finish parameter setting</p> <ul style="list-style-type: none"> ▶ Touch [Mode/Enter] several times until the current measured value is displayed or wait for 15 s. > The unit returns to the operating mode. 		

- Timeout:

If no touch button is activated for 15 s during parameter setting, the unit returns to the operating mode with unchanged values.

- Change from menu level 1 to menu level 2:

<ul style="list-style-type: none"> ▶ Touch [Mode/Enter] until [EF] is displayed. 	
<ul style="list-style-type: none"> ▶ Touch [Set] briefly. > The first parameter of the submenu is displayed (here: [Uni]). <p>If menu level 2 is protected by an access code, "Cod1" flashes in the display.</p> <ul style="list-style-type: none"> ▶ Touch [Set] and keep it touched until the valid code no. appears. ▶ Touch [Mode/Enter] briefly. <p>When delivered by ifm electronic: no access restriction.</p>	





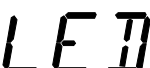
- Locking / unlocking

The unit can be locked electronically to prevent an unintentional operation.

<ul style="list-style-type: none"> ▶ Make sure that the unit is in the normal operating mode. ▶ Touch [Set], ▶ Additionally touch [Mode/Enter] and keep both buttons touched for 10 s. > The LED for the current unit of measurement flashes, the current system pressure continues to be displayed. After 10 s the display goes out for approx. 1 s. ▶ Release [Mode/Enter] and [Set] again. Both buttons must be released within 4 s. If this does not happen, the unit remains unlocked. > [Loc] is displayed, the unit is locked. <p>During operation the indicator LED for the display unit (→ 7 Operating and display elements) is flashing if you try to open the menu.</p>
<p>For unlocking:</p> <ul style="list-style-type: none"> ▶ Make sure that the unit is in the normal operating mode. ▶ Touch [Set], ▶ Additionally touch [Mode/Enter] and keep both buttons touched for 10 s. > The LED for the current unit of measurement flashes, the current system pressure continues to be displayed. After 10 s the display goes out for approx. 1 s. ▶ Release [Mode/Enter] and [Set] again. Both buttons must be released within 4 s. If this does not happen, the unit remains locked. > [uLoc] is displayed, the unit is unlocked.

On delivery: not locked.

9.2 Configuration of the digital display (optional)

<p>▶ Select [Uni] and set the unit of measurement: - [bAr], [mbAr], [PSI], [inHO].</p> <p> The unit of measurement available for selection depends on the device. See table Setting ranges (→ 10.3)</p>	
<p>▶ Select [SELD] and set type of display: - [P]: system pressure in the unit set in Uni. - [P%]: system pressure in % of the set scaling of the analogue output; the following applies: 0% = ASP value / 100% = AEP value. Note: display "0%" does not mean that no pressure is applied to the system.</p>	
<p>▶ Select [diS] and set the update rate 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. - [OFF] = The measured value display is deactivated in the Run mode. Touching one of the buttons indicates the current measured value for 15 s. Touching the [Mode/Enter] button again activates the display mode. The indicator LEDs remain active even if the display is deactivated.</p>	
<p>▶ Select [LED] and set the display function for the digital display and LED ring: - [SPRP]: One LED on the LED ring indicates the set point and a second LED the reset point. - [HInd]: 2 adjacent LEDs on the LED ring mark the lag indicator for maximum value ([HInd], high indication). - [LInd]: 2 adjacent LEDs on the LED ring mark the lag indicator for minimum value ([LInd], low indication). To reset: ▶ Touch [Set] for 1 second. > The two LEDs jump to the current position of the pointer. - [Ph]: Display of pulsating signals and pressure peaks: - In case of quick pressure changes (quickly pulsating signals) the digital display and LED ring indicate the minimum value and the maximum value. - In case of one-off short pressure peaks the indication in the digital display and LED ring is shown for a longer time. - [Pdir]: The LED ring indicates the trend of the pressure changes (5 LEDs below the pointer for rising pressure; 5 LEDs above the pointer for falling pressure).</p> <p>A damping set with dAP or dAA also has an effect on this display.</p>	

9.3 Set output signals

9.3.1 Set output functions

<ul style="list-style-type: none"> ▶ Select [OU1] and set the switching function: <ul style="list-style-type: none"> - [Hno] = hysteresis function/normally open - [Hnc] = hysteresis function/normally closed - [Fno] = window function/normally open - [Fnc] = window function/normally closed 	<i>OU 1</i>
<ul style="list-style-type: none"> ▶ Select [OU2] and set the analogue function: <ul style="list-style-type: none"> - [I] = current signal proportional to pressure 4...20 mA. - [InEG] = current signal proportional to pressure 20...4 mA. 	<i>OU2</i>


9.3.2 Set switching limits

<ul style="list-style-type: none"> ▶ Select [SP1] and set the value at which the output switches. 	<i>SP 1</i>
<ul style="list-style-type: none"> ▶ Select [rP1] and set the value at which OUT1 switches off. <p>rP1 is always lower than SP1. The unit only accepts values which are lower than SP1.</p>	<i>rP 1</i>

9.3.3 Scale analogue value for OUT2



<ul style="list-style-type: none"> ▶ Set the minimum pressure requested in the system. ▶ Touch [Mode/Enter] until [tASP] appears. ▶ Touch [Set] and keep it touched. <ul style="list-style-type: none"> > Current setting value flashes. ▶ Release [Set] when the display stops flashing. <ul style="list-style-type: none"> > New setting value is displayed. ▶ Touch [Mode/Enter] briefly. <ul style="list-style-type: none"> > The current system pressure is defined as start value for the analogue signal. 	<i>tASP</i>
<ul style="list-style-type: none"> ▶ Set the maximum pressure requested in the system. ▶ Touch [Mode/Enter] until [tAEP] appears. ▶ Touch [Set] and keep it touched. <ul style="list-style-type: none"> > Current setting value flashes. ▶ Release [Set] when the display stops flashing. <ul style="list-style-type: none"> > New setting value is displayed. ▶ Touch [Mode/Enter] briefly. <ul style="list-style-type: none"> > The current system pressure is defined as end value for the analogue signal. 	<i>tAEP</i>

ASP / AEP can only be set within defined limits (→ 10.3 Setting ranges). If settings are made with an invalid pressure value, [UL] or [OL] is displayed. After acknowledgement by [Mode/Enter] [Err] flashes, the ASP value / AEP value is not changed.

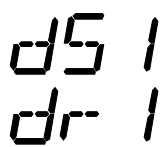
<p>Alternatively:</p> <ul style="list-style-type: none"> ▶ Select [ASP] and set the measured value at which 4 mA is provided (20 mA if [OU2] = [InEG]). ▶ Select [AEP] and set the measured value at which 20 mA is provided (4 mA if [OU2] = [InEG]). <p>Minimum distance between ASP and AEP = 25 % of the final value of the measuring range (turn-down 1:4).</p>	
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9.4 User settings (optional)

9.4.1 Carry out zero point calibration

<ul style="list-style-type: none"> ▶ Select [COF] and set a value between -5 % and 5 % of the final value of the measuring range. The internal measured value "0" is shifted by this value. 	
<p>Alternatively: automatic adjustment of the offset in the range 0 bar ± 5 %.</p> <ul style="list-style-type: none"> ▶ Make sure that no pressure is applied to the system. ▶ Touch [Mode/Enter] until [tCOF] appears. ▶ Touch [Set] and keep it touched. > The current offset value (in %) flashes briefly. > The current system pressure is displayed. ▶ Release [Set]. ▶ Touch [Mode/Enter] briefly (= to confirm the new offset value). 	


9.4.2 Set delay time for OUT1

<p>[dS1] = switch-on delay / [dr1] = switch-off delay.</p> <ul style="list-style-type: none"> ▶ Select [dS1] or [dr1] and set a value between 0.1 and 50 s (at 0.0 the delay time is not active). 	
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9.4.3 Set switching logic for OUT1

<ul style="list-style-type: none"> ▶ Select [P-n] and set [PnP] or [nPn]. 	
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9.4.4 Set damping for the switching signal

<ul style="list-style-type: none"> ▶ Select [dAP] and set a value between 0.01...30 s. <p>dAP value = response time between pressure change and change of the switching status in seconds.</p> <p>[dAP] influences the switching frequency: $f_{\max} = 1 \div 2dAP$.</p> <p>[dAP] also has an effect on the display.</p>	
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9.4.5 Set damping for the analogue signal

<ul style="list-style-type: none"> ▶ Select [dAA] and set a value between 0.01 and 30 s. <p>dAA value = response time between pressure change and change of the analogue signal in seconds.</p>	
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9.4.6 Calibrate curve of measured values


If the unit is to adopt the settings for the calibration points, the following conditions must be adhered to:

- CP1 and CP2 must be within the measuring range (i.e. between ASP and AEP).
- CP1 and CP2 must not be in the extended display range.
- Minimum distance between the calibration points CP1 and CP2: 5 % of the final value of the measuring range.
- Maximum correction value: ± 2 % of the final value of the measuring range.


<ul style="list-style-type: none"> ▶ Set a defined reference pressure between ASP and AEP in the system. ▶ Select [CAL]. ▶ Touch [Set] briefly. > [CP1] is displayed. ▶ Touch [Set] for 5 s. > The pressure measured by the unit is displayed. ▶ Touch [Set] until the set reference pressure is indicated (measured pressure = reference pressure) or the corresponding analogue signal is provided to OUT2. ▶ Touch [Mode/Enter] briefly. > [CP1] is displayed. ▶ Touch [Mode/Enter] briefly. > [CP2] is displayed. <p>Continue with a) or b).</p>	
<p>a) Finish calibration:</p> <ul style="list-style-type: none"> ▶ Touch [Mode/Enter] briefly. > [CAL] is displayed. <p>b) Change a 2nd point on the curve of measured values</p> <ul style="list-style-type: none"> ▶ Set a second defined reference pressure in the system. ▶ Touch [Set] for 5 s. > The pressure measured by the unit is displayed. ▶ Touch [Set] until the set reference pressure is indicated (measured pressure = reference pressure) or the corresponding analogue signal is provided to OUT2. ▶ Touch [Mode/Enter] briefly. > [CP2] is displayed. ▶ Touch [Mode/Enter] briefly. > [CAL] is displayed, the process is finished. 	

9.5 Service functions

9.5.1 Read min/max values for the system pressure

<ul style="list-style-type: none">▶ Select [HI] or [LO] and touch [Set] briefly. [HI] = maximum value, [LO] = minimum value. Delete memory:▶ Select [HI] or [LO].▶ Touch [Set] and keep it touched until [----] is displayed.▶ Touch [Mode/Enter] briefly.	
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9.5.2 Reset all parameters to factory setting

<ul style="list-style-type: none">▶ Select [rES].▶ Touch [Set] and keep it touched until [----] is displayed.▶ Touch [Mode/Enter] briefly. <p>We recommend noting down your own settings before carrying out a reset (→ 11 Factory setting).</p>	
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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).

Reset the lag indicator (if [LED] = [HInd] or [LInd]):

- ▶ Touch [Set] for 1 second.
- > The two lag indicator LEDs jump to the current position of the pointer.

10.1 Read set parameters

- ▶ Touch [Mode/Enter] until the requested parameter is displayed.
- ▶ Touch [Set] briefly.
- > The unit displays the corresponding parameter value for approx. 15 s. After another 15 s it returns to the Run mode.

10.2 Error indications

[OL]	Overload pressure (above measuring range).
[UL]	Underload pressure (below measuring range).
[SC1]	Short circuit in OUT1. The output is switched off as long as the short circuit persists.
[Err]	Flashing: internal error, invalid entry.

The messages SC1 and Err are displayed even if the display is switched off.

10.3 Setting ranges

		SP1		rP1		ASP		AEP		ΔP
		min	max	min	max	min	max	min	max	
PG2789	mbar	-4.8	160.0	-5.0	159.8	-5.0	135.0	20.0	160.0	0.1
	inH2O	-1.95	64.25	-2.05	64.15	-2.00	54.20	8.05	64.25	0.05
PG2793	bar	-0.96	40.00	-1.00	39.96	-1.00	33.76	5.24	40.00	0.02
	PSI	-13.8	580.2	-14.4	579.6	-14.4	489.6	75.9	580.2	0.3
PG2794	bar	-0.98	16.00	-1.00	15.98	-1.00	13.50	1.50	16.00	0.01
	PSI	-14.2	232.0	-14.5	231.8	-14.5	195.7	21.8	232.0	0.1
PG2795	bar	-0.990	6.400	-1.000	6.390	-1.000	5.400	0.000	6.400	0.005
	PSI	-14.35	92.80	-14.50	92.65	-14.50	78.30	0.00	92.80	0.05
PG2796	bar	-0.120	4.000	-0.124	3.996	-0.124	3.370	0.500	4.000	0.002
	PSI	-1.74	58.02	-1.80	57.96	-1.80	48.87	7.26	58.02	0.03
PG2797	bar	-0.048	1.600	-0.050	1.598	-0.050	1.350	0.200	1.600	0.001
	PSI	-0.70	23.21	-0.73	23.18	-0.73	19.58	2.90	23.21	0.01
PG2798	mbar	-12.0	400.0	-12.4	399.6	-12.4	337.6	50.0	400.0	0.2
	inH2O	-4.8	160.6	-5.0	160.4	-5.0	135.5	20.1	160.6	0.1
PG2799	bar	-0.998	1.600	-1.000	1.598	-1.000	1.100	-0.500	1.600	0.001
	PSI	-14.48	23.20	-14.50	23.18	-14.50	15.96	-7.26	23.20	0.02

ΔP = step increment

11 Factory setting

	Factory setting	User setting
OU1	Hno	
OU2	I	
SP1	25.0% VMR*	
rP1	24.9% VMR*	
ASP / tASP	0% VMR *	
AEP / tAEP	100% VMR *	
COF / tCOF	0.0	
dS1	0.0	
dr1	0.0	
P-n	pnp	
dAP	0.06	
dAA	0.03	
Uni	bAr / mbAr	
SELd	P	
dis	d2	
LED	SPRP	

* = The indicated percentage of the final value of the measuring range (VMR) of the respective sensor (for PG2799 the percentage of the measuring span) is set.