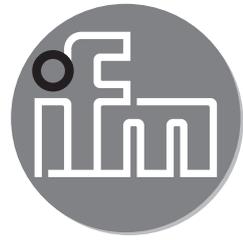


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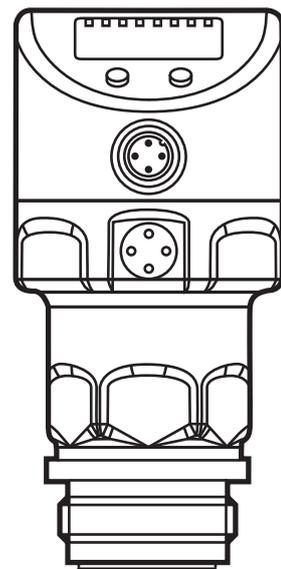
Operating instructions
Electronic pressure sensor

efector500[®]

PI27xx

UK

704554 / 00 09 / 2010



Contents

1	Preliminary note.....	4
1.1	Symbols used	4
2	Safety instructions	4
3	Functions and features	5
3.1	Applications	5
4	Function.....	5
4.1	Processing of the measured signals.....	5
4.2	Pressure monitoring / switching function	6
4.3	Pressure monitoring / analogue function	6
4.4	Customer-specific calibration	8
5	Installation.....	9
6	Electrical connection.....	10
7	Operating and display elements	11
8	Menu.....	12
8.1	Menu structure: main menu.....	12
8.2	Explanation of the main menu	13
8.3	Menu structure: level 2 (extended functions).....	14
8.4	Explanation of the menu level 2	15
8.5	Menu structure: level 3 (simulation).....	16
8.6	Explanation of the menu level 3	17
9	Parameter setting	18
9.1	General parameter setting.....	18
9.2	Configure display (optional).....	20
9.3	Set output signals	20
9.3.1	Set output functions.....	20
9.3.2	Set switching limits	21
9.3.3	Scale analogue value for OUT2	21
9.4	User settings (optional).....	22
9.4.1	Carry out zero point calibration	22
9.4.2	Set delay for the switching outputs.....	22
9.4.3	Set switching logic for the switching outputs	22
9.4.4	Set damping for the switching signal	22
9.4.5	Set damping for the analogue signal	22
9.4.6	Calibrate curve of measured values	23

9.5	Service functions	24
9.5.1	Read min/max values for system pressure	24
9.5.2	Reset all parameters to factory setting	24
9.6	Simulation function	24
9.6.1	Open menu level 3 (simulation).....	24
9.6.2	Set simulation value	24
9.6.3	Set time for simulation	25
9.6.4	Start simulation.....	25
10	Operation	25
10.1	Read set parameters	25
10.2	Change the display in the Run mode	26
10.3	Error indications.....	26
11	Scale drawing	27
12	Technical data	28
12.1	Setting ranges	30
13	Factory setting	31

1 Preliminary note

1.1 Symbols used

▶ Instruction

> Reaction, result

[...] Designation of pushbuttons, buttons or indications

→ Cross-reference



Important note

Non-compliance can result in malfunctions or interference.

2 Safety instructions

- Please read this document prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur.
- Check the compatibility of the product materials (→ 12 Technical data) with the media to be measured in all applications.

For the scope of validity cULus:

The device shall be supplied from an isolating transformer having a secondary Listed fuse rated either

a) max 5 amps for voltages 0~20 Vrms (0~28.3 Vp) or

b) 100/Vp for voltages of 20~30 Vrms (28.3~42.4 Vp).

The Sensor shall be connected only by using any R/C (CYJV2) cord, having suitable ratings.

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		Permissible overpressure		Bursting pressure	
	bar	PSI	bar	PSI	bar	PSI
PI2793	-1...25	-14.4...362.7	100	1450	350	5075
PI2794	-1...10	-14.5...145	50	725	150	2175
PI2795	-1...4	-14.5...58	30	435	100	1450
PI2796	-0.124...2.5	-1.8...36.27	20	290	50	725
PI2797	-0.05...1	-0.73...14.5	10	145	30	435
PI2799	-1...1	-14.5...14.5	10	145	30	435
	mbar	PSI	bar	PSI	bar	PSI
PI2798	-12.4...250	-0.18...3.62	10	145	30	435
PI2789	-5...100	-0.073...1.45	4	58	30	435



Avoid static and dynamic overpressure exceeding the given 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!

Not to be used in a system that has to fulfill D10.1.2/74-03 of 3A standard 74-03.

4 Function

4.1 Processing of the measured signals

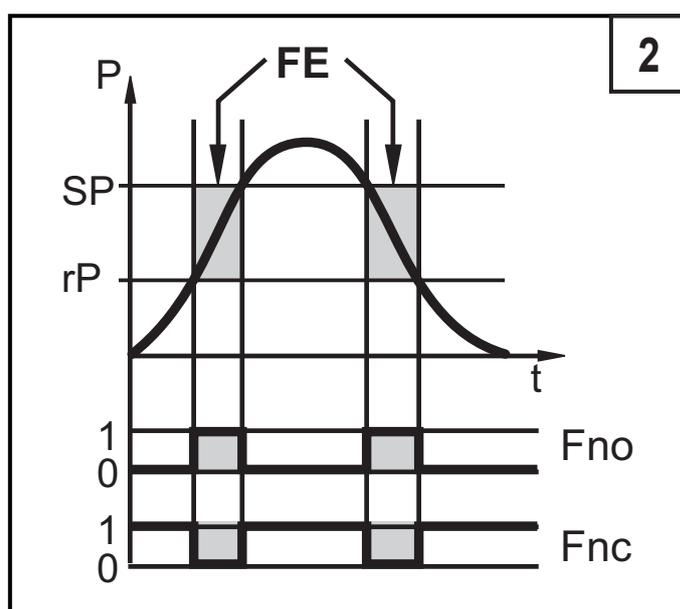
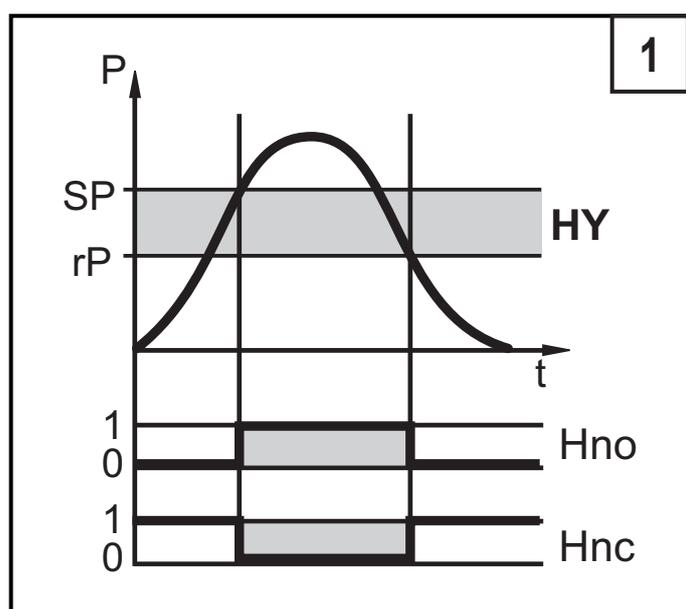
- The unit displays the current system pressure.
- It generates 2 output signals according to the parameter setting.

OUT1	• Switching signal for system pressure limit value.
OUT2	3 options: • Switching signal for system pressure limit value. • Analogue signal 4...20 mA. • Analogue signal 20...4 mA.

4.2 Pressure monitoring / switching function

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

- Hysteresis function / normally open: [OUx] = [Hno] (→ fig. 1).
- Hysteresis function / normally closed: [OUx] = [Hnc] (→ fig. 1).
First the set point (SPx) is set, then the reset point (rPx) with the requested difference.
- Window function / normally open: [OUx] = [Fno] (→ fig. 2).
- Window function / normally closed: [OUx] = [Fnc] (→ fig. 2).
The width of the window can be set by means of the difference between SPx and rPx. SPx = upper value, rPx = lower value.



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

4.3 Pressure monitoring / analogue function

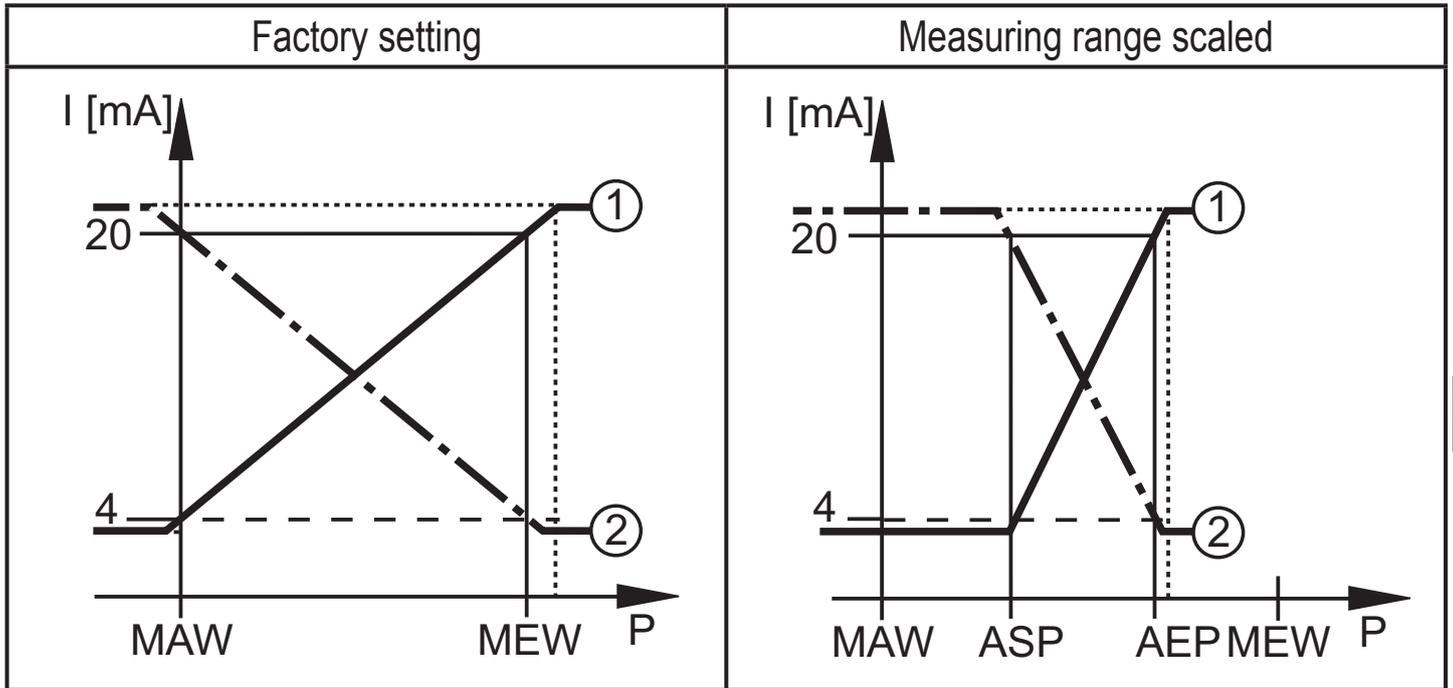
The analogue output can be configured.

- [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 teaching process or by entering a value for the ASP and AEP parameters.

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

Minimum distance between [ASP] and [AEP] = 25 % of the final value of the measuring range (turn-down 1:4).



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

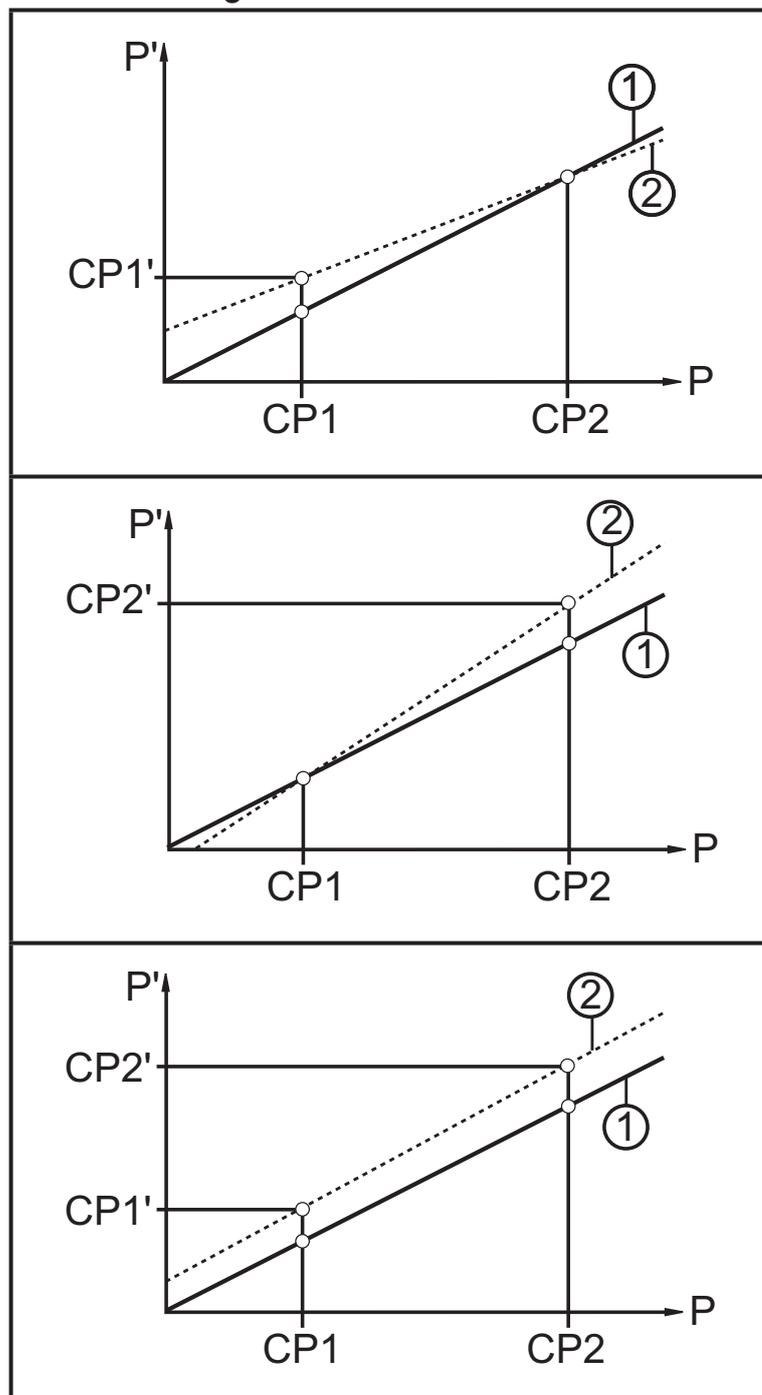
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4.4 Customer-specific calibration

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.
- The two calibration points must be within the scaled measuring range (→ 4.3 Pressure monitoring / analogue function).
- 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 at 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. Note: display “0%” does not mean that no pressure is applied to the system!

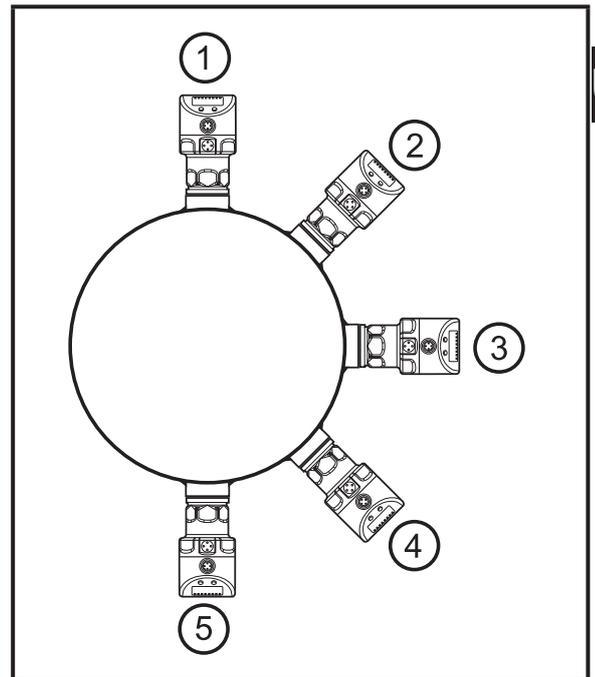


We recommend horizontal installation for high medium temperatures.

Use in hygienic installation situation following 3A

Orientation of the sensor in the pipe and tank

To ensure optimised cleanability in the area of the measuring cell according to the sanitary 3A criteria the sensor must not be installed at the lowest point (pos. 5 - see drawing) in a pipe or tank to allow the medium to flow off.



Use in hygienic areas to EHEDG

- Make sure that the sensors are integrated into the system in accordance with EHEDG.

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

1	<p>Installation using an adapter with sealing ring (order no. E332xx / E333xx)</p> <p>The adapters are supplied with an 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).</p> <p>Concerning installation → Installation instructions supplied with the adapter.</p>
2	<p>Installation using an adapter with metal-to-metal seal</p> <p>Order no. E337xx / E338xx</p> <p>Concerning installation → Installation instructions supplied with the adapter.</p>

3	Installation using a welding adapter <ul style="list-style-type: none"> • Order no. E30122 • Order no. E30130; adapter with leakage port <p>The adapters are supplied with an EPDM O-ring (order no. E30054). More sealing rings are available as accessories: FKM O-ring (order no. E30123). Concerning installation → Installation instructions supplied with the adapter.</p>
4	Installation to G 1 flange
	<p>The sealing ring on the sensor is used as process seal. The upper sealing area on the process connection must be flush with the tapped hole and have a surface characteristic of min. Rz 6.3.</p> <ul style="list-style-type: none"> ▶ Grease the sensor thread with a suitable paste. ▶ Insert the unit into the process connection. ▶ Tighten it using a spanner. Tightening torque: 35 Nm.

6 Electrical connection

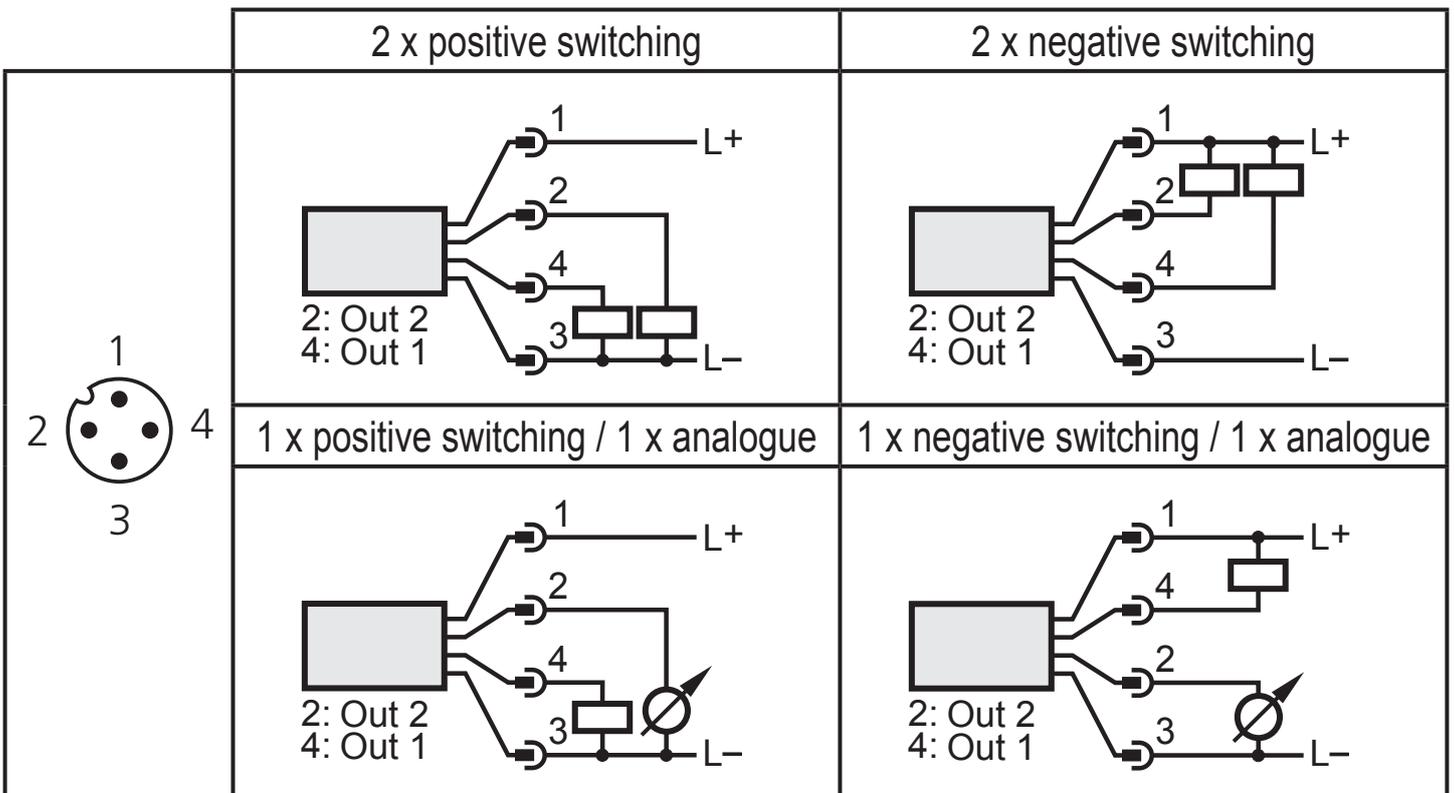


The unit must be connected by a qualified electrician.

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

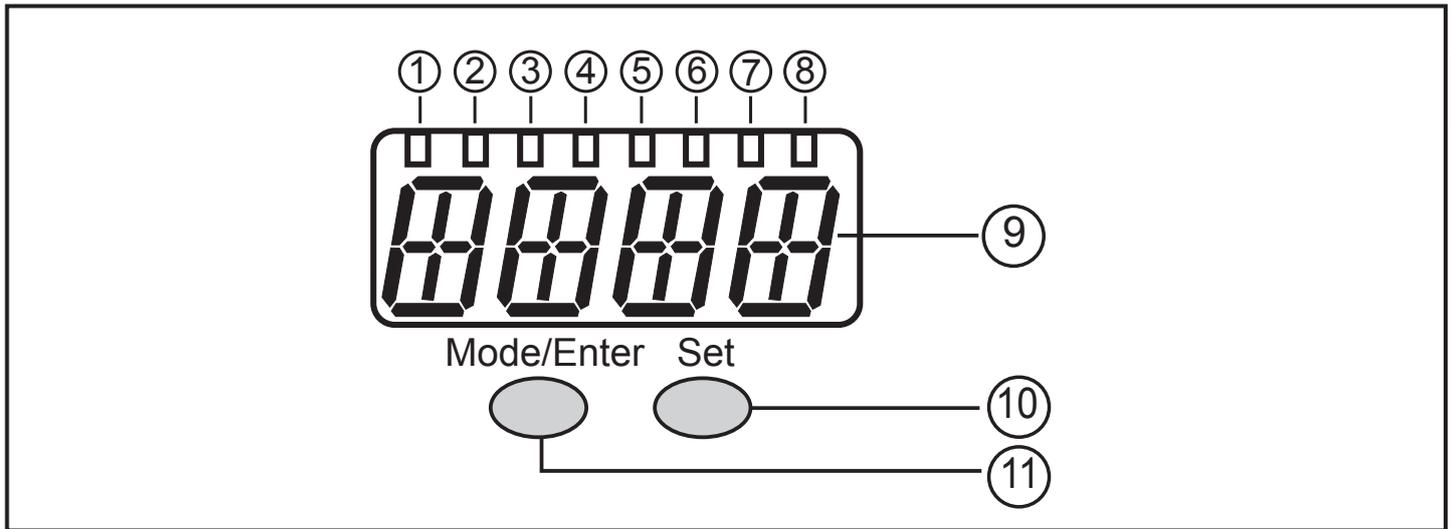
Voltage supply according to EN 50178, SELV, PELV.

- ▶ Disconnect power.
- ▶ Connect the unit as follows:



Pin 1	Ub+
Pin 3	Ub-
Pin 4 (OUT1)	Binary switching output pressure monitoring.
Pin 2 (OUT2)	Binary switching output pressure monitoring or analogue output for system pressure.

7 Operating and display elements



1 to 8: Indicator LEDs

- LED 1 to LED 5 = system pressure in the specified unit of measurement.
- LED 6 = System pressure in % of the set scaling of the analogue output if [OU2] is configured as analogue output.
System pressure in % of the final value of the measuring range if [OU2] is configured as switching output.
- LED 7 = switching status OUT2 (lights if output 2 is switched).
- LED 8 = switching status OUT1 (lights if output 1 is switched).

9: Alphanumeric display, 4 digits

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

10: Set button

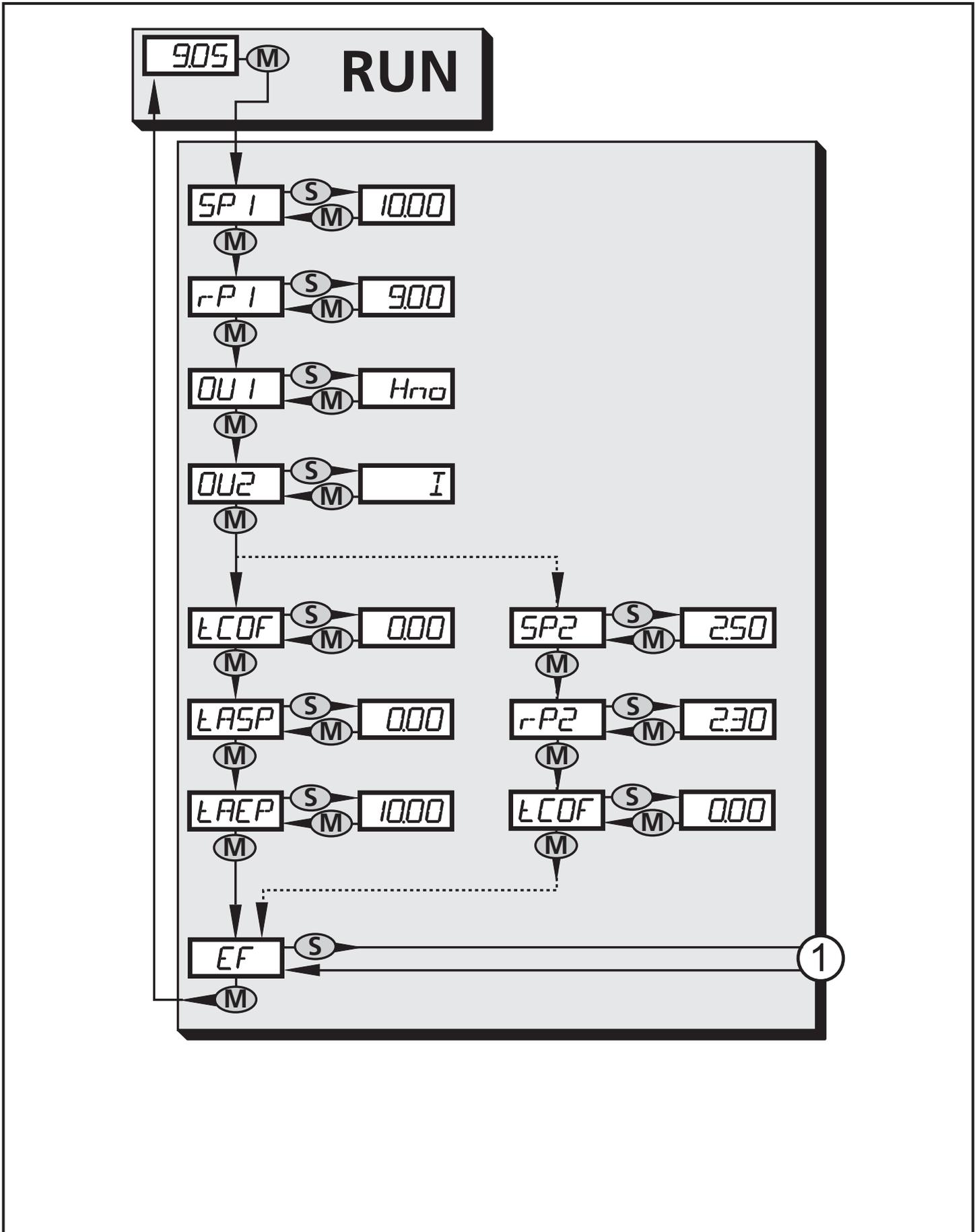
- Setting of the parameter values (scrolling by holding pressed; incrementally by pressing once).

11: Mode/Enter button

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

8 Menu

8.1 Menu structure: main menu



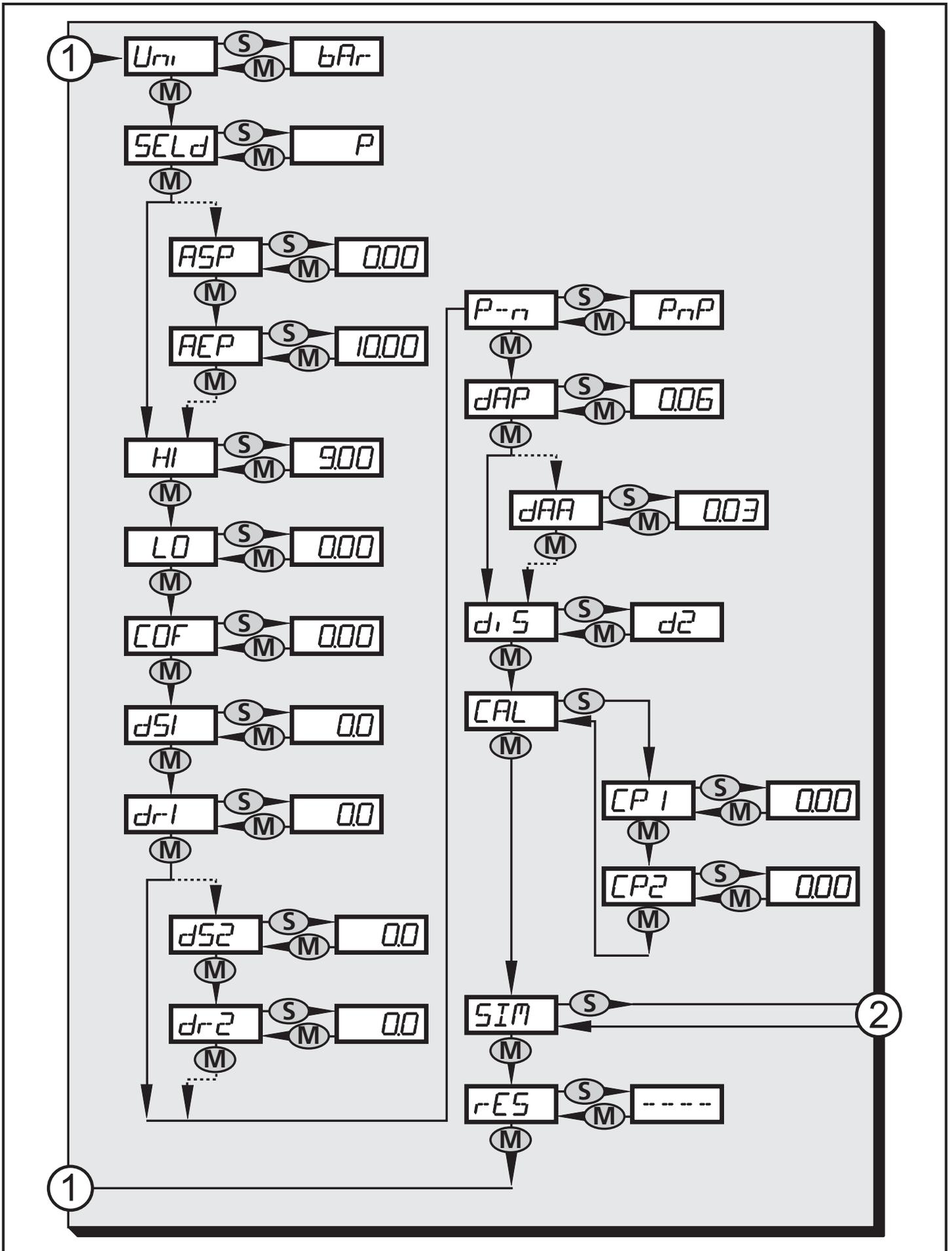
1: Change to menu level 2 (extended functions)

8.2 Explanation of the main menu

SP1/rP1	Upper / lower limit value for system pressure at which OUT1 switches.
OU1	Output function for OUT1: <ul style="list-style-type: none"> • Switching signal for the pressure limit values: 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"> • Switching signal for the pressure limit values: hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc]. • 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]).
SP2/rP2	Upper / lower limit value for system pressure at which OUT2 switches.
EF	Extended functions / opening of menu level 2.

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8.3 Menu structure: level 2 (extended functions)



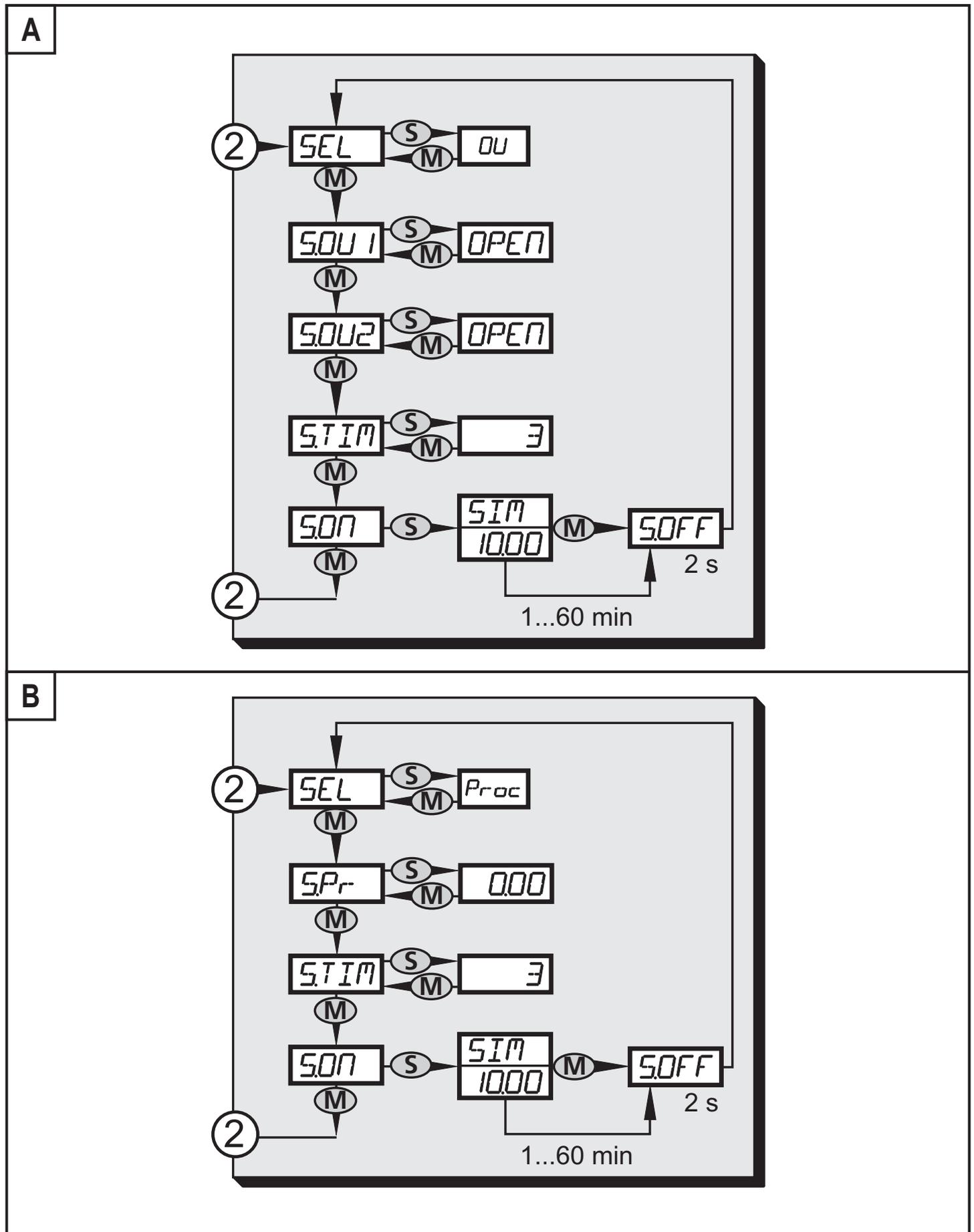
- 1: Change to the main menu
- 2: Change to menu level 3 (simulation)

8.4 Explanation of the 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.
dS2	Switch-on delay for OUT2; only active if [OU2] = [Hnc], [Hno], [Fnc] or [Fno].
dr2	Switch-off delay for OUT2; only active if [OU2] = [Hnc], [Hno], [Fnc] or [Fno].
P-n	Switching logic for the outputs: pnp or npn.
dAP	Damping for switching outputs and display.
dAA	Damping for analogue output (OUT2). only active if [OU2] = [I] or [InEG].
diS	Update rate and orientation of the display.
CAL	Calibration function (setting the curve of measured values).
CP1	Calibration point 1.
CP2	Calibration point 2.
SIM	Change to menu level 3 (simulation).
rES	Restore factory settings.

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8.5 Menu structure: level 3 (simulation)



2: Change to menu level 2 (extended functions)

A for setting SEL = OU

B for setting SEL = Proc

8.6 Explanation of the menu level 3

SEL	Status to be simulated: <ul style="list-style-type: none"> • Output functions [OU] (→ fig. A). • Process value [Proc] (→ fig. B).
S.OU1	Simulation values for OUT1; only active if [SEL] = [OU]. <ul style="list-style-type: none"> • Output inactive [OPEN] or output active [CLOS].
S.OU2	Simulation values for OUT2; only active if [SEL] = [OU]. <ul style="list-style-type: none"> • If OUT2 is configured as switching output: output inactive [OPEN] or active [CLOS]. • If OUT2 is set as analogue output: analogue signal between 3.5 and 21.1 mA (depending on the set value → 9.6.2).
S.Pr	Simulation of a process value; only active if [SEL] = [Proc]. <ul style="list-style-type: none"> • Any value between initial value of the measuring range and final value of the measuring range.
S.TIM	Time for the simulation process in minutes.
S.ON	Start of the simulation process. During the simulation process the display alternately shows [SIM] and the current operation indication (→ 9.6.4). If the simulation process is aborted (press [Mode/Enter] or [Set] briefly) [S.OFF] is indicated for 2 s, then [SEL] is active again.

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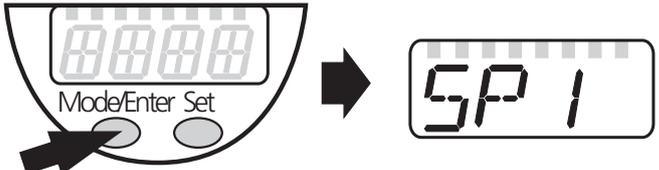
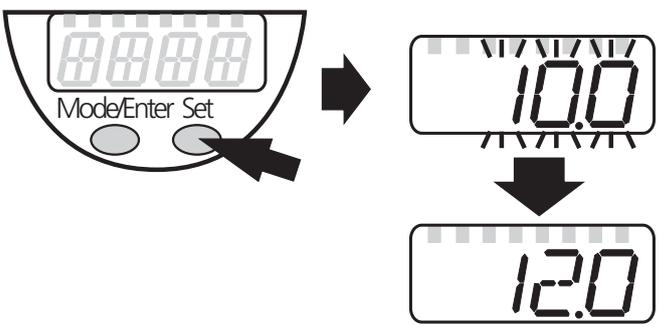
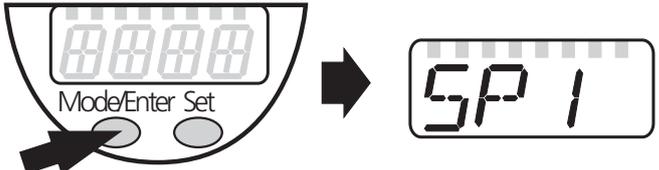
9 Parameter setting

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

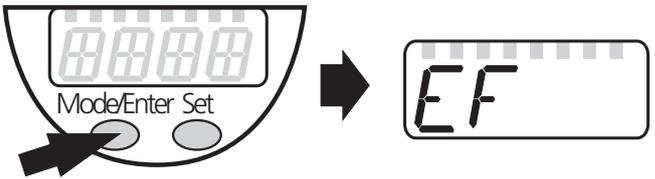
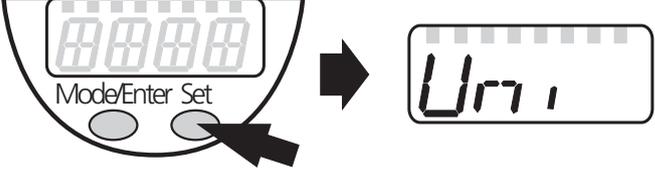
Exceptions: changes to the parameters COF (→ 9.4.1), CP1 and CP2 (→ 9.4.6) take effect immediately.

9.1 General parameter setting

3 steps must be taken for each parameter setting:

<p>1</p>	<p>Select parameter</p> <ul style="list-style-type: none"> ▶ Press [Mode/Enter] until the requested parameter is displayed. 	
<p>2</p>	<p>Set parameter value</p> <ul style="list-style-type: none"> ▶ Press [Set] and keep it pressed. > Current setting value of the parameter flashes for 5 s. > After 5 s: setting value is changed: incrementally by pressing the button once or continuously by keeping the button pressed. 	
<p>Numerical values are incremented continuously. To reduce 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"> ▶ Press [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"> ▶ Press [Mode/Enter] several times until the current measured value is displayed or wait for 15 s. > The unit returns to the operating mode. 		

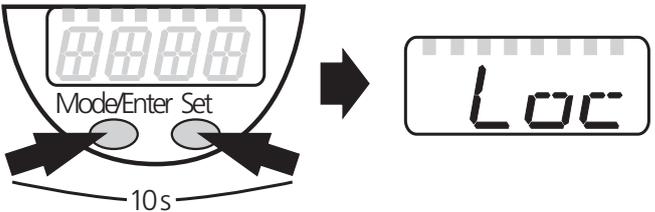
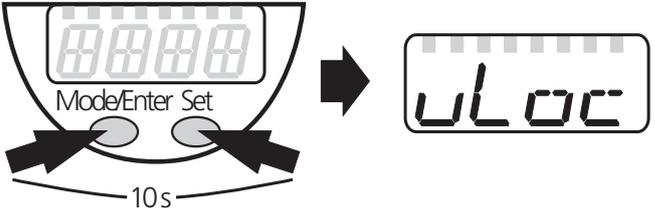
- Change from menu level 1 to menu level 2:

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

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- Locking / unlocking

The unit can be locked electronically to prevent unintentional settings.

<ul style="list-style-type: none"> ▶ Make sure that the unit is in the normal operating mode. ▶ Press [Mode/Enter] + [Set] for 10 s. > [Loc] is displayed. 	
<p>During operation: [Loc] is briefly displayed if you try to change parameter values.</p>	
<p>For unlocking:</p> <ul style="list-style-type: none"> ▶ Press [Mode/Enter] + [Set] for 10 s. > [uLoc] is displayed. 	

On delivery: unlocked.

- Timeout:

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

9.2 Configure display (optional)

<p>▶ Select [Uni] and set the unit of measurement:</p> <ul style="list-style-type: none"> - [bAr], [mbAr]. - [MPA], [kPA]. - [PSI] (only PI2793, PI2794, PI2795, PI2796, PI2797, PI2799). - [InHO] (only PI2789, PI2796, PI2797, PI2798, PI2799). - [mWS] (only PI2796, PI2797, PI2799). - [mmWS] (only PI2789 and PI2798). 	
<p>▶ Select [SEld] and set type of indication:</p> <ul style="list-style-type: none"> - [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. <p>Note: display "0%" does not mean that no pressure is applied to the system.</p>	
<p>▶ Select [diS] and set the update rate and orientation of the display:</p> <ul style="list-style-type: none"> - [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. Pressing one of the buttons indicates the current measured value for 15 s. Pressing the [Mode/Enter] button again activates the display mode. The LEDs remain active even if the display is deactivated. 	

9.3 Set output signals

9.3.1 Set output functions

<p>▶ Select [OU1] and set the switching function:</p> <ul style="list-style-type: none"> - [Hno] = hysteresis function/NO. - [Hnc] = hysteresis function/NC. - [Fno] = window function/NO. - [Fnc] = window function/NC. 	
<p>▶ Select [OU2] and set the function:</p> <ul style="list-style-type: none"> - [Hno] = hysteresis function/NO. - [Hnc] = hysteresis function/NC. - [Fno] = window function/NO. - [Fnc] = window function/NC. - [I] = current signal proportional to pressure 4...20 mA. - [InEG] = current signal proportional to pressure 20...4 mA. 	

9.3.2 Set switching limits

<ul style="list-style-type: none"> ▶ Select [SP1] / [SP2] and set the value at which the output switches. 	
<ul style="list-style-type: none"> ▶ Select [rP1] / [rP2] and set the value at which the output switches off. rPx is always smaller than SPx. The unit only accepts values which are lower than the value for SPx. 	

9.3.3 Scale analogue value for OUT2

<ul style="list-style-type: none"> ▶ Set the minimum pressure requested in the system. ▶ Press [Mode/Enter] until [tASP] appears. ▶ Press [Set] and keep it pressed. > Current setting value flashes. ▶ Release [Set] when the display stops flashing. > New setting value is displayed. ▶ Press [Mode/Enter] briefly. > The current system pressure is defined as start value for the analogue signal. 	
<ul style="list-style-type: none"> ▶ Set the maximum pressure requested in the system. ▶ Press [Mode/Enter] until [tAEP] appears. ▶ Press [Set] and keep it pressed. > Current setting value flashes. ▶ Release [Set] when the display stops flashing. > New setting value is displayed. ▶ Press [Mode/Enter] briefly. > The current system pressure is defined as end value for the analogue signal. 	
<p>ASP / AEP can only be set automatically within defined limits (→ 12.1 Setting ranges). If automatic setting is carried out at 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>	
<p>As an alternative:</p> <ul style="list-style-type: none"> ▶ Select [ASP] and set the measured value at which 4 mA is provided (20 mA at [OU2] = [InEG]). ▶ Select [AEP] and set the measured value at which 20 mA is provided (4 mA at [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>As an alternative: 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. ▶ Press [Mode/Enter] until [tCOF] appears. ▶ Press [Set] and keep it pressed. > The current offset value (in %) flashes briefly. > The current system pressure is displayed. ▶ Release [SET]. ▶ Press [Mode/Enter] briefly (= to confirm the new offset value). 	

9.4.2 Set delay for the switching outputs

<p>[dS1] / [dS2] = switch-on delay for OUT1 / OUT2. [dr1] / [dr2] = switch-off delay for OUT1 / OUT2.</p> <ul style="list-style-type: none"> ▶ Select [dS1], [dS2], [dr1] or [dr2] 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 the switching outputs

<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 0.00 and 30.00 s; (at 0.00 [dAP] is not active). <p>dAP value = response time between pressure change and change of the switching status in seconds. [dAP] influences the switching frequency: $f_{\max} = 1 \div 2dAP$. [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 0.00 and 30.00 s; (at 0.00 [dAA] is not active). <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

<ul style="list-style-type: none">▶ Set a defined reference pressure between ASP and AEP in the system.▶ Select [CAL].▶ Press [Set] briefly.> [CP1] is displayed.▶ Press [Set] for 5 s.> The pressure measured by the unit is displayed.▶ Press [Set] until the set reference pressure is indicated (measured pressure = reference pressure) or the corresponding analogue signal is provided to OUT2. Maximum correction value = $\pm 2\%$ of the final value of the measuring range.▶ Press [Mode/Enter] briefly.> [CP1] is displayed.▶ Press [Mode/Enter] briefly.> [CP2] is displayed. <p>Continue with a) or b).</p>	 <p>CAL CP1</p>
<p>a) Finish calibration:</p> <ul style="list-style-type: none">▶ Press [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. Minimum distance between the calibration points CP1 and CP2 = 5% of the final value of the measuring range.▶ Press [Set] for 5 s.> The pressure measured by the unit is displayed.▶ Press [Set] until the set reference pressure is indicated (measured pressure = reference pressure) or the corresponding analogue signal is provided to OUT2. Maximum correction value = $\pm 2\%$ of the final value of the measuring range.▶ Press [Mode/Enter] briefly.> [CP2] is displayed.▶ Press [Mode/Enter] briefly.> [CAL] is displayed, the process is finished.	 <p>CP2</p>

9.5 Service functions

9.5.1 Read min/max values for system pressure

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

<ul style="list-style-type: none">▶ Select [rES].▶ Press [Set] and keep it pressed until [----] is displayed.▶ Press [Mode/Enter] briefly. <p>It is recommended to take down your own settings in the table before carrying out a reset (→ 13 Factory setting).</p>	r-ES
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9.6 Simulation function

9.6.1 Open menu level 3 (simulation)

<ul style="list-style-type: none">▶ Select [EF] and press [Set] briefly (= to open menu level 2).▶ Select [SIM] and press [Set] briefly (= to open menu level 3).> [SEL] is displayed.	EF SIM
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9.6.2 Set simulation value

<p>Output states</p> <p>If [SEL] is active:</p> <ul style="list-style-type: none">▶ Press [Set] and keep it pressed until [OU] is displayed.▶ Press [Mode/Enter] briefly.> [S.OU1] is displayed.▶ Press [Set] to set the requested value:<ul style="list-style-type: none">- [OPEN] = output 1 not active / open.- [CLOS] = output 1 active / closed.▶ Press [Mode/Enter] briefly.> [S.OU2] is displayed.▶ Press [Set] to set the requested value:<ul style="list-style-type: none">• If [OU2] = [Hnc], [Hno], [Fnc] or [Fno]:<ul style="list-style-type: none">- [OPEN] = output 2 not active / open.- [CLOS] = output 2 active / closed.• If [OU2] = [I] or [InEG]:<ul style="list-style-type: none">- 3.50...21.10 mA in steps of 0.01 mA.▶ Press [Mode/Enter] briefly.	SEL S.OU1 S.OU2
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<p>Process value</p> <p>If [SEL] is active:</p> <ul style="list-style-type: none"> ▶ Press [Set] and keep it pressed until [Proc] is displayed. ▶ Press [Mode/Enter] briefly. > [S.Pr] is displayed. ▶ Press [Set] to set the requested pressure value. ▶ Press [Mode/Enter] briefly. 	
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9.6.3 Set time for simulation

<ul style="list-style-type: none"> ▶ Select [S.TIM] and set the value between 1...60 minutes. 	
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9.6.4 Start simulation

<ul style="list-style-type: none"> ▶ Select [S.ON]. ▶ Press [Set] and keep it pressed until the display alternately shows [SIM] and the current operation indication. <p>Current operation indication:</p> <ul style="list-style-type: none"> - Current system pressure if [SEL] = [OU]. - Simulated measured value set in [S.Pr] if [SEL] = [Proc]. <p>After the simulation time has elapsed [S.OFF] is displayed for 2 s, then [SEL].</p>	
<p>Abort simulation:</p> <ul style="list-style-type: none"> ▶ Press [Mode/Enter] or [Set] briefly. > [S.OFF] is displayed for 2 s, then [SEL]. 	

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.

Operating indicators → 7 Operating and display elements.

10.1 Read set parameters

- ▶ Press [Mode/Enter] until the requested parameter is displayed.
- ▶ Press [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 Change the display in the Run mode

► Press [Set] briefly in the Run mode.

> The unit indicates the current measured value in the selected type of indication for approx. 15 s:

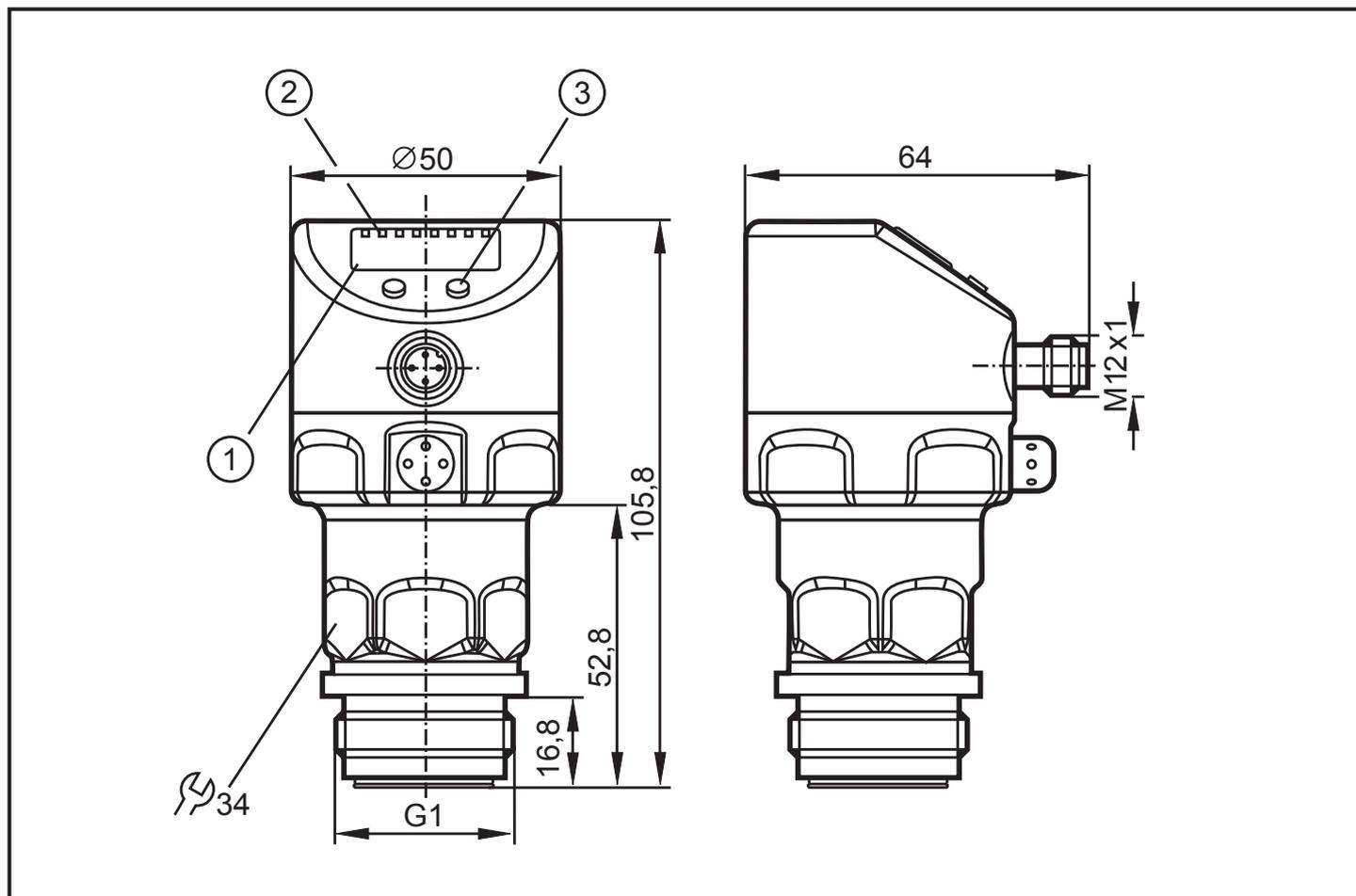
- System pressure in the unit set in Uni.
- System pressure in % of the set scaling of the analogue output if [OU2] is configured as analogue output.
- System pressure in % of the final value of the measuring range if [OU2] is configured as switching output.

10.3 Error indications

[OL]	Overload pressure (above measuring range).
[UL]	Underload pressure (below measuring range).
[SC1]	Short circuit in OUT1.
[SC2]	Short circuit in OUT2.
[SC]	Short circuit in both outputs.
[Err]	Flashing: internal error, invalid entry.

The messages SC, SC1, SC2 and Err are displayed even if the display is switched off.

11 Scale drawing



Dimensions in mm

1: display

2: LEDs

3: programming button

UK

12 Technical data

Operating voltage [V].....	18...32 DC	
Current consumption [mA].....	< 45	
Current rating [mA]	250	
Short-circuit protection; reverse polarity protection / overload protection, integrated watchdog		
Voltage drop [V]	< 2	
Power-on delay time [s]	0.4	
Min. response time switching output [ms]	3	
Switching frequency [Hz]	125	
Analogue output	4...20 mA / 20...4 mA	
Max. load [Ω]	$(U_b - 10) \times 50$	
Step response time analogue output [ms]	7	
Accuracy / deviations (in % of the span) ¹⁾		
	PI279x	PI2789
Switch point accuracy	< ± 0.2	< ± 0.5
Characteristics deviation (linearity, incl. hysteresis and repeatability) ²⁾	< ± 0.2	< ± 0.5
Linearity	< ± 0.15	< ± 0.25
Hysteresis	< ± 0.15	< ± 0.2
Repeatability (in case of temperature fluctuations < 10 K)	< ± 0.1	< ± 0.1
Long-term stability (in % of the span per year)	< ± 0.1	< ± 0.1
Temperature coefficients (TEMPCO) in the compensated temperature range 0 ...70°C (in % of the span per 10 K)		
	PI279x	PI2789
Greatest TEMPCO of the zero point	< ± 0.05	< ± 0.1
Greatest TEMPCO of the span	< ± 0.15	< ± 0.2

Materials (wetted parts)

.....	stainless steel 316L / 1.4435, surface characteristics: Ra < 0.4 / Rz 4 ceramics (99.9 % Al ₂ O ₃); PTFE
Housing materials.....	stainless steel 316L / 1.4404; FPM (Viton); PTFE; PBT (Pocan); PEI; PFA
Protection rating	IP 67 / IP 68 / IP 69K
Protection class	III
Insulation resistance [MΩ]	> 100 (500 V DC)
Shock resistance [g]	50 (DIN IEC 68-2-27, 11 ms)
Vibration resistance [g]	20 (DIN IEC 68-2-6, 10 - 2000 Hz)
Switching cycles min.	100 million
Ambient temperature [°C]	-25 ... 80
Medium temperature [°C]	-25... 125 (145 max. 1 h)
Storage temperature [°C].....	-40...100
EMC EN 61000-4-2 ESD:	4 / 8 kV
EN 61000-4-3 HF radiated:	10 V/m
EN 61000-4-4 Burst:	2 kV
EN 61000-4-5 Surge:	0.5 / 1 kV
EN 61000-4-6 HF conducted:	10 V

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- 1) 1) All indications are referred to a turn-down of 1:1
- 2) Limit value setting to DIN 16086

12.1 Setting ranges

		SP1 / SP2		rP1 / rP2		ASP		AEP		ΔP
		min	max	min	max	min	max	min	max	
PI2789	mbar	-4.8	100.0	-5.0	99.8	-5.0	75.0	20.0	100.0	0.1
	kPa	-0.48	10.00	-0.50	9.98	-0.50	7.50	2.00	10.00	0.01
	inH ₂ O	-1.92	40.16	-2.00	40.08	-2.00	30.12	8.04	40.16	0.04
	mmWS	-49	1020	-51	1018	-51	765	204	1020	1
PI2793	bar	-0.96	25.00	-1.00	24.96	-1.00	18.74	5.24	25.00	0.02
	PSI	-13.8	362.7	-14.4	362.1	-14.4	271.8	76.2	362.7	0.3
	MPa	-0.096	2.500	-0.100	2.496	-0.100	1.874	0.524	2.500	0.002
PI2794	bar	-0.98	10.00	-1.00	9.98	-1.00	7.50	1.50	10.00	0.01
	PSI	-14.2	145.0	-14.5	144.7	-14.5	108.7	21.8	145.0	0.1
	MPa	-0.098	1.000	-0.100	0.998	-0.100	0.750	0.150	1.000	0.001
PI2795	bar	-0.990	4.000	-1.000	3.990	-1.000	3.000	0.000	4.000	0.005
	PSI	-14.35	58.00	-14.50	57.85	-14.50	43.50	0.00	58.00	0.05
	kPa	-99.0	400.0	-100.0	399.0	-100.0	300.0	0.0	400.0	0.5
PI2796	bar	-0.120	2.500	-0.124	2.496	-0.124	1.880	0.500	2.500	0.002
	PSI	-1.74	36.27	-1.80	36.21	-1.80	27.27	7.26	36.27	0.03
	kPa	-12.0	250.0	-12.4	249.6	-12.4	188.0	50.0	250.0	0.2
	inH ₂ O	-48	1004	-50	1002	-50	755	201	1004	1
	mWS	-1.22	25.49	-1.26	25.45	-1.26	19.17	5.10	25.49	0.01
PI2797	mbar	-48	1000	-50	998	-50	750	200	1000	1
	PSI	-0.70	14.50	-0.73	14.47	-0.73	10.88	2.90	14.50	0.01
	kPa	-4.8	100.0	-5.0	99.8	-5.0	75.0	20.0	100.0	0.1
	inH ₂ O	-19.2	401.6	-20.0	400.8	-20.0	301.2	80.4	401.6	0.4
	mWS	-0.49	10.20	-0.51	10.18	-0.51	7.65	2.04	10.20	0.01
PI2798	mbar	-12.0	250.0	-12.4	249.6	-12.4	187.4	50.0	250.0	0.2
	kPa	-1.20	25.00	-1.24	24.96	-1.24	18.74	5.00	25.0	0.02
	inH ₂ O	-4.8	100.4	-5.0	100.2	-5.0	75.2	20.1	100.4	0.1
	mmWS	-122	2550	-126	2546	-126	1912	510	2550	2

ΔP = step increment

		SP1 / SP2		rP1 / rP2		ASP		AEP		ΔP
		min	max	min	max	min	max	min	max	
PI2799	mbar	-998	1000	-1000	998	-1000	500	-500	1000	1
	PSI	-14.45	14.50	-14.50	14.45	-14.50	7.25	-7.25	14.50	0.05
	kPa	-99.8	100.0	-100.0	99.8	-100.0	50.0	-50.0	100.0	0.1
	inH ₂ O	-400	401	-401	400	-401	201	-201	401	1
	mWS	-10.18	10.20	-10.20	10.18	-10.20	5.10	-5.10	10.20	0.01

ΔP = step increment

UK

13 Factory setting

	Factory setting	User setting
OU1	Hno	
OU2	I	
SP1	25% VMR *	
rP1	23% 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	

* = the indicated percentage of the final value of the measuring range (VMR) of the corresponding sensor is set.

More information at www.ifm.com