CE

Operating instructions
Electronic pressure sensor

PI2602   UK
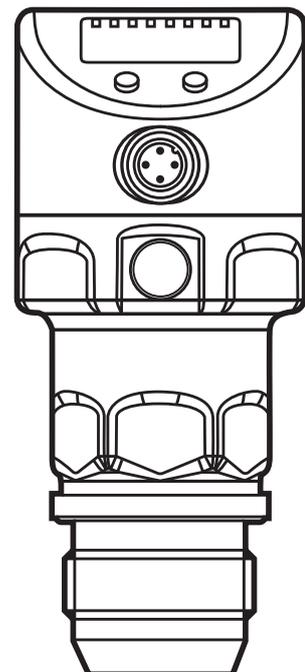
Contents

1 Preliminary note

1.1 Symbols used

▶   Instructions

\>   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

- 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 (→ 3 Functions and features).

- 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 unit must be carried out by qualified personnel authorised by the machine operator.

- Protect units and cables against damage.

3 Functions and features

The unit measures and monitors the system pressure in a plant.

3.1 Applications

Type of pressure: relative pressure

Order no.	Measuring range		Permissible overload pressure		Bursting pressure	
	bar	psi	bar	psi	bar	psi
PI2602	-1...100	-15...1450	200	2900	650	9425

> ⚠ 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!

> ⚠ Not suitable for use where the criteria for paragraph E1.2 / 63-03 of the 3A standard 63-03 have to be met.

> ⚠ The unit is vacuum resistant. Adhere to the specifications in the data sheet!

> ⚠ Use in gases at pressures > 25 bar only 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 laid out 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.
  - Using the FDT service program ifm Container, the current parameter settings can be stored and transferred to other units of the same type.

  The program library of the available DTM objects can be found at: www.ifm.com.

  Device-specific parameter lists for IO-Link parameter setting are available at: www.ifm.com.

4.1 Operating modes

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

4.1.1 2-wire operation

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

4.1.2 3-wire operation

OUT1 (pin 4)	• Switching signal for system pressure limit value • Communication via IO-Link
OUT2 (pin 2)	3 options: • Switching signal for system pressure limit value • Analogue signal proportional to pressure 4...20 mA • Analogue signal proportional to pressure 20...4 mA

4.2 Switching function (only for 3-wire operation)

OUTx changes its switching status 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] (→
    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] (→
    The width of the window can be set by means of the difference between SPx and rPx. SPx = upper value, rPx = lower value.
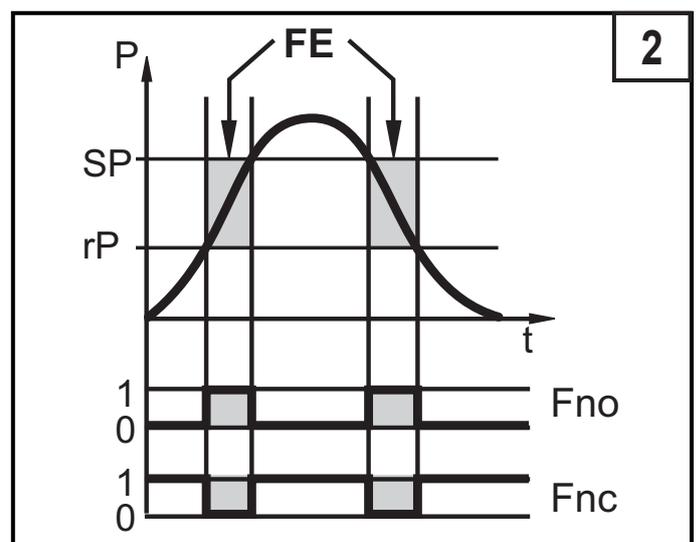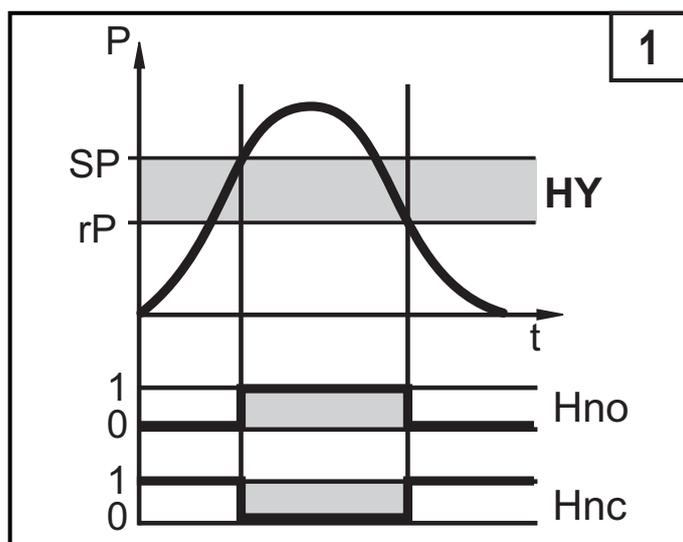
P = system pressure; HY = hysteresis; FE = window

4.3 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).

Factory setting	Measuring range scaled
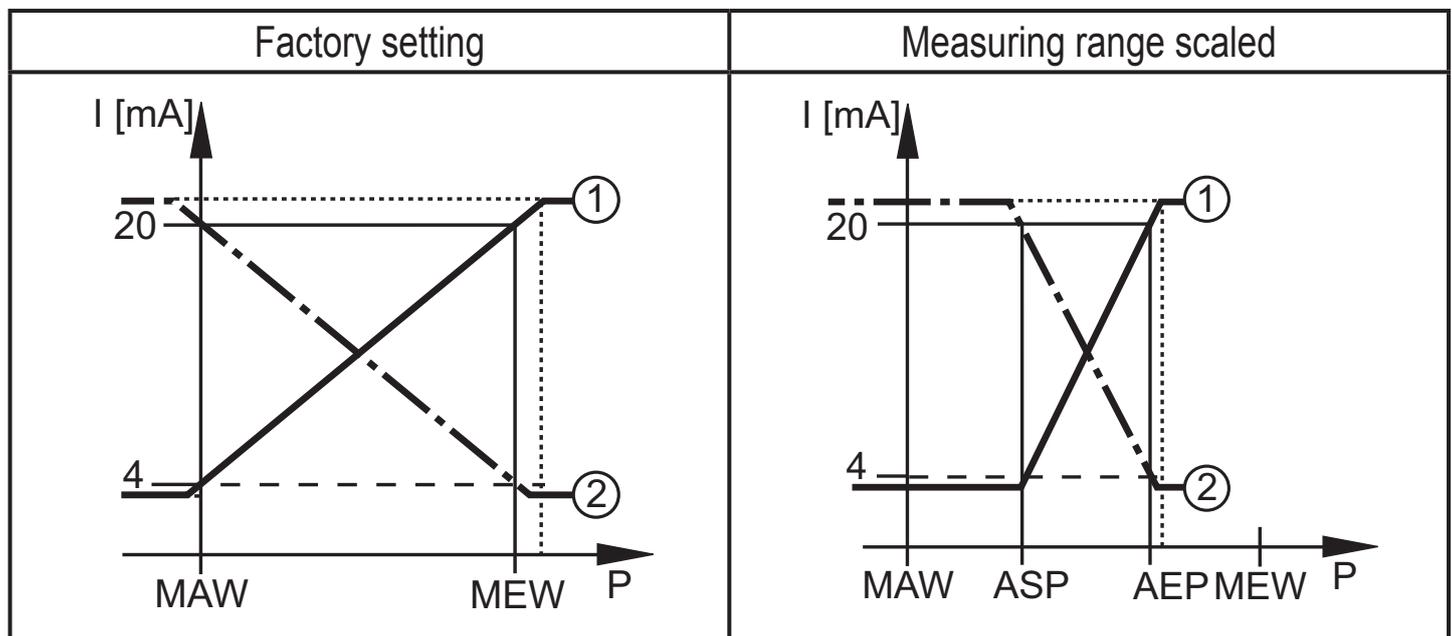
P = system pressure , MAW = initial value of the measuring range, MEW = final value of the measuring range

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 4 to 3.8 mA at [OU2] = [InEG].
- System pressure below the measuring range:
  - Output signal 4 to 3.8 mA at [OU2] = [I].
  - Output signal > 20 mA at [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.
- 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]).
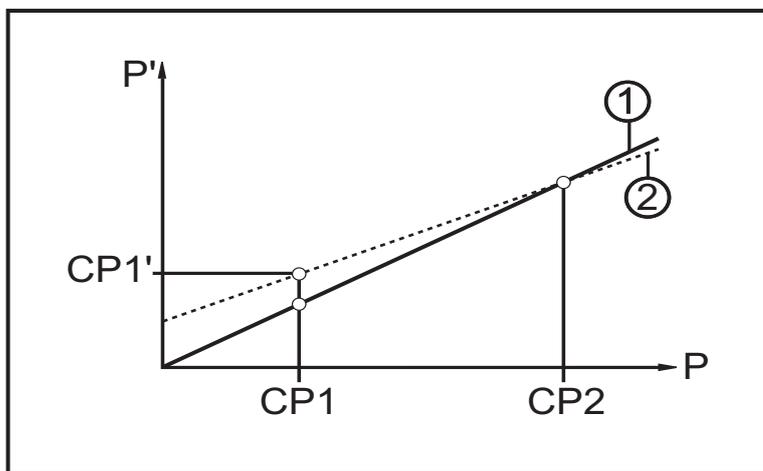
- P = measured pressure;
  P' = modified measured value
- CP1 = calibration point 1;
  CP1' = modified measured value for CP1
- CP2 = calibration point 2;
- 1 = curve of measured values at factory setting
- 2 = curve of measured values after calibration

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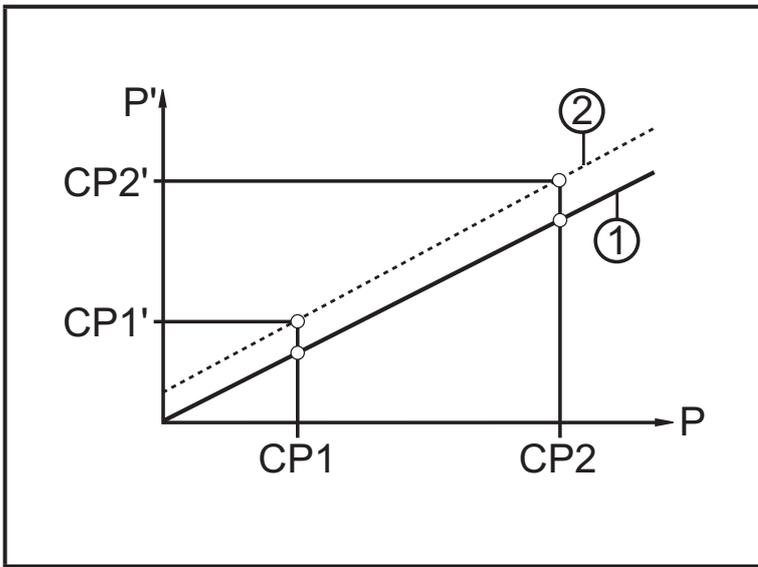
- P = measured pressure;
  P' = modified measured value
- CP1 = calibration point 1;
  CP1' = modified measured value for CP1
- CP2 = calibration point 2;
  CP2' = modified measured value for CP2
- 1 = curve of measured values at factory setting
- 2 = curve of measured values after calibration

5 Installation

⚠ Before installing and removing the unit: Make sure that no pressure is applied to the system. Please consider when the system pressure is displayed in % of the span: "0" does not mean that no pressure is applied to the system!

Use in hygienic areas to 3A
Orientation of the unit in pipes and tanks

For optimised cleaning of the measuring element according to the 3A criteria for hygienic areas please take the following into account:

Do not install the unit at the lowest point of the pipe or tank (see fig., position 5) in order that the medium can run off the area of the measuring element.
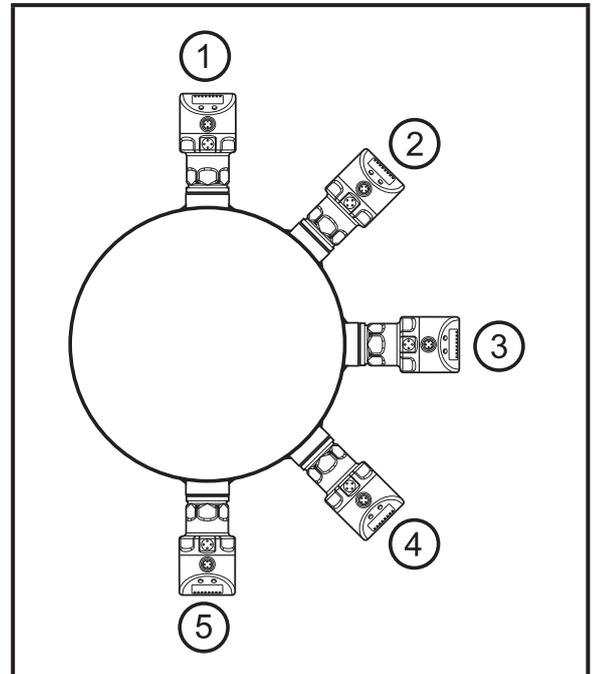
Use in hygienic areas to EHEDG
► Make sure that the sensor is integrated into the system in accordance with EHEDG.
See documents of the EHEDG work group.

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► Slightly grease the thread of the of the sensor using a lubricating paste which is suitable and approved for the application.
► Insert the unit in a G1 process connection.
► Tighten it using a spanner. Tightening torque: 20 Nm.
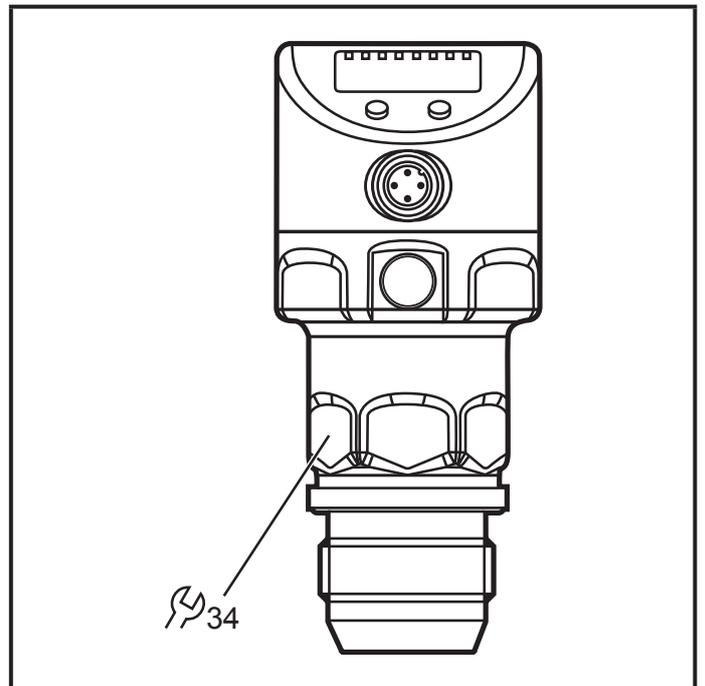
Using G1 adapters the unit can be adapted to different process connections (the adapters need to be ordered separately as accessories).

> **!** A guarantee for a long-term stable fitting in case of metallic sealing is only valid for once-only mounting.

> **ⓘ** Alternatively, adapters with O-ring seal are available that can be used for frequent inspections.

Welding adapter

First weld the adapter, then mount the unit.

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:

6.1 Connection for 2-wire operation
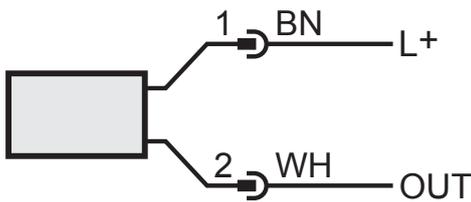
Core colours	
BN	brown
WH	white

OUT: analogue output 4...20 mA

Colours to DIN EN 60947-5-2

6.2 Connection for 3-wire operation
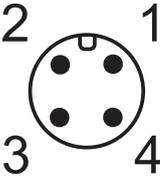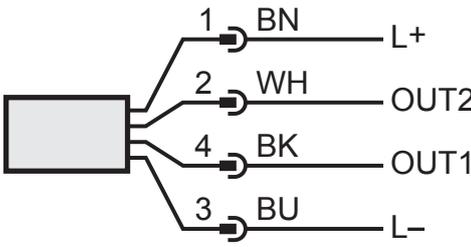
Core colours	
BK	black
BN	brown
BU	blue
WH	white

OUT1: switching output or IO-Link

OUT2: switching outputs or analogue output

Colours to DIN EN 60947-5-2

Wiring example

2 x positive switching	2 x negative switching
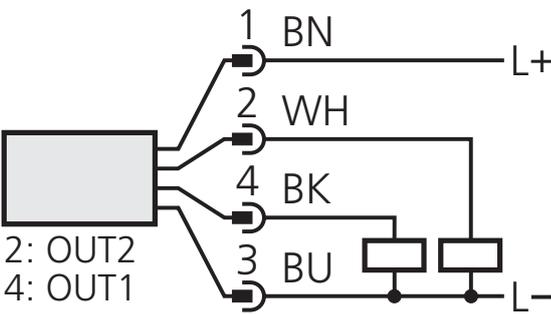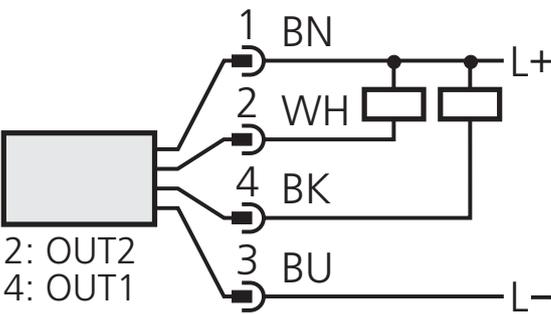
Wiring example

1 x positive switching / 1 x analogue	1 x negative switching / 1 x analogue

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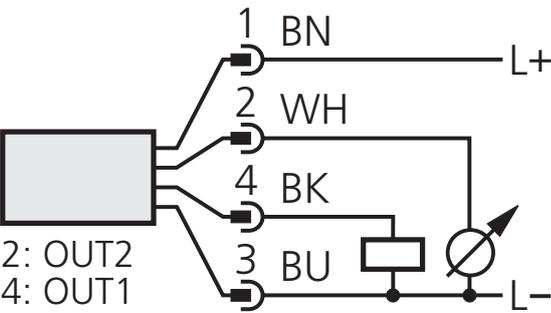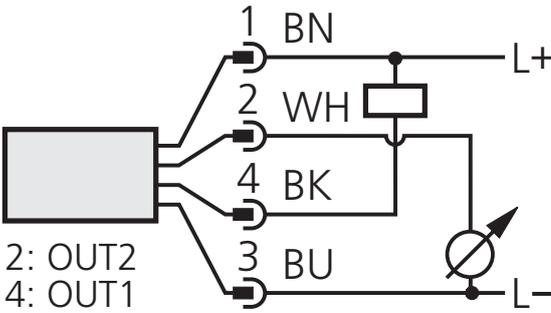
> ⚠ If analogue signal current (I) is selected in the menu under OU2 and the output is not connected (resistor = infinite), the error message W532 is displayed in intervals. The measuring result is not affected by this.
>
> ▶ Alternatively: change OU2 to switching output.

7 Operating and display elements
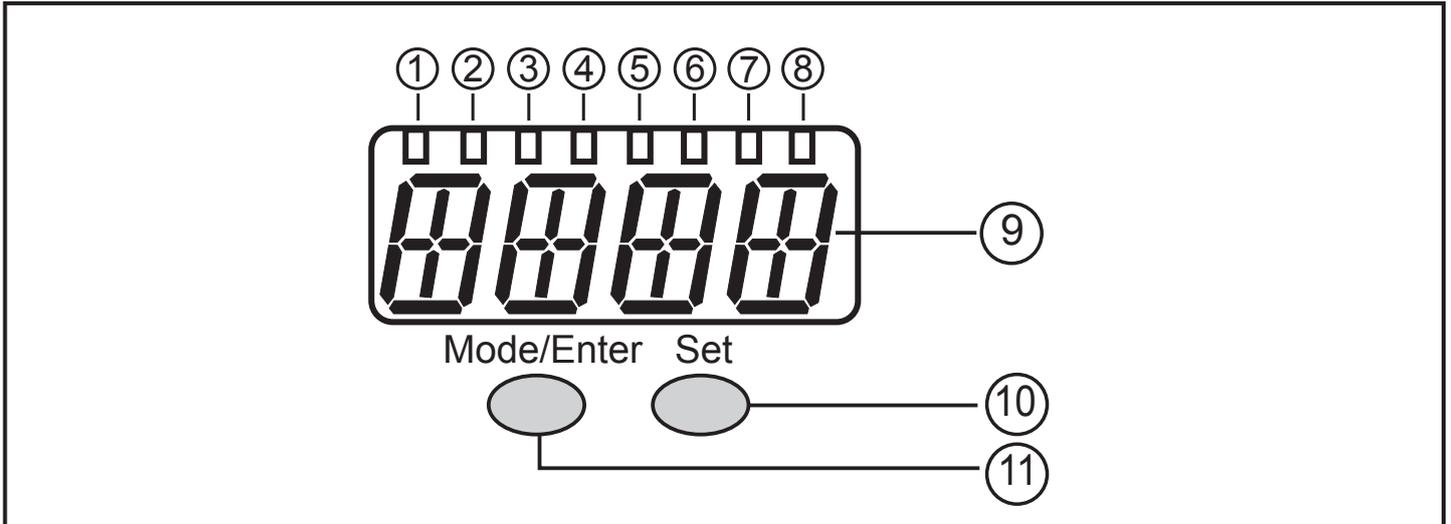
1 to 8: Indicator LEDs

- LED 1 to LED 5 = system pressure in the specified unit of measurement.
- LED 6 = system pressure in % of the scaling of the analogue output (range ASP to AEP) 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 when 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
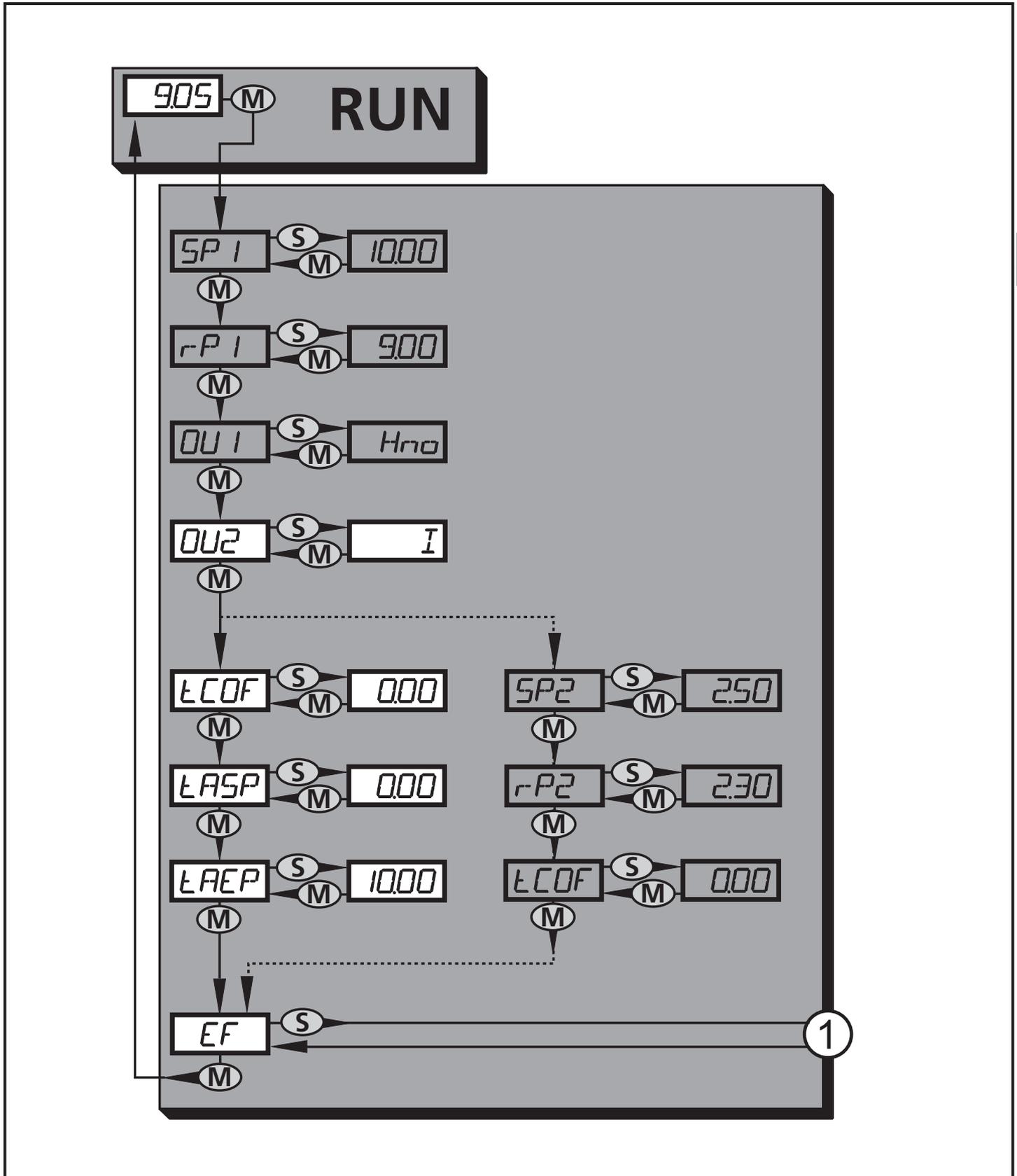
1: Change to menu level 2 (extended functions)

Menu items highlighted grey (SP1) are not active in 2-wire operation.

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: • 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: • Switching signal for the pressure limit values: hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc]; (only available for 3-wire operation). • 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.

* menu items not active in 2-wire operation

8.3 Menu structure: level 2 (extended functions)
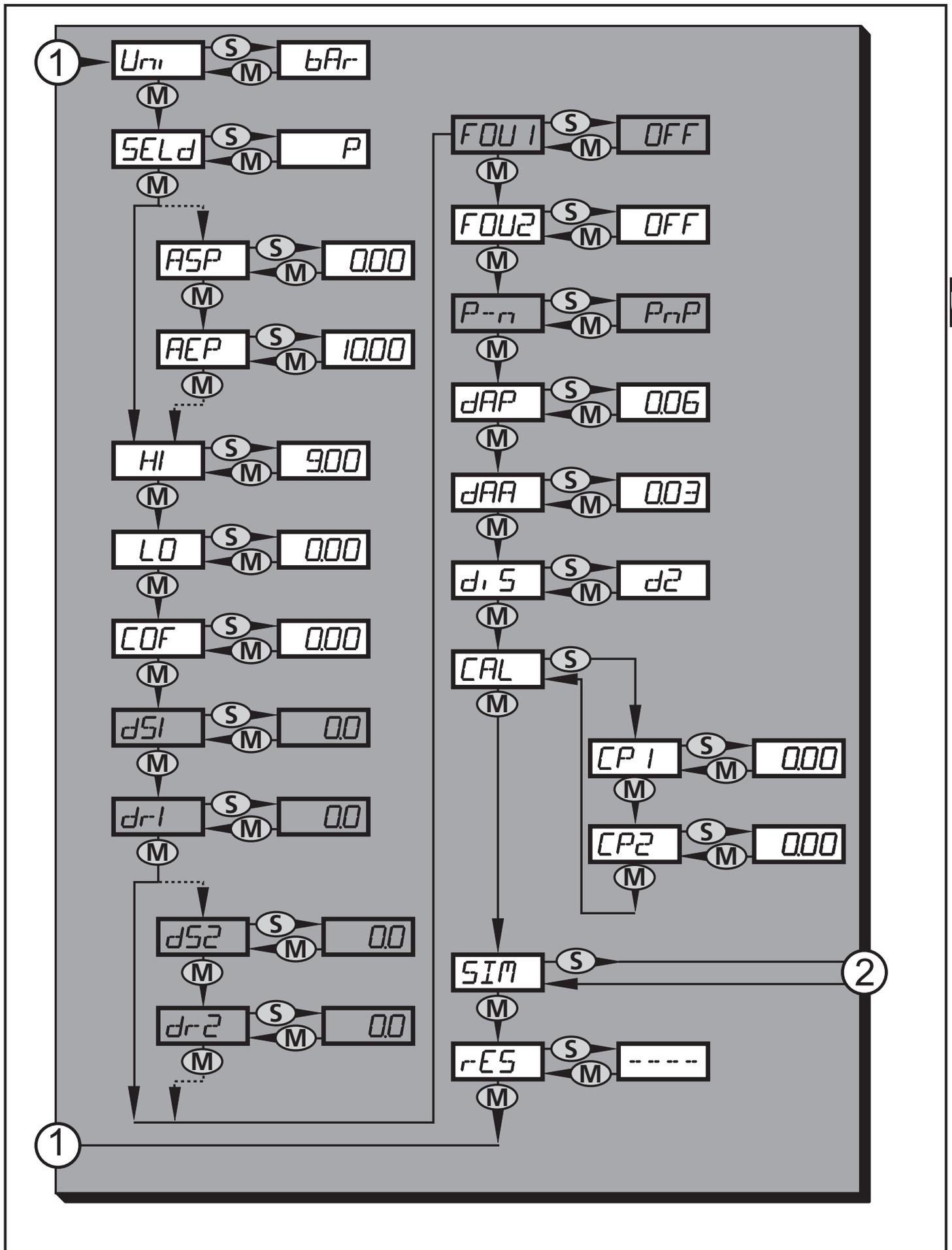
1: Change to the main menu; 2: Change to menu level 3 (simulation).
Menu items highlighted grey (ASP) are not active in 2-wire operation.

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8.4 Explanation of the menu level 2

Uni	Standard unit of measurement for system pressure.
SELd	Display mode: • 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].
FOU1*	Status of output 1 in case of an internal fault.
FOU2	Status of output 2 in case of an internal fault.
P-n*	Switching logic for the outputs: pnp or npn.
dAP	Damping for switching outputs and display.
dAA	Damping for analogue output (OUT2), also has effect on the IO-Link process value.
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 setting.

* menu items not active in 2-wire operation

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8.5 Menu structure: level 3 (simulation)

For setting SEL = OU	
	② → SEL ⟨S/M⟩ OU ↓M S.OU 1 ⟨S/M⟩ OPEN ↓M S.OU2 ⟨S/M⟩ 3.60 ↓M S.TIM ⟨S/M⟩ 3 ↓M S.ON ⟨S⟩ SIM 10.00 ⟨M⟩ S.OFF 2 s ↓M ② 1...60 min
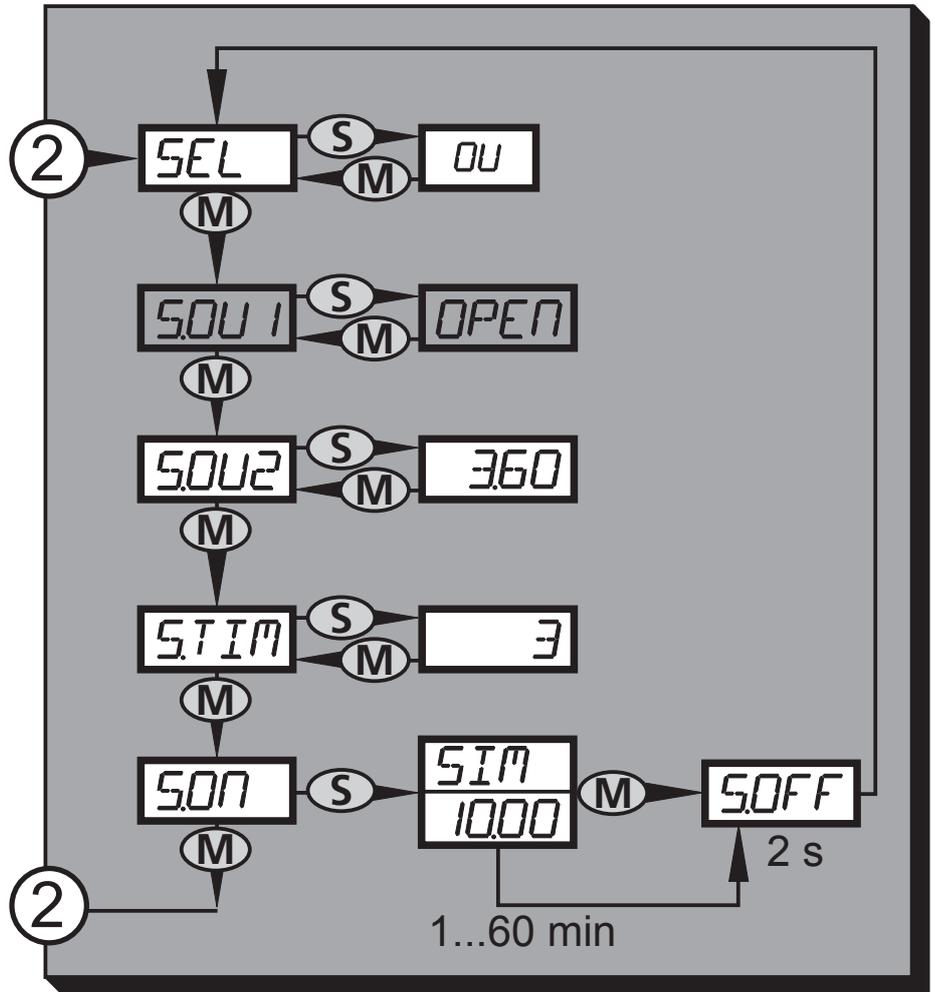
For setting SEL = Proc	
	② → SEL ⟨S/M⟩ Proc ↓M S.Pr ⟨S/M⟩ 0.00 ↓M S.TIM ⟨S/M⟩ 3 ↓M S.ON ⟨S⟩ SIM 10.00 ⟨M⟩ S.OFF 2 s ↓M ② 1...60 min

UK
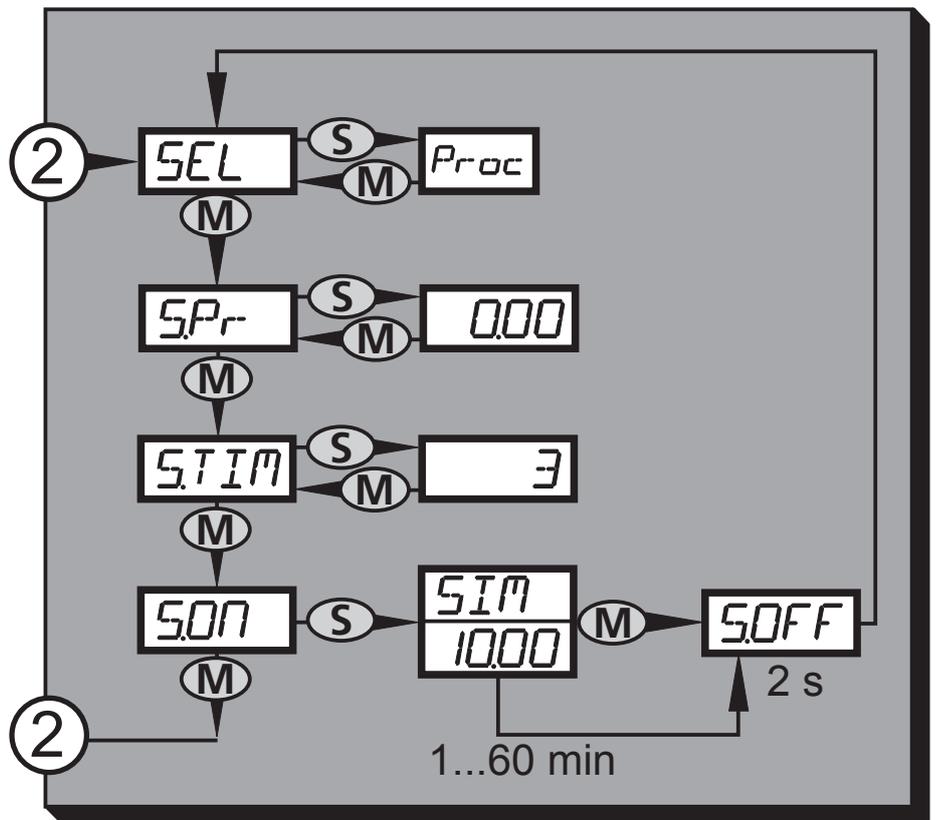
2: Change to menu level 2 (extended functions)
Menu items highlighted grey (S.OU1) are not active in 2-wire operation.

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8.6 Explanation of the menu level 3

For setting SEL = OU	
SEL	Status to be simulated: • Output functions [OU].
S.OU1*	Simulation values for OUT1; only active for 3-wire operation and if [SEL] = [OU]. • Output inactive [OPEN] or output active [CLOS].
S.OU2	Simulation values for OUT2; only active if [SEL] = [OU]. • For 3-wire operation and if OUT2 has been configured as switching output: output inactive [OPEN] or active [CLOS]. • If OUT2 is set as analogue output: analogue signal between 3.6 and 21.1 mA (depending on the set value → 9.6.2).
S.TIM	Time for the simulation process in minutes.
S.ON	Starting 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 (briefly press [Mode/Enter] or [Set]) [S.OFF] is indicated for 2 s, then [SEL] is active again.

* menu item not active in 2-wire operation

For setting SEL = Proc	
SEL	Status to be simulated: • Process value [Proc].
S.Pr	Simulation of a process value; only active if [SEL] = [Proc]. • Any value between the initial value of the measuring range and the 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 (briefly press [Mode/Enter] or [Set]) [S.OFF] is indicated for 2 s, then [SEL] is active again.

9 Parameter setting

During parameter setting the unit remains in the operating mode. It continues to monitor with the existing parameters until the parameter setting has been completed.

Exemptions: Changes to the parameters COF($\rightarrow$ 9.4.1), CP1 and CP2 ($\rightarrow$ 9.4.7) take effect immediately.

9.1 Parameter setting in general

3 steps must be taken for each parameter setting:

1	**Select parameter** ▶ Press [Mode/Enter] until the requested parameter is displayed. If the main menu is protected by an access code, [Cod0] flashes in the display. ▶ Press and hold [Set] until the valid code no. is displayed. ▶ Briefly press [Mode/Enter]. When delivered by ifm electronic: no access restriction.	
2	**Set parameter value** ▶ Press and hold [Set]. > 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.	
	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.	
3	**Acknowledge parameter value** ▶ Briefly press [Mode/Enter]. > The parameter is displayed again. The new setting value is saved.	
	Set other parameters ▶ Start again with step 1.	
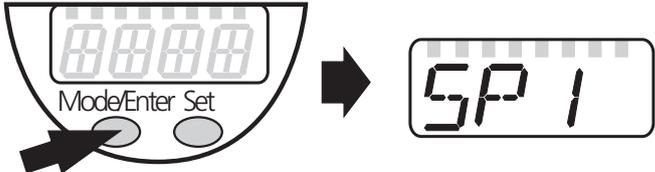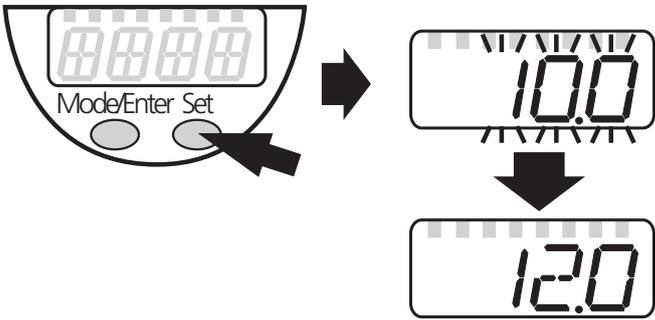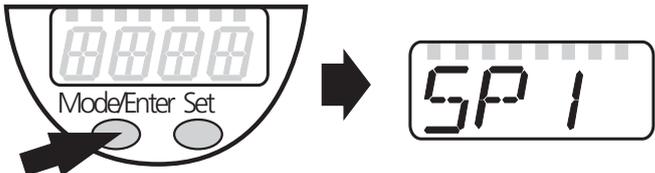
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Finish parameter setting

▶ Press [Mode/Enter] several times until the current measured value is displayed or wait for 15 s.

> The unit returns to the operating mode.

| ⓘ | For 2-wire operation those menu items referring to switching functions are not active (8 Menu structure); in addition, for some menu items, the parameter values that refer to switching functions cannot be selected. |

• If [SLoc] is displayed when attempting a modification of a parameter value, the sensor is locked by the software. This locking can only be undone with a parameter setting software.

• When parameter setting is done with the user interface of the ifm Container program, the values can be directly entered in the specified fields.

• For IO-Link parameter setting → device-specific parameter lists at: www.ifm.com

• Change from menu level 1 to menu level 2:

▶ Press [Mode/Enter] until [EF] is displayed.	
▶ Briefly press [Set]. > The first parameter of the submenu is displayed (here: [Uni]). If menu level 2 is protected by an access code, "Cod1" flashes in the display. ▶ Press and hold [Set] until the valid code no. is displayed. ▶ Briefly press [Mode/Enter]. When delivered by ifm electronic: no access restriction.	

• Locking / unlocking
  The unit can be locked electronically to prevent unintentional settings.

▶ Make sure that the unit is in the normal operating mode. ▶ Press [Mode/Enter] + [Set] for 10 s. > [Loc] is displayed.	
During operation: [Loc] is briefly displayed if you try to change parameter values.	

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For unlocking: ▶ Press [Mode/Enter] + [Set] for 10 s. > [uLoc] is displayed.	
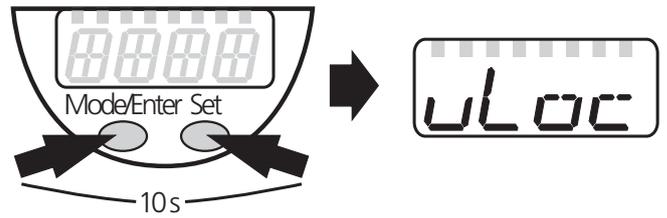
On delivery: not locked.

- 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)

▶ Select [Uni] and set the unit of measurement: - [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).	*Uni*
▶ Select [SELd] and set type of indication: - [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. If OU2 is configured as switching output, [ASP] and [AEP] are not active. In this case the following applies: 0% = initial value of the measuring range / 100% = final value of the measuring range. If [SELd] = [P%] please take the following into account: "0" does not mean that no pressure is applied to the system!	*SELd*
▶ 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. When one of the buttons is pressed, the current measured value is displayed for 15 s. Pressing the [Mode/Enter] button again activates the display mode. The LEDs remain active even if the display is deactivated. Error messages are displayed even if the display is deactivated.	*di S*

9.3 Set output signals

9.3.1 Set output functions

▶ Select [OU1] and set the switching function: - [Hno] = hysteresis function/NO, - [Hnc] = hysteresis function/NC, - [Fno] = window function/NO, - [Fnc] = window function/NC.	*OU1*
▶ Select [OU2] and set the function: - [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.	*OU2*

9.3.2 Set switching limits

▶ Select [SP1] / [SP2] and set the value at which the output switches.	*SP1* *SP2*
▶ Select [rP1] / [rP2] and set the value at which the output is reset. rPx is always smaller than SPx. The unit only accepts values which are lower than the value for SPx.	*rP1* *rP2*

9.3.3 Scale analogue value for OUT2

▶ Set the minimum pressure requested in the system. ▶ Press [Mode/Enter] until [tASP] appears. ▶ Press and hold [Set]. > Current setting value flashes. ▶ Release [Set] when the display stops flashing. > New setting value is displayed. ▶ Briefly press [Mode/Enter]. > The current system pressure is defined as start value for the analogue signal.	*tASP*

▶ Set the maximum pressure requested in the system. ▶ Press [Mode/Enter] until [tAEP] appears. ▶ Press and hold [Set]. > Current setting value flashes. ▶ Release [Set] when the display stops flashing. > New setting value is displayed. ▶ Briefly press [Mode/Enter]. > The current system pressure is defined as end value for the analogue signal.	*tAEP*

ASP / AEP can only be set automatically within defined limits (→ 10.4 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.

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

9.4 User settings (optional)

9.4.1 Carry out zero point calibration

▶ 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.	*COF*
Alternatively: Automatic adjustment of the offset in the range 0 bar ± 5 %. ▶ Make sure that no pressure is applied to the system. ▶ Press [Mode/Enter] until [tCOF] appears. ▶ Press and hold [Set]. > The current offset value (in %) flashes briefly. > The current system pressure is displayed. ▶ Release [Set]. ▶ Briefly press [Mode/Enter] (= to confirm the new offset value).	*tCOF*

9.4.2 Set output status in fault condition

▶ Select [FOU1] and set the value:
   - [On] = output 1 switches ON in case of an error.
   - [OFF] = output 1 switches OFF in case of an error.
   - [OU] = output 1 switches irrespective of an error as defined with the
     parameters SP1, rP1 and OU1.
▶ Select [FOU2] and set the value:
   - [On] = output 2 switches ON in case of a fault, the analogue signal
     goes to the upper final value.
   - [OFF] = output 2 switches OFF in case of a fault, the analogue signal
     goes to the lower final value.
   - [OU] = output 2 switches irrespective of the fault as defined with the
     parameters SP2, rP2, OU2. The analogue signal corresponds to the
     measured value.
	FOU1
	FOU2

Error indications → 10.3

9.4.3 Set delay for the switching outputs

[dS1] / [dS2] = switch-on delay for OUT1 / OUT2. [dr1] / [dr2] = switch-off delay for OUT1 / OUT2. ▶ 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).	*dS1* *dr1* *dS2* *dr2*

9.4.4 Set output logic for the switching outputs

▶ Select [P-n] and set [PnP] or [nPn].	*P--n*

9.4.5 Set damping for the switching signal

▶ Select [dAP] and set a value between 0.00 and 30.00 s; (at 0.00 [dAP] is not active). dAP value = response time between pressure change and change of the switching status in seconds. [dAP] influences the switching frequency: f_{max} = 1 ÷ 2dAP. [dAP] also has an effect on the display.	*dAP*

9.4.6 Set damping for the analogue signal

▶ Select [dAA] and set a value between 0.01 and 99.99 s; (at 0.00 [dAA] is not active). dAA value = response time between pressure change and change of the analogue signal in seconds.	*dAA*

9.4.7 Calibrate curve of measured values

▶ Set a defined reference pressure between ASP and AEP in the system. ▶ Select [CAL]. ▶ Briefly press [Set]. > [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 on OUT2. Maximum correction value = ± 2 % of the final value of the measuring range. ▶ Briefly press [Mode/Enter]. > [CP1] is displayed. ▶ Briefly press [Mode/Enter]. > [CP2] is displayed. Continue with a) or b).	CAL CP1
a) Finish calibration: ▶ Briefly press [Mode/Enter]. > [CAL] is displayed. b) Change a 2nd point on the curve of measured values: ▶ 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 on OUT2. Maximum correction value = ± 2 % of the final value of the measuring range. ▶ Briefly press [Mode/Enter]. > [CP2] is displayed. ▶ Briefly press [Mode/Enter]. > [CAL] is displayed, the process is finished.	CP2

UK

9.5 Service functions

9.5.1 Read min/max values for the system pressure

▶ Select [HI] or [LO] and briefly press [Set]. [HI] = maximum value, [LO] = minimum value. Delete memory: ▶ Select [HI] or [LO]. ▶ Press and hold [Set] until [----] is displayed. ▶ Briefly press [Mode/Enter].	*HI* *LO*

9.5.2 Reset all parameters to factory setting

▶ Select [rES]. ▶ Press and hold [Set] until [----] is displayed. ▶ Briefly press [Mode/Enter]. We recommend noting down your own settings before carrying out a reset (→ 13 Factory setting).	*rES*

9.6 Simulation function

9.6.1 Open menu level 3 (simulation)

▶ Select [EF] and briefly press [Set] (= to open menu level 2). ▶ Select [SIM] and briefly press [Set] (= to open menu level 3). > [SEL] is displayed.	*EF* *SIM*

9.6.2 Set simulation value

Output states
If [SEL] is active:
▶ Press [Set] and keep it pressed until [OU] is displayed.
▶ Briefly press [Mode/Enter].
> [S.OU1] is displayed (in 2-wire operation [S.OU2] is displayed).
▶ Press [Set] to set the requested value:
  - [OPEN] = output 1 not active / open.
  - [CLOS] = output 1 active / closed.
▶ Briefly press [Mode/Enter].
> [S.OU2] is displayed.
▶ Press [Set] to set the requested value:
  • If [OU2] = [Hnc], [Hno], [Fnc] or [Fno] (not in 2-wire operation):
   - [OPEN] = output 2 not active / open.
   - [CLOS] = output 2 active / closed.
  • If [OU2] = [I] or [InEG]:
   - 3.60...21.10 mA in steps of 0.01 mA.
▶ Briefly press [Mode/Enter].
	SEL
	S.OU1
	S.OU2

Process value If [SEL] is active: ▶ Press [Set] and keep it pressed until [Proc] is displayed. ▶ Briefly press [Mode/Enter]. > [S.Pr] is displayed. ▶ Press [Set] to set the requested pressure value. ▶ Briefly press [Mode/Enter].	*SEL* *S.Pr*

9.6.3 Set time for simulation

▶ Select [S.TIM] and set the value between 1...60 minutes.	*S.TIM*

9.6.4 Start simulation

▶ Select [S.ON].
▶ Press [Set] and keep it pressed until the display alternately shows [SIM] and the current operation indication.
   Current operation indication:
    -Current system pressure if [SEL] = [OU].
    - Simulated measured value set in [S.Pr] if [SEL] = [Proc].
After the simulation time has elapsed [S.OFF] is displayed for 2 s, then [SEL].
	S.ON

Abort simulation: ▶ Briefly press [Mode/Enter] or [Set]. > [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.

Operation indication → Chapter 7 Operating and display elements.

10.1 Read the set parameters

▶ Press [Mode/Enter] until the requested parameter is displayed.

▶ Briefly press [Set].

> The unit displays the corresponding parameter value for approx. 15 s. After about 15 s it again displays the parameter, then it returns to the Run mode.

10.2 Change the display in the Run mode

▶ Press [Set] briefly in the Run mode.

> The unit displays 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 Self-diagnosis / error indications

The unit has many self-diagnostic options.
- It monitors itself automatically during operation.
- It indicates warnings and faults via IO-Link and via display (even if the display is deactivated).
- If a fault is found, the outputs are set according to the set parameters FOU1 and FOU2 (→

Display	Warning	Error	Status LED	Type of fault	Corrective measures
*OFF		X		Supply voltage too low.	▶ Check / correct the supply voltage. ▶ In 2-wire operation: Check / correct the connected load.
SC1			OUT1 flashes	Excessive current switching output 1.	▶ Check switching output 1 for short-circuit or excessive current; remove the fault.
SC2			OUT2 flashes	Excessive current switching output 2.	▶ Check switching output 2 for short-circuit or excessive current; remove the fault.
SC	X		OUT1 and OUT2 flash	Excessive current switching output 1 and switching output 2.	▶ Check switching outputs 1 and 2 for short-circuit or excessive current; remove the fault.
PARA		X		Parameter setting outside the valid range.	▶ Repeat parameter setting.

* In case of undervoltage (fault no. W403) nothing is displayed.
** 2 = Out of Spec; 4 = failure

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Display	Warning	Error	Status LED	Type of fault	Corrective measures
OL	X			Above the measuring range: Measured value higher than +5% of the final value of the measuring range.	▶ Check / reduce system pressure.
UL	X			Below the measuring range: Measured value lower than +5 % of the final value of the measuring range.	▶ Check / increase the system pressure.
E100		X		Internal sensor error detected.	▶ Replace the unit.
W531	X			Analogue output at the upper limit (20.5 mA).	▶ Increase AEP value if possible (for [OU2] = [InEG] ASP value) or reduce system pressure.
Loc	X			Setting buttons on the unit locked, parameter change rejected.	▶ Unlock.
C.Loc	X			Parameter setting locked via pushbutton, parameter setting is active via IO-Link communication.	▶ Stop IO-Link communication before parameter setting on the sensor.
S.Loc	X			Setting buttons locked via parameter software, parameter change rejected.	▶ Unlocking the sensor via parameter setting software.
W530	X			Analogue output at the lower limit (3.8 mA).	▶ Reduce ASP value if possible (for [OU2] = [InEG] AEP value) or increase system pressure.
W532	X			Load at analogue output too high.***	▶ Reduce load at output 2 or increase the supply voltage.
W203	X			Error during the temperature compensation of the pressure measurement.	The unit uses a higher temperature coefficient (i.e. with reduced accuracy). ▶ Replace the unit.

* In case of undervoltage (fault no. W403) nothing is displayed.
** 2 = Out of Spec; 4 = failure

Display	Warning	Error	Status LED	Type of fault	Corrective measures
W703	X			Medium temperature too high (> 150 C).	Reduce the medium temperature.
W704	X			Medium temperature too low (< -30 °C).	Increase the medium temperature.
W161	X			Device temperature too high (> 90 °C).	Unit outside the specification. ▶ Do not insulate the installation.
W162	X			Unit temperature too low (< -30 °C).	Unit outside the specification. ▶ Insulate the installation.

* In case of undervoltage (fault no. W403) nothing is displayed.

** 2 = Out of Spec; 4 = failure

*** This message is only displayed for 3-wire operation. For 2-wire operation undervoltage is detected and displayed. If OU2 is not used for the application, the message can be suppressed by defining a switching function for OU2 (→ 9.3.1).

10.4 Setting ranges

		SP1 / SP2		rP1 / rP2		ASP		AEP		ΔP
		min	max	min	max	min	max	min	max	
PI2602	bar	-0,8	100,0	-1,0	99,8	-1,0	75,0	24,0	100,0	0,1
	psi	-12,0	1450	-15,0	1448	-15,0	1088	348	1450	1
	MPa	-0,08	10,0	-0,1	9,98	-0,1	7,5	2,4	10,0	0,01

ΔP = step increment

11 Factory setting

	Factory setting	User setting
SP1	25% VMR *	
rP1	23% VMR *	
OU1	Hno	
OU2	I	
SP2	75% VMR *	
rP2	73% VMR *	
COF / tCOF	0.0	
ASP / tASP	0% VMR *	
AEP / tAEP	100% VMR *	
Uni	bAr / mbAr	
SELd	P	
dS1	0.0	
dr1	0.0	
dS2	0.0	
dr2	0.0	
FOU1	OU	
FOU2	OU	
P-n	pnp	
dAP	0.06	
dAA	0.03	
dis	d2	
CP1	0.00	
CP2	0.00	

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

More information at www.ifm.com