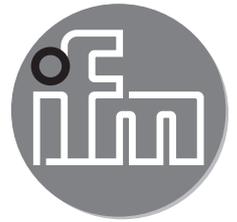




ifm electronic

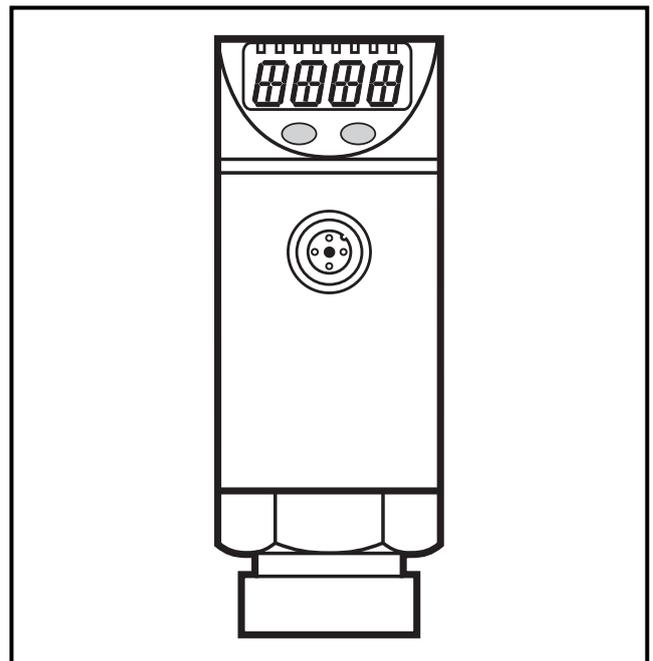


## Operating instructions

**efector<sup>500</sup>**

**Electronic pressure  
sensor**

**PY2068**



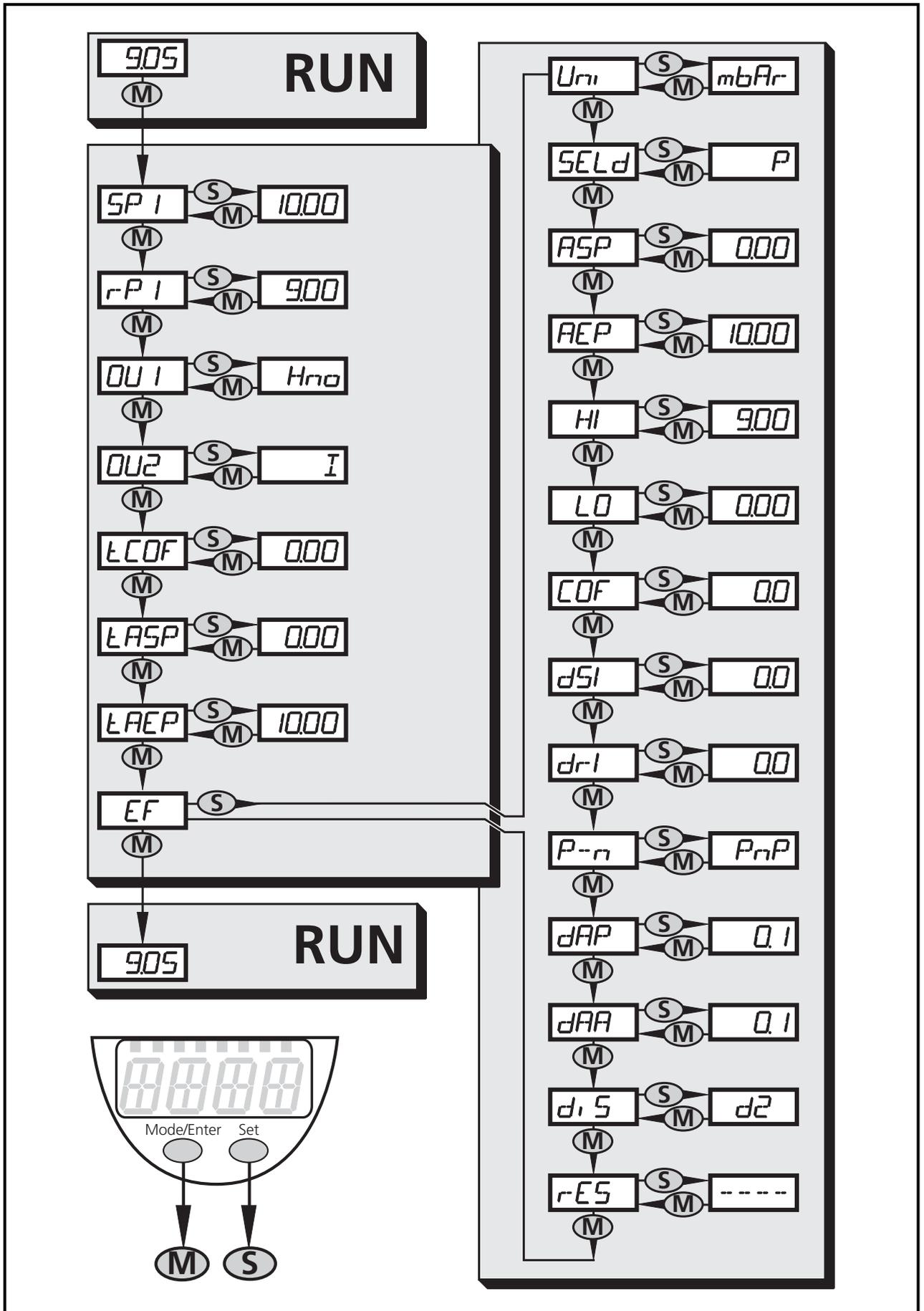
**ENGLISH**

704803/00 06/2010

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# Menü-Übersicht / Menu structure / Structure du menu



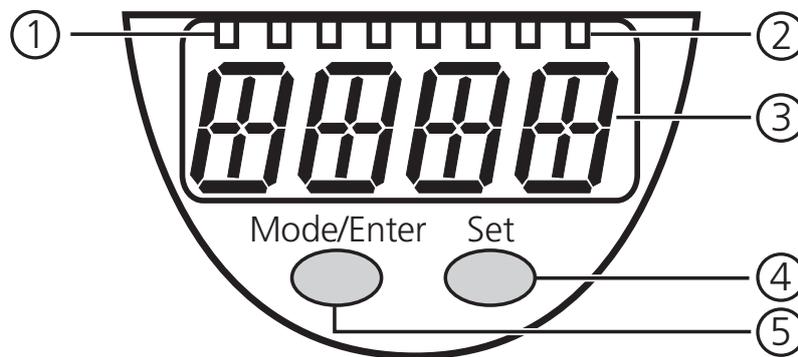
## Safety instructions

**Read the product description before installing the unit. Ensure that the product is suitable for your application without any restrictions.**

**Non-adherence to the operating instructions or technical data can lead to personal injury and/or damage to property.**

**In all applications check compliance of the product materials (see Technical data) with the media to be measured.**

## Controls and indicating elements



|          |                                      |  |
|----------|--------------------------------------|--|
| <b>①</b> | 4 x LED gren                         | Lighting LED = set display unit.   |
| <b>②</b> | 1 x LED yellow                       | Switching status;<br>lights if output 1 has switched.  |
| <b>③</b> | 4-digit<br>alphanumerical<br>display | Display of the system pressure,<br>display of parameters and parameter values.                         |
| <b>④</b> | Set button                           | Setting of the parameter values<br>(scrolling by holding pressed;<br>incremental by pressing briefly). |
| <b>⑤</b> | Mode / Enter button                  | Selection of the parameters and<br>acknowledgement of the parameter values.                            |

## Function and features

The pressure sensor **detects the system pressure** and evaluates the measured values according to the set parameters.

### Display

- Current system pressure in mbar, kPa, PSI.
- Current system pressure in % of the span.  
NOTE: Display "0%" does not mean that the system is free of pressure!

### Signal output

#### Output 1:

- Switching signal (limit value for system pressure, hysteresis or window function, NO or NC).
- Diagnostic signal (in case of a fault output 1 becomes inactive).

#### Output 2

- Analogue signal (4 ... 20 mA or 20 ... 4 mA).
  - Analogue signal (0 ... 10 V or 10 ... 0 V).
- The **measuring range can be scaled** to up to 25% of the value of the measuring range (max. turn down 1:4).

## Applications (Type of pressure: relative pressure)

| Order no. | Measuring range |              | Permissible overl. pressure |     | Bursting pressure |     |
|-----------|-----------------|--------------|-----------------------------|-----|-------------------|-----|
|           | mbar            | PSI          | bar                         | PSI | bar               | PSI |
| PY2068    | -250...250      | -3.63...3.63 | 10                          | 145 | 30                | 435 |

$$\text{kPa} = \text{mbar} \div 10$$



Avoid static and dynamic overpressure exceeding the given over-load pressure.

Even if the bursting pressure is exceeded only for a short time the unit can be destroyed (danger of injuries)!

## Operating modes

### Run mode

Normal operating mode

At power on the unit is in the Run mode. It carries out its measurement and evaluation functions and provides output signals according to the set parameters.

The display shows the current system pressure (can be deactivated; → page 33). The yellow LED indicates the switching state of the output.

### Display mode

Indication of parameters and the set parameter values

When the "Mode/Enter" button is pressed briefly, the unit passes to the Display mode which allows parameter values to be read. The internal sensing, processing and output functions of the unit continue as if in Run mode.

- The parameter names are scrolled with each pressing of the "Mode/Enter" button.
- When the "Set" button is pressed briefly, the corresponding parameter value is displayed for 15s. After another 15s the unit returns to the Run mode.

### Programming mode

Setting of the parameter values

While viewing a parameter value pressing the "Set" button for more than 5s causes the unit to enter the programming mode. You can alter the parameter value by pressing the "Set" button and confirm the new value by pressing the "Mode/Enter" button. The internal sensing, processing and output functions of the unit continue as if in Run mode with the original parameter values unless a new value is confirmed.

The unit returns to the Run mode when no button has been pressed for 15s.

## Installation

 Before mounting and removing the sensor, make sure that no pressure is applied to the system. NOTE: Display "0%" does not mean that the system is free of pressure!

Mount the pressure sensor on a G $\frac{1}{4}$  process connection.

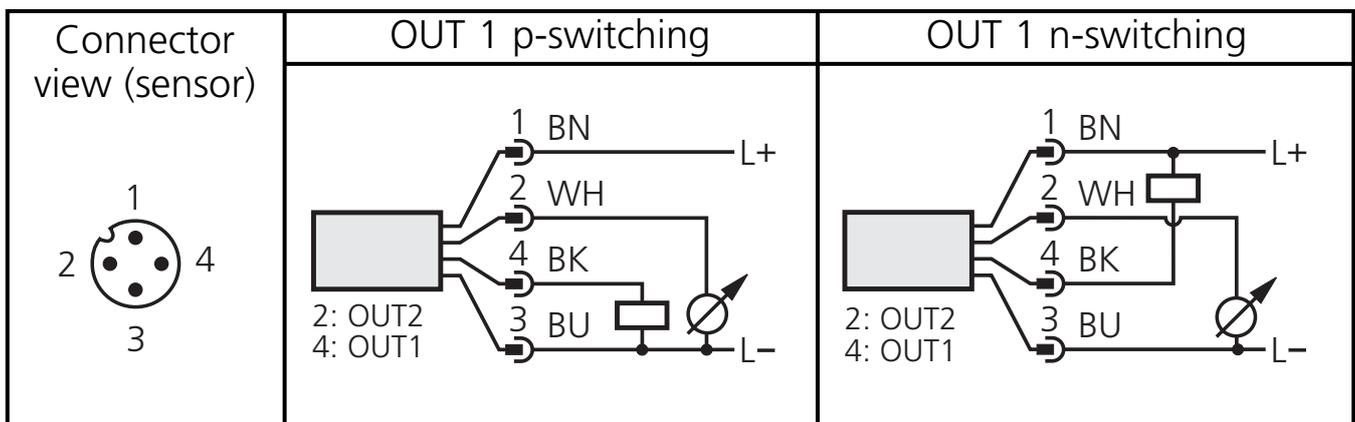
## Electrical connection

 The unit must be connected by a suitably qualified electrician. The national and international regulations for the installation of electrical equipment must be observed.

Voltage supply to EN50178, SELV, PELV.

The device shall be supplied from an isolating transformer having a secondary Listed fuse rated as noted in the following table.

| Control-circuit wire size |                    | Maximum protective device rating<br>Ampere |
|---------------------------|--------------------|--|
| AWG                       | (mm <sup>2</sup> ) |  |
| 26                        | (0.13)             | 1  |
| 24                        | (0.20)             | 2  |
| 22                        | (0.32)             | 3  |
| 20                        | (0.52)             | 5  |
| 18                        | (0.82)             | 7  |
| 16                        | (1.3)              | 10   |



ENGLISH

Core colours of ifm sockets:

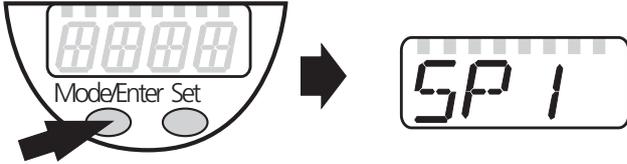
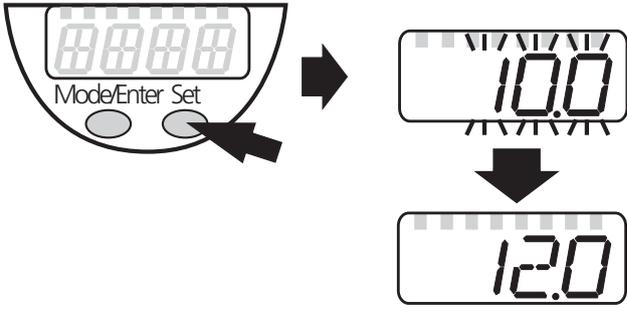
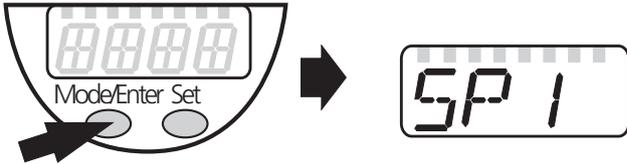
1 = BN (brown), 2 = WH (white), 3 = BU (blue), 4 = BK (black).

Pin 4 (OUT1) = switching output if OU1 = **Hno**, **Hnc**, **Fno**, **Fnc**

Pin 4 (OUT1) = diagnostic output if OU1 = **dESI**

Pin 2 (OUT2) = analogue output

## Programming

|   |   |   |
|---|---|---|
| 1 |    | <p>Press the <b>Mode/Enter</b> button several times until the <b>respective parameter</b> is displayed.</p>   |
| 2 |    | <p>Press the <b>Set</b> button and keep it pressed. The current <b>parameter value flashes</b> for 5s, <b>then the value is increased*</b> (incremental by pressing briefly or scrolling by holding pressed).</p> |
| 3 |   | <p>Press the <b>Mode/Enter</b> button <b>briefly</b> (= acknowledgement). The parameter is displayed again, the set <b>parameter value becomes effective</b>.</p>   |
| 4 | <p><b>Change more parameters:</b><br/>Start again with step 1.</p> <p><b>Finish programming:</b><br/>Wait for 15s or press the Mode/Enter button until the current measured value is indicated again.</p> |   |

\*Decrease the value: Let the display of the parameter value move to the maximum setting value. Then the cycle starts again at the minimum setting value.

Select the display unit (**Uni**) **before** setting the switch points (SP1, rP1) or the limits for the analogue output signal (ASP, AEP). This avoids rounding errors generated internally during the conversion of the units and enables exact setting of the values. Setting at the factory: **mbAr**.

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

Disconnect power before connecting the unit as follows:

## Installation and set-up / operation

The unit can be **electronically locked** to prevent unwanted adjustment of the set parameters: Press both pushbuttons for 10s (the unit must be in Run mode). Indication goes out briefly (acknowledgement of locking /

|             |  |
|-------------|--|
| <i>OL</i>   | Overload (above measuring range of the sensor).  |
| <i>UL</i>   | Underload (below measuring range of the sensor). |
| <i>SC 1</i> | Flashing: short circuit in the switching output. |
| <i>Err</i>  | Flashing: internal fault                         |

\*The output is switched off as long as the short circuit exists.  
The faults SC1, and Err are indicated even if the display is deactivated.

unlocking).

Units are delivered from the factory in the unlocked state.

With the unit in the locked state **Loc** is indicated briefly when you try to change parameter values.

After mounting, wiring and setting check whether the unit operates correctly

Faults displayed during operation

**Diagnostic function** (according to DESINA specification)

Output 1 is used as a diagnostic output if **OU1 = dESI**.

- If there is no fault, the output is switched and carries UB+ (if **P-n = PnP**) or UB- (if **P-n = nPn**).
- In case of malfunctions the output becomes inactive. The following malfunctions are detected:  
Undervoltage (starting with 18V); overvoltage (starting with 33V); temperature at the process connection too high ( $> 150^{\circ}\text{C}$ ) / too low ( $< -30^{\circ}\text{C}$ ); intrinsic temperature of the unit too high ( $> 100^{\circ}\text{C}$ ) / too low ( $< -30^{\circ}\text{C}$ ); RAM fault.

## Technical information / Functioning / Parameters

### Adjustable parameters

| <b>SP 1</b> | <p><b>Switch-on point</b><br/>Upper limit value at which the output changes its switching status.<br/>SP1 is active only if <b>OU1 = Hno, Hnc, Fno or Fnc.</b></p>   |                |             |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
|-------------|--|----------------|-------------|-----|-------------|------|--------------|--------------|---|-----|----------------|----------------|-----|-----|----------------|----------------|------|
| <b>rP 1</b> | <p><b>Switch-off point 1 / 2</b><br/>Lower limit value at which the output changes its switching status. rP1 is always lower than SP1. The unit only accepts values which are lower than SP1.<br/>Changing the switch-on point also changes the switch-off point (the distance between SP1 and rP1 remains constant).<br/>If the distance is higher than the new switch point, it is automatically reduced (rP1 is set to the minimum setting value).<br/>rP1 is active only if <b>OU1 = Hno, Hnc, Fno or Fnc.</b></p> <p><b>Setting range:</b></p> <table border="1" data-bbox="331 981 1457 1182"> <thead> <tr> <th></th> <th>SP1</th> <th>rP1</th> <th>in steps of</th> </tr> </thead> <tbody> <tr> <td>mbar</td> <td>-248 ... 250</td> <td>-250 ... 248</td> <td>1</td> </tr> <tr> <td>kPa</td> <td>-24.8 ... 25.0</td> <td>-25.0 ... 24.8</td> <td>0.1</td> </tr> <tr> <td>PSI</td> <td>-3.61 ... 3.63</td> <td>-3.63 ... 3.60</td> <td>0.01</td> </tr> </tbody> </table> |                | SP1         | rP1 | in steps of | mbar | -248 ... 250 | -250 ... 248 | 1 | kPa | -24.8 ... 25.0 | -25.0 ... 24.8 | 0.1 | PSI | -3.61 ... 3.63 | -3.63 ... 3.60 | 0.01 |
|             | SP1  | rP1            | in steps of |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
| mbar        | -248 ... 250   | -250 ... 248   | 1           |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
| kPa         | -24.8 ... 25.0   | -25.0 ... 24.8 | 0.1         |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
| PSI         | -3.61 ... 3.63   | -3.63 ... 3.60 | 0.01        |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
| <b>OU 1</b> | <p><b>Configuration of output 1</b><br/>4 switching functions and the diagnostic function can be set:</p> <ul style="list-style-type: none"> <li>- <b>Hno</b> = hysteresis / normally open</li> <li>- <b>Hnc</b> = hysteresis / normally closed</li> <li>- <b>Fno</b> = window function / normally open</li> <li>- <b>Fnc</b> = window function / normally closed</li> <li>- <b>dESI</b> = Output 1 is used as a diagnostic output</li> </ul>  |                |             |     |             |      |              |              |   |     |                |                |     |     |                |                |      |
| <b>OU 2</b> | <p><b>Configuration of output 2</b><br/>4 analogue signals can be set:</p> <ul style="list-style-type: none"> <li>- <b>I</b> = current output 4 ... 20 mA</li> <li>- <b>InEG</b> = current output inverted 20 ... 4 mA</li> <li>- <b>U</b> = voltage output 0 ... 10 V</li> <li>- <b>UnEG</b> = voltage output inverted 10 ... 0 V</li> </ul>  |                |             |     |             |      |              |              |   |     |                |                |     |     |                |                |      |

**LCOF**

### Teach zero-point calibration

Automatic adaptation offset (setting range 0 bar  $\pm 5\%$ ); e.g. in the event of a deviation of the mounting location of the sensor and the zero point level for level measurement; see also parameter **COF**.

Teach process:

- Make sure that no pressure is applied to the system.
- Press the "Mode/Enter" button until "**tCOF**" is displayed.
- Press the "Set" button and keep it pressed.

The current offset value (in %) briefly flashes, then the current system pressure (in the selected display unit) is displayed.

- Release the "Set" button.
- Press the "Mode/Enter" button briefly (= to confirm the new offset value).

**LASP**

### Teach analogue start point (ASP)

The current system pressure is defined to be the start value for the analogue signal. ASP = measured value at which 4 mA / 0V is provided (20 mA / 10V if OU2 = InEG / UnEG).

**LAEP**

### Teach analogue end point (AEP)

The current system pressure is defined to be the end value for the analogue signal. AEP = measured value at which 20 mA / 10V is provided (4 mA / 0V if OU2 = InEG / UnEG).

Teach process:

- Set the requested minimum pressure (for ASP) / maximum pressure (for AEP) in the system.
- Press the "Mode/Enter" button until "**tASP**" / "**tAEP**" is displayed.
- Press and keep pressed the "Set" button (currently set value flashes).
- Release the "Set" button when the display stops flashing (new set value is displayed).
- Press "Mode/Enter" button briefly.

ASP / AEP can only be taught within defined limits ( $\rightarrow$  page 28). If the teaching process is carried out at an invalid pressure, **UL** or **OL** is displayed. After acknowledgement by "Mode/Enter" **Err** flashes, the ASP value / AEP value is not changed.

EF

**Enhanced functions**

This menu item contains a submenu with additional parameters. You can access these parameters by pressing the SET button briefly.

If the submenu is protected with an access code, "Cod1" flashes in the display.

- Press the "Set" button and hold it pressed until the valid code no. is shown.
- Then briefly press the "Mode/Enter" button.

Delivery by ifm electronic: no access restriction.

Uni

**Display unit**

The measured value and the values for SP1, rP1, ASP and AEP can be displayed in the following units: **mbAr, kPA, PSI**.

Select the display unit **before** setting the switch points (SP1, rP1) and the limits for the analogue output signal (ASP, AEP).

This avoids rounding errors generated internally during the conversion of the units and enables exact setting of the values.

**Setting at the factory: Uni = mbAr.**

SELD

**Display mode**

2 settings can be selected:

- **P** = Pressure in the unit set in **Uni**.
- **P%** = percentage value (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 the system is free of pressure!

ASP

**Analogue start point**

Measured value at which 4mA / 0V is provided (20mA / 10V if OU2 = InEG / UnEG).

ASP can also be set by means of the teaching process (→ **tASP**).

AEP

**Analogue end point**

Measured value at which 20mA / 10V is provided (4mA / 0V if OU2 = InEG / UnEG).

Minimum distance between ASP and AEP = 25% (turn down 1:4).

AEP can also be set by means of the teaching process (→ **tAEP**).

**Setting range for ASP / AEP:**

|      | ASP            | AEP            | in Schritten von |
|------|----------------|----------------|------------------|
| mbar | -250 ... 125   | -125 ... 250   | 1                |
| kPa  | -25.0 ... 12.5 | -12.5 ... 25.0 | 0.1              |
| PSI  | -3.63 ... 1.82 | -1.82 ... 3.63 | 0.01             |

|                    |  |
|--------------------|--|
| <p>HI<br/>LO</p>   | <p><b>Min-Max memory for system pressure</b></p> <ul style="list-style-type: none"> <li>• HI: displays the highest measured pressure</li> <li>• LO: displays the lowest measured pressure</li> </ul> <p>Erase the memory:</p> <ul style="list-style-type: none"> <li>- Press the "Mode/Enter" button until <b>HI</b> or <b>LO</b> is displayed.</li> <li>- Press the "Set" button and keep it pressed until "----" is displayed.</li> <li>- Then press the "Mode/Enter" button briefly.</li> </ul>   |
| <p>COF</p>         | <p><b>Calibration offset</b></p> <p>The internal measured value (operating value of the sensor) is offset against the real measured value.</p> <ul style="list-style-type: none"> <li>• Setting range: -5 ... +5% of the value of the measuring range (with scaling as factory setting (ASP = 0% and AEP = 100%),</li> <li>• in steps of 0.1% of the value of the measuring range.</li> </ul> <p>COF can also be set by means of the teaching process (→ <b>tCOF</b>).</p>   |
| <p>dS1<br/>dr1</p> | <p><b>Delay time for the switching output</b></p> <p><b>dS1</b> = switch-on delay; <b>dr1</b> = switch-off delay</p> <p>The output does not immediately change its switching status when the switching condition is met but when the delay time has elapsed. If the switching condition is no longer met when the delay time has elapsed, the switching state of the output does not change.</p> <ul style="list-style-type: none"> <li>• Setting range: 0 / 0.1 ... 50s adjustable in steps of 0.1 s (0 = delay time not active),</li> <li>• Indicated in seconds.</li> </ul> |
| <p>P-n</p>         | <p><b>Output polarity (output 1)</b></p> <p>2 options can be selected:</p> <ul style="list-style-type: none"> <li>- <b>PnP</b> = positive switching</li> <li>- <b>nPn</b> = negative switching</li> </ul>  |
| <p>dAP</p>         | <p><b>Damping for the switching output (OU1)</b></p> <p>Pressure peaks of short duration or high frequency can be filtered out.</p> <p>dAP-value = response time between pressure change and change of the switching status in seconds (s).</p> <ul style="list-style-type: none"> <li>• Setting range: 0.1 ... 100s in steps of 0.1 s (0.1 = dAP is not active).</li> </ul> <p>Correlation between switching frequency and dAP: <math>f_{\max} = \frac{1}{2 \times dAP}</math></p> <p>Damping also affects the display.</p>   |

|             |  |
|-------------|--|
| <p>dAA</p>  | <p><b>Damping for the analogue output (OU2)</b><br/>         Pressure peaks of short duration or high frequency can be filtered out.<br/>         dAA-value = response time between pressure change and change of the switching status in seconds (s).<br/>         • Setting range: 0,1 ... 100s in steps of 0.1 s<br/>         (0.1 = dAA is not active).</p>  |
| <p>d, S</p> | <p><b>Setting of the display</b><br/>         7 options can be selected:<br/> <b>d1</b> = update of the measured value every 50 ms<br/> <b>d2</b> = update of the measured value every 200 ms<br/> <b>d3</b> = update of the measured value every 600 ms<br/>         The update interval only refers to the display. It has no effect on the outputs.<br/> <b>rd1, rd2, rd3</b> = display as d1, d2, d3; but rotated 180°.<br/> <b>OFF</b> = In the Run mode the display of the measured value is deactivated. If one of the buttons is pressed, the current measured value is displayed for 15s. Another press of the Mode/Enter button opens the Display mode. The LEDs remain active even if the display is deactivated.</p> |
| <p>r-ES</p> | <p><b>Reset to factory settings</b><br/>         - Press the "Mode/Enter" pushbutton until <b>rES</b> is displayed.<br/>         - Press the "Set" pushbutton and keep it pressed until "----" is displayed.<br/>         - Then press the "Mode/Enter" pushbutton briefly.<br/>         All modified parameter settings will be reset. Therefore it makes sense to note down your own settings before (→ table on page 52).</p>   |

## Hysteresis function (fig. 1):

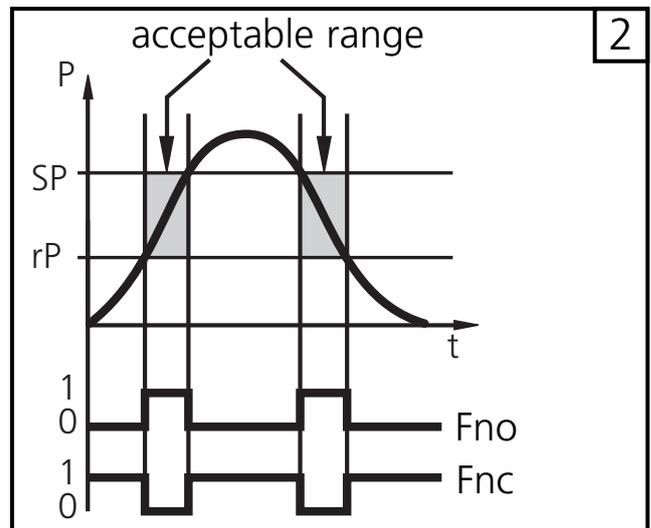
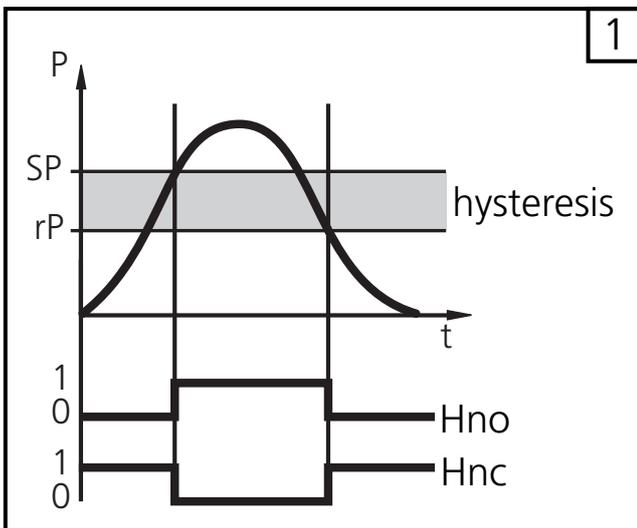
The hysteresis keeps the switching state of the output stable if the system pressure varies about the preset value. With the system pressure rising, the output switches when the switch-on point has been reached (SP1). With the system pressure falling the output does not switch back until the switch-off point (rP1) has been reached.

The hysteresis can be adjusted: First the switch-on point is set, then the switch-off point with the requested distance.

## Window function (fig. 2):

The window function enables the monitoring of a defined acceptable range. When the system pressure varies between the switch-on point (SP1) and the switch-off point (rP1), the output is switched (window function / NO) or not switched (window function / NC).

The width of the window can be set by means of the difference between SP1 and rP1. SP1 = upper value, rP1 = lower value.



## Scaling the measuring range (analogue output)

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

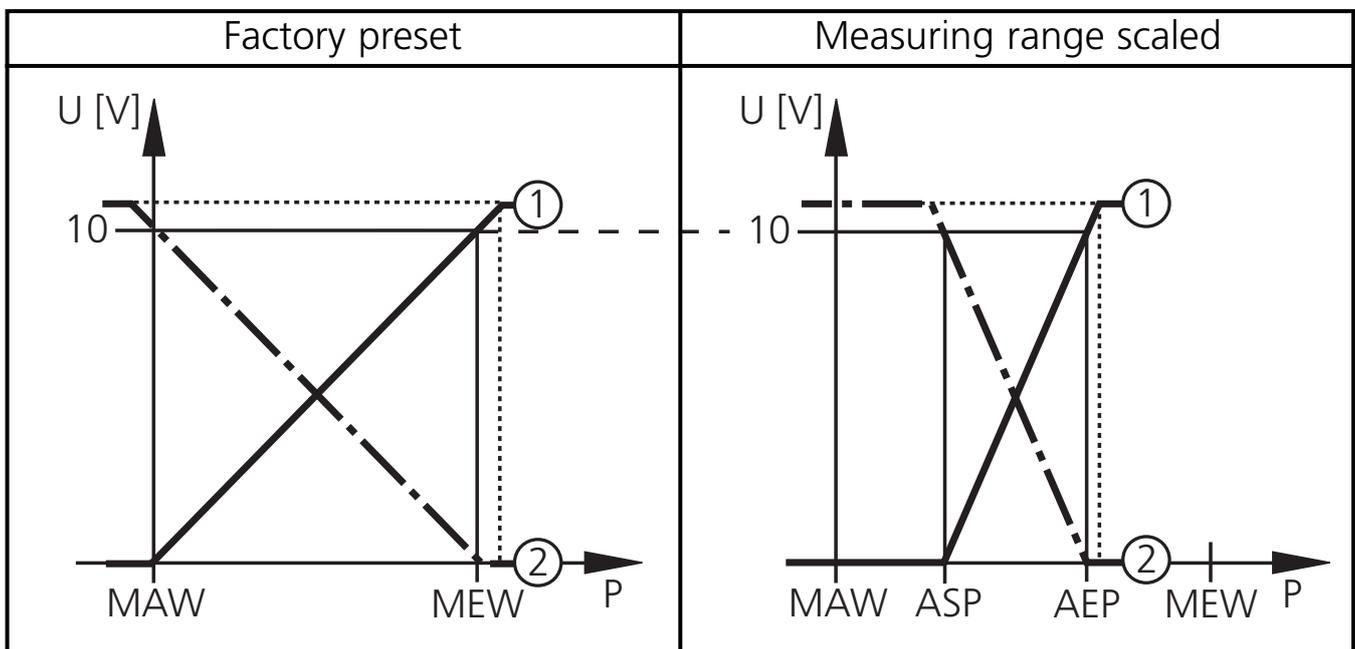
- By means of the **OU2** parameter you define whether the set measuring range is provided as a 4 ... 20 mA signal (OU2 = I), a 20 ... 4 mA signal (OU2 = InEG), a 0 ... 10 V signal (OU2 = U) or a 10 ... 0 V signal (OU2 = UnEG).
- By teaching the analogue start point (**tASP**) or setting the parameter **ASP** you define the measured value at which the output signal is 4 mA / 0 V (20 mA / 10 V at InEG / UnEG).

- By teaching the analogue end point (**tAEP**) or setting the parameter **AEP** you define the measured value at which the output signal is 20mA / 10V (4mA / 0V at InEG / UnEG).
- Minimum distance between ASP and AEP = 25 % of the final value of the measuring range (turn down 1:4).

Please note: If the system pressure is indicated as a percentage value (**SEld = P%**), then: 0% = ASP value / 100% = AEP value.

Display "0%" does not mean that the system is free of pressure!

## Voltage output



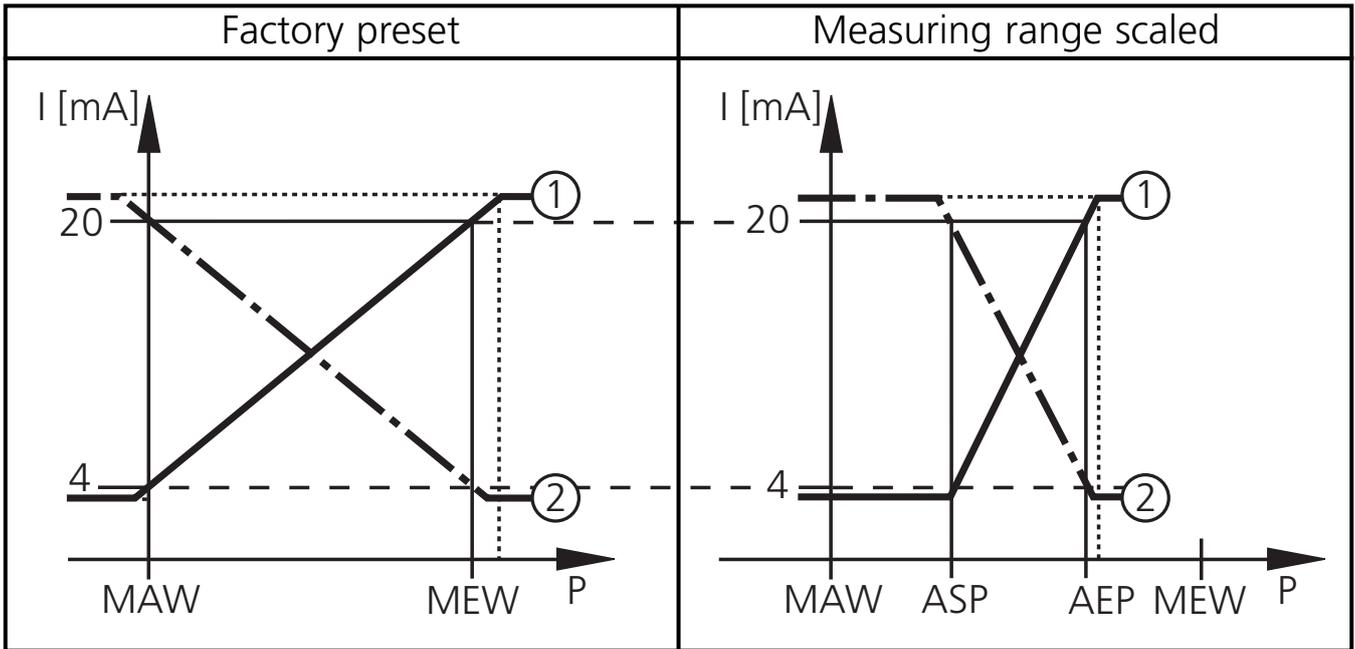
MAW = initial value of the measuring range;  
MEW = final value of the measuring range

The output signal is between 0 and 10V in the set measuring range (① for  $OU2 = U$  / ② for  $OU2 = UnEG$ ).

It is also indicated:

- System pressure above the measuring range: output signal > 10V if  $OU2 = U$ .
- System pressure below the measuring range: output signal > 10V if  $OU2 = UnEG$ .

## Current output



MAW = initial value of the measuring range;  
 MEW = final value of the measuring range

The output signal is between 4 and 20mA (① for  $OU2 = I$  / ② for  $OU2 = InEG$ ).

It is also indicated:

- System pressure above the measuring range:
  - output signal  $> 20\text{mA}$  if  $OU2 = I$ ,
  - output signal drops to max.  $3.8\text{mA}$  if  $OU2 = InEG$ .
- System pressure below the measuring range:
  - output signal drops to max.  $3.8\text{mA}$  if  $OU2 = I$ ,
  - output signal  $> 20\text{mA}$  if  $OU2 = InEG$ .

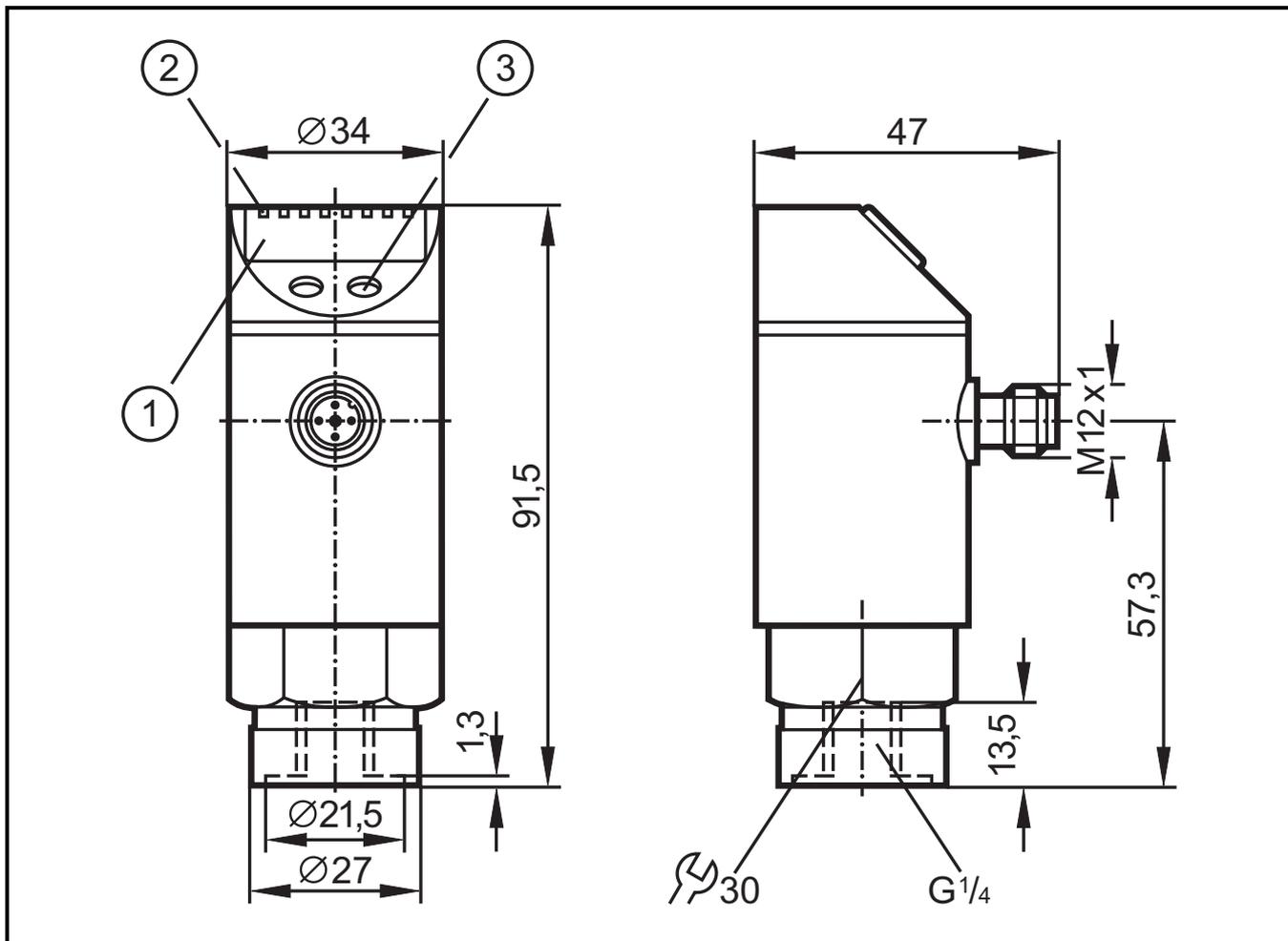
## Technical data

|   |  |
|---|--|
| Operating voltage [V]   | 18 ... 32 DC   |
| Current consumption [mA]  | < 50   |
| Current rating [mA]   | 250  |
| Protection:   | short-circuit, reverse polarity, overload; integrated Watchdog                                 |
| Voltage drop [V]  | < 2  |
| Power-on delay time [s]   | 0,5  |
| Min. response time switching output [s]   | 0,1  |
| Switching frequency [Hz]  | 6  |
| Analogue output (measuring range scaleable)   | 4 ... 20 mA / 0 ... 10 V   |
| Max. load current output [ $\Omega$ ]   | $(U_B - 10) \times 50$ ; 700 at $U_B = 24V$  |
| Min. load with voltage output [ $\Omega$ ]  | 2000   |
| Min. response time analogue output [s]  | 0.1  |
| Accuracy / deviations (in% of the span) <sup>1)</sup>   |  |
| - Characteristics deviation (linearity, incl. hysteresis and repeatability) <sup>2)</sup>                       | < $\pm 0.2$  |
| - Linearity   | < $\pm 0.2$  |
| - Hysteresis  | < $\pm 0.1$  |
| - Repeatability (with temperature fluctuations < 10K)   | < $\pm 0.1$  |
| - Long-time stability (in% of the span per year)  | < $\pm 0.1$  |
| - Temperature coefficients (TEMPCO) in the compensated temperature range 0 ... +80°C (in% of the span per 10 K) |  |
| - Greatest TEMPCO of the zero point   | < $\pm 0.2$  |
| - Greatest TEMPCO of the span   | < $\pm 0.2$  |
| Materials (wetted parts)  | stainless steel (303S22); ceramics; FPM (Viton)  |
| Housing material  | stainless steel (316S12); stainless steel (304S15);<br>PC (Macrolon); Pocan; PEI; FPM (Viton); |
| Protection rating   | IP 65  |
| Protective class  | III  |
| Insulation resistance [ $M\Omega$ ]   | > 100 (500 V DC)   |
| Shock resistance [g]  | 50 (DIN / IEC 68-2-27, 11ms)   |
| Vibration resistanc [g]   | 20 (DIN / IEC 68-2-6, 10 - 2000 Hz)  |
| Switching cycles min.   | 100 million  |
| Operating temperature [°C]  | -25 ... +80  |
| Medium temperature [°C]   | -25 ... +80  |
| 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 61000-4-6 HF conducted:  | 10 V   |

<sup>1)</sup> all indications are referred to a turn down of 1:1

<sup>2)</sup> limit value setting to DIN 16086

# Maßzeichnung Scale drawing Dimensions



- ① 4-stellige alphanumerische Anzeige
- ② LEDs
- ③ Programmier Taste

- ① 4-digit alphanumerical display
- ② LED's
- ③ programming button

- ① visualisation alphanumérique à 4 digits
- ② LEDs
- ③ bouton poussoir