Operating instructions
Flow meter compressed air / gases

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1 Preliminary note

Detailed instructions, technical data, approvals and other information via the QR code on the unit / on the packaging or at www.ifm.com.

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.

1.2 Warnings used

CAUTION
Warning of personal injury.
Slight reversible injuries may result.
2 Safety instructions

- The device described is a subcomponent for integration into a system.
  - The manufacturer is responsible for the safety of the system.
  - The system manufacturer undertakes to perform a risk assessment and to create a documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the manufacturer of the system.

- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Functions and features).
- Only use the product for permissible media (→ Technical data).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the 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 monitors the standard volume flow of compressed air in industrial use and / or technical gases (→ 3.2 Applications).

It detects the 5 process variables flow velocity, volumetric flow quantity, consumed quantity, medium temperature and pressure.

All indications apply to standard volume flow to DIN ISO 2533, i.e. volume flow at 1013 mbar, 15 °C and 0 % relative air humidity. The unit can be set to different standard conditions (→ 10.6.9).

⚠ This is a class A product. This product may cause radio interference in domestic areas.

► If required, take appropriate EMC screening measures.

3.1 Pressure Equipment Directive (PED)

The units comply with the Pressure Equipment Directive. They are designed for stable gases of group 2 fluids and manufactured in accordance with sound engineering practice.

3.2 Applications

SDx5xx
• Compressed air

SDx6xx
• Compressed air
• Argon (Ar)
• Carbon dioxide (CO2)
• Nitrogen (N2)

SDx8xx
• Helium (He)

Selection of the medium to be monitored (→ 10.6.7).
4 Function

• The volumetric flow is monitored by a calorimetric measuring system, the measured signals are evaluated by the electronics.
• The unit detects the pressure and the media temperature of the volumetric flow as additional process values.
• The unit features an IO-Link interface
• The unit displays the current process values.
• The unit has many self-diagnostic options.
• A simulation mode allows simplified set-up of the sensor.

4.1 Processing of the measured signals

The unit generates 2 output signals according to the parameter setting:

OUT1: 7 selection options
- switching signal for volumetric flow quantity limit
- switching signal for temperature limit
- switching signal for pressure limit
- switching signal for preset counter
- pulse signal for quantity meter
- IO-Link
- OFF (output switched to high impedance)

OUT2: 10 selection options
- switching signal for volumetric flow quantity limit
- switching signal for temperature limit
- switching signal for pressure limit
- switching signal for preset counter
- switching signal for quantity meter
- analogue signal for volumetric flow quantity
- analogue signal for temperature
- analogue signal for pressure
- input for external counter reset signal (InD)
- OFF (output switched to high impedance)
4.2 Switching output

OUTx changes its switching status if it is above or below the set switching limits (flow, temperature or pressure). Hysteresis or window function can be selected.

Example of volumetric flow monitoring:

**Hysteresis function**

<table>
<thead>
<tr>
<th>Q</th>
<th>SP</th>
<th>rP</th>
<th>HY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Window function**

<table>
<thead>
<tr>
<th>Q</th>
<th>FH</th>
<th>FL</th>
<th>FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table:**

<table>
<thead>
<tr>
<th>SP = set point</th>
<th>FH = upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>rP = reset point</td>
<td>FL = lower limit</td>
</tr>
<tr>
<td>HY = hysteresis</td>
<td>FE = window</td>
</tr>
<tr>
<td>Hno / Fno = NO (normally open)</td>
<td>Hnc / Fnc = NC (normally closed)</td>
</tr>
</tbody>
</table>

**Info:**

When the hysteresis function is set, the set point (SP) is defined first and then the reset point (rP) which must have a lower value. If only the set point is changed, the reset point is changed automatically; the difference remains constant.

**Info:**

When set to the window function, the upper limit value (FH) and the lower limit value (FL) have a fixed hysteresis of 0.25 % of the final value of the measuring range. This keeps the switching status of the output stable if the volumetric flow varies slightly.
4.3 Analogue output

The unit provides an analogue signal that is proportional to the volumetric flow quantity, the medium temperature or the pressure.

Within the measuring range the analogue signal is 4...20 mA.

The measuring range is scalable:

- [ASP2] determines at which measured value the output signal is 4 mA.
- [AEP2] determines at which measured value the output signal is 20 mA.

Minimum distance between [ASP2] and [AEP2] = 20 % of the final value of the measuring range.

If the measured value is outside the measuring range or in the event of an internal error, the current signal indicated in Fig. 1 is provided.

For measured values outside the display range or in case of a fault, messages are displayed (cr.UL, UL, OL, cr.OL, Err; → 12).

The analogue signal in case of a fault is adjustable (→ 10.6.13):

- [FOU] = On determines that the analogue signal goes to the upper final value (21.5 mA) in case of an error.
- [FOU] = OFF determines that the analogue signal goes to the lower final value (3.5 mA) in case of an error.
- [FOU] = OU defines that in case of a fault the analogue signal reacts as defined by the current parameters.
Fig. 1: Characteristics of the analogue output according to the standard IEC 60947-5-7.

1. analogue signal
2. measured value (volumetric flow, temperature or pressure)
3. detection zone
4. display range
5. measuring range
6. scaled measuring range

Q: flow
P: pressure
T: temperature

MAW: initial value of the measuring range for non-scaled measuring range (With setting of a low-flow cut for Q: signal output starting at MAW + LFC → 4.6.)

MEW: final value of the measuring range for non-scaled measuring range

ASP: analogue start point with scaled measuring range
AEP: analogue end point with scaled measuring range
UL: below the display range
OL: above the display range
cr.UL: below the detection zone (error)
cr.OL: above the detection zone (error)
4.4 Consumed quantity monitoring [ImP]
The unit has an internal quantity meter (totaliser). It continuously sums up the consumed quantity and provides this process value both on the display and via the IO-Link interface.

Pulse signals or a switching signal (preset counter) can be used to monitor the consumed quantity.
→ 4.4.3 Consumed quantity monitoring via pulse signals
→ 4.4.4 Consumed quantity monitoring via preset counter

4.4.1 Meter reading
The current quantity meter count can be indicated (→ 8.1).
In addition, the value before the last reset is saved. This value and the time since the last reset can also be displayed (→ 8.1).

The meter saves the totalled volumetric flow quantity every 10 minutes. After a power failure this value is available as the current meter reading. If a time-controlled reset is set, the elapsed time of the set reset interval is also saved. So the possible data loss can be at most 10 minutes.

4.4.2 Counter reset
There are different ways to reset the quantity meter.
→ 10.3.3 Manual counter reset
→ 10.3.4 Time-controlled counter reset
→ 10.3.6 Counter reset using an external signal
→ Counter reset via the IO-Link interface

If the quantity meter is not reset by applying one of the above-mentioned methods, an automatic reset takes place when the maximum volumetric flow quantity that can be displayed is exceeded (overflow).

OUT1 and OUT2 cannot be used simultaneously for the consumed quantity monitoring.

The accuracy of the consumed quantity measurement depends on the accuracy of the flow measurement.
4.4.3 Consumed quantity monitoring via pulse signals
Every time the flow rate set with [ImPS] has been reached (pulse value), the output provides a pulse signal.

⚠️ OUT1 and OUT2 cannot be used simultaneously for the pulse output.

4.4.4 Consumed quantity monitoring via preset counter
When the flow rate set under [ImPS] has been reached, the output provides a switching signal.

The setting of the parameter [rTo] defines if the volumetric flow quantity has to be reached irrespective of the time (1) or within a set time (2) so that the output switches:

<table>
<thead>
<tr>
<th>[rTo]</th>
<th>Output</th>
<th>Counter reset</th>
</tr>
</thead>
</table>
| **(1)** | OFF  
(→ 10.3.5) | • The output switches when the volumetric flow quantity set with [ImPS] has been reached.  
• The output remains switched until the counter reset.  
• The preset counter is only reset - when a manual reset is made (→ 10.3.3) or - when the maximum display range has been exceeded (overflow). |
| **(2)** | 1, 2,... h  
1, 2,... d  
1, 2,... w  
(→ 10.3.4) | • The output switches only when the volumetric flow quantity set with [ImPS] is reached within the set time.  
• The output remains switched until the counter reset.  
• If the output is not switched, the preset counter is automatically reset when the time has elapsed and the count starts again (→ 10.3.4 Time-controlled counter reset)  
• If the output is switched, the preset counter is only reset.  
  - when a manual reset is made (→ 10.3.3) or  
  - when the maximum display range has been exceeded (overflow). |
4.5 Measured value damping
The damping time \([dAP\_F] \text{ und } [dAP\_P]\) allows to set after how many seconds the output signal has reached 63 % of the final value if the flow value / the pressure value changes suddenly. The set damping time stabilises the switching outputs, the display and the process value transfer via the IO-Link interface.

The damping time is added to the response time of the sensor (→ Technical data).

The signals \([UL]\) and \([OL]\) (→ 12) are defined under consideration of the damping time.

4.6 Low flow cut-off
With the function low flow cut-off \([LFC]\) it is possible to suppress small volumetric flow quantities. Flows below the LFC value are evaluated by the sensor as standstill (\(Q = 0\)).

4.7 Simulation
With this function, the process values flow, temperature, pressure and meter reading of the totaliser are simulated and their signal chain is reviewed.

When the parameters \(cr\_UL, UL, OL\) und \(cr\_OL\) are set, the process values that lead to an error message or warning can be simulated (→ 12).

When the simulation is started, the values of the totaliser are frozen and the simulated totaliser is set to 0. The simulated flow value then has an effect on the simulated totaliser. When the simulation is ended, the initial totaliser values are restored.

- The simulation does not have any effect on the currently existing process values. The outputs operate as previously set.
- During the simulation the original totaliser value remains saved without any changes even if there is a real flow.
- During the simulation operation, no error message of the currently real application is available. They are suppressed by the simulation.
4.8 Colour of the characters in the display

The colour of the characters in the display can be set via the parameter [coL.x]:

- Permanent definition of the display colour:
  - bk/wh (black/white)
  - yellow
  - green
  - red

- Colour change from red to green or vice versa (Fig. 2):
  - r-cF (red display colour between the limits cFL...cFH)
  - G-cF (green display colour between the limits cFL...cFH)

![Fig. 2: Colour setting window function](image1)

- cFL = lower limit
- cFH = upper limit
- MAW = initial value of the measuring range
- MEW = final value of the measuring range

The limits can be freely selected within the measuring range and are independent of the output function set for OUT1 and OUT2.
4.9 IO-Link

This unit has an IO-Link communication interface which enables direct access to process and diagnostic data. In addition it is possible to set the parameters of the unit while it is in operation. Operation of the unit via an IO-Link interface requires an IO-Link master.

With a PC, suitable IO-Link software and an IO-Link adapter cable communication is possible when the system is not in operation.

The IODDs necessary for the configuration of the unit, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required IO-Link hardware and software can be found at www.ifm.com.

4.9.1 Additional functions via IO-Link

The following functions are only available via the IO-Link interface by means of a parameter setting software:

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash on / Flash off</td>
<td>Standard command for localising the sensor in the system.</td>
</tr>
<tr>
<td></td>
<td>When activated:</td>
</tr>
<tr>
<td></td>
<td>&gt; switching status indicating LEDs are flashing</td>
</tr>
<tr>
<td></td>
<td>&gt; display: &quot;IO-Link&quot; (green, flashes)</td>
</tr>
</tbody>
</table>

5 Installation

CAUTION

If the medium temperature is above 50 °C (122 °F), parts of the housing can increase in temperature to over 65 °C (149 °F).

> Risk of burns.
  ▶ Protect the housing against contact with flammable substances and unintentional contact.
  ▶ Apply the supplied warning label to the sensor cable.

▶ Ensure that the system is free of pressure during installation.
▶ The rules and regulations for the installation and operation of compressed air equipment must be observed.
5.1 Installation location
► Install the unit downstream of the cold dryer.
► Install the unit near the load.
► The unit can be installed downstream of a maintenance unit.
► If oil is used for the loads: install the unit upstream of the oiler.

5.2 Installation position
5.2.1 Inlet and outlet pipe lengths
Structures in the pipe, bends, valves, reducing pieces and the like affect the function of the unit.
► Adhere to the distances between sensor and interference:

<table>
<thead>
<tr>
<th>Interference</th>
<th>Distance to the sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>changes to the pipe diameter</td>
<td>10 x pipe diameter</td>
</tr>
<tr>
<td>90° elbow</td>
<td>10 x pipe diameter</td>
</tr>
<tr>
<td>two 90° elbows, one plane</td>
<td>15 x pipe diameter</td>
</tr>
<tr>
<td>two 90° elbows, two planes</td>
<td>25 x pipe diameter</td>
</tr>
<tr>
<td>valve, slide</td>
<td>40 x pipe diameter</td>
</tr>
</tbody>
</table>

⚠️ Shut-off valves and control devices are not allowed directly in front of the unit.

► Avoid diameter changes between the inlet pipe length and the unit.
If a diameter change cannot be prevented, make sure that the diameter of the inlet pipe length is greater than the diameter at the unit.
5.2.2 Orientation

Fig. 1: Orientation of the pipe length and the unit
1: pipe length vertical, unit any
2: pipe length horizontal, unit vertical
3: pipe length right, unit on side
4: avoid: pipe length left, unit on side

5.3 Installation in pipes
► Fit the unit in the pipe in accordance with the flow direction (arrow on the unit):

► Tighten both adapters in opposite direction by applying the defined tightening torque:
<table>
<thead>
<tr>
<th>Type</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD5xxx</td>
<td>50 Nm</td>
</tr>
<tr>
<td>SD6xxx, SD8xxx</td>
<td>100 Nm</td>
</tr>
<tr>
<td>SD2xxx, SD9xxx</td>
<td>150 Nm</td>
</tr>
</tbody>
</table>

### 6 Electrical connection

⚠ The device must be connected by a qualified electrician. Voltage supply according to EN 50178, SELV, PELV.

- Disconnect power.
- Connect the unit as follows:

![Electrical connection diagram](image)

Colours to DIN EN 60947-5-2
BK: black; BN: brown; BU: blue; WH: white

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
</table>
| 4 (OUT1) | • switching signal for volumetric flow  
          • switching signal for temperature  
          • switching signal for pressure  
          • switching signal for preset counter  
          • pulse signal for quantity meter  
          • IO-Link  
          • OFF                                                                 |
| 2 (OUT2/InD) | • switching signal for volumetric flow  
               • switching signal for temperature  
               • switching signal for pressure  
               • switching signal for preset counter  
               • pulse signal for quantity meter  
               • analogue signal for volumetric flow  
               • analogue signal for temperature  
               • analogue signal for pressure  
               • input for external counter reset signal (InD)  
               • OFF                                                                  |
Circuit examples:

<table>
<thead>
<tr>
<th>2 x positive switching</th>
<th>2 x negative switching</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Circuit Diagram" /></td>
<td><img src="image" alt="Circuit Diagram" /></td>
</tr>
<tr>
<td>1 BN</td>
<td>1 BN</td>
</tr>
<tr>
<td>2 WH</td>
<td>2 WH</td>
</tr>
<tr>
<td>4 BK</td>
<td>4 BK</td>
</tr>
<tr>
<td>3 BU</td>
<td>3 BU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 x positive switching / 1 x analogue</th>
<th>1 x negative switching / 1 x analogue</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Circuit Diagram" /></td>
<td><img src="image" alt="Circuit Diagram" /></td>
</tr>
<tr>
<td>1 BN</td>
<td>1 BN</td>
</tr>
<tr>
<td>2 WH</td>
<td>2 WH</td>
</tr>
<tr>
<td>4 BK</td>
<td>4 BK</td>
</tr>
<tr>
<td>3 BU</td>
<td>3 BU</td>
</tr>
</tbody>
</table>


7 Operating and display elements

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1 and 2: Switching status LEDs
- LED 1 = switching status OUT1 (on if output 1 is switched)
- LED 2 = switching status OUT2 (on if output 2 is switched)

3: TFT display
- Display of the current process values (volumetric flow quantity, temperature, pressure, totaliser)
- Display of the parameters and parameter values

4: [▲] and [▼] buttons
- Select parameter
- Change parameter value (hold button pressed)
- Change of the display unit in the normal operating mode (RUN mode)
- Lock / Unlock (buttons pressed simultaneously > 10 seconds)

5: [●] = Enter button
- Change from the RUN mode to the main menu
- Change to the setting mode
- Acknowledge the set parameter value

Display illumination:
- unit temperature > 70°C: brightness automatically reduced.
- unit temperature ≥ 100°C: display automatically switched off.
8 Menu

8.1 Process value display (RUN)

It is possible to select three process value indications during operation:

► Press [▲] or [▼].

> The display changes between the standard indication and two other views.

> After 30 s, the device returns to the standard display.

1: standard display as set under [diS.L] (→ 10.6.1)
2: overview of all process values
3: overview totaliser values
8.2 Main menu

Explanation of the parameters → 8.4 Submenu OUT1 and → 8.5 Submenu OUT2

The displayed parameters change when the factory setting in submenu OUT1 and OUT2 is changed.
8.3 Extended functions (EF)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>rES</td>
<td>restore factory setting</td>
</tr>
<tr>
<td>rTo</td>
<td>reset of the totaliser</td>
</tr>
<tr>
<td>Info</td>
<td>display device information</td>
</tr>
<tr>
<td>OUT1</td>
<td>configuration output 1</td>
</tr>
<tr>
<td>OUT2</td>
<td>configuration output 2</td>
</tr>
<tr>
<td>CGF</td>
<td>configuration basic settings</td>
</tr>
<tr>
<td>MEM</td>
<td>display min./max. process values</td>
</tr>
<tr>
<td>DIS</td>
<td>configuration display view</td>
</tr>
<tr>
<td>COLR</td>
<td>configuration display colour</td>
</tr>
<tr>
<td>SIM</td>
<td>configuration simulation mode</td>
</tr>
</tbody>
</table>
8.4 Submenu OUT1
### Explanations submenu OUT1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEL1</td>
<td>standard unit of measurement for evaluation by OUT1: FLOW (volumetric flow) or TEMP (temperature) or PRES (pressure)</td>
</tr>
<tr>
<td><strong>ou1</strong></td>
<td>output function for OUT1: • flow Hno, Hnc, Fno, Fnc, ImP • temperature: Hno, Hnc, Fno, Fnc • pressure: Hno, Hnc, Fno, Fnc Hno = switching signal with hysteresis function normally open Hnc = switching signal with hysteresis function normally closed Fno = switching signal with window function normally open Fnc = switching signal with window function normally closed ImP = consumed quantity monitoring (totaliser function) OFF = output OFF (of high impedance)</td>
</tr>
<tr>
<td>SP1</td>
<td>set point for OUT1</td>
</tr>
<tr>
<td>rP1</td>
<td>reset point for OUT1</td>
</tr>
<tr>
<td>FH1</td>
<td>upper limit value for OUT1</td>
</tr>
<tr>
<td>FL1</td>
<td>lower limit for OUT1</td>
</tr>
<tr>
<td>ImPS1</td>
<td>pulse value = volumetric flow quantity at which 1 pulse is delivered.</td>
</tr>
<tr>
<td>ImPR1</td>
<td>configuration of OUT1 for consumed quantity monitoring: YES (pulse signal), no (switching signal).</td>
</tr>
<tr>
<td>dS1</td>
<td>switching delay on OUT1</td>
</tr>
<tr>
<td>dr1</td>
<td>switch-off delay on OUT1</td>
</tr>
<tr>
<td><strong>FOU1</strong></td>
<td>response of OUT1 / OUT2 in case of an internal fault: OU = output reacts as in normal case On = output switches ON / analogue signal goes to 21.5 mA. OFF = output switches OFF / analogue signal goes to 3.5 mA.</td>
</tr>
</tbody>
</table>

FOU1 is not available if ou1 = ImP was selected.
The displayed parameters change when the factory setting in submenu OUT2 is changed.
### Explanation submenu OUT2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEL2</td>
<td>standard measured variable for evaluation by OUT2: FLOW (volumetric flow) or TEMP (temperature) or PRES (pressure)</td>
</tr>
</tbody>
</table>
| ou2       | output function for OUT2:  
|           |  • flow Hno, Hnc, Fno, Fnc, I, ImP  
|           |  • temperature: Hno, Hnc, Fno, Fnc, I  
|           |  • pressure: Hno, Hnc, Fno, Fnc, I  
|           | Hno = switching signal with hysteresis function normally open  
|           | Hnc = switching signal with hysteresis function normally closed  
|           | Fno = switching signal with window function normally open  
|           | Fnc = switching signal with window function normally closed  
|           | ImP = consumed quantity monitoring (totaliser function)  
|           | I = analogue signal 4...20 mA.  
|           | In.D = input for external counter reset signal  
|           | OFF = output OFF (of high impedance)  
| ASP2      | analogue start point for OUT2 |
| AEP2      | analogue end point for OUT2 |
| SP2       | set point for OUT2 |
| rP2       | reset point for OUT2 |
| FH2       | upper limit value for OUT2 |
| FL2       | lower limit for OUT2 |
| ImPS2     | pulse value = volumetric flow quantity at which 1 pulse is provided. |
| ImPR2     | configuration of OUT2 for consumed quantity monitoring: YES (pulse signal), no (switching signal). |
| DIn2      | reset of the totaliser via external signal: +EDG, -EDG, HIGH, LOW |
| dS2       | switching delay on OUT2 |
| dr2       | switch-off delay on OUT2 |
| FOU2      | response of OUT2 in case of an internal fault:  
|           | OU = output reacts as in normal case  
|           | On = output switches ON / analogue signal goes to 21.5 mA.  
|           | OFF = output switches OFF / analogue signal goes to 3.5 mA.  
|           | ❗️ FOU2 is not available if ou2 = ImP was selected. |
8.6 Submenu CFG

* only available for SDx6xx
## Explanation submenu CFG

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>uni.F</td>
<td>standard unit of measurement for volumetric flow</td>
</tr>
<tr>
<td>uni.T</td>
<td>standard unit of measurement for temperature</td>
</tr>
<tr>
<td>uni.P</td>
<td>standard unit of measurement for pressure</td>
</tr>
<tr>
<td>dAP.F</td>
<td>measured value damping for volumetric flow</td>
</tr>
<tr>
<td>dAP.P</td>
<td>measured value damping for pressure</td>
</tr>
<tr>
<td>P-n</td>
<td>output logic</td>
</tr>
<tr>
<td>MEdi</td>
<td>medium selection (only available for SDx6xx)</td>
</tr>
<tr>
<td>LFC</td>
<td>low flow cut-off</td>
</tr>
<tr>
<td>rEF.P</td>
<td>standard pressure to which the measured and display values for volumetric flow refer</td>
</tr>
<tr>
<td>rEF.T</td>
<td>standard temperature to which the measured and display values for volumetric flow refer</td>
</tr>
<tr>
<td>coF</td>
<td>Zero-point calibration for pressure measurement. The internal measured value &quot;0&quot; is shifted by this value.</td>
</tr>
</tbody>
</table>
8.7 Submenus MEM, DIS
### Explanation submenu MEM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lo.F</td>
<td>Minimum value of the flow value measured in the process (flow volume or flow velocity)</td>
</tr>
<tr>
<td>Hi.F</td>
<td>Maximum value of the flow value measured in the process (flow volume or flow velocity)</td>
</tr>
<tr>
<td>Lo.T</td>
<td>Minimum value of the temperature measured in the process</td>
</tr>
<tr>
<td>Hi.T</td>
<td>Maximum value of the temperature measured in the process</td>
</tr>
<tr>
<td>Lo.P</td>
<td>Minimum value of the pressure measured in the process</td>
</tr>
<tr>
<td>Hi.P</td>
<td>Maximum value of the pressure measured in the process</td>
</tr>
</tbody>
</table>

### Explanation submenu DIS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>diS.L</td>
<td>standard process value display</td>
</tr>
<tr>
<td></td>
<td>L1 = current process value for volumetric flow</td>
</tr>
<tr>
<td></td>
<td>L2.Temp = current process value for flow and temperature</td>
</tr>
<tr>
<td></td>
<td>L2.Pres = current process value for volumetric flow and pressure</td>
</tr>
<tr>
<td></td>
<td>L2.Totl = current process value for volumetric flow and totaliser</td>
</tr>
<tr>
<td></td>
<td>L3.TP = current process value for volumetric flow and temperature and pressure</td>
</tr>
<tr>
<td></td>
<td>L4 = current process value for volumetric flow and temperature and pressure and current totaliser value</td>
</tr>
<tr>
<td>diS.U</td>
<td>update rate of display</td>
</tr>
<tr>
<td></td>
<td>d1 = high</td>
</tr>
<tr>
<td></td>
<td>d2 = medium</td>
</tr>
<tr>
<td></td>
<td>d3 = low</td>
</tr>
<tr>
<td>diS.R</td>
<td>display rotation: 0°, 90°, 180°, 270°</td>
</tr>
<tr>
<td>diS.B</td>
<td>display brightness: 25 %, 50 %, 75 %, 100 %, OFF (measured value display in the RUN mode switched off)</td>
</tr>
</tbody>
</table>
8.8 Submenus COLR, SIM

Main menu

EF

rES
rTo
Info
OUT1
OUT2
CFG
MEM
DIS
COLR
SIM

coL.F ▪ bk/wh red green yellow r-cF G-cF

coL.T ▪ bk/wh red green yellow r-cF G-cF

coL.P ▪ bk/wh red green yellow r-cF G-cF

coL.V ▪ bk/wh red green yellow

S.FLW ▪ OL cr.OL

S.TMP ▪ OL cr.OL cr.UL UL

S.PRS ▪ OL

S.Tim ▪ 1 2 3 4 5 10 ...

S.On ▪ OFF On
Explanation submenu COLR

The displayed parameters change when the factory setting in submenu OUT1 and OUT2 is changed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>coL.F</td>
<td>colour of the characters in the display for the flow rate value</td>
</tr>
<tr>
<td>cFH.F</td>
<td>upper limit of the colour change for flow rate measurement</td>
</tr>
<tr>
<td>cFL.F</td>
<td>lower limit of the colour change for flow rate measurement</td>
</tr>
<tr>
<td>coL.T</td>
<td>colour of the characters in the display for the temperature value</td>
</tr>
<tr>
<td>cFH.T</td>
<td>upper limit of the colour change for temperature measurement</td>
</tr>
<tr>
<td>cFL.T</td>
<td>lower limit of the colour change for temperature measurement</td>
</tr>
<tr>
<td>coL.P</td>
<td>colour of the characters in the display for the pressure value</td>
</tr>
<tr>
<td>cFH.P</td>
<td>upper limit of the colour change for pressure measurement</td>
</tr>
<tr>
<td>cFL.P</td>
<td>lower limit of the colour change for pressure measurement</td>
</tr>
<tr>
<td>coL.V</td>
<td>colour of the characters in the display for the totaliser value</td>
</tr>
<tr>
<td>bk/wh</td>
<td>permanently black/white</td>
</tr>
<tr>
<td>yellow</td>
<td>permanently yellow</td>
</tr>
<tr>
<td>green</td>
<td>permanently green</td>
</tr>
<tr>
<td>red</td>
<td>permanently red</td>
</tr>
<tr>
<td>r-cF</td>
<td>display colour between limits cFL...cFH red, outside green.</td>
</tr>
<tr>
<td>G-cF</td>
<td>display colour between limits cFL...cFH green, outside red.</td>
</tr>
</tbody>
</table>

Explanation submenu SIM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation and setting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.FLW</td>
<td>simulated flow coefficient</td>
</tr>
<tr>
<td>S.TMP</td>
<td>simulated temperature value</td>
</tr>
<tr>
<td>S.PRS</td>
<td>simulated pressure value</td>
</tr>
<tr>
<td>cr.UL</td>
<td>measured value below the detection zone → error message</td>
</tr>
<tr>
<td>UL</td>
<td>measured value below the display range → warning</td>
</tr>
<tr>
<td>OL</td>
<td>measured value above the display range → warning</td>
</tr>
<tr>
<td>cr.OL</td>
<td>measured value above the detection zone → error message</td>
</tr>
<tr>
<td>S.Tim</td>
<td>simulation time in minutes</td>
</tr>
<tr>
<td>S.On</td>
<td>simulation status: OFF, On</td>
</tr>
</tbody>
</table>
9 Set-up

After power on and expiry of the power-on delay time of approx. 1 s, the unit is in the Run mode (= normal operating mode). It carries out its measurement and evaluation functions and generates output signals according to the set parameters.

- During the power-on delay time the outputs are switched as programmed:
  - ON with normally open function (Hno / Fno)
  - OFF with normally closed function (Hnc / Fnc)
  - OFF for consumed quantity monitoring (ImP)

- If output 2 is configured as analogue output, the output signal is at 20 mA during the power-on delay time.

10 Parameter setting

**CAUTION**
The housing can heat up considerably.
> Risk of burns
  ► Do not touch the device with your hands.
  ► Use another object (e.g. a ballpoint pen) to carry out settings on the unit.

Parameters can be set before installation and set-up of the unit or during operation.

If you change parameters during operation, this will influence the function of the plant.
  ► Ensure that there will be no malfunctions in your plant.

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

- The parameters can also be set via the IO-Link interface.
- Functions which can only be set via the IO-Link interface: → 4.9.1.
10.1 Parameter setting in general

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change from the RUN mode to the main menu</td>
</tr>
<tr>
<td>2</td>
<td>Select the requested parameter</td>
</tr>
<tr>
<td>3</td>
<td>Change to the setting mode</td>
</tr>
<tr>
<td>4</td>
<td>Change the parameter value</td>
</tr>
<tr>
<td>5</td>
<td>Acknowledge the set parameter value</td>
</tr>
<tr>
<td>6</td>
<td>Return to the RUN mode</td>
</tr>
</tbody>
</table>

If [🔒 Locked via Communication] is displayed when an attempt is made to modify a parameter value, an IO-Link communication is active (temporary locking).

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

10.1.1 Select submenu

1. Press [●] to change from the process value display to the main menu.
2. Press [▼] to select the menu EF and press [●].
3. Press [▼] to select the submenu and press [●].

10.1.2 Change to the process value display (RUN mode)

There are 2 possibilities:

1. Wait for 30 seconds (→ 10.1.4 Timeout).
2. Press [▲] or [▼] to go to the end of the menu and change to the next higher menu.

10.1.3 Lock / unlock

The unit can be locked electronically to prevent unintentional settings. On delivery: not locked.

Locking:

- Make sure that the unit is in the normal operating mode.
- Press [▲] and [▼] simultaneously for 10 s until [🔒 Set Menu lock] is displayed.
During operation: [🔒 Lock via key] is displayed if you try to change parameter values.

Unlocking:
► Make sure that the unit is in the normal operating mode.
► Press [▲] and [▼] simultaneously for 10 s until [Reset menu lock] is displayed.

10.1.4 Timeout
If no button is pressed for 30 s during parameter setting, the unit returns to the operating mode with unchanged values.

10.2 Settings for volumetric flow monitoring

10.2.1 Limit monitoring OUT1 or OUT2 / hysteresis function

► Select [uni.F] and set the unit of measurement.
► Select [SELx] and set FLOW.
► Select [oux] and adjust the switching signal:
  - Hno = hysteresis function / normally open
  - Hnc = hysteresis function / normally closed
► Select [SPx] and set the value at which the output is set.
► Select [rPx] and set the value at which the output is reset.

10.2.2 Limit monitoring OUT1 or OUT2 / window function

► Select [uni.F] and set the unit of measurement.
► Select [SELx] and set FLOW.
► Select [oux] and adjust the switching signal:
  - Fno = window function / normally open
  - Fnc = window function / normally closed
► Select [FHx] and set the upper limit of the window section.
► Select [FLx] and set the lower limit for the window section.

10.2.3 Analogue signal volumetric flow OUT2

► Select [uni.F] and set the unit of measurement.
► Select [SEL2] and set FLOW.
► Select [ou2] and select analogue signal: I (4...20 mA)
► Select [ASP2] and set the value at which 4 mA is provided.
► Select [AEP2] and set the value at which 20 mA is provided.
### 10.3 Settings for consumed quantity monitoring

#### 10.3.1 Quantity monitoring by pulse signal OUT1 or OUT2

- Select [uni.F] and set the unit of measurement.
- Select [SELx] and set FLOW.
- Select [oux] and adjust the pulse output: ImP
- Select [ImPSx] and set pulse value (= volumetric flow quantity at which a pulse is provided):
  1. Press [▲] or [▼] to select the setting range.
  2. Briefly press [●] to confirm the setting range.
  3. Press [▲] or [▼] to set the requested numeric value.
  4. Briefly press [●] to apply the value.
- Select [ImPRx] and set YES.

<table>
<thead>
<tr>
<th>Menu OUTx:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELx</td>
</tr>
<tr>
<td>oux</td>
</tr>
<tr>
<td>ImPSx</td>
</tr>
<tr>
<td>ImPRx</td>
</tr>
</tbody>
</table>

#### 10.3.2 Quantity monitoring by preset counter OUT1 or OUT2

- Select [uni.F] and set the unit of measurement.
- Select [SELx] and set FLOW.
- Select [oux] and adjust the pulse output: ImP
- Select [ImPSx] and set the volumetric flow quantity at which output x switches.
- Select [ImPRx] and set NO.

<table>
<thead>
<tr>
<th>Menu OUTx:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELx</td>
</tr>
<tr>
<td>oux</td>
</tr>
<tr>
<td>ImPSx</td>
</tr>
<tr>
<td>ImPRx</td>
</tr>
</tbody>
</table>

#### 10.3.3 Manual counter reset

- Select [rTo] and set rES.T.
  > The totaliser is reset to zero.

<table>
<thead>
<tr>
<th>Menu EF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>rTo</td>
</tr>
</tbody>
</table>

#### 10.3.4 Time-controlled counter reset

- Select [rTo] and set the requested value (intervals of hours, days or weeks).
  > The totaliser is reset automatically with the value now set.

<table>
<thead>
<tr>
<th>Menu EF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>rTo</td>
</tr>
</tbody>
</table>

#### 10.3.5 Deactivation of the counter reset

- Select [rTo] and set OFF.
  > The totaliser is only reset after overflow.

<table>
<thead>
<tr>
<th>Menu EF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>rTo</td>
</tr>
</tbody>
</table>
### 10.3.6 Counter reset using an external signal

- Select [ou2] and set In.D.
- Select [Dln2] and set counter reset signal:
  - HIGH = reset for high signal
  - LOW = reset for low signal
  - +EDG = reset for rising edge
  - –EDG = reset for falling edge
- The totaliser is reset to zero.

### 10.4 Settings for temperature monitoring

#### 10.4.1 Limit monitoring OUT1 or OUT2 / hysteresis function

- Select [uni.T] and set the unit of measurement.
- Select [SELx] and set TEMP.
- Select [oux] and adjust the switching signal:
  - Hno = hysteresis function / normally open
  - Hnc = hysteresis function / normally closed
- Select [SPx] and set the value at which the output is set.
- Select [rPx] and set the value at which the output is reset.

#### 10.4.2 Limit monitoring OUT1 or OUT2 / window function

- Select [uni.T] and set the unit of measurement.
- Select [SELx] and set TEMP.
- Select [oux] and adjust the switching signal:
  - Fno = window function / normally open
  - Fnc = window function / normally closed
- Select [FHx] and set the upper limit of the window section.
- Select [FLx] and set the lower limit of the window sector.

#### 10.4.3 Analogue signal temperature OUT2

- Select [uni.T] and set the unit of measurement.
- Select [SEL2] and set TEMP.
- Select [ou2] and select analogue signal: I (4...20 mA)
- Select [ASP2] and set the value at which 4 mA is provided.
- Select [AEP2] and set the value at which 20 mA is provided.
### 10.5 Settings for pressure monitoring

#### 10.5.1 Limit monitoring OUT1 or OUT2 / hysteresis function

- Select [uni.P] and set the unit of measurement.
- Select [SELx] and set PRES.
- Select [oux] and adjust the switching signal:
  - Hno = hysteresis function / normally open
  - Hnc = hysteresis function / normally closed
- Select [SPx] and set the value at which the output is set.
- Select [rPx] and set the value at which the output is reset.

<table>
<thead>
<tr>
<th>Menu OUTx:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SELx]</td>
</tr>
<tr>
<td>[oux]</td>
</tr>
<tr>
<td>[SPx]</td>
</tr>
<tr>
<td>[rPx]</td>
</tr>
</tbody>
</table>

#### 10.5.2 Limit monitoring OUT1 or OUT2 / window function

- Select [uni.P] and set the unit of measurement.
- Select [SELx] and set PRES.
- Select [oux] and adjust the switching signal:
  - Fno = window function / normally open
  - Fnc = window function / normally closed
- Select [FHx] and set the upper limit of the window section.
- Select [FLx] and set the lower limit of the window sector.

<table>
<thead>
<tr>
<th>Menu OUTx:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SELx]</td>
</tr>
<tr>
<td>[oux]</td>
</tr>
<tr>
<td>[FHx]</td>
</tr>
<tr>
<td>[FLx]</td>
</tr>
</tbody>
</table>

#### 10.5.3 Analogue signal pressure OUT2

- Select [uni.P] and set the unit of measurement.
- Select [SEL2] and set PRES.
- Select [ou2] and select analogue signal: I (4...20 mA)
- Select [ASP2] and set the value at which 4 mA is provided.
- Select [AEP2] and set the value at which 20 mA is provided.

<table>
<thead>
<tr>
<th>Menu OUT2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SEL2]</td>
</tr>
<tr>
<td>[ou2]</td>
</tr>
<tr>
<td>[ASP2]</td>
</tr>
<tr>
<td>[AEP2]</td>
</tr>
</tbody>
</table>
10.6 User settings (optional)

10.6.1 Standard display

► Select [diS.L] and set process value display:
  - L1  = current process value for volumetric flow
  - L2.Temp  = current process value for flow and temperature
  - L2.Pres  = current process value for volumetric flow and pressure
  - L2.Totl  = current process value for volumetric flow and totaliser
  - L3.TP  = current process value for volumetric flow and temperature and pressure
  - L4  = current process value for volumetric flow and temperature and pressure and current totaliser value

Menu DIS:
[diS.L]  
[diS.U]  
[diS.R]  
[diS.B]

► Select [diS.U] and set refresh rate of the display:
  - d1 = high
  - d2 = medium
  - d3 = low

► Select [diS.R] and set the orientation of the display:
  0°, 90°, 180°, 270°

► Select [diS.B] and set the brightness of the display:
  25 %, 50 %, 75 %, 100 %
  or OFF (= energy-saving mode. The display is switched off in the operating mode. Error messages are displayed even if the display is deactivated. Display activation by pressing any key.)

10.6.2 Standard unit of measurement for volumetric flow

► Select [uni.F] and set unit of measurement for standard display (→ 8.1):
  m³/min, m³/h, m/s, ft³/min, ft³/h, ft/s.

⚠️ Set [uni.F] prior to configuring the outputs.

ℹ️ The consumed quantity (meter reading) is automatically displayed in the unit of measurement providing the highest accuracy.

Menu CFG:
[uni.F]

10.6.3 Standard unit of measurement for temperature

► Select [uni.T] and set unit of measurement for standard display (→ 8.1):
  °C or °F.

⚠️ Set [uni.T] prior to configuring the outputs.

Menu CFG:
[uni.T]
10.6.4 Standard unit of measurement for pressure

► Select [uni.P] and set unit of measurement for standard display (→ 8.1): kPa, bar, psi.

⚠️ Set [uni.P] prior to configuring the outputs.

Menu CFG: [uni.P]

10.6.5 Measured value damping

► Select [dAP.F] for flow rate measurement or [dAP.P] for pressure measurement and set damping constant in seconds (τ value 63 %).

Menu CFG: [dAP.x]

10.6.6 Output logic

► Select [P-n] and set PnP or nPn.

Menu CFG: [P-n]

10.6.7 Medium

► Select [MEdi] and set the requested medium: Ar (argon), CO2 (carbon dioxide), N2 (nitrogen), AIR (compressed air).

This parameter cannot be selected for the SDx5xx and SDx8xx units.

Menu CFG: [MEdi]

10.6.8 Low flow cut-off

► Select [LFC] and set limit, below which a current is evaluated as standstill.

Menu CFG: [LFC]

10.6.9 Standard conditions

► Select [rEF.P] and set the standard pressure.
► Select [rEF.T] and set the standard temperature.

Menu CFG: [rEF.P] [rEF.T]

10.6.10 Zero-point calibration pressure

► Select [coF] and set value in bar.

> The internal measured value "0" is shifted by this value.

Menu CFG: [coF]
10.6.11 Colour of the characters in the display

► Select [coL.F] for volumetric flow or [coL.T] for temperature or [col.P] for pressure and set the colour of the characters for the process value in the standard display:
- bk/wh = permanently black/white
- yellow = permanently yellow
- green = permanently green
- red = permanently red
- r-cF = display colour red between the limits cFL...cFH, outside colour change to green
- G-cF = display colour green between the limits cFL...cFH, outside colour change to red

► Select [cFH.x] and [cFL.x] and set the limits for the colour window:
- cFH.F = upper limit for volumetric flow
- cFL.F = lower limit value for volumetric flow
- cFH.T = upper limit value for temperature
- cFL.T = lower limit value for temperature
- cFH.P = upper limit for pressure
- cFL.P = lower limit for pressure

► Select [coL.V] and set the colour of the characters for totaliser:
- bk/wh = permanently black/white
- yellow = permanently yellow
- green = permanently green
- red = permanently red

Menu COLR:
[coL.x]
[cFH.x]
[cFL.x]
[coL.V]

10.6.12 Switch-on /switch-off delay

► Select [dSx] and set the delay for setting OUTx in seconds.
► Select [drx] and set the delay for resetting OUTx in seconds.

Menu OUTx:
[dSx]
[drx]
10.6.13 Error behaviour of the outputs

- Select [FOU1] and set error behaviour for output 1:
  - switching output
    - 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 the error as defined with the parameters

- Select [FOU2] and set error behaviour for output 2:
  - switching output
    - 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 the error as defined with the parameters

- Analogue output
  - On = the analogue signal goes to the upper error value (→ 4.3)
  - OFF = the analogue value goes to the lower error value (→ 4.3)
  - OU = the analogue signal corresponds to the measured value

The parameter [FOUx] is not available if [ou] = Imp (consumed quantity monitoring) was selected. The pulses are provided independent of the fault.

10.6.14 Restore factory setting

- Select [rES].
- Briefly press [●].
- Keep [▲] or [▼] pressed.
- [----] is displayed.
- Briefly press [●].
- The device carries out a reboot.
- → 14 Factory setting. We recommend taking down your own settings in that table before carrying out a reset.
10.7 Diagnostic functions

10.7.1 Read min/max values

► Select [Lo.x] or [Hi.x] to display the highest or lowest process value measured:
  - [Lo.F] = min. value of the flow volume measured in the process
  - [Hi.F] = max. value of the flow volume measured in the process
  - [Lo.T] = min. value of the temperature measured in the process
  - [Hi.T] = max. value of the temperature measured in the process
  - [Lo.P] = min. value of the pressure measured in the process
  - [Hi.P] = max. value of the pressure measured in the process

Delete memory:
► Select [Lo.x] or [Hi.x].
► Keep [▲] and [▼] pressed.
> [----] is displayed.
► Briefly press [●].

It is recommended to delete the memories as soon as the unit operates under normal operating conditions for the first time.

10.7.2 Simulation

► Select [S.FLW] and set the flow value to be simulated.
► Select [S.TMP] and set the temperature value to be simulated.
► Select [S.PRS] and set the pressure value to be simulated.
► Select [S.Tim] and set the time of the simulation in minutes.
► Select [S.On] and set the function:
  - On = The simulation starts. The values are simulated for the time set with [S.Tim]. Cancel by pressing any button.
  - OFF = The simulation is not active.

Menu MEM:
[Lo.x] [Hi.x]

Menu SIM:
[S.FLW] [S.TMP] [S.PRS] [S.Tim] [S.On]
11 Operation

The process values to be displayed permanently can be preset (→ 10.6.1 Standard display). A standard unit measurement can be defined for the flow rate measurement, the temperature measurement and the pressure measurement (→ 10.6.2 and → 10.6.3 and → 10.6.4).

In addition to the preset standard display, the display can be changed by pressing [▲] or [▼] → 8.1 Process value display (RUN).

12 Error correction

The unit has many self-diagnostic options. It monitors itself automatically during operation.

Warnings and error states are displayed, even when the display is switched off. Error indications are also available via IO-Link.

The status signals are classified according to NAMUR recommendation NE107.

If several diagnostic events occur simultaneously, only the diagnostic message of the result with the highest priority is displayed.

If one process value fails, the other process values continue to be available.

Additional diagnostic functions are available via IO-Link → IODD interface description at www.ifm.com

<table>
<thead>
<tr>
<th>Process value line</th>
<th>Title line</th>
<th>Status LED</th>
<th>Type</th>
<th>Description</th>
<th>Output response</th>
<th>Error correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERROR</td>
<td>ERROR</td>
<td>---</td>
<td>✗</td>
<td>Unit faulty / malfunction</td>
<td>FOU</td>
<td>Replace device.</td>
</tr>
<tr>
<td>Off</td>
<td>Off</td>
<td>---</td>
<td>✗</td>
<td>Supply voltage too low</td>
<td>Off</td>
<td>Check the supply voltage. Change [diS.B] setting (→ 10.6.1).</td>
</tr>
<tr>
<td>PArA Parameter Error</td>
<td>Param- Error</td>
<td>---</td>
<td>✗</td>
<td>Parameter setting outside the valid range</td>
<td>FOU</td>
<td>Repeat parameter setting.</td>
</tr>
<tr>
<td>ERROR</td>
<td>Pressure Error</td>
<td>---</td>
<td>✗</td>
<td>Error in pressure measurement</td>
<td>FOU</td>
<td>Check pressure measurement. Replace device.</td>
</tr>
<tr>
<td>Process value line</td>
<td>Title line</td>
<td>Status LED</td>
<td>Type</td>
<td>Description</td>
<td>Output response</td>
<td>Error correction</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
<td>------</td>
<td>-------------</td>
<td>-----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>ERROR</td>
<td>Flow Error</td>
<td>---</td>
<td>✗</td>
<td>Error in flow measurement</td>
<td>FOU</td>
<td>Check flow measurement. Replace device.</td>
</tr>
<tr>
<td>ERROR</td>
<td>Temp Error</td>
<td>---</td>
<td>✗</td>
<td>Error in temperature measurement</td>
<td>FOU</td>
<td>Check temperature measurement. Replace device.</td>
</tr>
<tr>
<td>cr.OL</td>
<td>Critical over limit</td>
<td>---</td>
<td>✗</td>
<td>Detection zone* exceeded</td>
<td>FOU</td>
<td>Check flow range / temperature range / pressure range.</td>
</tr>
<tr>
<td>cr.UL</td>
<td>Critical under limit</td>
<td>---</td>
<td>✗</td>
<td>Detection zone* not reached</td>
<td>FOU</td>
<td>Check temperature range.</td>
</tr>
<tr>
<td>---</td>
<td>Short circuit OUT1/OUT2</td>
<td>OUT1 ✗ OUT2 ✗</td>
<td>?</td>
<td>Short circuit OUT1 and OUT2</td>
<td>---</td>
<td>Check switching outputs OUT1 and OUT2 for short-circuit or excessive current.</td>
</tr>
<tr>
<td>---</td>
<td>Short circuit OUT1</td>
<td>OUT1 ✗</td>
<td>?</td>
<td>Short circuit OUT1</td>
<td>---</td>
<td>Check switching output OUT1 for short-circuit or excessive current.</td>
</tr>
<tr>
<td>---</td>
<td>Short circuit OUT2</td>
<td>OUT2 ✗</td>
<td>?</td>
<td>Short circuit OUT2</td>
<td>---</td>
<td>Check switching output OUT2 for short-circuit or excessive current.</td>
</tr>
<tr>
<td>OL</td>
<td>Over limit</td>
<td>---</td>
<td>?</td>
<td>Detection zone* exceeded.</td>
<td>OU</td>
<td>Check flow range / temperature range / pressure range.</td>
</tr>
<tr>
<td>UL</td>
<td>Under limit</td>
<td>---</td>
<td>?</td>
<td>Detection zone* not reached</td>
<td>OU</td>
<td>Check flow range / temperature range / pressure range.</td>
</tr>
<tr>
<td>Lock via key</td>
<td>---</td>
<td>---</td>
<td>?</td>
<td>Setting buttons on the unit locked, parameter change rejected</td>
<td>OU</td>
<td>Unlock unit → 10.1.3</td>
</tr>
<tr>
<td>Process value line</td>
<td>Title line</td>
<td>Status LED</td>
<td>Type</td>
<td>Description</td>
<td>Output response</td>
<td>Error correction</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
<td>------</td>
<td>-------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Lock via communication</td>
<td>---</td>
<td>---</td>
<td>![Warning]</td>
<td>Parameter setting locked via push-buttons, parameter setting is active via IO-Link communication</td>
<td>OU</td>
<td>Finish parameter setting via IO-Link communication.</td>
</tr>
<tr>
<td>Lock via system</td>
<td>---</td>
<td>---</td>
<td>![Warning]</td>
<td>Setting buttons locked via parameter software, parameter change rejected</td>
<td>OU</td>
<td>Unlock the unit via IO-Link interface using the parameter setting software.</td>
</tr>
<tr>
<td>IO-Link</td>
<td>IO-Link flash</td>
<td>OUT1 ![LED] OUT2 ![LED]</td>
<td>![Warning]</td>
<td>IO-Link function for optical identification of the unit active</td>
<td>OU</td>
<td>Deactivate IO-Link function.</td>
</tr>
</tbody>
</table>

* Detection zone → 4.3, Figure 1.

⚠️ Error  In the event of an error, the outputs react according to the setting under [FOU1] and [FOU2] (→ 10.6.13).

⚠️ Warning
- ![LED] LED flashes
- ![LED] LED flashes quickly

## 13 Maintenance, repair and disposal

As a rule, no measures for maintenance are necessary.

- Define regular calibration intervals according to the process requirements.
  - Recommendation: every 12 months.

Only the manufacturer is allowed to repair the unit.

- After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.
# 14 Factory setting

<table>
<thead>
<tr>
<th>Menu</th>
<th>Parameter</th>
<th>Factory setting</th>
<th>User setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>rTo</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>OUT1</td>
<td>SEL1</td>
<td>FLOW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ou1</td>
<td>Hno</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP1 / FH1</td>
<td>20 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rP1 / FL1</td>
<td>19 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ImPS1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD55xx</td>
<td>0.0001 m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD56xx</td>
<td>(0.005 scf)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD65xx</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD66xx</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD58xx</td>
<td>0.000005 l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD68xx</td>
<td>0.000010 l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD8xxx</td>
<td>0.001 m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD9xxx</td>
<td>(0.04 scf)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD2xxx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ImPR1</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dS1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dr1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOU1</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>OUT2</td>
<td>SEL2</td>
<td>FLOW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ou2</td>
<td>l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASP2</td>
<td>0 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AEP2</td>
<td>100 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP2 / FH2</td>
<td>40 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rP2 / FL2</td>
<td>39 %</td>
<td></td>
</tr>
<tr>
<td>Menu</td>
<td>Parameter</td>
<td>Factory setting</td>
<td>User setting</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>ImPS2</td>
<td>SD55xx</td>
<td>0.0001 m³ (0.005 scf)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD56xx</td>
<td>0.000005 l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD65xx</td>
<td>0.000010 l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD66xx</td>
<td>0.001 m³ (0.04 scf)</td>
<td></td>
</tr>
<tr>
<td>ImPR2</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dln2</td>
<td>+EDG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dS2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dr2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FO2U</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFG</td>
<td>uni.F</td>
<td>m³/h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>uni.T</td>
<td>SDxxx0 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SDxxx1 °F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>uni.P</td>
<td>SDxxx0 bar</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SDxxx1 psi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dAP.F</td>
<td>0.6 s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dAP.P</td>
<td>0.06 s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-n</td>
<td>PnP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MEdi *</td>
<td>CO2</td>
<td></td>
</tr>
<tr>
<td>LFC</td>
<td>SD5xxx</td>
<td>0.02 m³/h (0.7 scfh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD6xxx</td>
<td>0.1 m³/h (4 scfh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD8xxx</td>
<td>0.3 m³/h (11 scfh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD9xxx</td>
<td>0.5 m³/h (18 scfh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD2xxx</td>
<td>2.0 m³/h (71 scfh)</td>
<td></td>
</tr>
<tr>
<td>Menu</td>
<td>Parameter</td>
<td>Factory setting</td>
<td>User setting</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>rEF.P</td>
<td>1013 mbar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rEF.T</td>
<td>15 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coF</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>diS.L</td>
<td>L3.TP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>diS.U</td>
<td>d3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>diS.R</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>diS.B</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>COLR</td>
<td>coL.F</td>
<td>bk/wh</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coL.T</td>
<td>bk/wh</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coL.P</td>
<td>bk/wh</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coL.V</td>
<td>bk/wh</td>
<td></td>
</tr>
</tbody>
</table>

The percentage values refer to the final value of the measuring range.
* only for SDx6xx