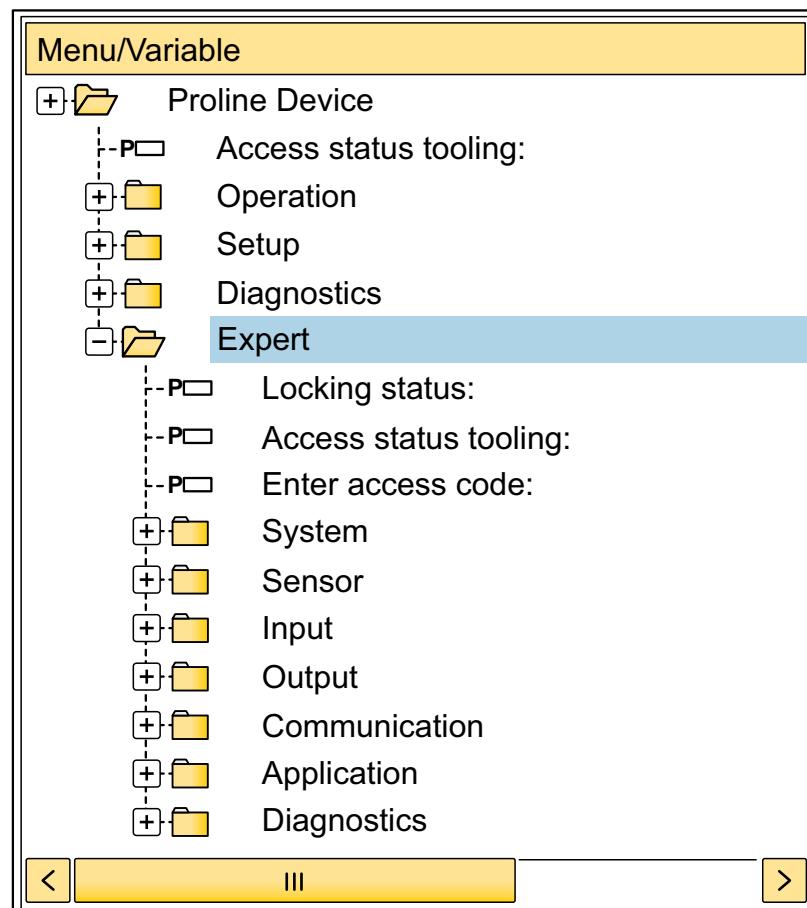


# Description of Device Parameters

## Proline Promass 100

### EtherNet/IP

Coriolis flowmeter





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# 1      About this document

## 1.1    Document function

The document is part of the Operating Instructions and serves as a reference for parameters, providing a detailed explanation of each individual parameter of the Expert operating menu.

It is used to perform tasks that require detailed knowledge of the function of the device:

- Commissioning measurements under difficult conditions
- Optimal adaptation of the measurement to difficult conditions
- Detailed configuration of the communication interface
- Error diagnostics in difficult cases

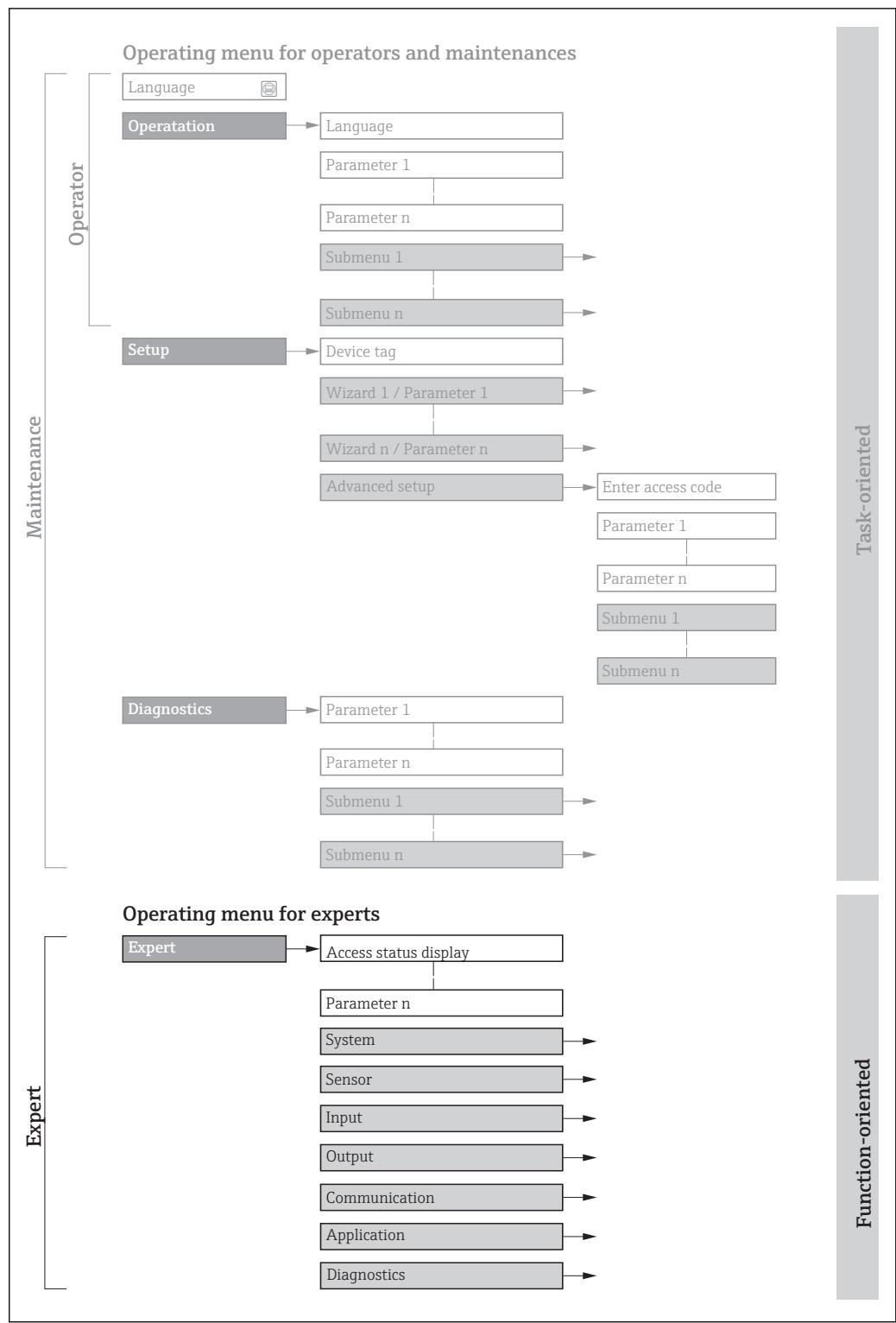
## 1.2    Target group

The document is aimed at specialists who work with the device over the entire life cycle and perform specific configurations.

## 1.3    Using this document

### 1.3.1    Information on the document structure

The document lists the submenus and their parameters according to the structure from the **Expert** menu (→ 8), which is displayed when the "**Maintenance**" user role is enabled.



1 Sample graphic for the schematic layout of the operating menu



Additional information regarding:

- The arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu with a brief description: Operating Instructions
- Operating concept of the operating menus: Operating Instructions

### 1.3.2 Structure of a parameter description

The individual parts of a parameter description are described in the following section:

Complete parameter name

Write-protected parameter = 

**Navigation**



Navigation path to the parameter via the local display (direct access code) or web browser  
Navigation path to the parameter via the operating tool  
The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.

**Prerequisite**

The parameter is only available under these specific conditions

**Description**

Description of the parameter function

**Selection**

List of the individual options for the parameter

- Option 1
- Option 2

**User entry**

Input range for the parameter

**User interface**

Display value/data for the parameter

**Factory setting**

Default setting ex works

**Additional information**

Additional explanations (e.g. in examples):

- On individual options
- On display values/data
- On the input range
- On the factory setting
- On the parameter function

## 1.4 Symbols used

### 1.4.1 Symbols for certain types of information

Symbol	Meaning
	<b>Tip</b> Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
	Operation via local display
	Operation via operating tool
	Write-protected parameter

### 1.4.2 Symbols in graphics

Symbol	Meaning	Symbol	Meaning
1, 2, 3 ...	Item numbers	A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections		

## 1.5 Documentation

### 1.5.1 Standard documentation

#### Operating Instructions

Measuring device	Documentation code
Promass A 100	BA01182D
Promass E 100 (8E1B**-...)	BA01064D
Promass E 100 (8E1C**-...)	BA01712D
Promass F 100	BA01065D
Promass G 100	BA01347D
Promass H 100	BA01184D
Promass I 100	BA01066D
Promass O 100	BA01185D
Promass P 100	BA01067D
Promass S 100	BA01068D
Promass X 100	BA01186D

### 1.5.2 Supplementary device-dependent documentation

#### Special Documentation

Content	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Concentration Measurement	SD01152D
Heartbeat Technology	SD01153D
Web server	SD01822D

## 2 Overview of the Expert operating menu

The following table provides an overview of the menu structure of the expert operating menu and its parameters. The page reference indicates where the associated description of the submenu or parameter can be found.

<b>Expert</b>	
Direct access	→ <a href="#">10</a>
Locking status	→ <a href="#">11</a>
Access stat.disp	→ <a href="#">12</a>
Access stat.tool	→ <a href="#">12</a>
Ent. access code	→ <a href="#">13</a>
<b>System</b>	
▶ Display	→ <a href="#">13</a>
▶ Diagn. handling	→ <a href="#">27</a>
▶ Administration	→ <a href="#">35</a>
<b>Sensor</b>	
▶ Measured val.	→ <a href="#">41</a>
▶ System units	→ <a href="#">49</a>
▶ Process param.	→ <a href="#">64</a>
▶ Measurement mode	→ <a href="#">72</a>
▶ External comp.	→ <a href="#">74</a>
▶ Calculated value	→ <a href="#">77</a>
▶ Sensor adjustm.	→ <a href="#">80</a>
▶ Calibration	→ <a href="#">86</a>
▶ Supervision	→ <a href="#">88</a>
▶ Communication	→ <a href="#">88</a>
▶ Configuration	→ <a href="#">88</a>

► Application	→ 106
Reset all tot.	→ 106
► Totalizer 1 to n	→ 106
► Viscosity	→ 111
► Concentration	→ 112
► Diagnostics	→ 112
Actual diagnos.	→ 112
Prev.diagnostics	→ 113
Time fr. restart	→ 114
Operating time	→ 114
► Diagnostic list	→ 115
► Event logbook	→ 118
► Device info	→ 120
► Min/max val.	→ 124
► Heartbeat	→ 133
► Simulation	→ 133

### 3 Description of device parameters

In the following section, the parameters are listed according to the menu structure of the local display. Specific parameters for the operating tools are included at the appropriate points in the menu structure.

<b>Expert</b>	
Direct access	→  10
Locking status	→  11
Access stat_disp	→  12
Access stat_tool	→  12
Ent. access code	→  13
<b>▶ System</b>	→  13
<b>▶ Sensor</b>	→  40
<b>▶ Communication</b>	→  88
<b>▶ Application</b>	→  106
<b>▶ Diagnostics</b>	→  112

---

#### Direct access

**Navigation**

Expert → Direct access

**Prerequisite**

There is a local display with operating elements.

**Description**

Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.

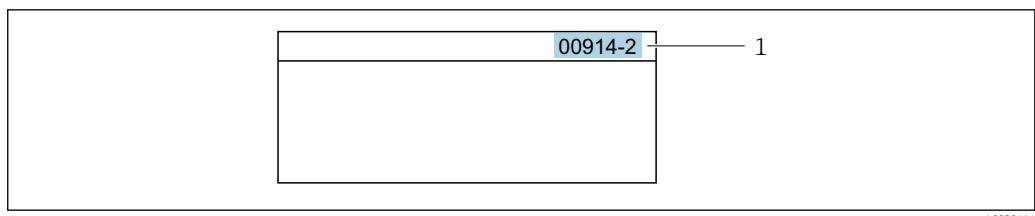
**User entry**

0 to 65 535

**Additional information**

*User entry*

The direct access code consists of a 5-digit number (at maximum) and the channel number, which identifies the channel of a process variable: e.g. 00914-2. In the navigation view, this appears on the right-hand side in the header of the selected parameter.



1 Direct access code

Note the following when entering the direct access code:

- The leading zeros in the direct access code do not have to be entered.  
Example: Enter "914" instead of "00914"
- If no channel number is entered, channel 1 is accessed automatically.  
Example: Enter 00914 → **Assign variable** parameter
- If a different channel is accessed: Enter the direct access code with the corresponding channel number.  
Example: Enter 00914-2 → **Assign variable** parameter

## Locking status

**Navigation** Expert → Locking status

**Description** Displays the active write protection.

**User interface**

- Hardware locked
- Temp. locked

**Additional information** *User interface*

If two or more types of write protection are active, the write protection with the highest priority is shown on the local display. In the operating tool all active types of write protection are displayed.

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device

*Selection*

Options	Description
Hardware locked (priority 1)	The write protection switch (DIP switch) for hardware locking is activated on the I/O electronic module. This locks write access to the parameters .
Temp. locked (priority 2)	Write access to the parameters is temporarily locked on account of internal processes running in the device (e.g. data upload/download, reset etc.). Once the internal processing has been completed, the parameters can be changed once again.

## Access stat.disp

<b>Navigation</b>	  Expert → Access stat.disp
<b>Prerequisite</b>	A local display is provided.
<b>Description</b>	Displays the access authorization to the parameters via the local display.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Operator</li><li>▪ Maintenance</li></ul>
<b>Factory setting</b>	Operator
<b>Additional information</b>	<p><i>Description</i></p> <p>If the -symbol appears in front of a parameter, it cannot be modified via the local display with the current access authorization.</p> <p> Access authorization can be modified via the <b>Ent. access code</b> parameter (→  13).</p> <p> For information about the <b>Ent. access code</b> parameter: see the "Disabling write protection via the access code" section of the Operating Instructions for the device</p> <p> If additional write protection is active, this restricts the current access authorization even further.</p> <p><i>Display</i></p> <p> Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device</p>

## Access stat.tool

<b>Navigation</b>	  Expert → Access stat.tool
<b>Description</b>	Displays the access authorization to the parameters via the operating tool or Web browser.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Operator</li><li>▪ Maintenance</li></ul>
<b>Factory setting</b>	Maintenance
<b>Additional information</b>	<p><i>Description</i></p> <p> Access authorization can be modified via the <b>Ent. access code</b> parameter (→  13).</p> <p> If additional write protection is active, this restricts the current access authorization even further.</p> <p><i>Display</i></p> <p> Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device</p>

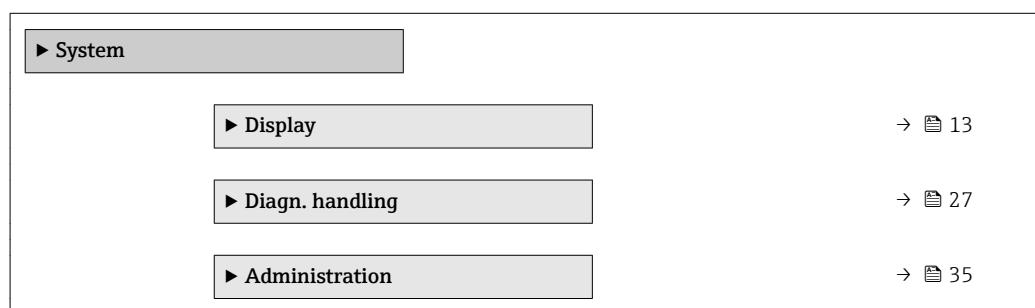
**Ent. access code****Navigation**
 Expert → Ent. access code
**Description**

Use this function to enter the user-specific release code to remove parameter write protection.

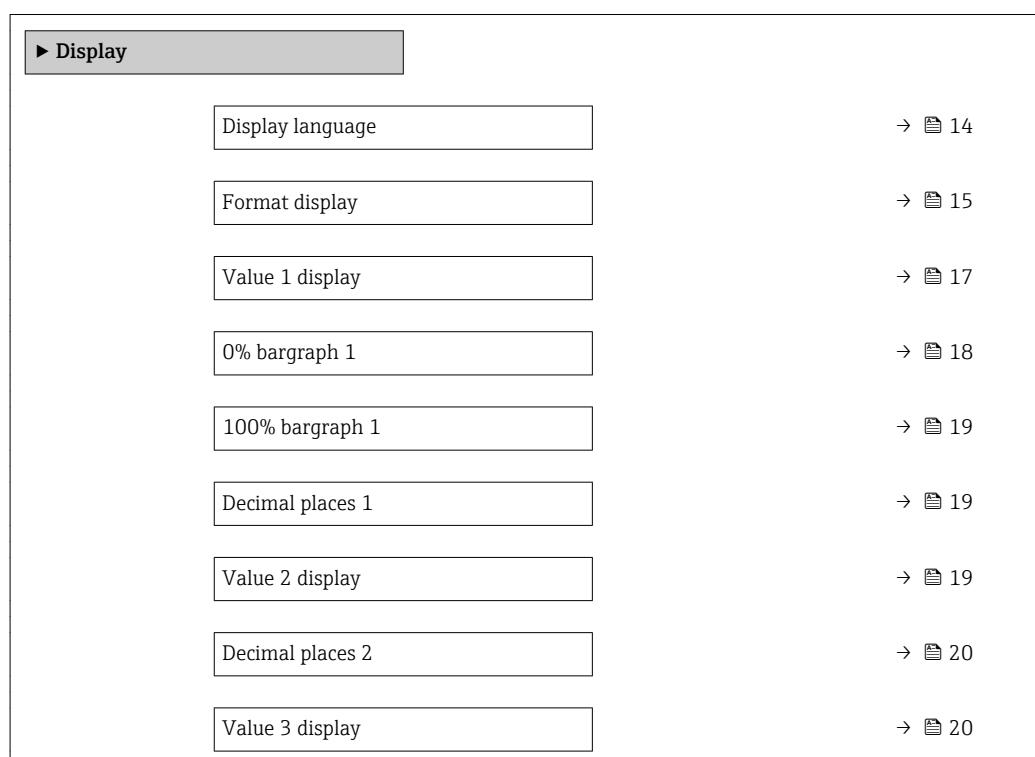
**User entry**

0 to 9 999

### 3.1 "System" submenu

*Navigation*
 Expert → System


#### 3.1.1 "Display" submenu

*Navigation*
 Expert → System → Display


0% bargraph 3	→  21
100% bargraph 3	→  21
Decimal places 3	→  22
Value 4 display	→  22
Decimal places 4	→  23
Display interval	→  23
Display damping	→  24
Header	→  24
Header text	→  25
Separator	→  25
Contrast display	→  26
Backlight	→  26
Access stat.disp	→  26

## Display language

### Navigation

Expert → System → Display → Display language

### Prerequisite

A local display is provided.

### Description

Use this function to select the configured language on the local display.

### Selection

- English
- Deutsch \*
- Français \*
- Español \*
- Italiano \*
- Nederlands \*
- Portuguesa \*
- Polski \*
- русский язык(Ru) \*
- Svenska \*
- Türkçe \*
- 中文 (Chinese) \*
- 日本語 (Japanese) \*

\* Visibility depends on order options or device settings

- 한국어 (Korean) \*
- Bahasa Indonesia \*
- tiếng Việt (Viet) \*
- čeština (Czech) \*

<b>Factory setting</b>	English (alternatively, the ordered language is preset in the device)
------------------------	---

---

## Format display

---

**Navigation**  Expert → System → Display → Format display

**Prerequisite** A local display is provided.

**Description** Use this function to select how the measured value is shown on the local display.

- Selection**
- 1 value, max.
  - Bargr. + 1 value
  - 2 values
  - Val. large+2val.
  - 4 values

**Factory setting** 1 value, max.

**Additional information** *Description*

The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.

-  ■ The **Value 1 display** parameter (→ 17) to **Value 4 display** parameter (→ 22) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured via the **Display interval** parameter (→ 23).

---

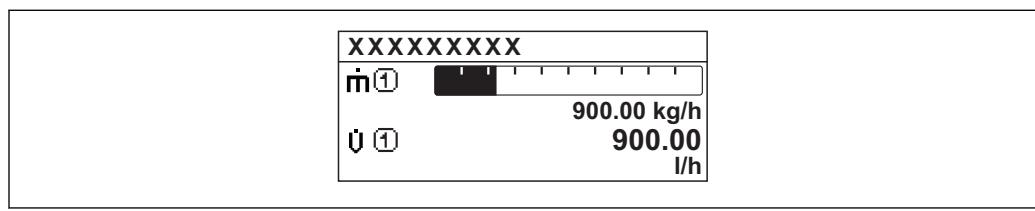
\* Visibility depends on order options or device settings

Possible measured values shown on the local display:

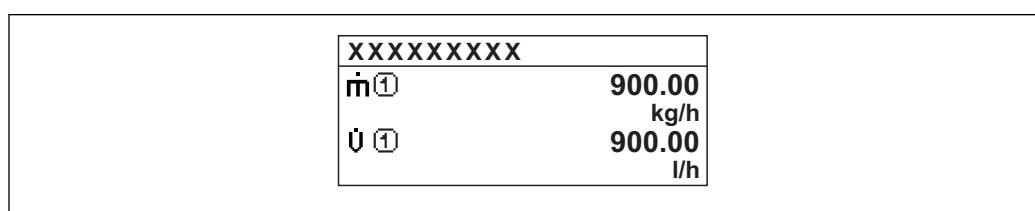
"1 value, max." option



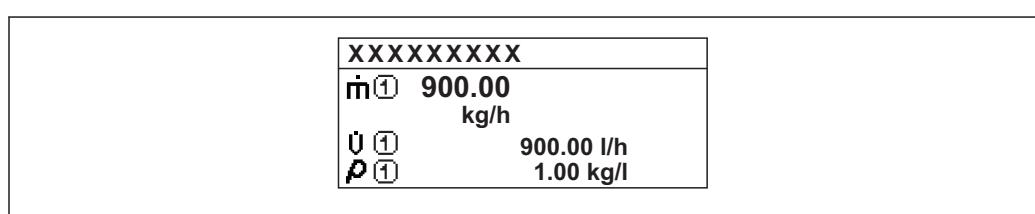
"Bagr. + 1 value" option



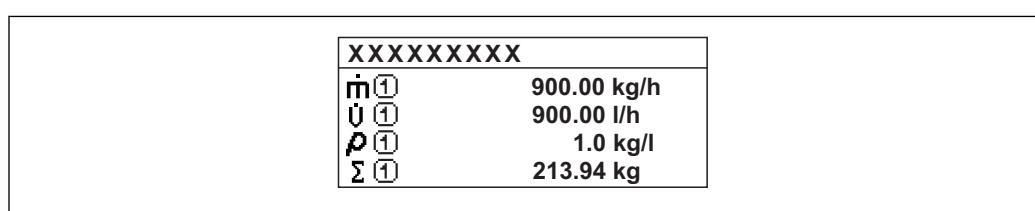
"2 values" option



"Val. large+2val." option



"4 values" option



**Value 1 display****Navigation**

Expert → System → Display → Value 1 display

**Prerequisite**

A local display is provided.

**Description**

Use this function to select one of the measured values to be shown on the local display.

**Selection**

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl.\*
- Density
- Ref.density
- Concentration \*
- Dynam. viscosity \*
- Kinematic visc.
- TempCompDynVisc \*
- TempCompKinVisc \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 \*
- Freq. fluct. 0
- Freq. fluct. 1 \*
- Osc. ampl. 0 \*
- Osc. ampl. 1 \*
- Freq. fluct. 0
- Osc. damping 0
- Osc. damping 1 \*
- Damping fluct 0
- Damping fluct 1
- Signal asymmetry
- Exc. current 0
- Exc. current 1 \*
- Sensor integrity \*
- None
- Totalizer 1
- Totalizer 2
- Totalizer 3

**Factory setting**

Mass flow

---

\* Visibility depends on order options or device settings

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the first value to be displayed. The value is only displayed during normal operation.

 The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Dependency*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

*Selection*

- **Oscil. frequency** option

Displays the current oscillation frequency of the measuring tubes. This frequency depends on the density of the medium.

- **Oscil. amplitude** option

Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100 % under optimum conditions.

- **Oscil. damping** option

Displays the current oscillation damping. Oscillation damping is an indicator of the sensor's current need for excitation power.

- **Signal asymmetry** option

Displays the relative difference between the oscillation amplitude at the inlet and outlet of the sensor. The measured value is the result of production tolerances of the sensor coils and should remain constant over the life time of a sensor.

---

**0% bargraph 1****Navigation**

 Expert → System → Display → 0% bargraph 1

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter the 0% bar graph value to be shown on the display for the measured value 1.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg/h
- 0 lb/min

**Additional information***Description*

 The **Format display** parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

*User entry*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

---

**100% bargraph 1**

<b>Navigation</b>	Expert → System → Display → 100% bargraph 1
<b>Prerequisite</b>	A local display is provided.
<b>Description</b>	Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Depends on country and nominal diameter →  137
<b>Additional information</b>	<i>Description</i> The <b>Format display</b> parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph.  <i>User entry</i> The unit of the displayed measured value is taken from the <b>System units</b> submenu (→  49).

---

**Decimal places 1**

<b>Navigation</b>	Expert → System → Display → Decimal places 1
<b>Prerequisite</b>	A measured value is specified in the <b>Value 1 display</b> parameter (→  17).
<b>Description</b>	Use this function to select the number of decimal places for measured value 1.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ X</li><li>■ X.X</li><li>■ X.XX</li><li>■ X.XXX</li><li>■ X.XXXX</li></ul>
<b>Factory setting</b>	X.XX
<b>Additional information</b>	<i>Description</i> This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

---

**Value 2 display**

<b>Navigation</b>	Expert → System → Display → Value 2 display
<b>Prerequisite</b>	A local display is provided.

**Description** Use this function to select one of the measured values to be shown on the local display.

**Selection** For the picklist, see the **Value 1 display** parameter (→ 17)

**Factory setting** None

**Additional information** *Description*

If several measured values are displayed at once, the measured value selected here will be the second value to be displayed. The value is only displayed during normal operation.

**i** The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Dependency*

**i** The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

## Decimal places 2



**Navigation** Expert → System → Display → Decimal places 2

**Prerequisite** A measured value is specified in the **Value 2 display** parameter (→ 19).

**Description** Use this function to select the number of decimal places for measured value 2.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting** X.XX

**Additional information** *Description*

**i** This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

## Value 3 display



**Navigation** Expert → System → Display → Value 3 display

**Prerequisite** A local display is provided.

**Description** Use this function to select one of the measured values to be shown on the local display.

**Selection** For the picklist, see the **Value 1 display** parameter (→ 17)

**Factory setting** None

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the third value to be displayed. The value is only displayed during normal operation.



The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Selection*

The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

**0% bargraph 3****Navigation**

Expert → System → Display → 0% bargraph 3

**Prerequisite**

A selection was made in the **Value 3 display** parameter (→ 20).

**Description**

Use this function to enter the 0% bar graph value to be shown on the display for the measured value 3.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg/h
- 0 lb/min

**Additional information***Description*

The **Format display** parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

*User entry*

The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

**100% bargraph 3****Navigation**

Expert → System → Display → 100% bargraph 3

**Prerequisite**

A selection was made in the **Value 3 display** parameter (→ 20).

**Description**

Use this function to enter the 100% bar graph value to be shown on the display for the measured value 3.

**User entry**

Signed floating-point number

**Factory setting**

0

**Additional information***Description*

 The **Format display** parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

*User entry*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

---

**Decimal places 3****Navigation**

  Expert → System → Display → Decimal places 3

**Prerequisite**

A measured value is specified in the **Value 3 display** parameter (→ 20).

**Description**

Use this function to select the number of decimal places for measured value 3.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting**

x.xx

**Additional information***Description*

 This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

---

**Value 4 display****Navigation**

  Expert → System → Display → Value 4 display

**Prerequisite**

A local display is provided.

**Description**

Use this function to select one of the measured values to be shown on the local display.

**Selection**

For the picklist, see the **Value 1 display** parameter (→ 17)

**Factory setting**

None

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the fourth value to be displayed. The value is only displayed during normal operation.



The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Selection*

The unit of the displayed measured value is taken from the **System units** submenu (→ 49).

---

**Decimal places 4****Navigation**

Expert → System → Display → Decimal places 4

**Prerequisite**

A measured value is specified in the **Value 4 display** parameter (→ 22).

**Description**

Use this function to select the number of decimal places for measured value 4.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting**

X.XX

**Additional information***Description*

This setting does not affect the measuring or computational accuracy of the device.

The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

---

**Display interval****Navigation**

Expert → System → Display → Display interval

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter the length of time the measured values are displayed if the values alternate on the display.

**User entry**

1 to 10 s

**Factory setting**

5 s

**Additional information***Description*

This type of alternating display only occurs automatically if the number of measured values defined exceeds the number of values the selected display format can display simultaneously.



- The **Value 1 display** parameter (→ 17) to **Value 4 display** parameter (→ 22) are used to specify which measured values are shown on the local display.
- The display format of the displayed measured values is specified using the **Format display** parameter (→ 15).

**Display damping****Navigation**

Expert → System → Display → Display damping

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter a time constant for the reaction time of the local display to fluctuations in the measured value caused by process conditions.

**User entry**

0.0 to 999.9 s

**Factory setting**

0.0 s

**Additional information***User entry*

Use this function to enter a time constant (PT1 element<sup>1)</sup>) for display damping:

- If a low time constant is entered, the display reacts particularly quickly to fluctuating measured variables.
- On the other hand, the display reacts more slowly if a high time constant is entered.



Damping is switched off if **0** is entered (factory setting).

**Header****Navigation**

Expert → System → Display → Header

**Prerequisite**

A local display is provided.

**Description**

Use this function to select the contents of the header of the local display.

**Selection**

- Device tag
- Free text

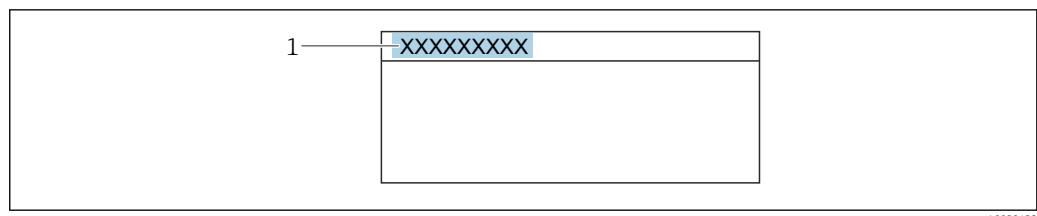
**Factory setting**

Device tag

**Additional information***Description*

The header text only appears during normal operation.

1) proportional transmission behavior with first order delay



1 Position of the header text on the display

#### *Selection*

- Device tag  
Is defined in the **Device tag** parameter (→ 121).
- Free text  
Is defined in the **Header text** parameter (→ 25).

---

## Header text



### Navigation

Expert → System → Display → Header text

### Prerequisite

In the **Header** parameter (→ 24), the **Free text** option is selected.

### Description

Use this function to enter a customer-specific text for the header of the local display.

### User entry

Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

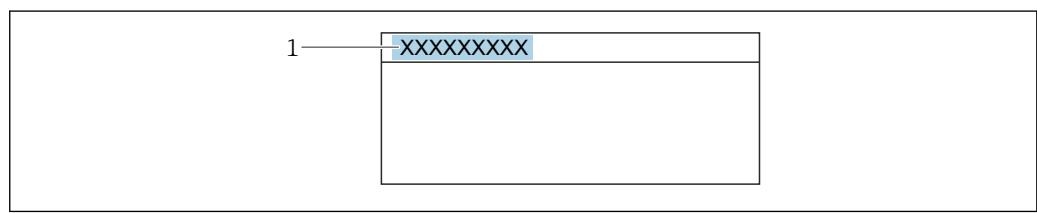
### Factory setting

-----

### Additional information

#### *Description*

The header text only appears during normal operation.



1 Position of the header text on the display

#### *User entry*

The number of characters displayed depends on the characters used.

---

## Separator



### Navigation

Expert → System → Display → Separator

### Prerequisite

A local display is provided.

**Description** Use this function to select the decimal separator.

**Selection**

- . (point)
- , (comma)

**Factory setting** . (point)

---

## Contrast display

---

**Navigation**  Expert → System → Display → Contrast display

**Prerequisite** A local display is provided.

**Description** Use this function to enter a value to adapt the display contrast to the ambient conditions (e.g. the lighting or viewing angle).

**User entry** 20 to 80 %

**Factory setting** Depends on the display

---

## Backlight

---

**Navigation**  Expert → System → Display → Backlight

**Description** Use this function to switch the backlight of the local display on and off.

**Selection**

- Disable
- Enable

**Factory setting** Enable

---

## Access stat.disp

---

**Navigation**  Expert → System → Display → Access stat.disp

**Prerequisite** A local display is provided.

**Description** Displays the access authorization to the parameters via the local display.

**User interface**

- Operator
- Maintenance

**Factory setting** Operator

**Additional information***Description*

If the -symbol appears in front of a parameter, it cannot be modified via the local display with the current access authorization.

 Access authorization can be modified via the **Ent. access code** parameter (→  13).

 For information about the **Ent. access code** parameter: see the "Disabling write protection via the access code" section of the Operating Instructions for the device

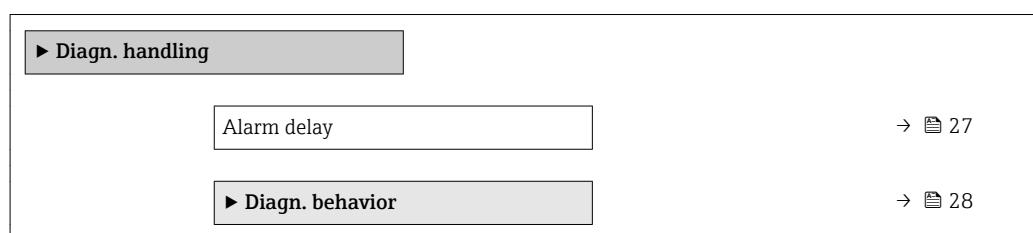
 If additional write protection is active, this restricts the current access authorization even further.

*Display*

 Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device

**3.1.2 "Diagn. handling" submenu***Navigation*

  Expert → System → Diagn. handling

**Alarm delay***Navigation*

  Expert → System → Diagn. handling → Alarm delay

*Description*

Use this function to enter the time interval until the device generates a diagnostic message.

 The diagnostic message is reset without a time delay.

*User entry*

0 to 60 s

*Factory setting*

0 s

*Additional information**Result*

This setting affects the following diagnostic messages:

- 046 Sensor limit
- 140 Sensor sig.asym.
- 144 MeasErrorTooHigh
- 190 Special event 1
- 191 Special event 5
- 192 Special event 9

- 830 Sensor temp.
- 831 Sensor temp.
- 832 Electronic temp.
- 833 Electronic temp.
- 834 Process temp.
- 835 Process temp.
- 843 Process limit
- 862 Partly filled
- 910 Tube not oscill.
- 912 Medium inhomog.
- 913 Medium unsuitab.
- 944 MonitoringFailed
- 990 Special event 4
- 991 Special event 8
- 992 Special event 12

#### "Diagn. behavior" submenu

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagn. behavior** submenu (→ 28).

The following options are available in the **Assign behavior of diagnostic no. xxx** parameters:

Options	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.
Warning	The device continues to measure. The totalizers are not affected. A diagnostic message is generated.
Logbook only	The device continues to measure. The diagnostic message is entered only in the <b>Event logbook</b> submenu (→ 118) ( <b>Event list</b> submenu (→ 119)) and is not displayed in alternation with the measured value display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.

 For a list of all the diagnostic events, see the Operating Instructions for the device

*Navigation*

  Expert → System → Diagn. handling → Diagn. behavior

**► Diagn. behavior**

Diagnostic no. 140	→ 29
Diagnostic no. 046	→ 29
Diagnostic no. 144	→ 30
Diagnostic no. 832	→ 30
Diagnostic no. 833	→ 31

Diagnostic no. 834	→  31
Diagnostic no. 835	→  31
Diagnostic no. 912	→  32
Diagnostic no. 913	→  32
Diagnostic no. 944	→  32
Diagnostic no. 948	→  33
Diagnostic no. 192	→  33
Diagnostic no. 274	→  33
Diagnostic no. 392	→  34
Diagnostic no. 592	→  34
Diagnostic no. 992	→  34

**Diagnostic no. 140 (Sensor sig.asym.)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140

**Description**

Use this function to change the diagnostic behavior of the diagnostic message **140 Sensor sig.asym..**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 046 (Sensor limit)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046

**Description**

Option for changing the diagnostic behavior of the diagnostic message **046 Sensor limit.**

<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

---

**Diagnostic no. 144 (MeasErrorTooHigh)**

---

<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>144 MeasErrorTooHigh</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Alarm
<b>Additional information</b>	 For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

---

**Diagnostic no. 832 (Electronic temp.)**

---

<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832
<b>Description</b>	Use this function to change the diagnostic behavior of the diagnostic message <b>832 Electronic temp.</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

---

**Diagnostic no. 833 (Electronic temp.)**

---



<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833
<b>Description</b>	Use this function to change the diagnostic behavior of the diagnostic message <b>833 Electronic temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

---

**Diagnostic no. 834 (Process temp.)**

---



<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834
<b>Description</b>	Use this function to change the diagnostic behavior of the diagnostic message <b>834 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

---

**Diagnostic no. 835 (Process temp.)**

---



<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835
<b>Description</b>	Use this function to change the diagnostic behavior of the diagnostic message <b>835 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

**Diagnostic no. 912 (Medium inhomog.)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912

**Description** Option for changing the diagnostic behavior of the diagnostic message **912 Medium inhomog..**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

**Additional information** For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 913 (Medium unsuitab.)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913

**Description** Option for changing the diagnostic behavior of the diagnostic message **913 Medium unsuitab..**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

**Additional information** For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 944 (MonitoringFailed)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944

**Description** Option for changing the diagnostic behavior of the diagnostic message **944 MonitoringFailed.**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

**Additional information** For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 948 (Oscill. damping)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>948 Oscill. damping</b> .
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ Alarm</li> <li>▪ Warning</li> <li>▪ Logbook only</li> </ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

**Diagnostic no. 192 (Special event 9)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 192
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>192 Special event 9</b> .
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ Alarm</li> <li>▪ Warning</li> <li>▪ Logbook only</li> </ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

**Diagnostic no. 374 (Sensor electron.)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 274
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>374 Sensor electron..</b>
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ Alarm</li> <li>▪ Warning</li> <li>▪ Logbook only</li> </ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	For a detailed description of the options available, see → <a href="#">28</a> → <a href="#">28</a>

**Diagnostic no. 392 (Special event 10)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 392

**Description** Option for changing the diagnostic behavior of the diagnostic message **392 Special event 10.**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

**Additional information** For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 592 (Special event 11)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 592

**Description** Option for changing the diagnostic behavior of the diagnostic message **592 Special event 11.**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

**Additional information** For a detailed description of the options available, see → 28 → 28

**Diagnostic no. 992 (Special event 12)**

**Navigation** Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 992

**Description** Option for changing the diagnostic behavior of the diagnostic message **992 Special event 12.**

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting** Warning

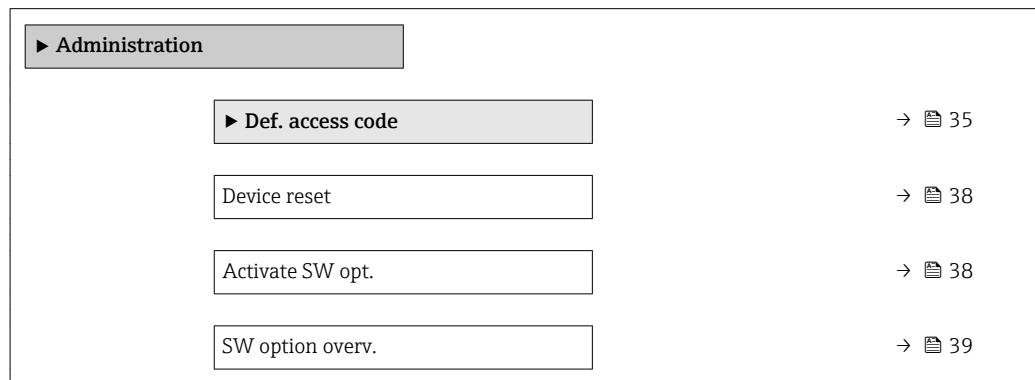
**Additional information**

For a detailed description of the options available, see → [28](#) → [28](#)

### 3.1.3 "Administration" submenu

*Navigation*

Expert → System → Administration



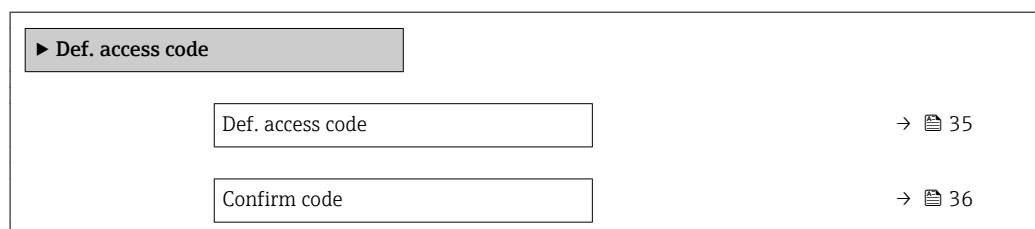
#### "Def. access code" wizard

The **Def. access code** wizard (→ [35](#)) is only available when operating via the local display or Web browser.

If operating via the operating tool, the **Def. access code** parameter (→ [37](#)) can be found directly in the **Administration** submenu. There is no **Confirm code** parameter if the device is operated via the operating tool.

*Navigation*

Expert → System → Administration → Def. access code




---

## Def. access code



### Navigation

Expert → System → Administration → Def. access code → Def. access code

### Description

Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the configuration of the device against any inadvertent changes via the local display or Web browser.

**User entry** 0 to 9 999

**Factory setting** 0

**Additional information***Description*

The write protection affects all parameters in the document marked with the  symbol.

On the local display, the  symbol in front of a parameter indicates that the parameter is write-protected.

The parameters that cannot be write-accessed are grayed out in the Web browser.

 Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Ent. access code** parameter (→  13).

 If you lose the access code, please contact your Endress+Hauser sales organization.

*User entry*

A message is displayed if the access code is not in the input range.

*Factory setting*

If the factory setting is not changed or **0** is defined as the access code, the parameters are not write-protected and the device configuration data can be modified. The user is logged on in the "**Maintenance**" role.

**Confirm code****Navigation**

 Expert → System → Administration → Def. access code → Confirm code

**Description**

Enter the defined release code a second time to confirm the release code.

**User entry**

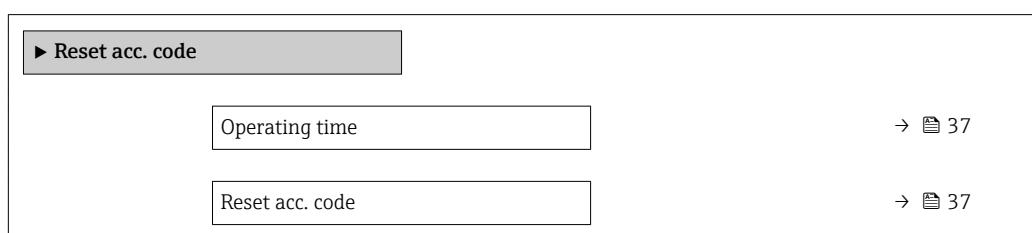
0 to 9 999

**Factory setting**

0

**"Reset access code" submenu***Navigation*

  Expert → System → Administration → Reset acc. code



---

## Operating time

---

**Navigation**   Expert → Diagnostics → Operating time  
  Diagnostics → Operating time

**Description** Use this function to display the length of time the device has been in operation.

**User interface** Days (d), hours (h), minutes (m) and seconds (s)

**Additional information** *User interface*  
The maximum number of days is 9999, which is equivalent to 27 years.

---

## Reset acc. code

---

**Navigation**   Expert → System → Administration → Reset acc. code → Reset acc. code

**Description** Use this function to enter a reset code to reset the user-specific release code to the factory setting.

**User entry** Character string comprising numbers, letters and special characters

**Factory setting** 0x00

**Additional information** *Description*

 For a reset code, contact your Endress+Hauser service organization.

*User entry*

The reset code can only be entered via:

- Web browser
- DeviceCare, FieldCare (via interface CDI RJ45)
- Fieldbus

### Additional parameters in the "Administration" submenu

---

## Def. access code

---



**Navigation**  Expert → System → Administration → Def. access code

**Description** Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the configuration of the device against any inadvertent changes via the operating tool.

**User entry** 0 to 9 999

**Factory setting** 0

**Additional information** *Description*

The write protection affects all parameters in the document marked with the  symbol.

 Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Ent. access code** parameter (→ 13).

 If you lose the access code, please contact your Endress+Hauser sales organization.

*User entry*

A message is displayed if the access code is not in the input range.

*Factory setting*

If the factory setting is not changed or 0 is defined as the access code, the parameters are not write-protected and the device configuration data can be modified. The user is logged on in the "Maintenance" role.

## Device reset



**Navigation**

  Expert → System → Administration → Device reset

**Description**

Use this function to choose whether to reset the device configuration - either entirely or in part - to a defined state.

**Selection**

- Cancel
- To delivery set.
- Restart device

**Factory setting**

Cancel

**Additional information**

*Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
To delivery set.	Every parameter for which a customer-specific default setting was ordered is reset to this customer-specific value. All other parameters are reset to the factory setting.   This option is not visible if no customer-specific settings have been ordered.
Restart device	The restart resets every parameter whose data are in the volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.

## Activate SW opt.



**Navigation**

  Expert → System → Administration → Activate SW opt.

**Description**

Use this function to enter an activation code to enable an additional, ordered software option.

<b>User entry</b>	Max. 10-digit string consisting of numbers.
<b>Factory setting</b>	Depends on the software option ordered
<b>Additional information</b>	<p><i>Description</i></p> <p>If a measuring device was ordered with an additional software option, the activation code is programmed in the device at the factory.</p> <p><i>User entry</i></p> <p> To activate a software option subsequently, please contact your Endress+Hauser sales organization.</p> <p><b>NOTE!</b></p> <p><b>The activation code is linked to the serial number of the measuring device and varies according to the device and software option.</b></p> <p>If an incorrect or invalid code is entered, this results in the loss of software options that have already been activated.</p> <ul style="list-style-type: none"> <li>▶ Before you enter a new activation code, make a note of the current activation code .</li> <li>▶ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.</li> <li>▶ Once the activation code has been entered, check if the new software option is displayed in the <b>SW option overv.</b> parameter (→ 39).</li> <li>↳ The new software option is active if it is displayed.</li> <li>↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.</li> <li>▶ If the code entered is incorrect or invalid, enter the old activation code .</li> <li>▶ Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.</li> </ul> <p><i>Example for a software option</i></p> <p>Order code for "Application package", option <b>EB</b> "Heartbeat Verification + Monitoring"</p> <p> The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→ 39).</p> <p><i>Web browser</i></p> <p> Once a software option has been activated, the page must be loaded again in the Web browser.</p>

---

## SW option overv.

---

<b>Navigation</b>	 Expert → System → Administration → SW option overv.
<b>Description</b>	Displays all the software options that are enabled in the device.
<b>User interface</b>	<ul style="list-style-type: none"> <li>▪ HBT Verification</li> <li>▪ HBT Monitoring</li> <li>▪ Concentration</li> <li>▪ Viscosity</li> </ul>

**Additional information***Description*

Displays all the options that are available if ordered by the customer.

*"HBT Verification" option and "HBT Monitoring" option*

Order code for "Application package", option **EB** "Heartbeat Verification + Monitoring"

*"Concentration" option*

Order code for "Application package", option **ED** "Concentration" and option **EE** "Special density"

*"Viscosity" option*

 Only available for Promass I.

Order code for "Application package", option **EG** "Viscosity"

## 3.2 "Sensor" submenu

*Navigation*

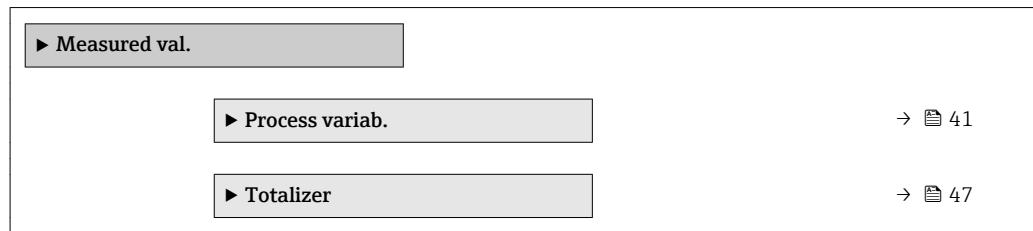
 Expert → Sensor

<b>► Sensor</b>	
<b>► Measured val.</b>	→  41
<b>► System units</b>	→  49
<b>► Process param.</b>	→  64
<b>► Measurement mode</b>	→  72
<b>► External comp.</b>	→  74
<b>► Calculated value</b>	→  77
<b>► Sensor adjustm.</b>	→  80
<b>► Calibration</b>	→  86
<b>► Supervision</b>	→  88

### 3.2.1 "Measured val." submenu

*Navigation*

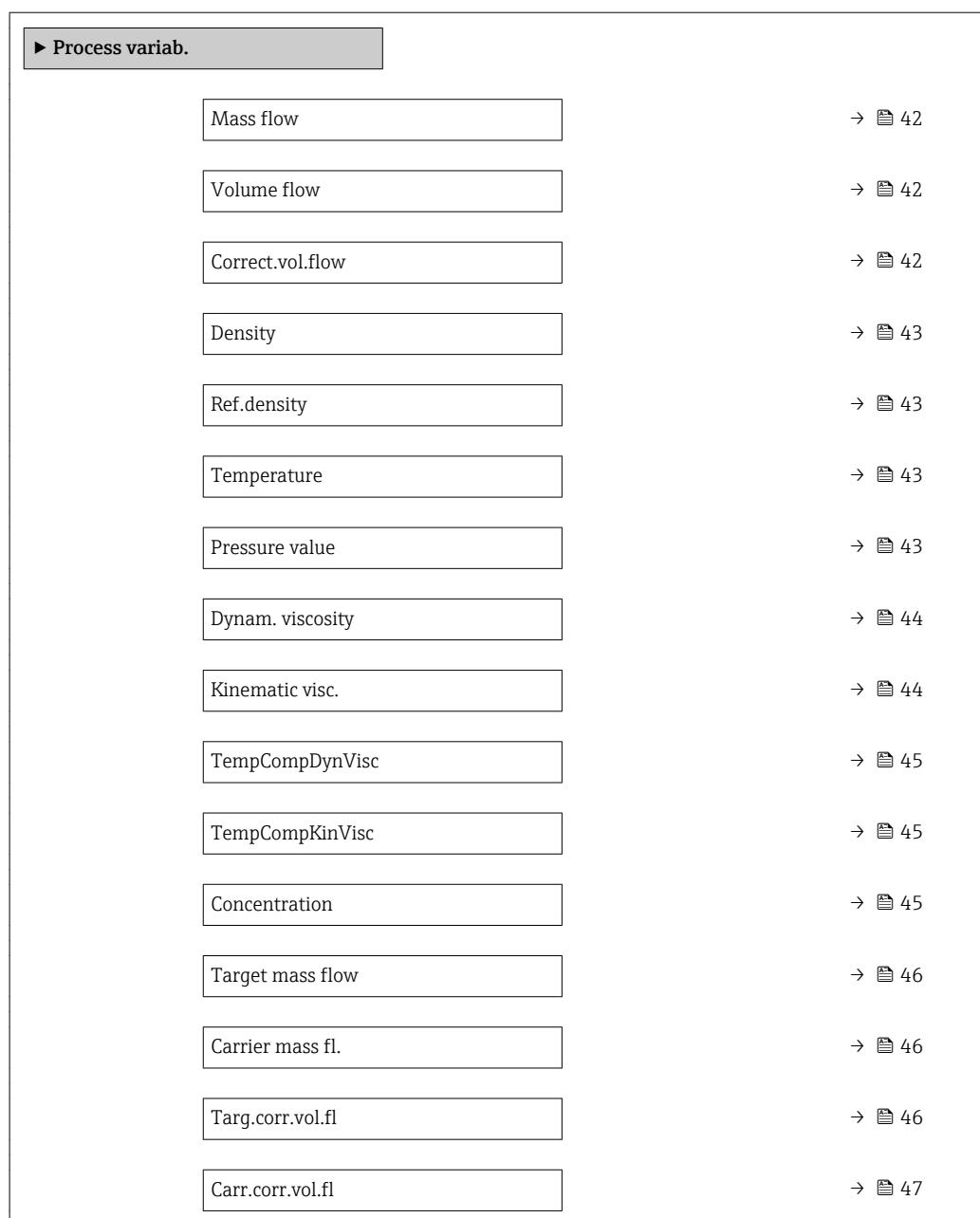
Expert → Sensor → Measured val.



#### "Process variab." submenu

*Navigation*

Expert → Sensor → Measured val. → Process variab.



Target vol. flow	→  47
Carrier vol. fl.	→  47

---

## Mass flow

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Mass flow

**Description** Displays the mass flow that is currently measured.

**User interface** Signed floating-point number

**Additional information** *Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 50)

---

## Volume flow

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Volume flow

**Description** Displays the volume flow currently calculated.

**User interface** Signed floating-point number

**Additional information** *Description*

The volume flow is calculated from the mass flow currently measured and the density currently measured.

*Dependency*

The unit is taken from the **Volume flow unit** parameter (→ 51)

---

## Correct.vol.flow

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow

**Description** Displays the corrected volume flow currently measured.

**User interface** Signed floating-point number

**Additional information** *Dependency*

The unit is taken from the **Cor.volflow unit** parameter (→ 53)

## Density

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → Density
<b>Description</b>	Displays the density currently measured.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Density unit</b> parameter (→ <a href="#">55</a> )

---

## Ref.density

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → Ref.density
<b>Description</b>	Displays the reference density currently calculated.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Ref. dens. unit</b> parameter (→ <a href="#">56</a> )

---

## Temperature

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → Temperature
<b>Description</b>	Displays the medium temperature currently measured.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Temperature unit</b> parameter (→ <a href="#">56</a> )

---

## Pressure value

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → Pressure value
<b>Description</b>	Displays the fixed or external pressure value.
<b>User interface</b>	Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Pressure unit** parameter (→ [57](#))

---

**Dynam. viscosity**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Dynam. viscosity

**Prerequisite**

For the following order code:

"Application package", option **EG "Viscosity"**



The software options currently enabled are displayed in the **SW option overv.** parameter (→ [39](#)).

**Description**

Displays the dynamic viscosity currently calculated.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Dyn. visc. unit** parameter.

---

**Kinematic visc.**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Kinematic visc.

**Prerequisite**

For the following order code:

"Application package", option **EG "Viscosity"**



The software options currently enabled are displayed in the **SW option overv.** parameter (→ [39](#)).

**Description**

Displays the kinematic viscosity currently calculated.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Kin. visc. unit** parameter.

---

## TempCompDynVisc

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → TempCompDynVisc
<b>Prerequisite</b>	For the following order code: "Application package", option <b>EG</b> "Viscosity"  The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  39).
<b>Description</b>	Displays the temperature compensation currently calculated for the viscosity.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Dyn. visc. unit</b> parameter.

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## TempCompKinVisc

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<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → TempCompKinVisc
<b>Prerequisite</b>	For the following order code: "Application package", option <b>EG</b> "Viscosity"  The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  39).
<b>Description</b>	Displays the temperature compensation currently calculated for the kinetic viscosity.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Kin. visc. unit</b> parameter.

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## Concentration

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<b>Navigation</b>	 Expert → Sensor → Measured val. → Process variab. → Concentration
<b>Prerequisite</b>	For the following order code: "Application package", option <b>ED</b> "Concentration"  The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  39).
<b>Description</b>	Displays the concentration currently calculated.
<b>User interface</b>	Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Concentr. unit** parameter.

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**Target mass flow**

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**Navigation**

④ ⑤ Expert → Sensor → Measured val. → Process variab. → Target mass flow

**Prerequisite**

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- The **WT-%** option or the **User conc.** option is selected in the **Concentr. unit** parameter.



The software options currently enabled are displayed in the **SW option overv.** parameter (→ ④ 39).

**Description**

Displays the mass flow currently measured for the target medium.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Mass flow unit** parameter (→ ④ 50)

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**Carrier mass fl.**

---

**Navigation**

④ ⑤ Expert → Sensor → Measured val. → Process variab. → Carrier mass fl.

**Prerequisite**

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- The **WT-%** option or the **User conc.** option is selected in the **Concentr. unit** parameter.



The software options currently enabled are displayed in the **SW option overv.** parameter (→ ④ 39).

**Description**

Displays the mass flow currently measured for the carrier medium.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Mass flow unit** parameter (→ ④ 50)

---

**Targ.corr.vol.fl**

---

**Navigation**

④ ⑤ Expert → Sensor → Measured val. → Process variab. → Targ.corr.vol.fl

**User interface**

Signed floating-point number

**Factory setting** 0 NL/h

### Carr.corr.vol.fl

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Carr.corr.vol.fl

**User interface** Signed floating-point number

**Factory setting** 0 NL/h

### Target vol. flow

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Target vol. flow

**User interface** Signed floating-point number

**Factory setting** 0 l/h

### Carrier vol. fl.

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Carrier vol. fl.

**User interface** Signed floating-point number

**Factory setting** 0 l/h

### "Totalizer" submenu

*Navigation*  Expert → Sensor → Measured val. → Totalizer

► Totalizer

Totalizer val. 1 to n

→  48

Tot. overflow 1 to n

→  48

**Totalizer val. 1 to n****Navigation**

Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to n

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*

**Description**

Displays the current totalizer reading.

**User interface**

Signed floating-point number

**Additional information***Description*

As it is only possible to display a maximum of 7 digits in the operating tool, the current counter value is the sum of the totalizer value and the overflow value from the **Tot. overflow 1 to n** parameter if the display range is exceeded.

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 111).

*User interface*

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 109).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 107).

*Example*

Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

- Value in the **Totalizer val. 1** parameter: 1968457 m<sup>3</sup>
- Value in the **Tot. overflow 1** parameter: 1 · 10<sup>7</sup> (1 overflow) = 10 000 000 [m<sup>3</sup>]
- Current totalizer reading: 11 968 457 m<sup>3</sup>

**Tot. overflow 1 to n****Navigation**

Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to n

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*

**Description**

Displays the current totalizer overflow.

\* Visibility depends on order options or device settings

**User interface** Integer with sign

**Additional information** *Description*

If the current totalizer reading exceeds 7 digits, which is the maximum value range that can be displayed by the operating tool, the value above this range is output as an overflow. The current totalizer value is therefore the sum of the overflow value and the totalizer value from the **Totalizer val. 1 to n** parameter.

*User interface*

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [107](#)).

*Example*

Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

- Value in the **Totalizer val. 1** parameter: 1 968 457 m<sup>3</sup>
- Value in the **Tot. overflow 1** parameter:  $2 \cdot 10^7$  (2 overflows) = 20 000 000 [m<sup>3</sup>]
- Current totalizer reading: 21 968 457 m<sup>3</sup>

### 3.2.2 "System units" submenu

*Navigation*

  Expert → Sensor → System units

<b>► System units</b>	
Mass flow unit	→ <a href="#">50</a>
Mass unit	→ <a href="#">50</a>
Volume flow unit	→ <a href="#">51</a>
Volume unit	→ <a href="#">53</a>
Cor.volflow unit	→ <a href="#">53</a>
Corr. vol. unit	→ <a href="#">54</a>
Density unit	→ <a href="#">55</a>
Ref. dens. unit	→ <a href="#">56</a>
Temperature unit	→ <a href="#">56</a>
Pressure unit	→ <a href="#">57</a>
Date/time format	→ <a href="#">57</a>
<b>► User-spec. units</b>	
	→ <a href="#">58</a>

**Mass flow unit****Navigation**

Expert → Sensor → System units → Mass flow unit

**Description**

Use this function to select the unit for the mass flow.

**Selection***SI units*

- g/s
- g/min
- g/h
- g/d
- kg/s
- kg/min
- kg/h
- kg/d
- t/s
- t/min
- t/h
- t/d

*US units*

- oz/s
- oz/min
- oz/h
- oz/d
- lb/s
- lb/min
- lb/h
- lb/d
- STon/s
- STon/min
- STon/h
- STon/d

*Custom-specific units*

- User mass/s
- User mass/min
- User mass/h
- User mass/d

**Factory setting***Country-specific:*

- kg/h (DN > 150 (6"): t/h)
- lb/min

**Additional information***Result*

The selected unit applies for:

- **Target mass flow** parameter (→ [46](#))
- **Carrier mass fl.** parameter (→ [46](#))
- **Mass flow** parameter (→ [42](#))

*Selection*

For an explanation of the abbreviated units: → [141](#)

*Customer-specific units*

The unit for the customer-specific mass is specified in the **Mass text** parameter (→ [59](#)).

**Mass unit****Navigation**

Expert → Sensor → System units → Mass unit

**Description**

Use this function to select the unit for the mass.

Selection	<i>SI units</i>	<i>US units</i>
	<ul style="list-style-type: none"><li>■ g</li><li>■ kg</li><li>■ t</li></ul>	<ul style="list-style-type: none"><li>■ oz</li><li>■ lb</li><li>■ STon</li></ul>
	<i>Custom-specific units</i>	
	User mass	
Factory setting	Country-specific: <ul style="list-style-type: none"><li>■ kg (DN &gt; 150 (6)": t)</li><li>■ lb</li></ul>	
Additional information	<i>Selection</i>   For an explanation of the abbreviated units: → <a href="#">141</a>	
	<i>Customer-specific units</i>   The unit for the customer-specific mass is specified in the <b>Mass text</b> parameter (→ <a href="#">59</a> ).	

---

## Volume flow unit



**Navigation**  Expert → Sensor → System units → Volume flow unit

**Description** Use this function to select the unit for the volume flow.

**Selection**

- | <i>SI units</i>        | <i>US units</i>        | <i>Imperial units</i> |
|------------------------|------------------------|-----------------------|
| ■ cm <sup>3</sup> /s   | ■ af/s                 | ■ gal/s (imp)         |
| ■ cm <sup>3</sup> /min | ■ af/min               | ■ gal/min (imp)       |
| ■ cm <sup>3</sup> /h   | ■ af/h                 | ■ gal/h (imp)         |
| ■ cm <sup>3</sup> /d   | ■ af/d                 | ■ gal/d (imp)         |
| ■ dm <sup>3</sup> /s   | ■ ft <sup>3</sup> /s   | ■ Mgal/s (imp)        |
| ■ dm <sup>3</sup> /min | ■ ft <sup>3</sup> /min | ■ Mgal/min (imp)      |
| ■ dm <sup>3</sup> /h   | ■ ft <sup>3</sup> /h   | ■ Mgal/h (imp)        |
| ■ dm <sup>3</sup> /d   | ■ ft <sup>3</sup> /d   | ■ Mgal/d (imp)        |
| ■ m <sup>3</sup> /s    | ■ fl oz/s (us)         | ■ bbl/s (imp;beer)    |
| ■ m <sup>3</sup> /min  | ■ fl oz/min (us)       | ■ bbl/min (imp;beer)  |
| ■ m <sup>3</sup> /h    | ■ fl oz/h (us)         | ■ bbl/h (imp;beer)    |
| ■ m <sup>3</sup> /d    | ■ fl oz/d (us)         | ■ bbl/d (imp;beer)    |
| ■ ml/s                 | ■ gal/s (us)           | ■ bbl/s (imp;oil)     |
| ■ ml/min               | ■ gal/min (us)         | ■ bbl/min (imp;oil)   |
| ■ ml/h                 | ■ gal/h (us)           | ■ bbl/h (imp;oil)     |
| ■ ml/d                 | ■ gal/d (us)           | ■ bbl/d (imp;oil)     |
| ■ l/s                  | ■ kgal/s (us)          |                       |
| ■ l/min                | ■ kgal/min (us)        |                       |
| ■ l/h                  | ■ kgal/h (us)          |                       |
| ■ l/d                  | ■ kgal/d (us)          |                       |
| ■ hl/s                 | ■ Mgal/s (us)          |                       |
| ■ hl/min               | ■ Mgal/min (us)        |                       |
| ■ hl/h                 | ■ Mgal/h (us)          |                       |
| ■ hl/d                 | ■ Mgal/d (us)          |                       |
| ■ Ml/s                 | ■ bbl/s (us;liq.)      |                       |
| ■ Ml/min               | ■ bbl/min (us;liq.)    |                       |
| ■ Ml/h                 | ■ bbl/h (us;liq.)      |                       |
| ■ Ml/d                 | ■ bbl/d (us;liq.)      |                       |
|                        | ■ bbl/s (us;beer)      |                       |
|                        | ■ bbl/min (us;beer)    |                       |
|                        | ■ bbl/h (us;beer)      |                       |
|                        | ■ bbl/d (us;beer)      |                       |
|                        | ■ bbl/s (us;oil)       |                       |
|                        | ■ bbl/min (us;oil)     |                       |
|                        | ■ bbl/h (us;oil)       |                       |
|                        | ■ bbl/d (us;oil)       |                       |
|                        | ■ bbl/s (us;tank)      |                       |
|                        | ■ bbl/min (us;tank)    |                       |
|                        | ■ bbl/h (us;tank)      |                       |
|                        | ■ bbl/d (us;tank)      |                       |

*Custom-specific units*

- User vol./s
- User vol./min
- User vol./h
- User vol./d

**Factory setting**

## Country-specific:

- l/h (DN > 150 (6"): m<sup>3</sup>/h)
- gal/min (us)

**Additional information***Result*

The selected unit applies for:  
**Volume flow** parameter (→ 42)

*Selection*

For an explanation of the abbreviated units: → 141

*Customer-specific units*

The unit for the customer-specific volume is specified in the **Volume text** parameter (→ 60).

**Volume unit****Navigation**

Expert → Sensor → System units → Volume unit

**Description**

Use this function to select the unit for the volume.

**Selection***SI units*

- cm<sup>3</sup>
- dm<sup>3</sup>
- m<sup>3</sup>
- ml
- l
- hl
- Ml Mega

*US units*

- af
- ft<sup>3</sup>
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;oil)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;tank)

*Imperial units*

- gal (imp)
- Mgal (imp)
- bbl (imp;beer)
- bbl (imp;oil)

*Custom-specific units*

User vol.

**Factory setting**

Country-specific:

- l (DN > 150 (6"): m<sup>3</sup>)
- gal (us)

**Additional information***Selection*

For an explanation of the abbreviated units: → 141

*Customer-specific units*

The unit for the customer-specific volume is specified in the **Volume text** parameter (→ 60).

**Cor.volflow unit****Navigation**

Expert → Sensor → System units → Cor.volflow unit

**Description**

Use this function to select the unit for the corrected volume flow.

**Selection**

- | <i>SI units</i>        | <i>US units</i>         |
|------------------------|-------------------------|
| ■ NI/s                 | ■ Sft <sup>3</sup> /s   |
| ■ NI/min               | ■ Sft <sup>3</sup> /min |
| ■ NI/h                 | ■ Sft <sup>3</sup> /h   |
| ■ NI/d                 | ■ Sft <sup>3</sup> /d   |
| ■ Nm <sup>3</sup> /s   | ■ Sgal/s (us)           |
| ■ Nm <sup>3</sup> /min | ■ Sgal/min (us)         |
| ■ Nm <sup>3</sup> /h   | ■ Sgal/h (us)           |
| ■ Nm <sup>3</sup> /d   | ■ Sgal/d (us)           |
| ■ Sm <sup>3</sup> /s   | ■ Sbbl/s (us;liq.)      |
| ■ Sm <sup>3</sup> /min | ■ Sbbl/min (us;liq.)    |
| ■ Sm <sup>3</sup> /h   | ■ Sbbl/h (us;liq.)      |
| ■ Sm <sup>3</sup> /d   | ■ Sbbl/d (us;liq.)      |

*Custom-specific units*

- UserCrVol./s
- UserCrVol./min
- UserCrVol./h
- UserCrVol./d

**Factory setting**

Country-specific:

- NI/h (DN > 150 (6"): Nm<sup>3</sup>/h)
- Sft<sup>3</sup>/min

**Additional information***Result*

The selected unit applies for:

**Correct.vol.flow** parameter (→ 42)*Selection*

 For an explanation of the abbreviated units: → 141

**Corr. vol. unit****Navigation**

  Expert → Sensor → System units → Corr. vol. unit

**Description**

Use this function to select the unit for the corrected volume.

**Selection**

- | <i>SI units</i>   | <i>US units</i>    | <i>Imperial units</i> |
|-------------------|--------------------|-----------------------|
| ■ NI              | ■ Sft <sup>3</sup> | Sgal (imp)            |
| ■ Nm <sup>3</sup> | ■ Sgal (us)        |                       |
| ■ Sm <sup>3</sup> | ■ Sbbl (us;liq.)   |                       |

*Custom-specific units*

UserCrVol.

**Factory setting**

Country-specific:

- NI (DN > 150 (6"): Nm<sup>3</sup>)
- Sft<sup>3</sup>

**Additional information***Selection*

For an explanation of the abbreviated units: → [141](#)

**Density unit****Navigation**

Expert → Sensor → System units → Density unit

**Description**

Use this function to select the unit for the density.

**Selection***SI units*

- g/cm<sup>3</sup>
- g/m<sup>3</sup>
- kg/dm<sup>3</sup>
- kg/l
- kg/m<sup>3</sup>
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

*US units*

- lb/ft<sup>3</sup>
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

*Imperial units*

- lb/gal (imp)
- lb/bbl (imp;beer)
- lb/bbl (imp;oil)

*Custom-specific units*

User dens.

**Factory setting**

Country-specific:

- kg/l
- lb/ft<sup>3</sup>

**Additional information***Result*

The selected unit applies for:

**Density** parameter (→ [43](#))

*Selection*

- SD = specific density

The specific density is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).

- SG = specific gravity

The specific gravity is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).



For an explanation of the abbreviated units: → [141](#)

*Customer-specific units*

The unit for the customer-specific density is specified in the **Density text** parameter (→ [62](#)).

---

**Ref. dens. unit****Navigation**

Expert → Sensor → System units → Ref. dens. unit

**Description**

Use this function to select the unit for the reference density.

**Selection**

SI units	US units
■ kg/Nm <sup>3</sup>	lb/Sft <sup>3</sup>
■ kg/Nl	
■ g/Scm <sup>3</sup>	
■ kg/Sm <sup>3</sup>	

**Factory setting**

Country-dependent

- kg/Nl
- lb/Sft<sup>3</sup>

**Additional information***Result*

The selected unit applies for:

- **Ext. ref.density** parameter (→ 78)
- **Fix ref.density** parameter (→ 78)
- **Ref.density** parameter (→ 43)

*Selection*

For an explanation of the abbreviated units: → 141

---

**Temperature unit****Navigation**

Expert → Sensor → System units → Temperature unit

**Description**

Use this function to select the unit for the temperature.

**Selection**

SI units	US units
■ °C	■ °F
■ K	■ °R

**Factory setting**

Country-specific:

- °C
- °F

**Additional information***Result*

The selected unit applies for:

- **Maximum value** parameter (→ 125)
- **Minimum value** parameter (→ 125)
- **Maximum value** parameter (→ 126)
- **Minimum value** parameter (→ 126)
- **Maximum value** parameter (→ 127)
- **Minimum value** parameter (→ 127)
- **External temp.** parameter (→ 76)

- **Ref. temperature** parameter
- **Temperature** parameter (→ [43](#))
- **Ref. temperature** parameter (→ [78](#))

*Selection*

 For an explanation of the abbreviated units: → [141](#)

## Pressure unit



### Navigation

  Expert → Sensor → System units → Pressure unit

### Description

Use this function to select the unit for the pipe pressure.

### Selection

#### SI units

- Pa a
- kPa a
- MPa a
- bar
- Pa g
- kPa g
- MPa g
- bar g

#### US units

- psi a
- psi g

#### Custom-specific units

User pres.

### Factory setting

Country-specific:

- bar a
- psi a

### Additional information

#### Result

The unit is taken from:

- **Pressure value** parameter (→ [75](#))
- **External press.** parameter (→ [75](#))
- **Pressure value** parameter (→ [43](#))

*Selection*

 For an explanation of the abbreviated units: → [141](#)

## Date/time format



### Navigation

  Expert → Sensor → System units → Date/time format

### Description

Use this function to select the desired time format for calibration history.

### Selection

- dd.mm.yy hh:mm
- dd.mm.yy am/pm
- mm/dd/yy hh:mm
- mm/dd/yy am/pm

**Factory setting** dd.mm.yy hh:mm

**Additional information** Selection

 For an explanation of the abbreviated units: → [141](#)

### "User-spec. units" submenu

*Navigation*  Expert → Sensor → System units → User-spec. units

► User-spec. units	
Mass text	→ <a href="#">59</a>
Mass offset	→ <a href="#">59</a>
Mass factor	→ <a href="#">59</a>
Volume text	→ <a href="#">60</a>
Volume offset	→ <a href="#">60</a>
Volume factor	→ <a href="#">61</a>
Corr. vol. text	→ <a href="#">61</a>
Corr vol. offset	→ <a href="#">61</a>
Cor.vol. factor	→ <a href="#">62</a>
Density text	→ <a href="#">62</a>
Density offset	→ <a href="#">62</a>
Density factor	→ <a href="#">62</a>
Pressure text	→ <a href="#">63</a>
Pressure offset	→ <a href="#">63</a>
Pressure factor	→ <a href="#">63</a>

**Mass text****Navigation**

Expert → Sensor → System units → User-spec. units → Mass text

**Description**

Use this function to enter a text for the user-specific unit of mass and mass flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.

**User entry**

Max. 10 characters such as letters, numbers or special characters (@, %, /)

**Factory setting**

User mass

**Additional information**

*Result*

- The defined unit is shown as an option in the choose list of the following parameters:
- **Mass flow unit** parameter (→ 50)
  - **Mass unit** parameter (→ 50)

*Example*

If the text CENT for "centner" is entered, the following options are displayed in the picklist for the **Mass flow unit** parameter (→ 50):

- CENT/s
- CENT/min
- CENT/h
- CENT/d

**Mass offset****Navigation**

Expert → Sensor → System units → User-spec. units → Mass offset

**Description**

Use this function to enter the zero point shift for the user-specific mass and mass flow unit.

**User entry**

Signed floating-point number

**Factory setting**

0

**Additional information**

*Description*

- Value in user-specific unit = (factor × value in base unit) + offset

**Mass factor****Navigation**

Expert → Sensor → System units → User-spec. units → Mass factor

**Description**

Use this function to enter a quantity factor (without time) for the user-specific mass and mass flow unit.

**User entry**

Signed floating-point number

**Factory setting** 1.0

**Additional information** *Example*

Mass of 1 Zentner = 50 kg → 0.02 Zentner = 1 kg → entry: 0.02

---

## Volume text



**Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Volume text

**Description**

Use this function to enter a text for the user-specific unit of volume and volume flow. The corresponding time units (s, min, h, d) for volume flow are generated automatically.

**User entry**

Max. 10 characters such as letters, numbers or special characters (@, %, /)

**Factory setting**

User vol.

**Additional information**

*Result*

- The defined unit is shown as an option in the choose list of the following parameters:
- **Volume flow unit** parameter (→ ④ 51)
  - **Volume unit** parameter (→ ④ 53)

*Example*

If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→ ④ 51) shows the following options:

- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

---

## Volume offset



**Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Volume offset

**Description**

Use this function to enter the offset for adapting the user-specific volume unit and volume flow unit (without time).

**User entry**

Signed floating-point number

**Factory setting**

0

**Additional information**

*Description*

- Value in user-specific unit = (factor × value in base unit) + offset

**Volume factor**

**Navigation** Expert → Sensor → System units → User-spec. units → Volume factor

**Description** Use this function to enter a quantity factor (without time) for the user-specific volume and volume flow unit.

**User entry** Signed floating-point number

**Factory setting** 1.0

**Corr. vol. text**

**Navigation** Expert → Sensor → System units → User-spec. units → Corr. vol. text

**Description** Use this function to enter a text for the user-specific unit of the corrected volume and corrected volume flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.

**User entry** Max. 10 characters such as letters, numbers or special characters (@, %, /)

**Factory setting** UserCrVol.

**Additional information***Result*

- The defined unit is shown as an option in the choose list of the following parameters:
- **Cor.volflow unit** parameter (→ 53)
  - **Corr. vol. unit** parameter (→ 54)

*Example*

If the text GLAS is entered, the choose list of the **Cor.volflow unit** parameter (→ 53) shows the following options:

- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

**Corr vol. offset**

**Navigation** Expert → Sensor → System units → User-spec. units → Corr vol. offset

**Description** Use this function to enter the offset for adapting the user-specific corrected volume unit and corrected volume flow unit (without time).

- Value in user-specific unit = (factor × value in base unit) + offset

**User entry** Signed floating-point number

**Factory setting** 0

**Cor.vol. factor****Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Cor.vol. factor

**Description**

Use this function to enter a quantity factor (without time) for the user-specific corrected volume unit and corrected volume flow unit.

**User entry**

Signed floating-point number

**Factory setting**

1.0

**Density text****Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Density text

**Description**

Use this function to enter a text or the user-specific unit of density.

**User entry**

Max. 10 characters such as letters, numbers or special characters (@, %, /)

**Factory setting**

User dens.

**Additional information**

*Result*

The defined unit is shown as an option in the choose list of the **Density unit** parameter (→ ④ 55).

*Example*

Enter text “CE\_L” for centners per liter

**Density offset****Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Density offset

**Description**

Use this function to enter the zero point shift for the user-specific density unit.

Value in user-specific unit = (factor × value in base unit) + offset

**User entry**

Signed floating-point number

**Factory setting**

0

**Density factor****Navigation**

④ ⑤ Expert → Sensor → System units → User-spec. units → Density factor

**Description**

Use this function to enter a quantity factor for the user-specific density unit.

**User entry** Signed floating-point number

**Factory setting** 1.0

---

#### Pressure text



**Navigation** Expert → Sensor → System units → User-spec. units → Pressure text

**Description** Use this function to enter a text for the user-specific pressure unit.

**User entry** Max. 10 characters such as letters, numbers or special characters (@, %, /)

**Factory setting** User pres.

**Additional information** *Result*

The defined unit is shown as an option in the choose list of the **Pressure unit** parameter (→ 57).

---

#### Pressure offset



**Navigation** Expert → Sensor → System units → User-spec. units → Pressure offset

**Description** Use this function to enter the offset for adapting the user-specific pressure unit.

**User entry** Signed floating-point number

**Factory setting** 0

---

#### Pressure factor



**Navigation** Expert → Sensor → System units → User-spec. units → Pressure factor

**Description** Use this function to enter a quantity factor for the user-specific pressure unit.

**User entry** Signed floating-point number

**Factory setting** 1.0

**Additional information** *Example*

1 Dyn/cm<sup>2</sup> = 0.1 Pa → 10 Dyn/cm<sup>2</sup> = 1 Pa → user entry: 10

### 3.2.3 "Process param." submenu

Navigation

 Expert → Sensor → Process param.

▶ Process param.	
Flow damping	→  64
Density damping	→  65
Temp. damping	→  65
Flow override	→  66
▶ Low flow cut off	→  66
▶ Partial pipe det	→  69

#### Flow damping



Navigation

 Expert → Sensor → Process param. → Flow damping

#### Description

Use this function to enter a time constant for flow damping (PT1 element). Reduction of the variability of the flow measured value (in relation to interference). For this purpose, the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.

#### User entry

0 to 100.0 s

#### Factory setting

0 s

#### Additional information

##### Description

 The damping is performed by a PT1 element<sup>2)</sup>.

##### User entry

- Value = 0: no damping
- Value > 0: damping is increased

 Damping is switched off if **0** is entered (factory setting).

##### Result

 The damping affects the following variables of the device:

- Outputs
- Low flow cut off →  66
- Totalizers →  106

2) Proportional behavior with first-order lag

**Density damping****Navigation**

Expert → Sensor → Process param. → Density damping

**Description**

Use this function to enter a time constant for the damping (PT1 element) of the density measured value.

**User entry** 0 to 999.9 s

**Factory setting** 0 s

**Additional information** *Description*

The damping is performed by a PT1 element<sup>3)</sup>.

*User entry*

- Value = 0: no damping
- Value > 0: damping is increased

Damping is switched off if **0** is entered (factory setting).

**Temp. damping****Navigation**

Expert → Sensor → Process param. → Temp. damping

**Description**

Use this function to enter a time constant for the damping (PT1 element) of the temperature measured value.

**User entry** 0 to 999.9 s

**Factory setting** 0 s

**Additional information** *Description*

The damping is performed by a PT1 element<sup>4)</sup>.

*User entry*

- Value = 0: no damping
- Value > 0: damping is increased

Damping is switched off if **0** is entered (factory setting).

3) Proportional behavior with first-order lag

4) Proportional behavior with first-order lag

**Flow override****Navigation**

Expert → Sensor → Process param. → Flow override

**Description**

Use this function to select whether to interrupt the evaluation of measured values. This is useful for the cleaning processes of a pipeline, for example.

**Selection**

- Off
- On

**Factory setting**

Off

**Additional information**

*Result*

This setting affects all the functions and outputs of the measuring device.

*Description***Flow override is active**

- The diagnostic message diagnostic message **△C453 Flow override** is displayed.
- Output values
  - Output: Value at zero flow
  - Temperature: proceeding output
  - Totalizers 1-3: Stop being totalized

Positive zero return can also be enabled via the Status input: **Assign stat.inp.** parameter.

**"Low flow cut off" submenu****Navigation**

Expert → Sensor → Process param. → Low flow cut off

<b>Low flow cut off</b>	
Assign variable	→  66
On value	→  67
Off value	→  67
Pres. shock sup.	→  68

**Assign variable****Navigation**

Expert → Sensor → Process param. → Low flow cut off → Assign variable

**Description**

Use this function to select the process variable for low flow cutoff detection.

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Mass flow</li> <li>■ Volume flow</li> <li>■ Correct.vol.flow</li> </ul>
------------------	---

<b>Factory setting</b>	Mass flow
------------------------	-----------

---

**On value**

<b>Navigation</b>	Expert → Sensor → Process param. → Low flow cut off → On value
-------------------	--

<b>Prerequisite</b>	One of the following options is selected in the <b>Assign variable</b> parameter (→ <a href="#">66</a> ):
	<ul style="list-style-type: none"> <li>■ Mass flow</li> <li>■ Volume flow</li> <li>■ Correct.vol.flow</li> </ul>

<b>Description</b>	Use this function to enter a switch-on value for low flow cut off. Low flow cut off is activated if the value entered is not equal to 0 → <a href="#">67</a> .
--------------------	--

<b>User entry</b>	Positive floating-point number
-------------------	--------------------------------

<b>Factory setting</b>	Depends on country and nominal diameter → <a href="#">138</a>
------------------------	---

<b>Additional information</b>	<i>Dependency</i>
-------------------------------	-------------------

The unit depends on the process variable selected in the **Assign variable** parameter (→ [66](#)).

---

**Off value**

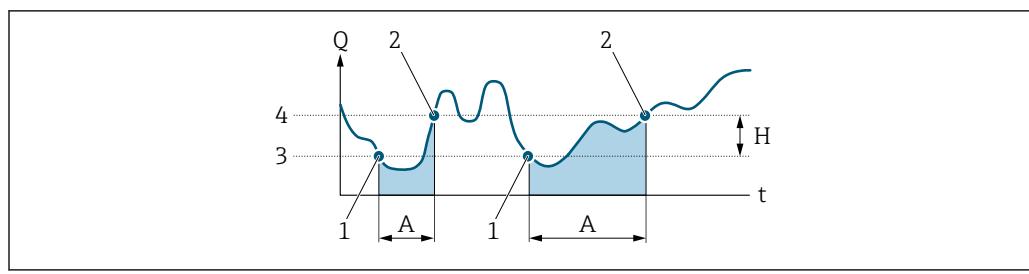
<b>Navigation</b>	Expert → Sensor → Process param. → Low flow cut off → Off value
-------------------	---

<b>Prerequisite</b>	One of the following options is selected in the <b>Assign variable</b> parameter (→ <a href="#">66</a> ):
	<ul style="list-style-type: none"> <li>■ Mass flow</li> <li>■ Volume flow</li> <li>■ Correct.vol.flow</li> </ul>

<b>Description</b>	Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → <a href="#">67</a> .
--------------------	--

<b>User entry</b>	0 to 100.0 %
-------------------	--------------

<b>Factory setting</b>	50 %
------------------------	------

**Additional information***Example*

- Q* Flow
- t* Time
- H* Hysteresis
- A* Low flow cut off active
- 1 Low flow cut off is activated
- 2 Low flow cut off is deactivated
- 3 On value entered
- 4 Off value entered

**Pres. shock sup.****Navigation**

Expert → Sensor → Process param. → Low flow cut off → Pres. shock sup.

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 66):

- Mass flow
- Volume flow
- Correct.vol.flow

**Description**

Use this function to enter the time interval for signal suppression (= active pressure shock suppression).

**User entry**

0 to 100 s

**Factory setting**

0 s

**Additional information***Description***Pressure shock suppression is enabled**

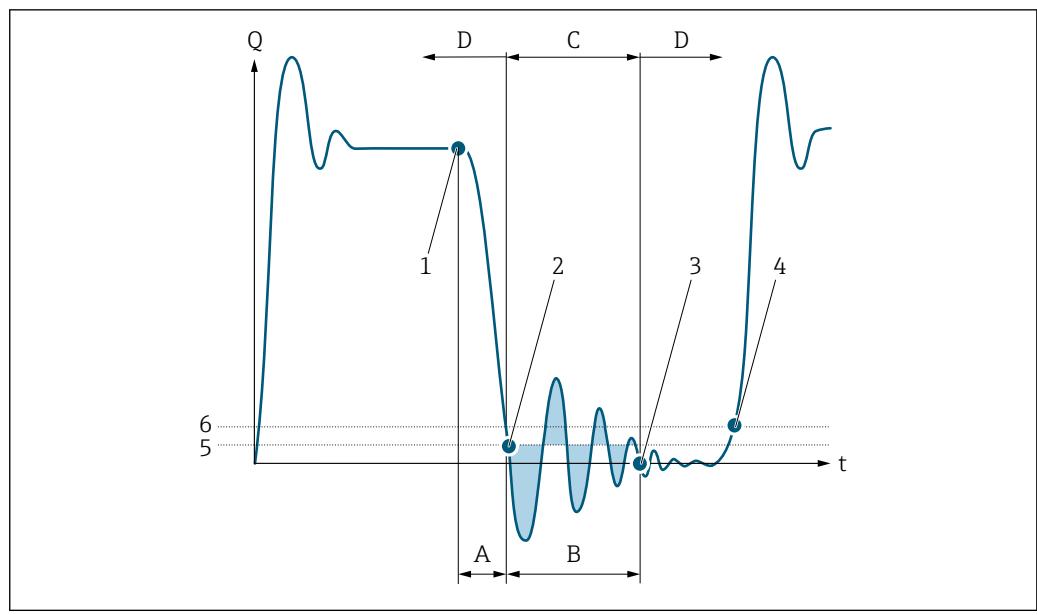
- Prerequisite:
  - Flow rate < on-value of low flow cut off
  - or
  - Changing the flow direction
- Output values
  - Flow displayed: 0
  - Totalizer: the totalizers are pegged at the last correct value

**Pressure shock suppression is disabled**

- Prerequisite: the time interval set in this function has elapsed.
- If the flow also exceeds the switch-off value for low flow cut off, the device starts processing the current flow value again and displays it.

*Example*

When closing a valve, momentarily strong fluid movements may occur in the pipeline, which are registered by the measuring system. These totalized flow values lead to a false totalizer status, particularly during batching processes.



- Q* Flow
- t* Time
- A* Drip
- B* Pressure shock
- C* Pressure shock suppression active as specified by the time entered
- D* Pressure shock suppression inactive
- 1 Valve closes
- 2 Flow falls below the on-value of the low flow cut off: pressure shock suppression is activated
- 3 The time entered has elapsed: pressure shock suppression is deactivated
- 4 The actual flow value is now displayed and output
- 5 On value for low flow cut off
- 6 Off value for low flow cut off

### "Partial pipe det" submenu

Navigation

Expert → Sensor → Process param. → Partial pipe det

► Partial pipe det	
Assign variable	→ 70
Low value	→ 70
High value	→ 70
Response time	→ 71
Max. damping	→ 71

**Assign variable****Navigation**

Expert → Sensor → Process param. → Partial pipe det → Assign variable

**Description**

Use this function to select a process variable to detect empty or partially filled measuring tubes.

For gas measurement: Deactivate monitoring due to low gas density.

**Selection**

- Off
- Density
- Ref.density

**Factory setting**

Off

**Low value****Navigation**

Expert → Sensor → Process param. → Partial pipe det → Low value

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 70):

- Density
- Ref.density

**Description**

Use this function to enter a lower limit value to enable detection of empty or partially filled measuring tubes. If the measured density falls below this value, monitoring is enabled.

**User entry**

Signed floating-point number

**Factory setting**

200

**Additional information**

*User entry*

The lower limit value must be less than the upper limit value defined in the **High value** parameter (→ 70).

**i** The unit depends on the process variable selected in the **Assign variable** parameter (→ 70).

**Limit value**

**i** If the displayed value is outside the limit value, the measuring device displays the diagnostic message **△S862 Partly filled**.

**High value****Navigation**

Expert → Sensor → Process param. → Partial pipe det → High value

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 70):

- Density
- Ref.density

<b>Description</b>	Use this function to enter an upper limit value to enable detection of empty or partially filled measuring tubes. If the measured density exceeds this value, detection is enabled.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	6 000
<b>Additional information</b>	<p><i>User entry</i></p> <p>The upper limit value must be greater than the lower limit value defined in the <b>Low value</b> parameter (→ 70).</p> <p> The unit depends on the process variable selected in the <b>Assign variable</b> parameter (→ 70).</p> <p><i>Limit value</i></p> <p> If the displayed value is outside the limit value, the measuring device displays the diagnostic message <b>△S862 Partly filled</b>.</p>

---

**Response time**

<b>Navigation</b>	 Expert → Sensor → Process param. → Partial pipe det → Response time
<b>Prerequisite</b>	One of the following options is selected in the <b>Assign variable</b> parameter (→ 70): ■ Density ■ Ref.density
<b>Description</b>	Use this function to enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message <b>△S862 Partly filled</b> to be triggered if the measuring pipe is empty or partially full.
<b>User entry</b>	0 to 100 s
<b>Factory setting</b>	1 s

---

**Max. damping**

<b>Navigation</b>	 Expert → Sensor → Process param. → Partial pipe det → Max. damping
<b>Prerequisite</b>	One of the following options is selected in the <b>Assign variable</b> parameter (→ 70): ■ Density ■ Ref.density
<b>Description</b>	Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	0

**Additional information****Description**

If oscillation damping exceeds the specified value, the measuring device presumes that the pipe is partially filled and the flow signal is set to **0**. The measuring device displays the diagnostic message **△S862 Partly filled**. In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases.

*User entry*

- Damping is disabled if **0** is entered (factory setting).
- Damping is enabled if the value entered is greater than **0**.
- The value entered depends on application-specific influence variables, such as the medium, nominal diameter, sensor etc.

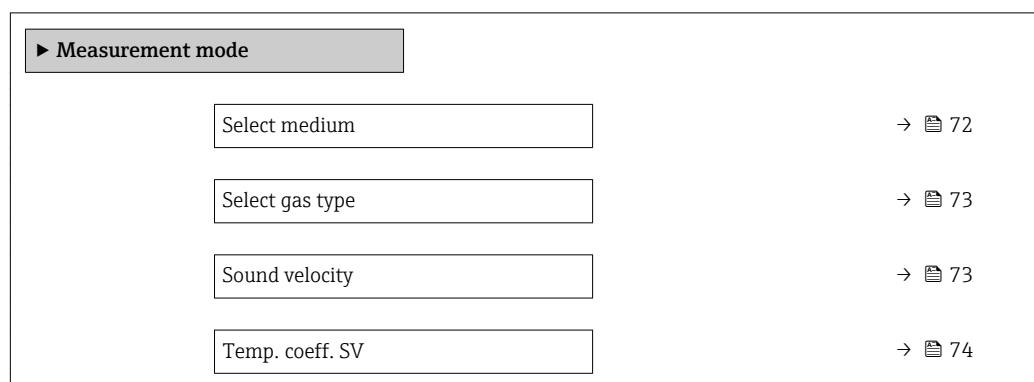
*Example*

- If the pipe is filled normally the value of the oscillation damping is 500.
- If the pipe is partially filled the value of the oscillation damping is > 5000.
- A practical damping value would then be 2000: enter 2000 as the value.

### 3.2.4 "Measurement mode" submenu

*Navigation*

Expert → Sensor → Measurement mode



#### Select medium

*Navigation*

Expert → Sensor → Measurement mode → Select medium

*Description*

Use this function to select the type of medium.

*Selection*

Liquid

*Factory setting*

Liquid

---

**Select gas type****Navigation**

Expert → Sensor → Measurement mode → Select gas type

**Prerequisite**

The **Gas** option is selected in the **Select medium** parameter (→ 72).

**Description**

Use this function to select the type of gas for the measuring application.

**Selection**

- Air
- Ammonia NH<sub>3</sub>
- Argon Ar
- Sulf. hex.fl.SF<sub>6</sub>
- Oxygen O<sub>2</sub>
- Ozone O<sub>3</sub>
- Nitrog. ox. NO<sub>x</sub>
- Nitrogen N<sub>2</sub>
- Nitrous ox. N<sub>2</sub>O
- Methane CH<sub>4</sub>
- Hydrogen H<sub>2</sub>
- Helium He
- Hydrog.chlor.HCl
- Hydrog.sulf. H<sub>2</sub>S
- Ethylene C<sub>2</sub>H<sub>4</sub>
- Carbon diox. CO<sub>2</sub>
- Carbon monox. CO
- Chlorine Cl<sub>2</sub>
- Butane C<sub>4</sub>H<sub>10</sub>
- Propane C<sub>3</sub>H<sub>8</sub>
- Propylene C<sub>3</sub>H<sub>6</sub>
- Ethane C<sub>2</sub>H<sub>6</sub>
- Others

**Factory setting**

Methane CH<sub>4</sub>

**Additional information***Description*

The gas type needs to be selected so that it is possible to comply with accuracy specifications in gas applications.

---

**Sound velocity****Navigation**

Expert → Sensor → Measurement mode → Sound velocity

**Prerequisite**

In the **Select gas type** parameter (→ 73), the **Others** option is selected.

**Description**

Use this function to enter the sound velocity of the gas at 0 °C (+32 °F).

**User entry**

1 to 99 999.9999 m/s

**Factory setting**

415.0 m/s

**Temp. coeff. SV****Navigation**

Expert → Sensor → Measurement mode → Temp. coeff. SV

**Prerequisite**

The **Others** option is selected in the **Select gas type** parameter (→ 73).

**Description**

Use this function to enter a temperature coefficient for the sound velocity of the gas.

**User entry**

Positive floating-point number

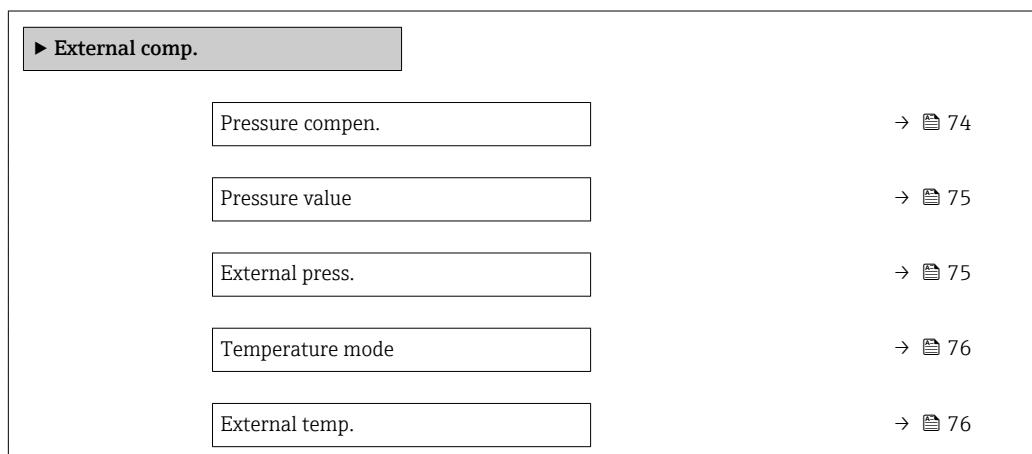
**Factory setting**

0 (m/s)/K

### 3.2.5 "External comp." submenu

**Navigation**

Expert → Sensor → External comp.

**Pressure compen.****Navigation**

Expert → Sensor → External comp. → Pressure compen.

**Description**

Use this function to select the type of pressure compensation.

**Selection**

- Off
- Fixed value
- External value

**Factory setting**

Off

**Additional information***Selection*

- Fixed value  
A fixed pressure value is used for compensation: **Pressure value** parameter (→ 75)
- External value  
The pressure value read in via EtherNet/IP is used for compensation.
- Current input 1  
The pressure value read in via the current input is used for compensation.



For more information, see the "Cyclic data transmission" section of the Operating Instructions

---

**Pressure value****Navigation**

Expert → Sensor → External comp. → Pressure value

**Prerequisite**

The **Fixed value** option is selected in the **Pressure compen.** parameter (→ 74).

**Description**

Use this function to enter a value for the process pressure that is used for pressure correction.

**User entry**

Positive floating-point number

**Factory setting**

0 bar

**Additional information***User entry*

The unit is taken from the **Pressure unit** parameter (→ 57)

---

**External press.****Navigation**

Expert → Sensor → External comp. → External press.

**Prerequisite**

The **External value** option is selected in the **Pressure compen.** parameter (→ 74).

**Description**

Use this function to enter an external pressure value.

**User entry**

Positive floating-point number

**Factory setting**

0 bar

**Additional information***User entry*

The unit is taken from the **Pressure unit** parameter (→ 57)

## Temperature mode



**Navigation** Expert → Sensor → External comp. → Temperature mode

**Description** Use this function to select the temperature mode.

**Selection**

- Internal value
- External value

**Factory setting** Internal value

**Additional information** *Description*  
Use this function to select the type of temperature compensation.

*Selection*

All the options available for selection are used for measured value compensation.

- Internal value  
The temperature value measured internally (temperature sensor of the measuring sensor) is used for compensation.
- External value  
The temperature value read in via EtherNet/IP is used for compensation.
- Current input 1  
The temperature value read in via the current input is used for compensation.

For more information, see the "Cyclic data transmission" section of the Operating Instructions

---

## External temp.

---

**Navigation** Expert → Sensor → External comp. → External temp.

**Prerequisite** In the **Temperature mode** parameter (→ 76), the **External value** option is selected.

**Description** Use this function to enter the external temperature.

**User entry** -273.15 to 99 999 °C

**Factory setting** Country-specific:  

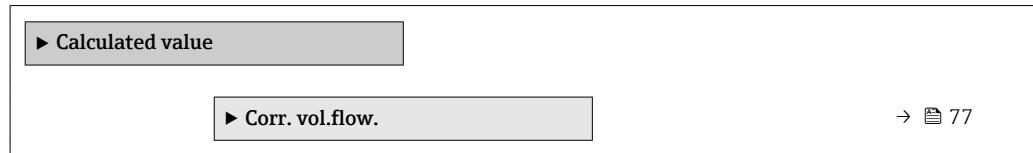
- 0 °C
- +32 °F

**Additional information** *Description*  
 The unit is taken from the **Temperature unit** parameter (→ 56)

### 3.2.6 "Calculated value" submenu

*Navigation*

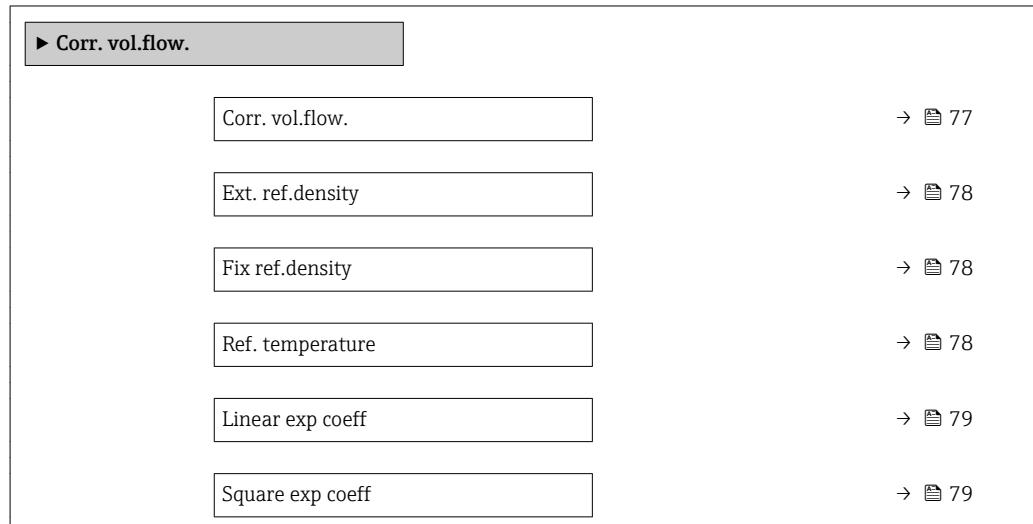
Expert → Sensor → Calculated value



#### "Corr. vol.flow." submenu

*Navigation*

Expert → Sensor → Calculated value → Corr. vol.flow.



## Corr. vol.flow.



**Navigation**

Expert → Sensor → Calculated value → Corr. vol.flow. → Corr. vol.flow.

**Description**

Use this function to select the reference density for calculating the corrected volume flow.

**Selection**

- Fix ref.density
- Calc ref density
- Ref. dens API 53
- Ext. ref.density

**Factory setting**

Calc ref density

**Additional information**

*Selection*

The **Ref. dens API 53** option is suitable only for applications involving LPG<sup>5)</sup>, where the flow rate is measured on the basis of the corrected volume flow.

Selecting this option means that the reference density is used, taking into account the values in table 53 E of API MPMS section 11.2. Temperature measurement (measured internally or read into the device from an external source) and density measurement take

5) liquefied petroleum gas

place during operation while the medium is flowing. The mass flow is divided by the reference density to give the corrected volume flow and is issued as an output signal.

---

## Ext. ref.density

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density
<b>Prerequisite</b>	In the <b>Corr. vol.flow.</b> parameter (→  77), the <b>Ext. ref.density</b> option is selected.
<b>Description</b>	Displays the reference density which is read in externally, e.g. via the current input.
<b>User interface</b>	Floating point number with sign
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Ref. dens. unit</b> parameter (→  56)

---

## Fix ref.density

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density
<b>Prerequisite</b>	The <b>Fix ref.density</b> option is selected in the <b>Corr. vol.flow.</b> parameter (→  77) parameter.
<b>Description</b>	Use this function to enter a fixed value for the reference density.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1 kg/Nl
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Ref. dens. unit</b> parameter (→  56)

---

## Ref. temperature

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature
<b>Prerequisite</b>	The <b>Calc ref density</b> option is selected in the <b>Corr. vol.flow.</b> parameter (→  77).
<b>Description</b>	Use this function to enter a reference temperature for calculating the reference density.
<b>User entry</b>	-273.15 to 99 999 °C

**Factory setting**

Country-specific:

- +20 °C
- +68 °F

**Additional information***Dependency*The unit is taken from the **Temperature unit** parameter (→ 56)*Reference density calculation*

$$\rho_a = \rho \cdot (1 + \alpha \cdot \Delta t + \beta \cdot \Delta t^2)$$

A0023403

- $\rho_N$ : reference density
- $\rho$ : fluid density currently measured
- $t$ : fluid temperature currently measured
- $t_N$ : reference temperature at which the reference density is calculated (e.g. 20 °C)
- $\Delta t$ :  $t - t_N$
- $\alpha$ : linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- $\beta$ : square expansion coefficient of the fluid, unit = [1/K<sup>2</sup>]

**Linear exp coeff****Navigation**

Expert → Sensor → Calculated value → Corr. vol.flow. → Linear exp coeff

**Prerequisite**The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 77) parameter.**Description**

Use this function to enter a linear, fluid-specific expansion coefficient for calculating the reference density.

**User entry**

Signed floating-point number

**Factory setting**

0.0

**Square exp coeff****Navigation**

Expert → Sensor → Calculated value → Corr. vol.flow. → Square exp coeff

**Prerequisite**The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 77) parameter.**Description**

For fluid with a non-linear expansion pattern: use this function to enter a quadratic, fluid-specific expansion coefficient for calculating the reference density.

**User entry**

Signed floating-point number

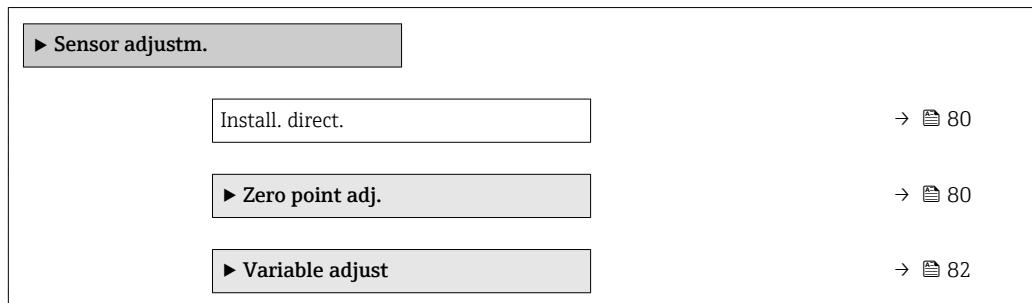
**Factory setting**

0.0

### 3.2.7 "Sensor adjustm." submenu

Navigation

Expert → Sensor → Sensor adjustm.



#### Install. direct.



Navigation

Expert → Sensor → Sensor adjustm. → Install. direct.

Description

Use this function to change the sign of the medium flow direction.

Selection

- In arrow direct.
- Against arrow

Factory setting

In arrow direct.

Additional information

Description

**i** Before changing the sign: ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor nameplate.

#### "Zero point adj." submenu



- It is generally not necessary to perform zero point adjustment.
- However, this function may be needed in some applications with low flow and strict accuracy requirements.
- A zero point adjustment cannot increase repeatability.
- The following conditions should be met to perform a zero point adjustment successfully without the adjustment finishing in an error:
  - The real flow must be **0**.
  - The pressure must be at least 15 psi g.
- The adjustment takes a maximum of 60 s. The more stable the conditions, the faster the adjustment is completed.
- This function can also be used to check the health of the measuring device.  
A healthy measuring device has a maximum zero point deviation of ±100 compared to the factory setting of the measuring device (calibration report).

**Navigation** Expert → Sensor → Sensor adjustm. → Zero point adj.**► Zero point adj.**

Zero point adj.

→  81

Progress

→  81**Zero point adj.****Navigation** Expert → Sensor → Sensor adjustm. → Zero point adj. → Zero point adj.**Description**

Use this function to select the start of the zero point adjustment.

Observe conditions →  80.**Selection**

- Cancel
- Busy
- Zero adjust fail
- Start

**Factory setting**

Cancel

**Additional information****Description**

- Cancel  
If zero point adjustment has failed, select this option to cancel zero point adjustment.
- Busy  
Is displayed during zero point adjustment.
- Zero adjust fail  
Is displayed if zero point adjustment has failed.
- Start  
Select this option to start zero point adjustment.

**Progress****Navigation** Expert → Sensor → Sensor adjustm. → Zero point adj. → Progress**Description**

The progress of the process is indicated.

**User interface**

0 to 100 %

**"Variable adjust" submenu***Navigation*
 Expert → Sensor → Sensor adjustm. → Variable adjust

► Variable adjust	
Mass flow offset	→  82
Mass flow factor	→  83
Vol. flow offset	→  83
Vol. flow factor	→  83
Density offset	→  84
Density factor	→  84
Corr. vol offset	→  84
Corr. vol factor	→  85
Ref.dens. offset	→  85
Ref.dens. factor	→  85
Temp. offset	→  86
Temp. factor	→  86

**Mass flow offset****Navigation**
 Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset
**Description**

Use this function to enter the zero point shift for the mass flow trim. The mass flow unit on which the shift is based is kg/s.

**User entry**

Signed floating-point number

**Factory setting**

0 kg/s

**Additional information***Description*

 Corrected value = (factor × value) + offset

---

**Mass flow factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow factor

**Description** Use this function to enter a quantity factor (without time) for the mass flow. This multiplication factor is applied over the mass flow range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Vol. flow offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset

**Description** Use this function to enter the zero point shift for the volume flow trim. The volume flow unit on which the shift is based is m<sup>3</sup>/s.

**User entry** Signed floating-point number

**Factory setting** 0 m<sup>3</sup>/s

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Vol. flow factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow factor

**Description** Use this function to enter a quantity factor (without time) for the volume flow. This multiplication factor is applied over the volume flow range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

**Density offset****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Density offset

**Description**

Use this function to enter the zero point shift for the density trim. The density unit on which the shift is based is kg/m<sup>3</sup>.

**User entry**

Signed floating-point number

**Factory setting**

0 kg/m<sup>3</sup>

**Additional information***Description*

Corrected value = (factor × value) + offset

**Density factor****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Density factor

**Description**

Use this function to enter a quantity factor for the density. This multiplication factor is applied over the density range.

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information***Description*

Corrected value = (factor × value) + offset

**Corr. vol offset****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset

**Description**

Use this function to enter the zero point shift for the corrected volume flow trim. The corrected volume flow unit on which the shift is based is 1 Nm<sup>3</sup>/s.

**User entry**

Signed floating-point number

**Factory setting**

0 Nm<sup>3</sup>/s

**Additional information***Description*

Corrected value = (factor × value) + offset

---

**Corr. vol factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor

**Description** Use this function to enter a quantity factor (without time) for the corrected volume flow. This multiplication factor is applied over the corrected volume flow range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Ref.dens. offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. offset

**Description** Use this parameter to enter the zero point shift for the reference density trim. The reference density unit on which the shift is based is 1 kg/Nm<sup>3</sup>.

**User entry** Signed floating-point number

**Factory setting** 0 kg/Nm<sup>3</sup>

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Ref.dens. factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. factor

**Description** Use this function to enter a quantity factor (without time) for the reference density. This multiplication factor is applied over the reference density range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

**Temp. offset****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset

**Description**

Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is K.

**User entry**

Signed floating-point number

**Factory setting**

0 K

**Additional information***Description*

Corrected value = (factor × value) + offset

**Temp. factor****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor

**Description**

Use this function to enter a quantity factor for the temperature. In each case, this factor refers to the temperature in K.

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information***Description*

Corrected value = (factor × value) + offset

### 3.2.8 "Calibration" submenu

**Navigation**

Expert → Sensor → Calibration

► Calibration

Cal. factor	→  87
Zero point	→  87
Nominal diameter	→  87
C0 to 5	→  87

---

**Cal. factor**

<b>Navigation</b>	  Expert → Sensor → Calibration → Cal. factor
<b>Description</b>	Displays the current calibration factor for the sensor.
<b>User interface</b>	Signed floating-point number
<b>Factory setting</b>	Depends on nominal diameter and calibration.

---

**Zero point**

<b>Navigation</b>	  Expert → Sensor → Calibration → Zero point
<b>Description</b>	Use this function to enter the zero point correction value for the sensor.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Depends on nominal diameter and calibration.

---

**Nominal diameter**

<b>Navigation</b>	  Expert → Sensor → Calibration → Nominal diameter
<b>Description</b>	Displays the nominal diameter of the sensor.
<b>User interface</b>	DNxx / x"
<b>Factory setting</b>	Depends on the size of the sensor
<b>Additional information</b>	<i>Description</i>
	 The value is also specified on the sensor nameplate.

---

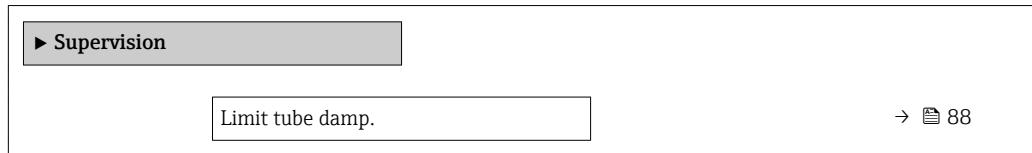
**C0 to 5**

<b>Navigation</b>	  Expert → Sensor → Calibration → C0 to 5
<b>Description</b>	Displays the current density coefficients C0 to 5 of the sensor.
<b>User interface</b>	Signed floating-point number
<b>Factory setting</b>	0

### 3.2.9 "Supervision" submenu

Navigation

Expert → Sensor → Supervision



#### Limit tube damp.



Navigation

Expert → Sensor → Supervision → Limit tube damp.

Description

Use this function to enter a limit value for measuring tube damping.

User entry

Positive floating-point number

Factory setting

Positive floating-point number

Additional information

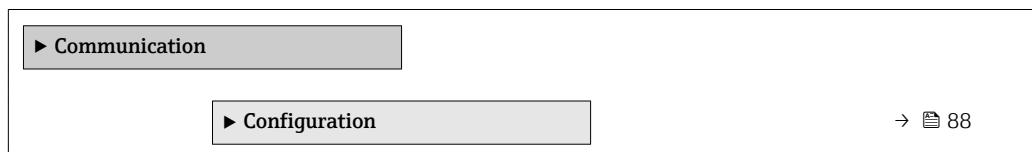
*Limit value*

- If the displayed value is outside the limit value, the measuring device displays the diagnostic message **△S948 Tube damp. high.**
  - For detecting inhomogeneous media, for example

## 3.3 "Communication" submenu

Navigation

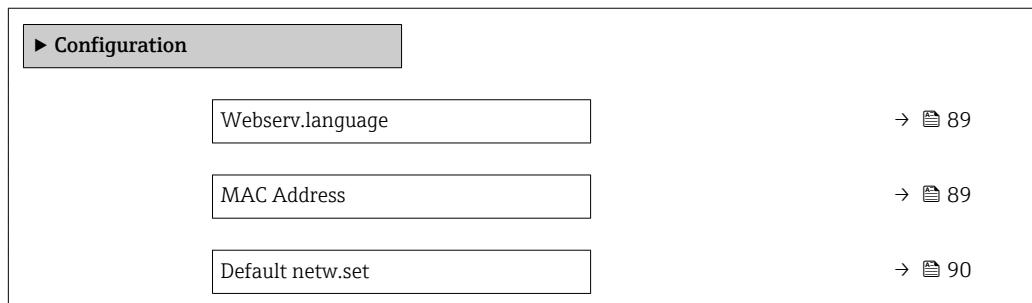
Expert → Communication



### 3.3.1 "Configuration" submenu

Navigation

Expert → Communication → Configuration



DHCP client	→  90
IP address	→  90
Subnet mask	→  91
Default gateway	→  91
Webserver funct.	→  91
▶ Input assembly	→  93

## Webserv.language

**Navigation** Expert → Communication → Configuration → Webserv.language

**Description** Use this function to select the Web server language setting.

**Selection**

- English
- Deutsch \*
- Français \*
- Español \*
- Italiano \*
- Nederlands \*
- Portuguesa \*
- Polski \*
- русский язык(Ru) \*
- Svenska \*
- Türkçe \*
- 中文 (Chinese) \*
- 日本語 (Japanese) \*
- 한국어 (Korean) \*
- العربية (Ara) \*
- Bahasa Indonesia \*
- ภาษาไทย (Thai) \*
- tiếng Việt (Viet) \*
- čeština (Czech)

**Factory setting** English

## MAC Address

**Navigation** Expert → Communication → Configuration → MAC Address

**Description** Displays the MAC <sup>6)</sup> address of the measuring device.

\* Visibility depends on order options or device settings  
6) Media Access Control

**User interface** Unique 12-digit character string comprising letters and numbers

**Factory setting** Each measuring device is given an individual address.

**Additional information** *Example*

For the display format  
00:07:05:10:01:5F

---

## Default netw.set

---

**Navigation**  Expert → Communication → Configuration → Default netw.set

**Description** Displays the use of default network settings.

**User interface**

- Off
- On

**Factory setting** Off

**Additional information** *User interface*

The **On** option is displayed as soon as the last octet of the IP address is set via DIP switches.

---

## DHCP client

---



**Navigation**  Expert → Communication → Configuration → DHCP client

**Description** Use this function to activate and deactivate the DHCP client functionality.

**Selection**

- Off
- On

**Factory setting** Off

**Additional information** *Result*

If the DHCP client functionality of the Web server is activated, the IP address (→  90), Subnet mask (→  91) and Default gateway (→  91) are set automatically.

 Identification is via the MAC address of the measuring device.

---

## IP address

---



**Navigation**  Expert → Communication → Configuration → IP address

**Description** Use this function to enter the IP address of the device's web server.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 192.168.1.212

---

**Subnet mask**

**Navigation** Expert → Communication → Configuration → Subnet mask

**Description** Use this function to enter the subnet mask.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 255.255.255.0

---

**Default gateway**

**Navigation** Expert → Communication → Configuration → Default gateway

**Description** Use this function to enter the default gateway.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 0.0.0.0

---

**Webserver funct.**

**Navigation** Expert → Communication → Configuration → Webserver funct.

**Description** Use this function to switch the Web server on and off.

**Selection**  
■ Off  
■ On

**Factory setting** On

**Additional information***Description*

Once disabled, the Webserver funct. can only be re-enabled via the local display or the operating tool FieldCare.

*Selection*

Option	Description
Off	<ul style="list-style-type: none"> <li>■ The web server is completely disabled.</li> <li>■ Port 80 is locked.</li> </ul>
On	<ul style="list-style-type: none"> <li>■ The complete functionality of the web server is available.</li> <li>■ JavaScript is used.</li> <li>■ The password is transferred in an encrypted state.</li> <li>■ Any change to the password is also transferred in an encrypted state.</li> </ul>

**Login page****Navigation** Expert → Communication → Web server → Login page**Description**

Use this function to select the format of the login page.

**Selection**

- Without header
- With header

**Factory setting**

With header

**Capability flags****Navigation** Expert → Communication → Configuration → Capability flags**Description**

Displays the DLR (Device Level Ring) properties of the device.

**User interface**

- Announce-b. node
- Beacon-b. node
- Supervisor cap.
- Redund. gateway
- Flush tab. frame

**Factory setting**

Beacon-b. node

**User description****Navigation** Expert → Communication → Configuration → User description**Description**

Use this function to enter the user-defined device name and location (separated by a semicolon).

**Factory setting**

description;location

**"Input assembly" submenu***Navigation*

Expert → Communication → Configuration → Input assembly

► Input assembly	
Position 1	→  94
Position 2	→  94
Position 3	→  95
Position 4	→  95
Position 5	→  95
Position 6	→  95
Position 7	→  96
Position 8	→  96
Position 9	→  96
Position 10	→  96
Position 11	→  97
Position 12	→  97
Position 13	→  97
Position 14	→  98
Position 15	→  98
Position 16	→  98
Position 17	→  98
Position 18	→  99
Position 19	→  99
Position 20	→  99

**Position 1****Navigation**

Expert → Communication → Configuration → Input assembly → Position 1

**Description**

Use this function to select a process variable for input value 1.

**Selection**

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Dynam. viscosity \*
- Kinematic visc.
- TempCompDynVisc \*
- TempCompKinVisc \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 \*
- Osc. ampl. 0 \*
- Osc. ampl. 1 \*
- Freq. fluct. 0
- Freq. fluct. 1 \*
- Osc. damping 0
- Osc. damping 1 \*
- Damping fluct 0
- Damping fluct 1 \*
- Signal asymmetry
- Exc. current 0
- Exc. current 1 \*
- Spv.exc.curr. 1 \*
- Spv.exc.curr. 2 \*
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Sensor integrity

**Factory setting**

Mass flow

**Position 2****Navigation**

Expert → Communication → Configuration → Input assembly → Position 2

**Description**

Use this function to select a process variable for input value 2.

**Selection**

Picklist, see **Input assembly position 1** parameter (→ 94)

\* Visibility depends on order options or device settings

**Factory setting** Volume flow

---

#### Position 3



**Navigation** Expert → Communication → Configuration → Input assembly → Position 3

**Description** Use this function to select a process variable for input value 3.

**Selection** Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting** Correct.vol.flow

---

#### Position 4



**Navigation** Expert → Communication → Configuration → Input assembly → Position 4

**Description** Use this function to select a process variable for input value 4.

**Selection** Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting** Temperature

---

#### Position 5



**Navigation** Expert → Communication → Configuration → Input assembly → Position 5

**Description** Use this function to select a process variable for input value 5.

**Selection** Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting** Density

---

#### Position 6



**Navigation** Expert → Communication → Configuration → Input assembly → Position 6

**Description** Use this function to select a process variable for input value 6.

**Selection** Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting** Ref.density

**Position 7****Navigation**

Expert → Communication → Configuration → Input assembly → Position 7

**Description**

Use this function to select a process variable for input value 7.

**Selection**

Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting**

Spv.exc.curr. 1

**Position 8****Navigation**

Expert → Communication → Configuration → Input assembly → Position 8

**Description**

Use this function to select a process variable for input value 8.

**Selection**

Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting**

Totalizer 1

**Position 9****Navigation**

Expert → Communication → Configuration → Input assembly → Position 9

**Description**

Use this function to select a process variable for input value 9.

**Selection**

Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting**

Totalizer 2

**Position 10****Navigation**

Expert → Communication → Configuration → Input assembly → Position 10

**Description**

Use this function to select a process variable for input value 10.

**Selection**

Picklist, see **Input assembly position 1** parameter (→ 94)

**Factory setting**

Totalizer 3

**Position 11**

<b>Navigation</b>	Expert → Communication → Configuration → Input assembly → Position 11
<b>Description</b>	Use this function to select a process variable for input value 11.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Actual diagnos.</li> <li>■ Prev.diagnostics</li> <li>■ Mass flow unit</li> <li>■ Volume flow unit</li> <li>■ Cor.volflow unit</li> <li>■ Temperature unit</li> <li>■ Density unit</li> <li>■ Ref. dens. unit</li> <li>■ Concentr. unit *</li> <li>■ Dyn. visc. unit *</li> <li>■ Kin. visc. unit *</li> <li>■ Current unit</li> <li>■ Unit totalizer 1</li> <li>■ Unit totalizer 2</li> <li>■ Unit totalizer 3</li> <li>■ Verific. results *</li> <li>■ Verific. status *</li> </ul>
<b>Factory setting</b>	Mass flow unit

**Position 12**

<b>Navigation</b>	Expert → Communication → Configuration → Input assembly → Position 12
<b>Description</b>	Use this function to select a process variable for input value 12.
<b>Selection</b>	Picklist, see <b>Input assembly position 11</b> parameter (→  97)
<b>Factory setting</b>	Volume flow unit

**Position 13**

<b>Navigation</b>	Expert → Communication → Configuration → Input assembly → Position 13
<b>Description</b>	Use this function to select a process variable for input value 13.
<b>Selection</b>	Picklist, see <b>Input assembly position 11</b> parameter (→  97)
<b>Factory setting</b>	Cor.volflow unit

\* Visibility depends on order options or device settings

**Position 14**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 14

**Description** Use this function to select a process variable for input value 14.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Temperature unit

**Position 15**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 15

**Description** Use this function to select a process variable for input value 15.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Density unit

**Position 16**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 16

**Description** Use this function to select a process variable for input value 16.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Ref. dens. unit

**Position 17**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 17

**Description** Use this function to select a process variable for input value 17.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Current unit

**Position 18**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 18

**Description** Use this function to select a process variable for input value 18.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Unit totalizer 1

**Position 19**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 19

**Description** Use this function to select a process variable for input value 19.

**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Unit totalizer 2

**Position 20**

**Navigation** Expert → Communication → Configuration → Input assembly → Position 20

**Description** Use this function to select a process variable for input value 20.

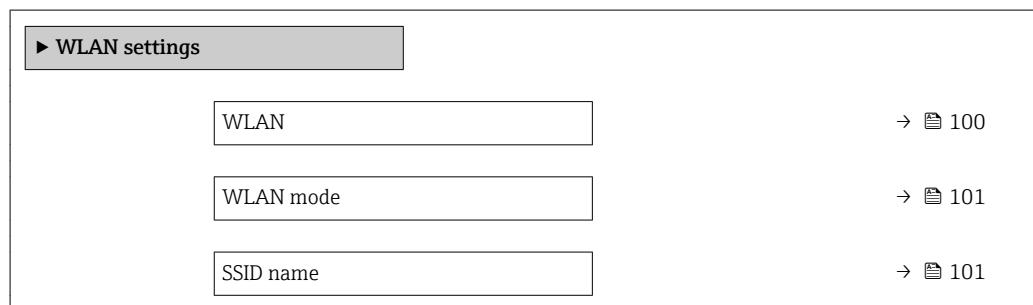
**Selection** Picklist, see **Input assembly position 11** parameter (→ 97)

**Factory setting** Unit totalizer 3

### 3.3.2 "WLAN settings" submenu

*Navigation*

Expert → Communication → WLAN settings



Network security	→  101
Sec. identific.	→  102
User name	→  102
WLAN password	→  102
WLAN IP address	→  102
WLAN MAC address	→  103
WLAN subnet mask	→  103
WLAN MAC address	→  103
WLAN passphrase	→  103
Assign SSID name	→  103
SSID name	→  104
WLAN channel	→  104
Select antenna	→  104
Connection state	→  105
Rec.sig.strength	→  105
WLAN IP address	→  102
Gateway IP addr.	→  105
IP address DNS	→  105

## WLAN

**Navigation**

Expert → Communication → WLAN settings → WLAN

**Description**

Use this function to enable and disable the WLAN connection.

**Selection**

- Disable
- Enable

**Factory setting**

Enable

---

**WLAN mode**

**Navigation** Expert → Communication → WLAN settings → WLAN mode

**Description** Use this function to select the WLAN mode.

**Selection**

- Access point
- WLAN Client

**Factory setting** Access point

---

**SSID name**

**Navigation** Expert → Communication → WLAN settings → SSID name

**Prerequisite** The client is activated.

**Description** Use this function to enter the user-defined SSID name (max. 32 characters).

**User entry** –

**Factory setting** –

---

**Network security**

**Navigation** Expert → Communication → WLAN settings → Network security

**Description** Use this function to select the type of security for the WLAN interface.

**Selection**

- Unsecured
- WPA2-PSK
- EAP-PEAP MSCHAP2
- EAP-PEAP NoAuth.
- EAP-TLS

**Factory setting** WPA2-PSK

**Additional information** *Selection*

- Unsecured  
Access the WLAN connection without identification.
- WPA2-PSK  
Access the WLAN connection with a network key.

---

**Sec. identific.**

---

**Navigation**  Expert → Communication → WLAN settings → Sec. identific.**Description**

Use this function to select the security settings (download via the menu: Data Management > Security > Download WLAN).

**User interface**

- Root certificate
- Device certific.
- Dev. private key

---

**User name****Navigation**  Expert → Communication → WLAN settings → User name**Description**

Use this function to enter the user name.

**User entry**

–

**Factory setting**

–

---

**WLAN password****Navigation**  Expert → Communication → WLAN settings → WLAN password**Description**

Use this function to enter the WLAN password.

**User entry**

–

**Factory setting**

–

---

**WLAN IP address****Navigation**  Expert → Communication → WLAN settings → WLAN IP address**Description**

Use this function to enter the IP address of the measuring device's WLAN connection.

**User entry**

4 octet: 0 to 255 (in the particular octet)

**Factory setting**

192.168.1.212

**WLAN MAC address**

<b>Navigation</b>	 Expert → Communication → WLAN settings → WLAN MAC address
<b>Description</b>	Displays the MAC <sup>7)</sup> address of the measuring device.
<b>User interface</b>	Unique 12-digit character string comprising letters and numbers
<b>Factory setting</b>	Each measuring device is given an individual address.
<b>Additional information</b>	<p><i>Example</i></p> <p>For the display format</p> <p>00:07:05:10:01:5F</p>

**WLAN subnet mask**

<b>Navigation</b>	 Expert → Communication → WLAN settings → WLAN subnet mask
<b>Description</b>	Use this function to enter the subnet mask.
<b>User entry</b>	4 octet: 0 to 255 (in the particular octet)
<b>Factory setting</b>	255.255.255.0

**WLAN passphrase**

<b>Navigation</b>	 Expert → Communication → WLAN settings → WLAN passphrase
<b>Prerequisite</b>	The <b>WPA2-PSK</b> option is selected in the <b>Security type</b> parameter (→  101).
<b>Description</b>	Use this function to enter the network key.
<b>User entry</b>	8 to 32-digit character string comprising numbers, letters and special characters
<b>Factory setting</b>	Serial number of the measuring device (e.g. L100A802000)

**Assign SSID name**

<b>Navigation</b>	 Expert → Communication → WLAN settings → Assign SSID name
<b>Description</b>	Use this function to select which name is used for the SSID <sup>8)</sup> .

7) Media Access Control  
8) Service Set Identifier

---

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Device tag</li><li>■ User-defined</li></ul>
<b>Factory setting</b>	User-defined
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>■ Device tag The device tag name is used as the SSID.</li><li>■ User-defined A user-defined name is used as the SSID.</li></ul>

---

**SSID name**

**Navigation** Expert → Communication → WLAN settings → SSID name

**Prerequisite**

- The **User-defined** option is selected in the **Assign SSID name** parameter (→ 103).
- The **Access point** option is selected in the **WLAN mode** parameter (→ 101).

**Description** Use this function to enter a user-defined SSID name.

**User entry** Max. 32-digit character string comprising numbers, letters and special characters

**Factory setting**

---

**WLAN channel**

**Navigation** Expert → Communication → WLAN settings → WLAN channel

**Description** Use this function to enter the WLAN channel.

**User entry** 1 to 11

**Factory setting** 6

**Additional information** *Description*



- It is only necessary to enter a WLAN channel if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

---

**Select antenna**

**Navigation** Expert → Communication → WLAN settings → Select antenna

**Description** Use this function to select whether the external or internal antenna is used for reception.

**Selection**

- External antenna
- Internal antenna

---

<b>Factory setting</b>	Internal antenna
------------------------	------------------

---

### Connection state

---

<b>Navigation</b>	 Expert → Communication → WLAN settings → Connection state
<b>Description</b>	The connection status is displayed.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Connected</li><li>■ Not connected</li></ul>
<b>Factory setting</b>	Not connected

---

### Rec.sig.strength

---

<b>Navigation</b>	  Expert → Communication → WLAN settings → Rec.sig.strength
<b>Description</b>	Displays the signal strength received.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Low</li><li>■ Medium</li><li>■ High</li></ul>
<b>Factory setting</b>	High

---

### Gateway IP addr.

---

<b>Navigation</b>	  Expert → Communication → WLAN settings → Gateway IP addr.
<b>Description</b>	Use this function to enter the IP address of the gateway.
<b>Factory setting</b>	192.168.1.212

---

### IP address DNS

---

<b>Navigation</b>	 Expert → Communication → WLAN settings → IP address DNS  Expert → Communication → WLAN settings → IP address DNS
<b>Description</b>	Use this function to enter the IP address of the domain name server.
<b>Factory setting</b>	192.168.1.212

### 3.4 "Application" submenu

Navigation

Expert → Application

<b>► Application</b>	
Reset all tot.	→ 106
<b>► Totalizer 1 to n</b>	→ 106
<b>► Viscosity</b>	→ 111
<b>► Concentration</b>	→ 112

#### Reset all tot.

Navigation

Expert → Application → Reset all tot.

Description

Use this function to reset all totalizers to the value **0** and restart the totaling process. This deletes all the flow values previously totalized.

Selection

- Cancel
- Reset + totalize

Factory setting

Cancel

Additional information

*Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
Reset + totalize	Resets all totalizers to 0 and restarts the totaling process. This deletes all the flow values previously totalized.

#### 3.4.1 "Totalizer 1 to n" submenu

Navigation

Expert → Application → Totalizer 1 to n

<b>► Totalizer 1 to n</b>	
Assign variable	→ 107
Unit totalizer	→ 107
Operation mode	→ 109

Control Tot. 1 to n	→  109
Preset value 1 to n	→  110
Failure mode	→  111

**Assign variable****Navigation**

Expert → Application → Totalizer 1 to n → Assign variable

**Description**

Use this function to select a process variable for the Totalizer 1 to n.

**Selection**

- Off
- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow <sup>\*</sup>
- Carrier mass fl. <sup>\*</sup>

**Factory setting**

Mass flow

**Additional information***Description*

If the option selected is changed, the device resets the totalizer to 0.

*Selection*

If the **Off** option is selected, only **Assign variable** parameter (→ 107) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

**Unit totalizer****Navigation**

Expert → Application → Totalizer 1 to n → Unit totalizer

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow <sup>\*</sup>
- Carrier mass fl. <sup>\*</sup>

**Description**

Use this function to select the process variable unit for the Totalizer 1 to n (→ 106).

\* Visibility depends on order options or device settings

**Selection**

- |   |   |
|---|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ g</li> <li>■ kg</li> <li>■ t</li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ oz</li> <li>■ lb</li> <li>■ STon</li> </ul> |
|---|---|

*Custom-specific units*

User mass

or

- |  |  |   |
|--|--|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ cm<sup>3</sup></li> <li>■ dm<sup>3</sup></li> <li>■ m<sup>3</sup></li> <li>■ ml</li> <li>■ l</li> <li>■ hl</li> <li>■ Ml Mega</li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ af</li> <li>■ ft<sup>3</sup></li> <li>■ fl oz (us)</li> <li>■ gal (us)</li> <li>■ kgal (us)</li> <li>■ Mgal (us)</li> <li>■ bbl (us;liq.)</li> <li>■ bbl (us;beer)</li> <li>■ bbl (us;oil)</li> <li>■ bbl (us;tank)</li> </ul> | <p><i>Imperial units</i></p> <ul style="list-style-type: none"> <li>■ gal (imp)</li> <li>■ Mgal (imp)</li> <li>■ bbl (imp;beer)</li> <li>■ bbl (imp;oil)</li> </ul> |
|--|--|---|

*Custom-specific units*

User vol.

or

- |   |   |   |
|---|---|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ Nl</li> <li>■ Nm<sup>3</sup></li> <li>■ Sl</li> <li>■ Sm<sup>3</sup></li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ Sft<sup>3</sup></li> <li>■ Sgal (us)</li> <li>■ Sbbl (us;liq.)</li> </ul> | <p><i>Imperial units</i></p> <ul style="list-style-type: none"> <li>Sgal (imp)</li> </ul> |
|---|---|---|

*Custom-specific units*

UserCrVol.

**Factory setting**

Country-specific:

- kg
- lb

**Additional information***Description*

-  The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 49).

*Selection*

The selection is dependent on the process variable selected in the **Assign variable** parameter (→ 107).

**Operation mode****Navigation**

Expert → Application → Totalizer 1 to n → Operation mode

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*

**Description**

Use this function to select how the totalizer summates the flow.

**Selection**

- Net flow total
- Forward total
- Reverse total

**Factory setting**

Net flow total

**Additional information***Selection*

- Net flow total  
Flow values in the forward and reverse flow direction are totalized and balanced against one another. Net flow is registered in the flow direction.
- Forward total  
Only the flow in the forward flow direction is totalized.
- Reverse total  
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

**Control Tot. 1 to n****Navigation**

Expert → Application → Totalizer 1 to n → Control Tot. 1 to n

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*

**Description**

Use this function to select the control of totalizer value 1-3.

**Selection**

- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Preset+totalize

**Factory setting**

Totalize

\* Visibility depends on order options or device settings

**Additional information***Selection*

Options	Description
Totalize	The totalizer is started or continues running.
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.
Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the <b>Preset value</b> parameter.
Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.
Preset+totalize	The totalizer is set to the defined start value from the <b>Preset value</b> parameter and the totaling process is restarted.

**Preset value 1 to n****Navigation**
 Expert → Application → Totalizer 1 to n → Preset value 1 to n
**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow <sup>\*</sup>
- Carrier mass fl.

**Description**

Use this function to enter a start value for the Totalizer 1 to n.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg
- 0 lb

**Additional information***Entry*

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 107).

*Example*

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

\* Visibility depends on order options or device settings

**Failure mode****Navigation**

Expert → Application → Totalizer 1 to n → Failure mode

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 107) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*

**Description**

Use this function to select how a totalizer behaves in the event of a device alarm.

**Selection**

- Stop
- Actual value
- Last valid value

**Factory setting**

Stop

**Additional information***Description*

This setting does not affect the failsafe mode of other totalizers and the outputs. This is specified in separate parameters.

*Selection*

- Stop  
The totalizer is stopped in the event of a device alarm.
- Actual value  
The totalizer continues to count based on the actual measured value; the device alarm is ignored.
- Last valid value  
The totalizer continues to count based on the last valid measured value before the device alarm occurred.

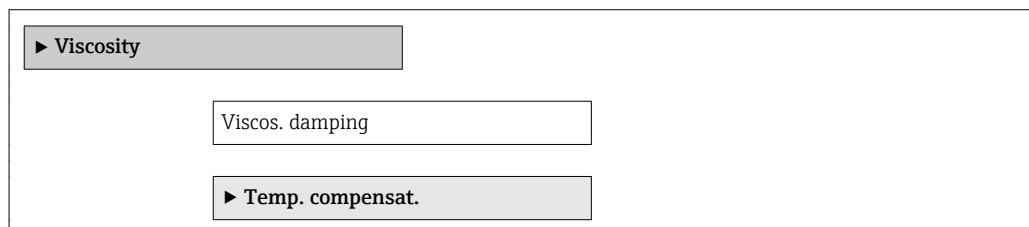
**3.4.2 "Viscosity" submenu**

Only available for Promass I.

For detailed information on the parameter descriptions for the **Viscosity** application package, refer to the Special Documentation for the device

*Navigation*

Expert → Application → Viscosity



\* Visibility depends on order options or device settings

► Dynam. viscosity

► Kinematic visc.

### 3.4.3 "Concentration" submenu

 For detailed information on the parameter descriptions for the **Concentration** application package, refer to the Special Documentation for the device

Navigation

 Expert → Application → Concentration

► Concentration

## 3.5 "Diagnostics" submenu

Navigation

 Expert → Diagnostics

► Diagnostics

Actual diagnos.

→  112

Prev.diagnostics

→  113

Time fr. restart

→  114

Operating time

→  114

► Diagnostic list

→  115

► Event logbook

→  118

► Device info

→  120

► Min/max val.

→  124

► Heartbeat

→  133

► Simulation

→  133

### Actual diagnos.

Navigation

 Expert → Diagnostics → Actual diagnos.

Prerequisite

A diagnostic event has occurred.

---

<b>Description</b>	Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<p><i>Display</i></p>  Additional pending diagnostic messages can be viewed in the <b>Diagnostic list</b> submenu (→  115).
	<p><i>Example</i></p> <p>For the display format: ⊗F271 Main electronic</p>

---

## Timestamp

---

<b>Navigation</b>	 Expert → Diagnostics → Timestamp
<b>Description</b>	Displays the operating time when the current diagnostic message occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<p><i>Display</i></p>  The diagnostic message can be viewed via the <b>Actual diagnos.</b> parameter (→  112).
	<p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>

---

## Prev.diagnostics

---

<b>Navigation</b>	  Expert → Diagnostics → Prev.diagnostics
<b>Prerequisite</b>	Two diagnostic events have already occurred.
<b>Description</b>	Displays the diagnostic message that occurred before the current message.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<p><i>Example</i></p> <p>For the display format: ⊗F271 Main electronic</p>

---

**Timestamp**

---

<b>Navigation</b>	  Expert → Diagnostics → Timestamp
<b>Description</b>	Displays the operating time when the last diagnostic message before the current message occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>Display</i>  The diagnostic message can be viewed via the <b>Prev.diagnostics</b> parameter (→  113).
	<i>Example</i> For the display format: 24d12h13m00s

---

**Time fr. restart**

---

<b>Navigation</b>	  Expert → Diagnostics → Time fr. restart
<b>Description</b>	Use this function to display the time the device has been in operation since the last device restart.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)

---

**Operating time**

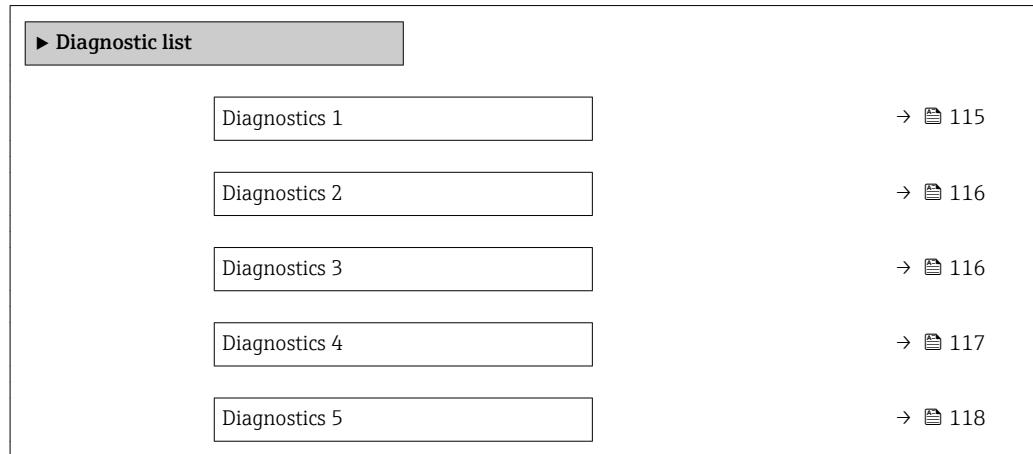
---

<b>Navigation</b>	  Expert → Diagnostics → Operating time
<b>Description</b>	Use this function to display the length of time the device has been in operation.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

### 3.5.1 "Diagnostic list" submenu

#### *Navigation*

Expert → Diagnostics → Diagnostic list



## Diagnostics 1

#### **Navigation**

Expert → Diagnostics → Diagnostic list → Diagnostics 1

#### **Description**

Displays the current diagnostics message with the highest priority.

#### **User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

#### **Additional information**

##### *Examples*

For the display format:

- F271 Main electronic
- F276 I/O module

## Timestamp

#### **Navigation**

Expert → Diagnostics → Diagnostic list → Timestamp

#### **Description**

Displays the operating time when the diagnostic message with the highest priority occurred.

#### **User interface**

Days (d), hours (h), minutes (m) and seconds (s)

#### **Additional information**

##### *Display*

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 115).

##### *Example*

For the display format:

24d12h13m00s

---

## Diagnostics 2

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 2
<b>Description</b>	Displays the current diagnostics message with the second-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<i>Examples</i> For the display format: <ul style="list-style-type: none"><li>▪  F271 Main electronic</li><li>▪  F276 I/O module</li></ul>

---

## Timestamp

---

<b>Navigation</b>	 Expert → Diagnostics → Diagnostic list → Timestamp
<b>Description</b>	Displays the operating time when the diagnostic message with the second-highest priority occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>Display</i>  The diagnostic message can be viewed via the <b>Diagnostics 2</b> parameter (→  116).  <i>Example</i> For the display format: 24d12h13m00s

---

## Diagnostics 3

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 3
<b>Description</b>	Displays the current diagnostics message with the third-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<i>Examples</i> For the display format: <ul style="list-style-type: none"><li>▪  F271 Main electronic</li><li>▪  F276 I/O module</li></ul>

---

**Timestamp**

---

<b>Navigation</b>	 Expert → Diagnostics → Diagnostic list → Timestamp
<b>Description</b>	Displays the operating time when the diagnostic message with the third-highest priority occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<p><i>Display</i></p>  The diagnostic message can be viewed via the <b>Diagnostics 3</b> parameter (→  116).
	<p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>

---

**Diagnostics 4**

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 4
<b>Description</b>	Displays the current diagnostics message with the fourth-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> <li>▪  F271 Main electronic</li> <li>▪  F276 I/O module</li> </ul>

---

**Timestamp**

---

<b>Navigation</b>	 Expert → Diagnostics → Diagnostic list → Timestamp
<b>Description</b>	Displays the operating time when the diagnostic message with the fourth-highest priority occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<p><i>Display</i></p>  The diagnostic message can be viewed via the <b>Diagnostics 4</b> parameter (→  117).
	<p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>

## Diagnostics 5

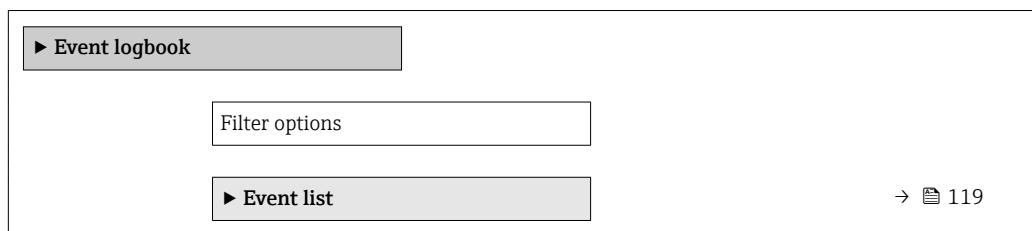
<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 5
<b>Description</b>	Displays the current diagnostics message with the fifth-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<i>Examples</i> For the display format: <ul style="list-style-type: none"><li>▪  F271 Main electronic</li><li>▪  F276 I/O module</li></ul>

## Timestamp

<b>Navigation</b>	 Expert → Diagnostics → Diagnostic list → Timestamp
<b>Description</b>	Displays the operating time when the diagnostic message with the fifth-highest priority occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>Display</i>  The diagnostic message can be viewed via the <b>Diagnostics 5</b> parameter (→  118).  <i>Example</i> For the display format: 24d12h13m00s

### 3.5.2 "Event logbook" submenu

*Navigation*  Expert → Diagnostics → Event logbook



**Filter options****Navigation**

Expert → Diagnostics → Event logbook → Filter options

**Description**

Use this function to select the category whose event messages are displayed in the event list of the operating tool.

**Selection**

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

**Factory setting**

All

**Additional information***Description*

- The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
  - C = Function Check
  - S = Out of Specification
  - M = Maintenance Required

**"Event list" submenu**

The **Event list** submenu is only displayed if operating via the local display.

If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.

If operating via the Web browser, the event messages can be found directly in the **Event logbook** submenu.

*Navigation* Expert → Diagnostics → Event logbook → Event list

**Event list****Navigation**

Expert → Diagnostics → Event logbook → Event list

**Description**

Displays the history of event messages of the category selected in the **Filter options** parameter.

**User interface**

- For a "Category I" event message  
Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)  
Diagnostics code, short message, symbol for event recording and operating time when error occurred

**Additional information***Description*

A maximum of 20 event messages are displayed in chronological order.

The following symbols indicate whether an event has occurred or has ended:

- ⊖: Occurrence of the event
- ⊕: End of the event

*Examples*

For the display format:

- I1091 Configuration modified  
⊖ 24d12h13m00s
- ⊕F271 Main electronic  
⊖ 01d04h12min30s

*HistoROM*

A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

### 3.5.3 "Device info" submenu

*Navigation*

☰ Expert → Diagnostics → Device info

**► Device info**

Device tag	→  121
Serial number	→  121
Firmware version	→  121
Device name	→  122
Order code	→  122
Ext. order cd. 1	→  122
Ext. order cd. 2	→  123
Ext. order cd. 3	→  123
Config. counter	→  123
ENP version	→  123

---

## Device tag

---

<b>Navigation</b>	  Expert → Diagnostics → Device info → Device tag
<b>Description</b>	Displays a unique name for the measuring point so it can be identified quickly within the plant.
<b>User interface</b>	Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).
<b>Factory setting</b>	Promass 100

---

## Serial number

---

<b>Navigation</b>	  Expert → Diagnostics → Device info → Serial number
<b>Description</b>	Displays the serial number of the measuring device.  The number can be found on the nameplate of the sensor and transmitter.
<b>User interface</b>	A maximum of 11-digit character string comprising letters and numbers.
<b>Additional information</b>	<i>Description</i>  <b>Uses of the serial number</b> <ul style="list-style-type: none"><li>■ To identify the measuring device quickly, e.g. when contacting Endress+Hauser.</li><li>■ To obtain specific information on the measuring device using the Device Viewer: <a href="http://www.endress.com/deviceviewer">www.endress.com/deviceviewer</a></li></ul>

---

## Firmware version

---

<b>Navigation</b>	  Expert → Diagnostics → Device info → Firmware version
<b>Description</b>	Displays the device firmware version installed.
<b>User interface</b>	Character string in the format xx.yy.zz
<b>Additional information</b>	<i>Display</i>  The Firmware version is also located: <ul style="list-style-type: none"><li>■ On the title page of the Operating instructions</li><li>■ On the transmitter nameplate</li></ul>

---

**Device name**

---

**Navigation**   Expert → Diagnostics → Device info → Device name

**Description** Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

**User interface** Max. 32 characters such as letters or numbers.

**Factory setting** Promass 100

---

**Order code**

---



**Navigation**   Expert → Diagnostics → Device info → Order code

**Description** Displays the device order code.

**User interface** Character string composed of letters, numbers and certain punctuation marks (e.g. /).

**Additional information** *Description*

 The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

 **Uses of the order code**

- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

---

**Ext. order cd. 1**

---



**Navigation**   Expert → Diagnostics → Device info → Ext. order cd. 1

**Description** Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

**User interface** Character string

**Additional information** *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

 The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

---

**Ext. order cd. 2**

**Navigation** Expert → Diagnostics → Device info → Ext. order cd. 2

**Description** Displays the second part of the extended order code.

**User interface** Character string

**Additional information** For additional information, see **Ext. order cd. 1** parameter (→ 122)

---

**Ext. order cd. 3**

**Navigation** Expert → Diagnostics → Device info → Ext. order cd. 3

**Description** Displays the third part of the extended order code.

**User interface** Character string

**Additional information** For additional information, see **Ext. order cd. 1** parameter (→ 122)

---

**Config. counter**

**Navigation** Expert → Diagnostics → Device info → Config. counter

**Description** Displays the number of parameter modifications for the device. When the user changes a parameter setting, this counter is incremented.

**User interface** 0 to 65 535

---

**ENP version**

**Navigation** Expert → Diagnostics → Device info → ENP version

**Description** Displays the version of the electronic nameplate.

**User interface** Character string

**Factory setting** 2.02.00

**Additional information** *Description*

This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

### 3.5.4 "Min/max val." submenu

Navigation

  Expert → Diagnostics → Min/max val.

 <b>Min/max val.</b>	
Reset min/max	→  124
 <b>Electronic temp.</b>	→  125
 <b>Medium temp.</b>	→  126
 <b>Carr. pipe temp.</b>	→  126
 <b>Oscil. frequency</b>	→  128
 <b>Tors.oscil.freq.</b>	→  128
 <b>Oscil. amplitude</b>	→  129
 <b>Tor. osc. amp.</b>	→  130
 <b>Oscil. damping</b>	→  131
 <b>Tors.oscil.damp.</b>	→  131
 <b>Signal asymmetry</b>	→  132

#### Reset min/max



Navigation

  Expert → Diagnostics → Min/max val. → Reset min/max

Description

Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

Selection

- Cancel
- Oscil. amplitude
- Osc. ampl. 1 \*
- Oscil. damping
- Tors.oscil.damp. \*
- Oscil. frequency
- Tors.oscil.freq.\*
- Signal asymmetry

Factory setting

Cancel

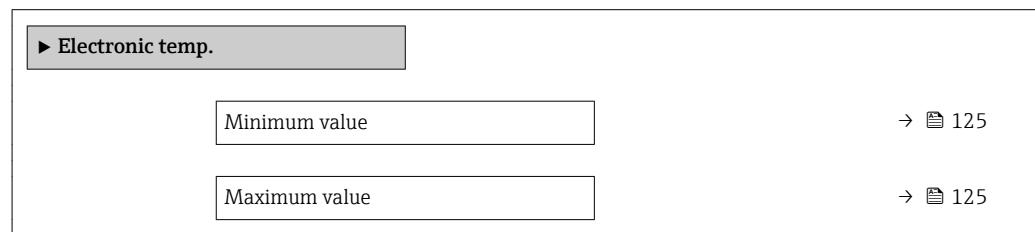
\* Visibility depends on order options or device settings

**Additional information***Selection*

Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ [17](#))

**"Electronic temp." submenu****Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp.



---

**Minimum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp. → Minimum value

**Description**

Displays the lowest previously measured temperature value of the main electronics module.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [56](#))

---

**Maximum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp. → Maximum value

**Description**

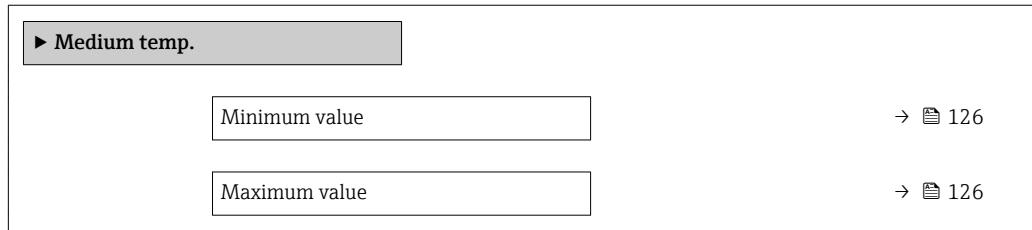
Displays the highest previously measured temperature value of the main electronics module.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [56](#))

**"Medium temp." submenu****Navigation** Expert → Diagnostics → Min/max val. → Medium temp.

---

**Minimum value**

---

**Navigation** Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value**Description**

Displays the lowest previously measured medium temperature value.

**User interface**

Signed floating-point number

**Additional information***Dependency* The unit is taken from the **Temperature unit** parameter (→  56)

---

**Maximum value**

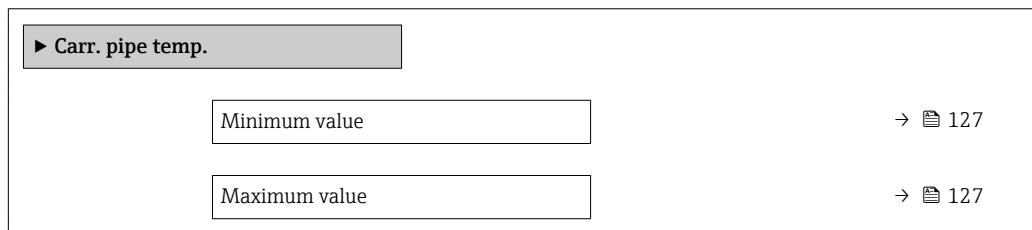
---

**Navigation** Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value**Description**

Displays the highest previously measured medium temperature value.

**User interface**

Signed floating-point number

**Additional information***Dependency* The unit is taken from the **Temperature unit** parameter (→  56)**"Carr. pipe temp." submenu****Navigation** Expert → Diagnostics → Min/max val. → Carr. pipe temp.

---

**Minimum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value

**Prerequisite**

 Only available for:

- Promass A
- Promass F
- Promass G
- Promass H
- Promass I
- Promass O
- Promass P
- Promass Q
- Promass S
- Promass X

For the following order code  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**

Displays the lowest previously measured temperature value of the carrier pipe.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

 The unit is taken from the **Temperature unit** parameter (→  56)

---

**Maximum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value

**Prerequisite**

 Only available for:

- Promass A
- Promass F
- Promass G
- Promass H
- Promass I
- Promass O
- Promass P
- Promass Q
- Promass S
- Promass X

For the following order code  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**

Displays the highest previously measured temperature value of the carrier pipe.

**User interface**

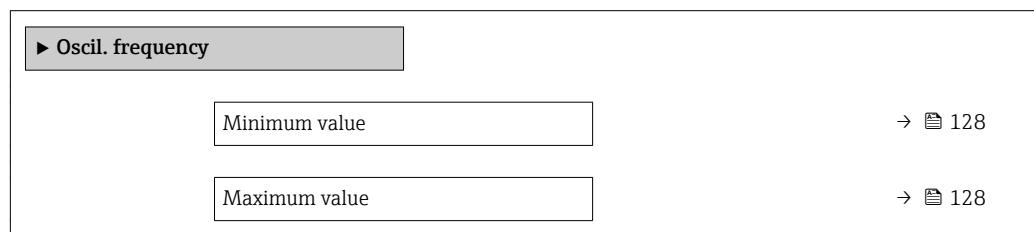
Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [56](#))

**"Oscil. frequency" submenu****Navigation**

Expert → Diagnostics → Min/max val. → Oscil. frequency



---

**Minimum value****Navigation**

Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value

**Description**

Displays the lowest previously measured oscillation frequency.

**User interface**

Signed floating-point number

---

**Maximum value****Navigation**

Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value

**Description**

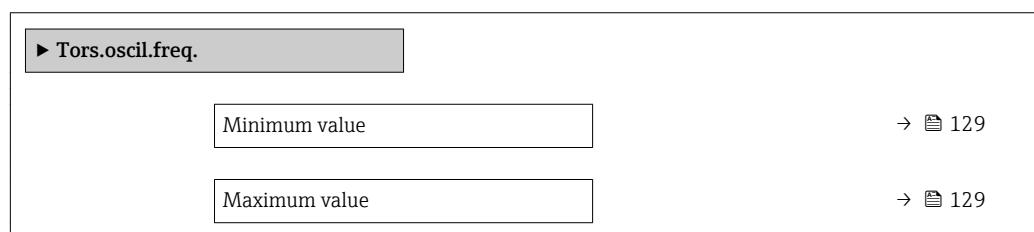
Displays the highest previously measured oscillation frequency.

**User interface**

Signed floating-point number

**"Tors.oscil.freq." submenu****Navigation**

Expert → Diagnostics → Min/max val. → Tors.oscil.freq.



---

**Minimum value**

---

<b>Navigation</b>	◀ ▶ Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Minimum value
<b>Prerequisite</b>	 Only available for Promass I. For the following order code: "Application package", option <b>EB</b> "Heartbeat Verification + Monitoring"
<b>Description</b>	Displays the lowest previously measured torsion oscillation frequency.
<b>User interface</b>	Signed floating-point number

---

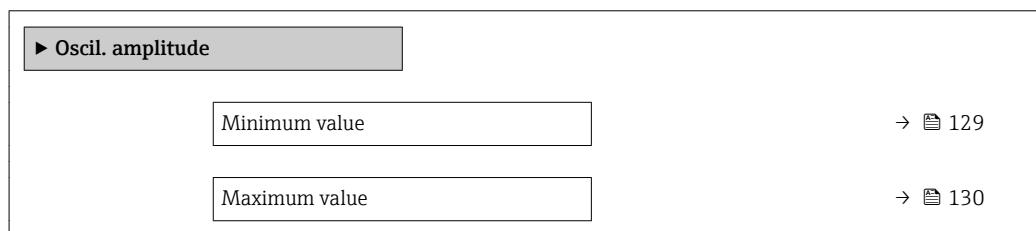
**Maximum value**

---

<b>Navigation</b>	◀ ▶ Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Maximum value
<b>Prerequisite</b>	 Only available for Promass I. For the following order code: "Application package", option <b>EB</b> "Heartbeat Verification + Monitoring"
<b>Description</b>	Displays the highest previously measured torsion oscillation frequency.
<b>User interface</b>	Signed floating-point number

**"Oscil. amplitude" submenu**

*Navigation*       Expert → Diagnostics → Min/max val. → Oscil. amplitude



---

**Minimum value**

---

<b>Navigation</b>	◀ ▶ Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value
<b>Description</b>	Displays the lowest previously measured oscillation amplitude.
<b>User interface</b>	Signed floating-point number

---

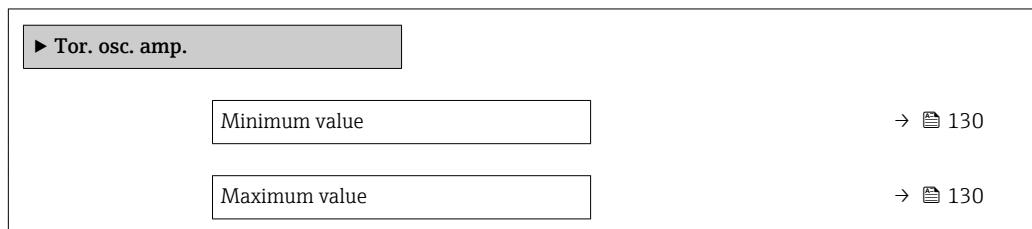
## Maximum value

---

<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value
<b>Description</b>	Displays the highest previously measured oscillation amplitude.
<b>User interface</b>	Signed floating-point number

### "Tor. osc. amp." submenu

*Navigation*        Expert → Diagnostics → Min/max val. → Tor. osc. amp.



---

## Minimum value

---

<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value
<b>Prerequisite</b>	 Only available for Promass I. For the following order code: "Application package", option <b>EB</b> "Heartbeat Verification + Monitoring"
<b>Description</b>	Displays the lowest previously measured torsion oscillation amplitude.
<b>User interface</b>	Signed floating-point number

---

## Maximum value

---

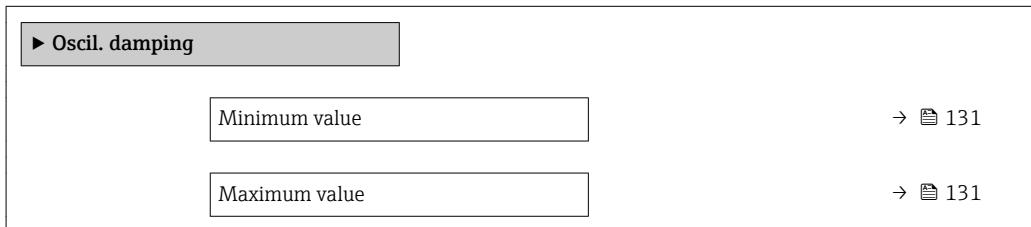
<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value
<b>Prerequisite</b>	 Only available for Promass I. For the following order code: "Application package", option <b>EB</b> "Heartbeat Verification + Monitoring"
<b>Description</b>	Displays the highest previously measured torsion oscillation amplitude.

---

User interface	Signed floating-point number
----------------	------------------------------

### "Oscil. damping" submenu

*Navigation*      Expert → Diagnostics → Min/max val. → Oscil. damping




---

#### Minimum value

**Navigation**      Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value

**Description**      Displays the lowest previously measured oscillation damping.

**User interface**      Signed floating-point number

---

#### Maximum value

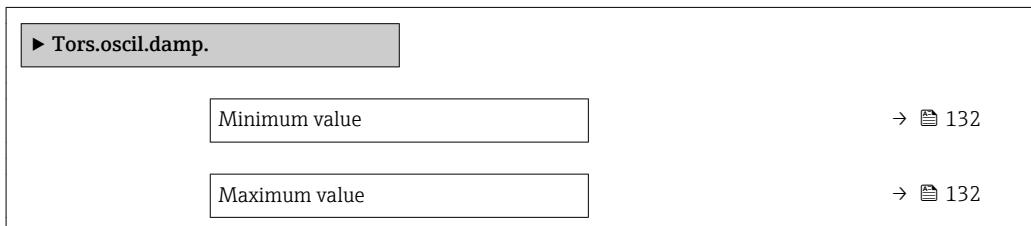
**Navigation**      Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value

**Description**      Displays the highest previously measured oscillation damping.

**User interface**      Signed floating-point number

### "Tors.oscil.damp." submenu

*Navigation*      Expert → Diagnostics → Min/max val. → Tors.oscil.damp.



## Minimum value

**Navigation**   Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Minimum value

**Prerequisite**  Only available for Promass I.

For the following order code:  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description** Displays the lowest previously measured torsion oscillation damping.

**User interface** Signed floating-point number

## Maximum value

**Navigation**   Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Maximum value

**Prerequisite**  Only available for Promass I.

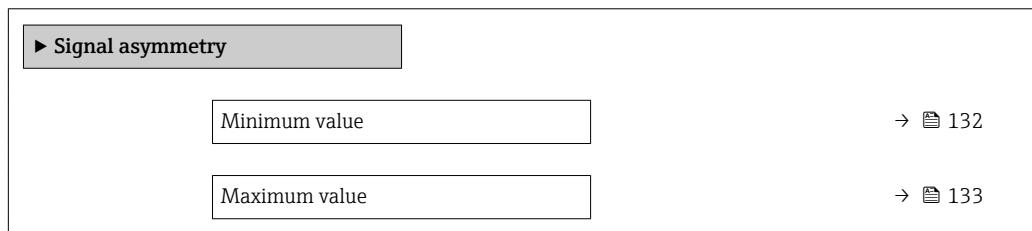
For the following order code:  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description** Displays the highest previously measured torsion oscillation damping.

**User interface** Signed floating-point number

## "Signal asymmetry" submenu

*Navigation*   Expert → Diagnostics → Min/max val. → Signal asymmetry



## Minimum value

**Navigation**   Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value

**Description** Displays the lowest previously measured signal asymmetry.

**User interface** Signed floating-point number

**Maximum value**

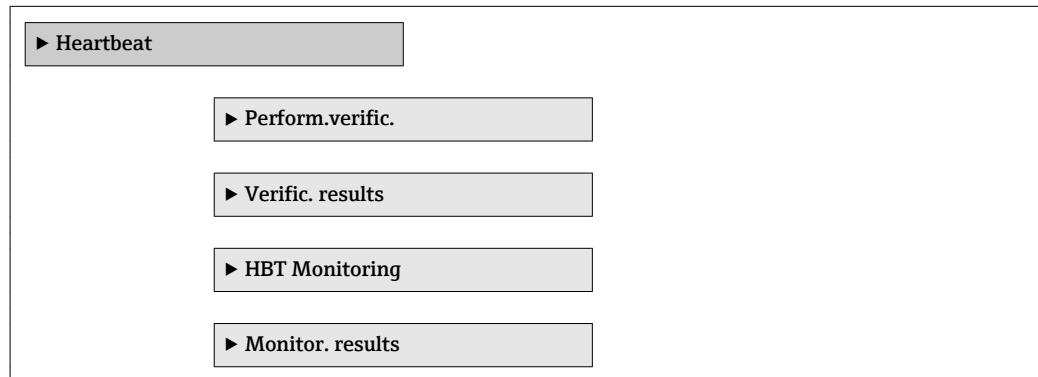
<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value
<b>Description</b>	Displays the highest previously measured signal asymmetry.
<b>User interface</b>	Signed floating-point number

**3.5.5 "Heartbeat" submenu**

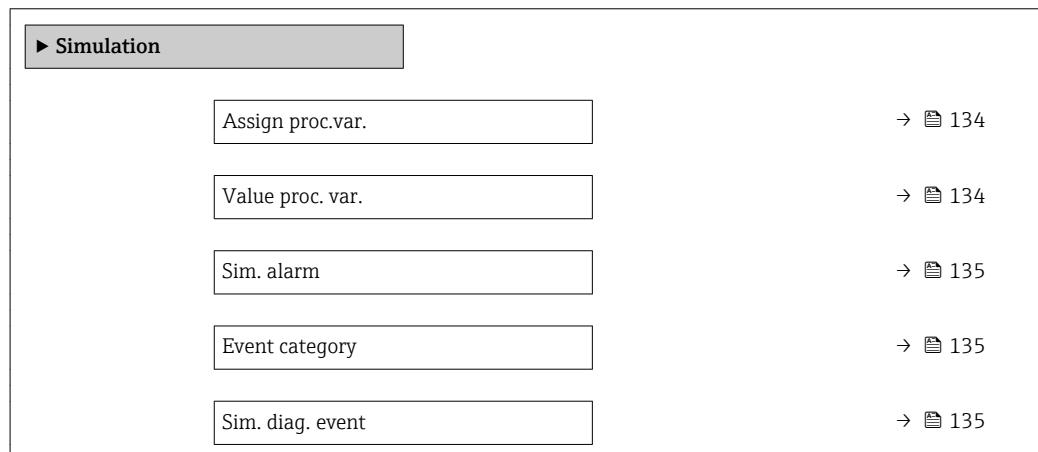
 For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** application package, refer to the Special Documentation for the device

*Navigation*

Expert → Diagnostics → Heartbeat

**3.5.6 "Simulation" submenu***Navigation*

Expert → Diagnostics → Simulation



**Assign proc.var.****Navigation**

Expert → Diagnostics → Simulation → Assign proc.var.

**Description**

Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Dynam. viscosity<sup>\*</sup>
- Kinematic visc.
- TempCompDynVisc<sup>\*</sup>
- TempCompKinVisc<sup>\*</sup>
- Concentration<sup>\*</sup>
- Target mass flow<sup>\*</sup>
- Carrier mass fl.<sup>\*</sup>

**Factory setting**

Off

**Additional information***Description*

The simulation value of the process variable selected is defined in the **Value proc. var.** parameter (→ 134).

**Value proc. var.****Navigation**

Expert → Diagnostics → Simulation → Value proc. var.

**Prerequisite**

One of the following options is selected in the **Assign proc.var.** parameter (→ 134):

- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Dynam. viscosity<sup>\*</sup>
- Kinematic visc.
- TempCompDynVisc<sup>\*</sup>
- TempCompKinVisc<sup>\*</sup>
- Concentration<sup>\*</sup>
- Target mass flow<sup>\*</sup>
- Carrier mass fl.<sup>\*</sup>

\* Visibility depends on order options or device settings

---

<b>Description</b>	Use this function to enter a simulation value for the selected process variable. Subsequent measured value processing and the signal output use this simulation value. In this way, users can verify whether the measuring device has been configured correctly.
<b>User entry</b>	Depends on the process variable selected
<b>Factory setting</b>	0
<b>Additional information</b>	<p><i>Entry</i></p>  The unit of the displayed measured value is taken from the <b>System units</b> submenu (→ 49).

---

## Sim. alarm



<b>Navigation</b>	 Expert → Diagnostics → Simulation → Sim. alarm
<b>Description</b>	Use this function to switch the device alarm on and off.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ On</li> </ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<p><i>Description</i></p> <p>The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.</p>

---

## Event category

<b>Navigation</b>	 Expert → Diagnostics → Simulation → Event category
<b>Description</b>	Use this function to select the category of the diagnostic events that are displayed for the simulation in the <b>Sim. diag. event</b> parameter (→ 135).
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Sensor</li> <li>▪ Electronics</li> <li>▪ Configuration</li> <li>▪ Process</li> </ul>
<b>Factory setting</b>	Process

---

## Sim. diag. event

<b>Navigation</b>	 Expert → Diagnostics → Simulation → Sim. diag. event
<b>Description</b>	Use this function to select a diagnostic event for the simulation process that is activated.

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Diagnostic event picklist (depends on the category selected)</li></ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<p><i>Description</i></p> <p> For the simulation, you can choose from the diagnostic events of the category selected in the <b>Event category</b> parameter (→ 135).</p>

## 4 Country-specific factory settings

### 4.1 SI units

 Not valid for USA and Canada.

#### 4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	l
Volume flow	l/h
Corrected volume	Nl
Corrected volume flow	Nl/h
Density	kg/l
Reference density	kg/Nl
Temperature	°C
Pressure	bar a

#### 4.1.2 Full scale values

 The factory settings apply to the following parameters:  
100% bar graph value 1

Nominal diameter [mm]	[kg/h]
1	4
2	20
4	90
8	400
15	1300
15 FB	3600
25	3600
25 FB	9000
40	9000
40 FB	14000
50	14000
50 FB	36000
80	36000
100	60000
150	130 t/h
250	360 t/h
350	650 t/h

### 4.1.3 On value low flow cut off

**i** The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	On-value for liquid [kg/h]
1	0.08
2	0.4
4	1.8
8	8
15	26
15 FB	72
25	72
25 FB	180
40	180
40 FB	300
50	300
50 FB	720
80	720
100	1200
150	2.6 t/h
250	7.2 t/h
350	13 t/h

Nominal diameter [mm]	Switch-on value for gas [kg/h]
1	0.02
2	0.1
4	0.45
8	2
15	6.5
15 FB	18
25	18
25 FB	45
40	45
40 FB	75
50	75
50 FB	180
80	180
100	300
150	650
250	1.8 t/h
350	3.25 t/h

## 4.2 US units

 Only valid for USA and Canada.

### 4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	gal (us)
Volume flow	gal/min (us)
Corrected volume	Sft <sup>3</sup>
Corrected volume flow	Sft <sup>3</sup> /min
Density	lb/ft <sup>3</sup>
Reference density	lb/Sft <sup>3</sup>
Temperature	°F
Pressure	psi a

### 4.2.2 Full scale values

 The factory settings apply to the following parameters:  
100% bar graph value 1

Nominal diameter [in]	[lb/min]
1/24	0.15
1/12	0.75
1/8	3.3
3/8	15
1/2	50
1/2 FB	130
1	130
1 FB	330
1½	330
1½ FB	550
2	550
2 FB	1300
3	1300
4	2200
6	4800
10	13 000
14	23 500

### 4.2.3 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	On-value for liquid [lb/min]
1/24	0.003
1/12	0.015
1/8	0.066
3/8	0.3
1/2	1
1/2 FB	2.6
1	2.6
1 FB	6.6
1½	6.6
1½ FB	11
2	11
2 FB	26
3	26
4	44
6	95
10	260
14	470

Nominal diameter [in]	Switch-on value for gas [lb/min]
1/24	0.001
1/12	0.004
1/8	0.016
3/8	0.075
1/2	0.25
1/2 FB	0.65
1	0.65
1 FB	1.65
1½	1.65
1½ FB	2.75
2	2.75
2 FB	6.5
3	6.5
4	11
6	23.75
10	65
14	117.5

## 5 Explanation of abbreviated units

### 5.1 SI units

Process variable	Units	Explanation
Density	g/cm <sup>3</sup> , g/m <sup>3</sup>	Gram/volume unit
	kg/dm <sup>3</sup> , kg/l, kg/m <sup>3</sup>	Kilogram/volume unit
	SD4°C, SD15°C, SD20°C	Specific density: The specific density is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
	SG4°C, SG15°C, SG20°C	Specific gravity: The specific gravity is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
Pressure	Pa a, kPa a, MPa a	Pascal, kilopascal, megapascal (absolute)
	bar	Bar
	Pa g, kPa g, MPa g	Pascal, kilopascal, megapascal (relative/gauge)
	bar g	Bar (relative/gauge)
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
Ref.density	kg/Nm <sup>3</sup> , kg/Nl, g/Scm <sup>3</sup> , kg/Sm <sup>3</sup>	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm <sup>3</sup> , Sm <sup>3</sup>	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm <sup>3</sup> /s, Nm <sup>3</sup> /min, Nm <sup>3</sup> /h, Nm <sup>3</sup> /d	Normal cubic meter/time unit
	Sm <sup>3</sup> /s, Sm <sup>3</sup> /min, Sm <sup>3</sup> /h, Sm <sup>3</sup> /d	Standard cubic meter/time unit
Temperature	°C, K	Celsius, Kelvin
Volume	cm <sup>3</sup> , dm <sup>3</sup> , m <sup>3</sup>	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm <sup>3</sup> /s, cm <sup>3</sup> /min, cm <sup>3</sup> /h, cm <sup>3</sup> /d	Cubic centimeter/time unit
	dm <sup>3</sup> /s, dm <sup>3</sup> /min, dm <sup>3</sup> /h, dm <sup>3</sup> /d	Cubic decimeter/time unit
	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d	Cubic meter/time unit
	ml/s, ml/min, ml/h, ml/d	Milliliter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
	hl/s, hl/min, hl/h, hl/d	Hectoliter/time unit
	Ml/s, Ml/min, Ml/h, Ml/d	Megaliter/time unit
Time	s, m, h, d, y	Second, minute, hour, day, year

### 5.2 US units

Process variable	Units	Explanation
Density	lb/ft <sup>3</sup> , lb/gal (us)	Pound/cubic foot, pound/gallon
	lb/bbl (us;liq.), lb/bbl (us;beer), lb/bbl (us;oil), lb/bbl (us;tank)	Pound/volume unit

Process variable	Units	Explanation
Pressure	psi a	Pounds per square inch (absolute)
	psi g	Pounds per square inch (gauge)
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Ref.density	lb/Sft <sup>3</sup>	Weight unit/standard volume unit
Corrected volume	Sft <sup>3</sup> , Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.flow	Sft <sup>3</sup> /s, Sft <sup>3</sup> /min, Sft <sup>3</sup> /h, Sft <sup>3</sup> /d	Standard cubic foot/time unit
	Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)	Standard gallon/time unit
	Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)	Barrel/time unit (normal liquids)
Temperature	°F, °R	Fahrenheit, Rankine
Volume	af	Acre foot
	ft <sup>3</sup>	Cubic foot
	fl oz (us), gal (us), kgal (us), Mgal (us)	Fluid ounce, gallon, kilogallon, million gallon
	bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)	Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)
Volume flow	af/s, af/min, af/h, af/d	Acre foot/time unit
	ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem ( before midday), post meridiem (after midday)

### 5.3 Imperial units

Process variable	Units	Explanation
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Corrected volume	Sgal (imp)	Standard gallon
Correct.vol.flow	Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)	Standard gallon/time unit
Volume	gal (imp), Mgal (imp) bbl (imp;beer), bbl (imp;oil)	Gallon, mega gallon Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp) Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp) bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Gallon/time unit Mega gallon/time unit Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 34.97 gal/bbl
Time	s, m, h, d, y am, pm	Second, minute, hour, day, year Ante meridiem ( before midday), post meridiem (after midday)

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