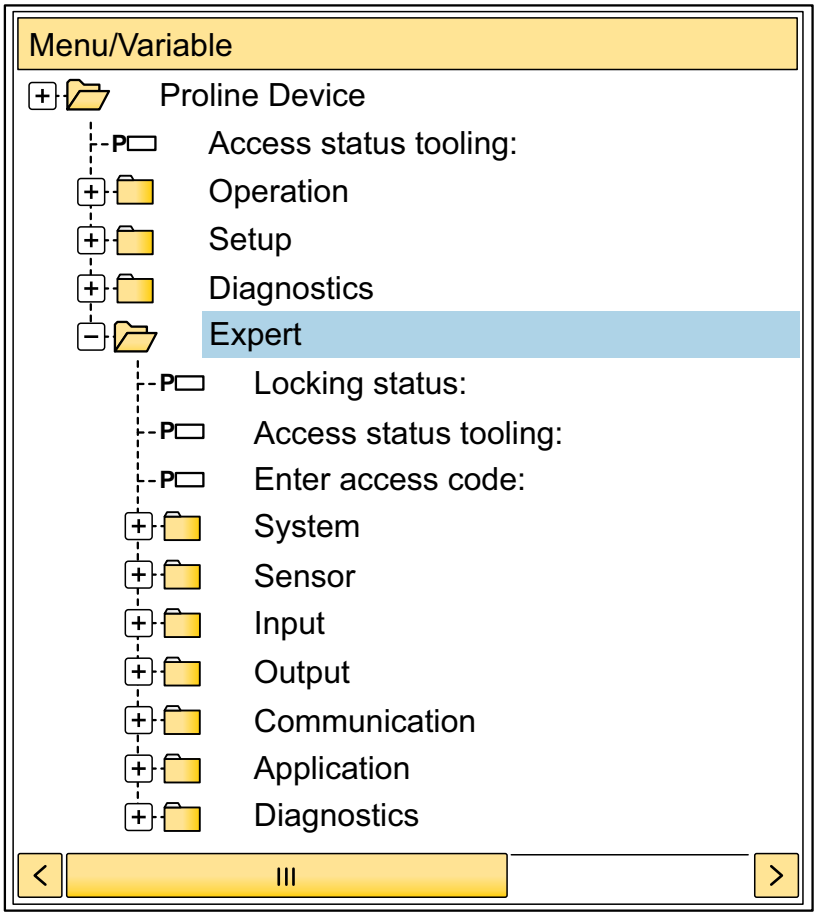
GP01037D/06/EN/02.17
71377887

Valid as of version
01.00.zz (Device firmware)

Description of Device Parameters
Proline Promass 100
PROFINET

Coriolis flowmeter



Endress+Hauser
People for Process Automation

Table of contents

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

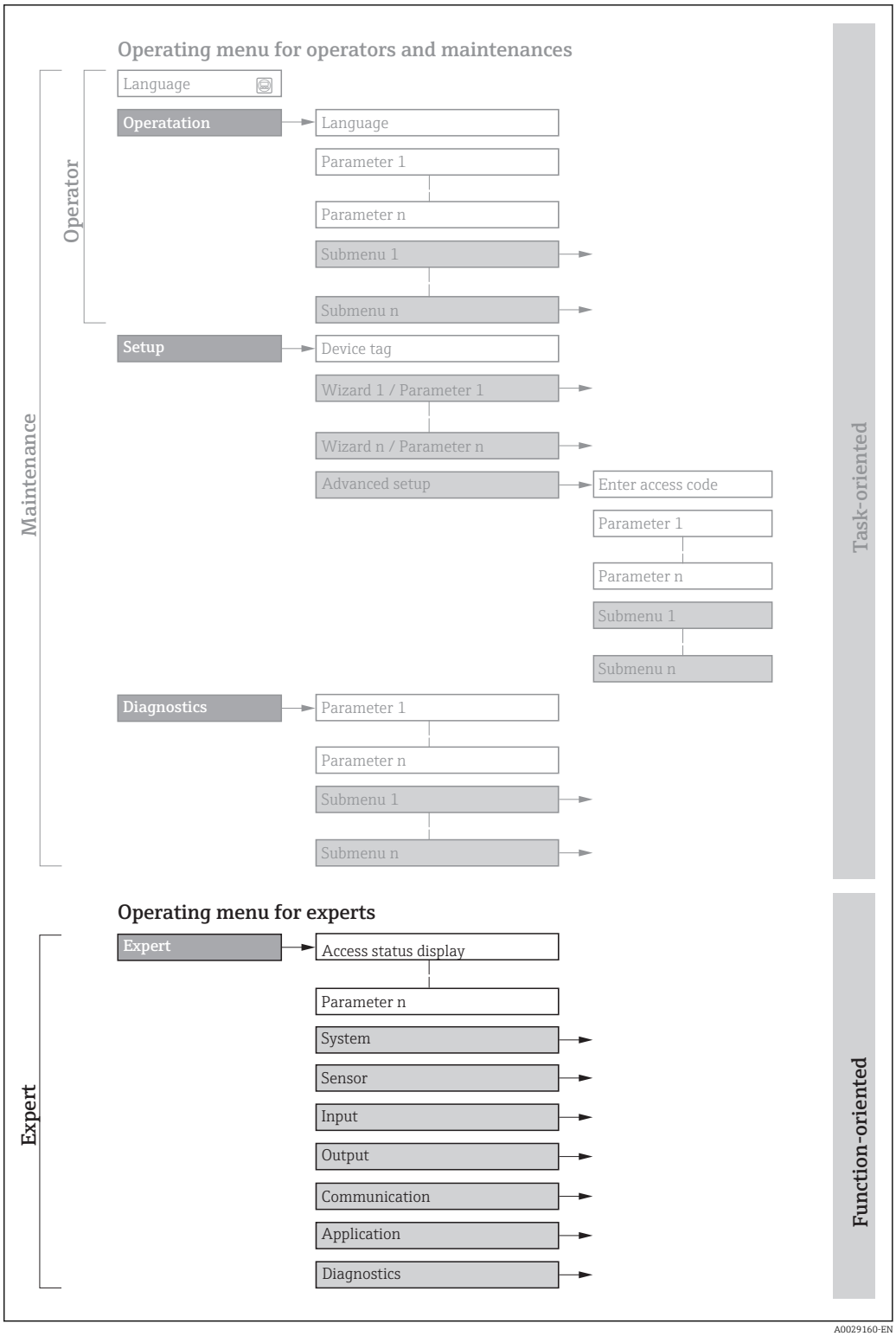
1.2 Target group

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
	Tip 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	BA01424D
Promass E 100 (8E1B**-...)	BA01426D
Promass E 100 (8E1C**-...)	BA01715D
Promass F 100	BA01427D
Promass G 100	BA01433D
Promass H 100	BA01428D
Promass I 100	BA01429D
Promass O 100	BA01430D
Promass P 100	BA01431D
Promass S 100	BA01432D
Promass X 100	BA01437D

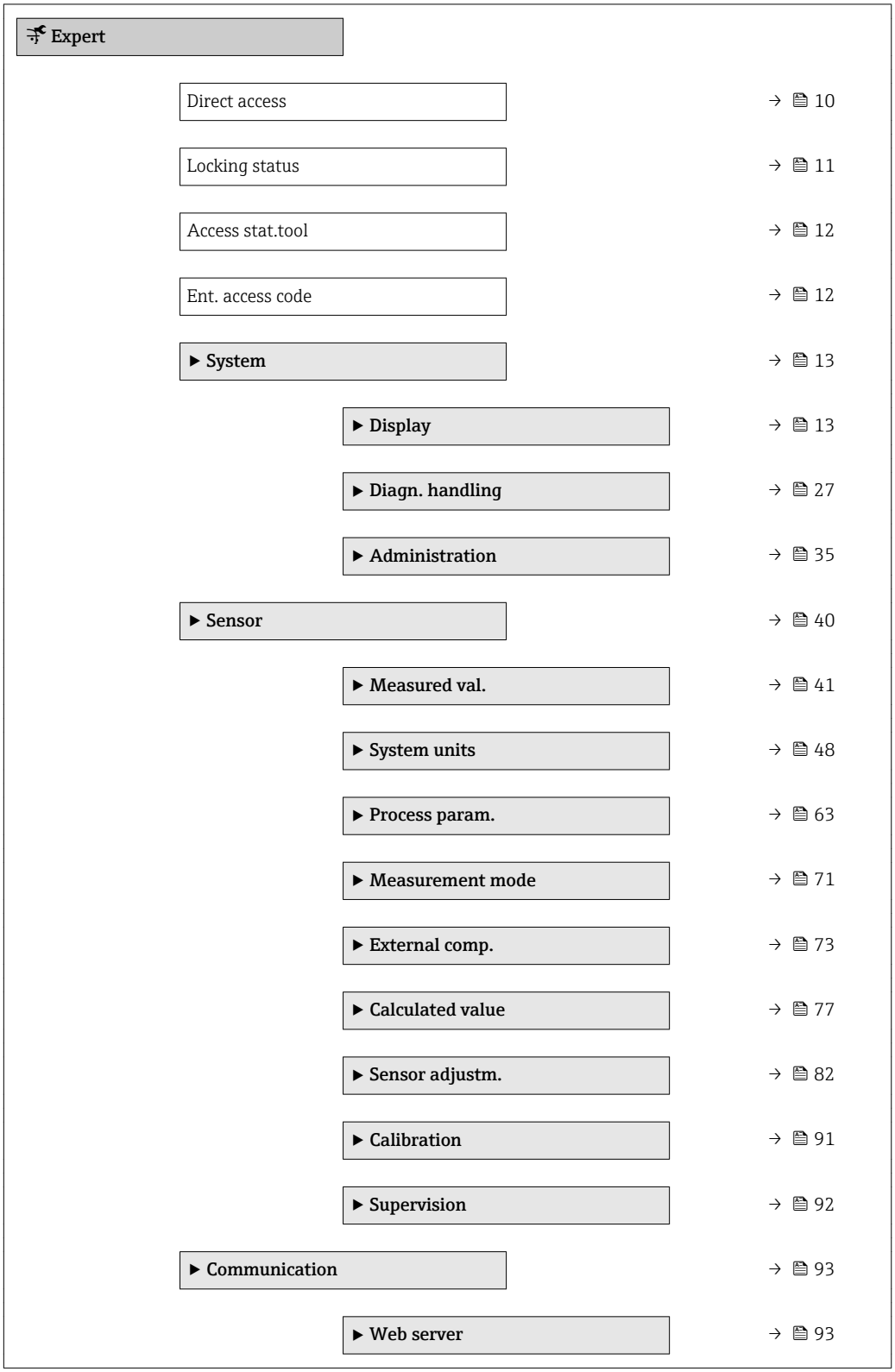
1.5.2 Supplementary device-dependent documentation

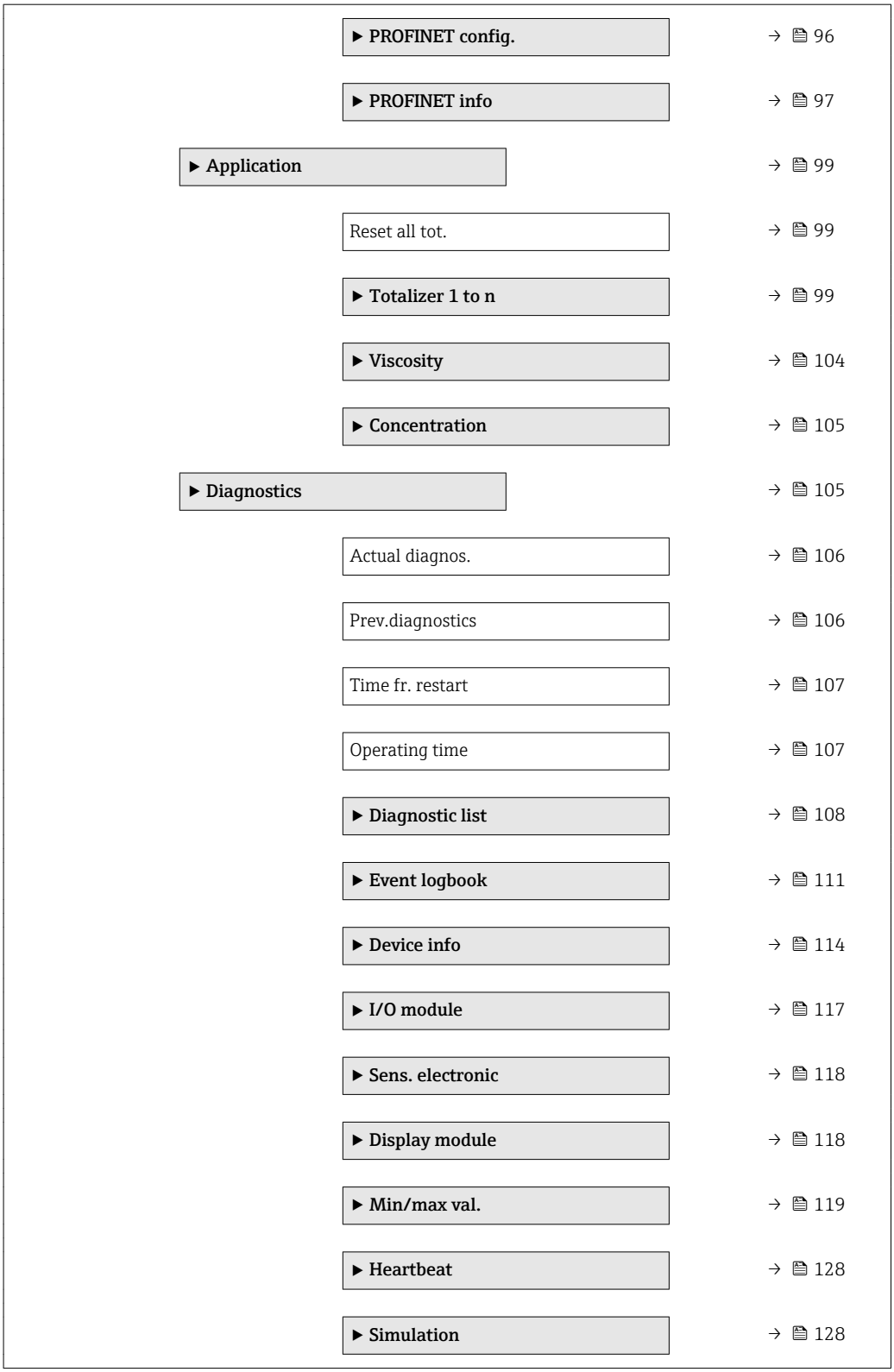
Special Documentation

Content	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Concentration Measurement	SD01503D
Heartbeat Technology	SD01493D
Web server	SD01823D

2 Overview of the Expert operating menu

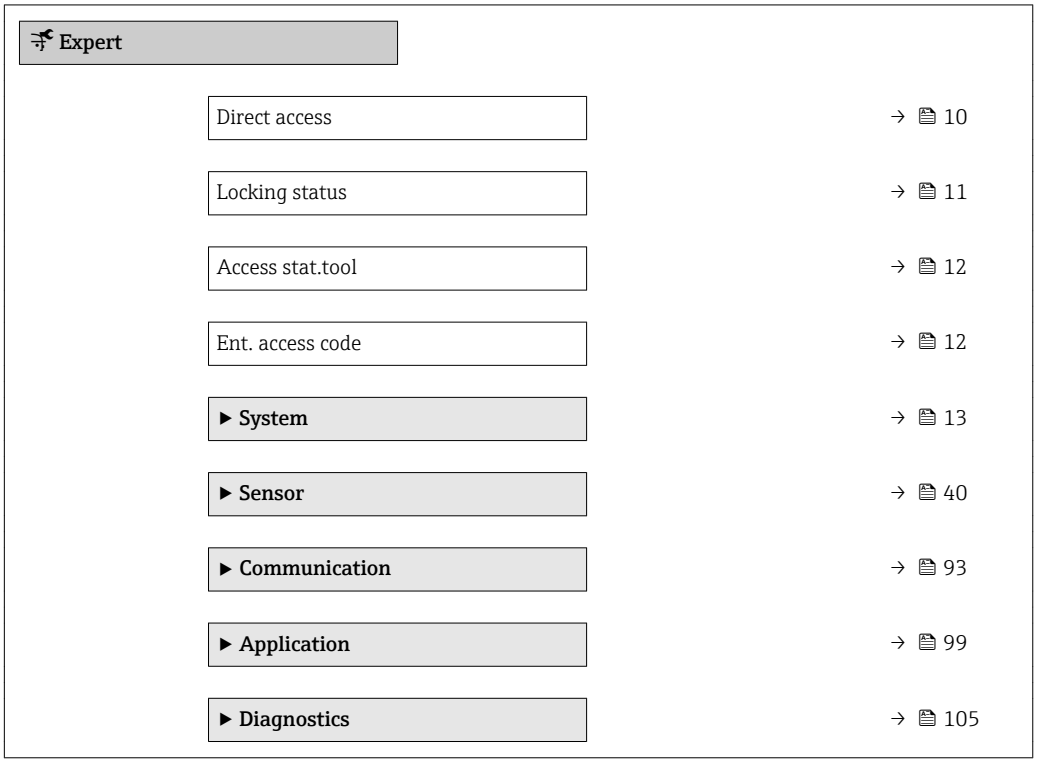
The following table provides an overview of the menu structure of the expert operating menu and its parameters. The page reference indicates where the associated description of the submenu or parameter can be found.




▶ PROFINET config.
→ 96
▶ PROFINET info
→ 97
▶ Application
→ 99
Reset all tot.
→ 99
▶ Totalizer 1 to n
→ 99
▶ Viscosity
→ 104
▶ Concentration
→ 105
▶ Diagnostics
→ 105
Actual diagnos.
→ 106
Prev.diagnostics
→ 106
Time fr. restart
→ 107
Operating time
→ 107
▶ Diagnostic list
→ 108
▶ Event logbook
→ 111
▶ Device info
→ 114
▶ I/O module
→ 117
▶ Sens. electronic
→ 118
▶ Display module
→ 118
▶ Min/max val.
→ 119
▶ Heartbeat
→ 128
▶ Simulation
→ 128

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.



Direct access

Navigation Expert → Direct access

Prerequisite There is a local display with operating elements.

Description Input of the access code to enable direct access to the desired parameter via the local display. For this reason, each parameter is assigned a parameter number that appears in the navigation view on the right in the header of the selected parameter.

User entry 0 to 65 535

Additional information *User entry*

The direct access code consists of a 4-digit number and the channel number, which identifies the channel of a process variable: e.g. 0914-1

- The leading zeros in the direct access code do not have to be entered.
  Example: Input of **"914"** instead of **"0914"**
- If no channel number is entered, channel 1 is jumped to automatically.
  Example: Enter **0914** → **Assign variable** parameter
- If a different channel is jumped to: Enter the direct access code with the corresponding channel number.
  Example: Enter **0914-3** → **Assign variable** parameter

Locking status

Navigation Expert → Locking status

Description Displays the active write protection.

User interface
- Hardware locked
- Temp. locked

Additional information

Display

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.

If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 11).

"Hardware locked" option (priority 1)

The DIP switch for hardware locking is activated on the main electronics module. This locks write access to the parameters (e.g. via local display or operating tool).

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.

"Temp. locked" option (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

Navigation Expert → 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 (→ 🖹 12).

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

If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 🖹 11).

Display

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.

Access stat.tool

Navigation Expert → Access stat.tool

Description Displays the access authorization to the parameters via the operating tool or Web browser.

User interface
- Operator
- Maintenance

Factory setting Maintenance

Additional information

Description

Access authorization can be modified via the **Ent. access code** parameter (→ 🖹 12).

If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 🖹 11).

Display

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.

Ent. access code

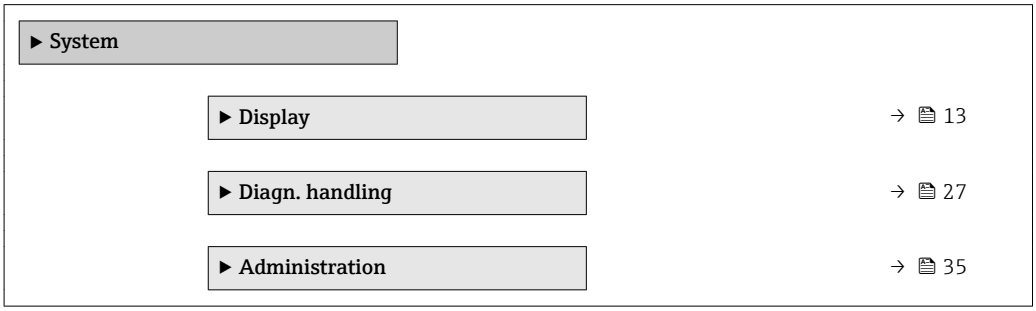
Navigation Expert → Ent. access code

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

User entry 0 to 9 999

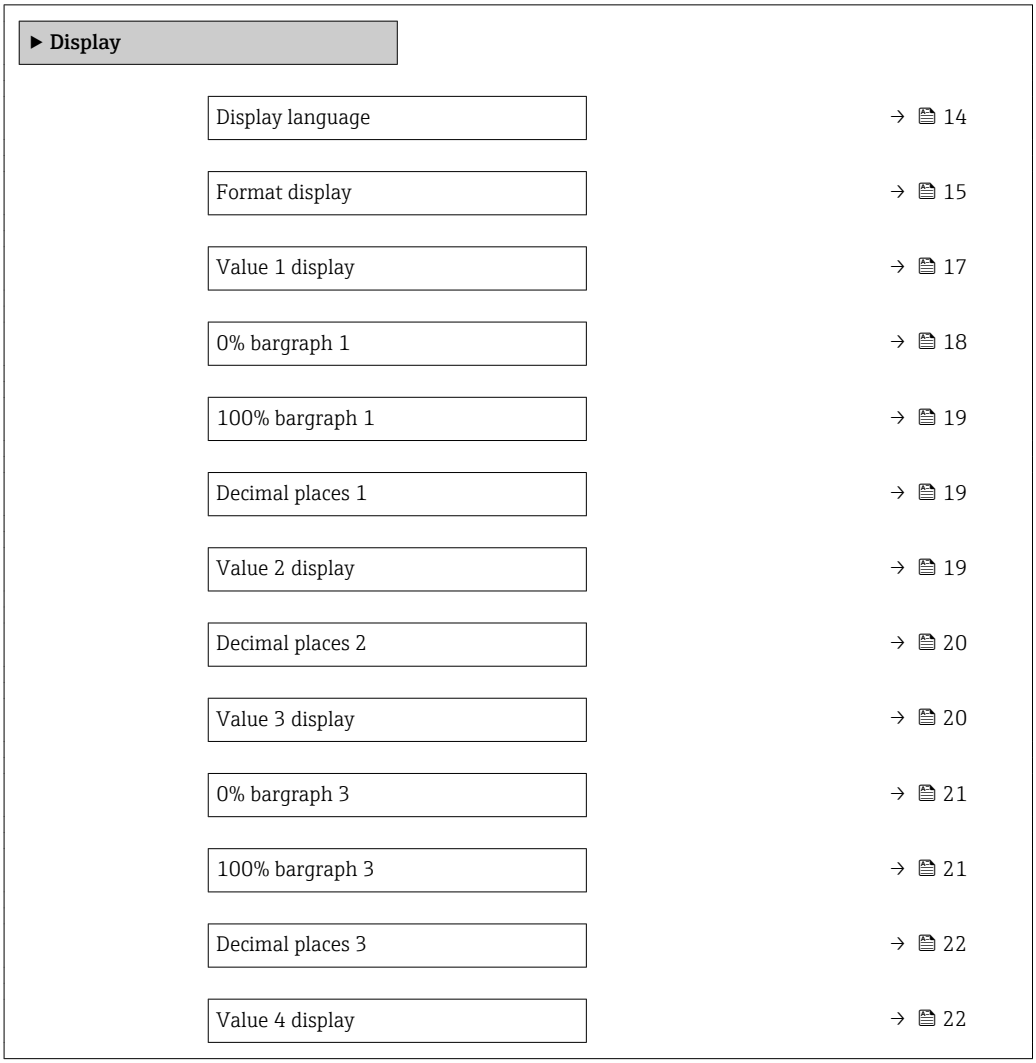
3.1 "System" submenu

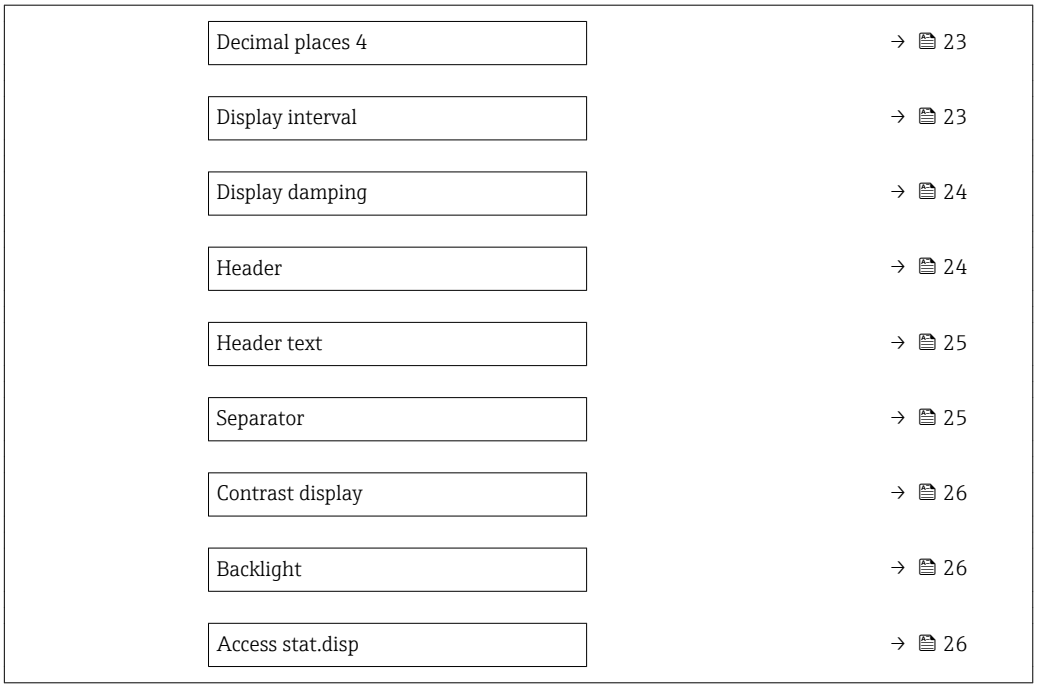
Navigation Expert → System



3.1.1 "Display" submenu

Navigation Expert → System → Display





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

Factory setting English (alternatively, the ordered language is preset in the device)

* Visibility depends on order options or device settings

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.

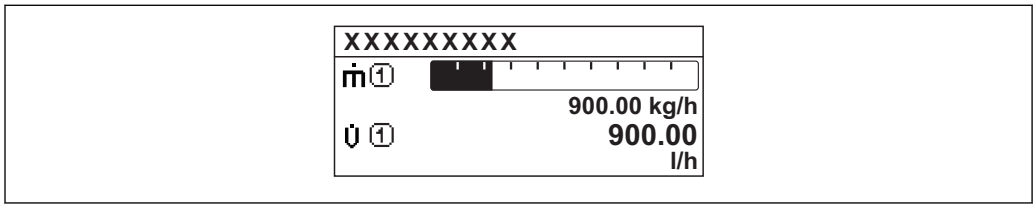
- The **Value 1 display** parameter (→ 17) to **Value 4 display** parameter (→ 22) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display.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

Possible measured values shown on the local display:

"1 value, max." option

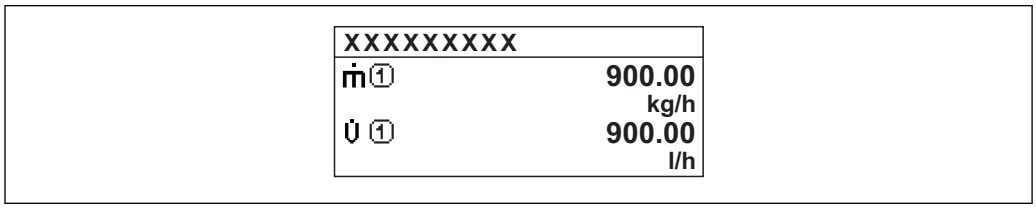
A0013099

"Bargr. + 1 value" option



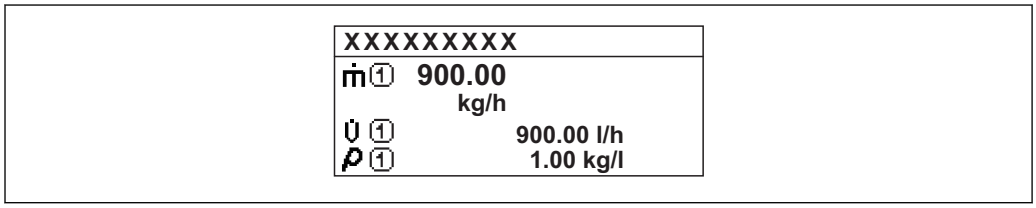
A0013098

"2 values" option



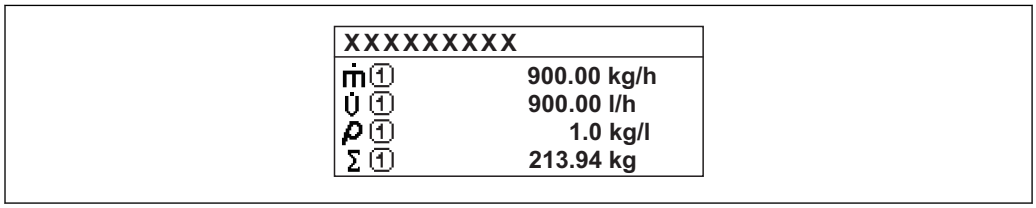
A0013100

"Val. large+2val." option



A0013102

"4 values" option



A0013103

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 (→ 48).

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 (→ 48).

100% bargraph 1

Navigation Expert → System → Display → 100% bargraph 1

Prerequisite A local display is provided.

Description Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter → 132

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 (→ 48).

Decimal places 1

Navigation Expert → System → Display → Decimal places 1

Prerequisite A measured value is specified in the **Value 1 display** parameter (→ 17).

Description Use this function to select the number of decimal places for measured value 1.

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 2 display

Navigation Expert → System → Display → Value 2 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 second 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 (→ 48).

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*

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 (→ 48).

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 (→ 48).

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 (→ 48).

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 (→ 48).

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 [1]) 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.

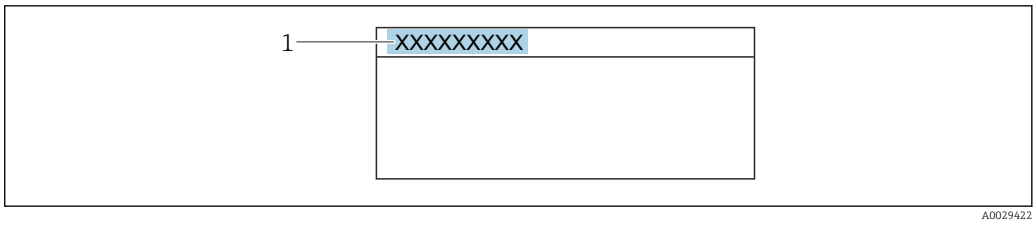
Selection
- Device tag
- Free text

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 (→ 114).
- 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.

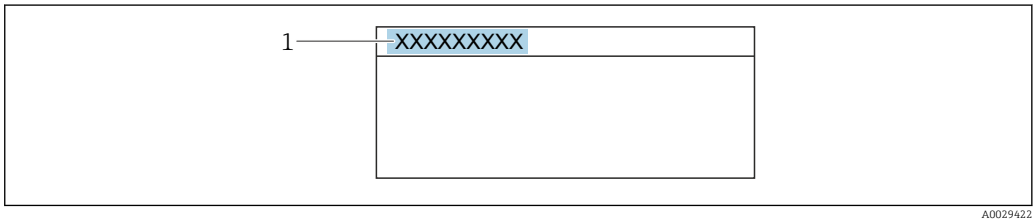
Description Use this function to enter a customer-specific text for the header of the local display.

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 (→ 📄 12).

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

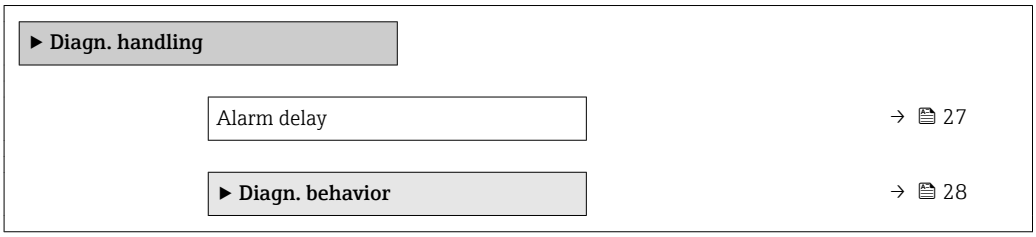
If additional write protection is active, this restricts the current access authorization even further.

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
- 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:

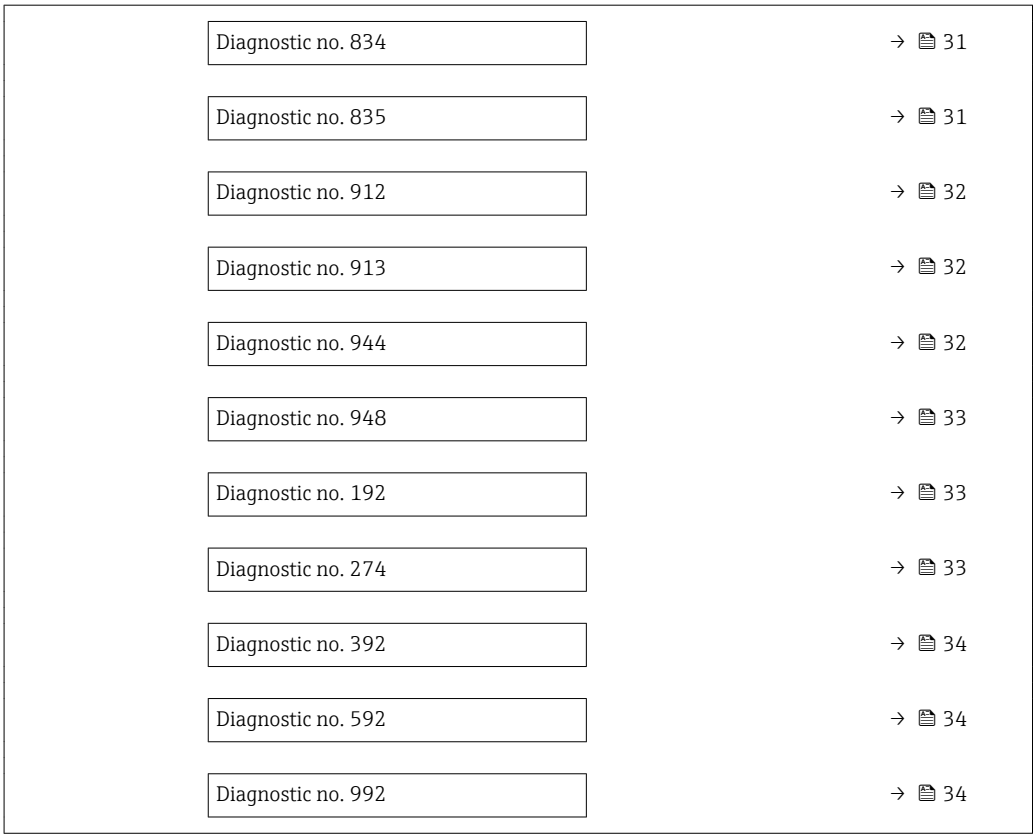
Diagnostic behavior	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.
Warning	The device continues to measure. The measured value output via PROFINET and the totalizers are not affected. A diagnostic message is generated.
Logbook only	The device continues to measure. The diagnostic message is displayed only in the **Event logbook** submenu (→ 🖹 111) (**Event list** submenu (→ 🖹 113)) and not in alternation with the operational 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. 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

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**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 144 (MeasErrorTooHigh)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144

Description Option for changing the diagnostic behavior of the diagnostic message **144 MeasErrorTooHigh**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Alarm

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

Diagnostic no. 832 (Electronic temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832

Description Use this function to change the diagnostic behavior of the diagnostic message **832 Electronic temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 833 (Electronic temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833

Description Use this function to change the diagnostic behavior of the diagnostic message **833 Electronic temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 834 (Process temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834

Description Use this function to change the diagnostic behavior of the diagnostic message **834 Process temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 835 (Process temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835

Description Use this function to change the diagnostic behavior of the diagnostic message **835 Process temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

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

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

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

Diagnostic no. 948 (Oscill. damping)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948

Description Option for changing the diagnostic behavior of the diagnostic message **948 Oscill. damping**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 192 (Special event 9)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 192

Description Option for changing the diagnostic behavior of the diagnostic message **192 Special event 9**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

Diagnostic no. 374 (Sensor electron.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 274

Description Option for changing the diagnostic behavior of the diagnostic message **374 Sensor electron.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

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

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

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**.

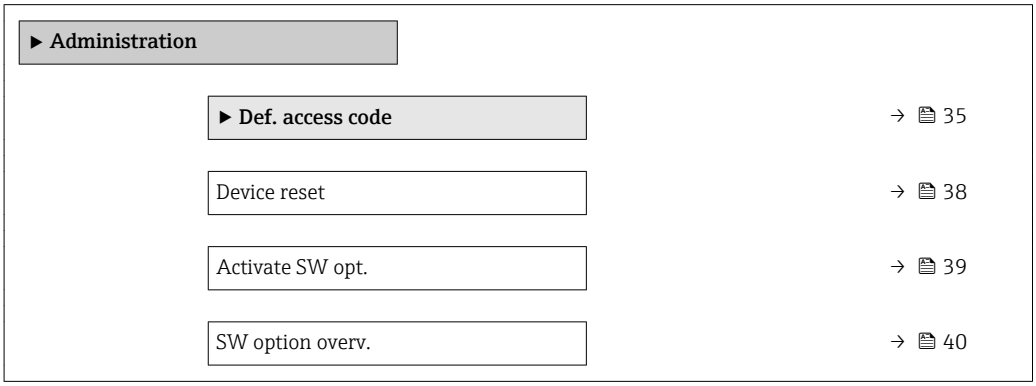
Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

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

3.1.3 "Administration" submenu

Navigation Expert → System → Administration

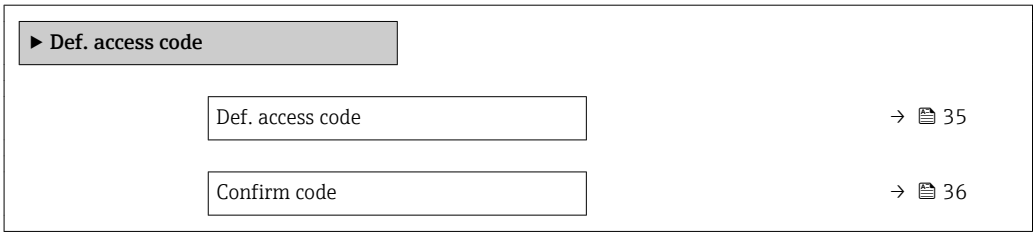


"Def. access code" wizard

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 (→ 12).

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

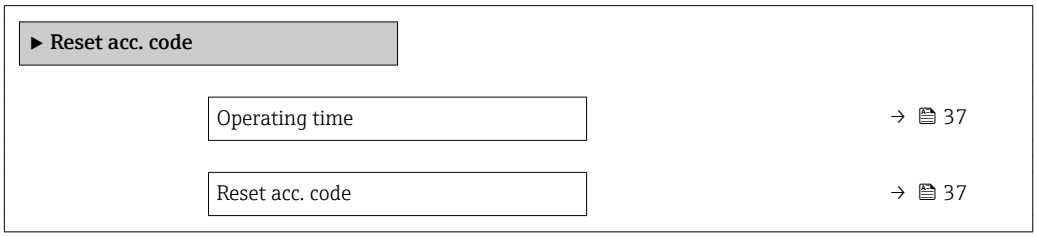
Description Enter the defined release code a second time to confirm the release code.

User entry 0 to 9999

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 (→ 12).

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
- Del.p.fail stor.
- Delete T-DAT
- Del. fact. data

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.

User entry Max. 10-digit string consisting of numbers.

Factory setting Depends on the software option ordered

Additional information

Description

If a measuring device was ordered with an additional software option, the activation code is programmed in the device at the factory.

User entry

To activate a software option subsequently, please contact your Endress+Hauser sales organization.

NOTE!

The activation code is linked to the serial number of the measuring device and varies according to the device and software option.

If an incorrect or invalid code is entered, this results in the loss of software options that have already been activated.

▸ Before you enter a new activation code, make a note of the current activation code .

▸ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.

▸ Once the activation code has been entered, check if the new software option is displayed in the **SW option overv.** parameter (→ 40).

↳ The new software option is active if it is displayed.

↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.

▸ If the code entered is incorrect or invalid, enter the old activation code .

▸ Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

Example for a software option

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

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 40).

Web browser

Once a software option has been activated, the page must be loaded again in the Web browser.

SW option overv.

Navigation Expert → System → Administration → SW option overv.

Description Displays all the software options that are enabled in the device.

User interface
- HBT Verification
- HBT Monitoring
- Concentration
- Viscosity

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

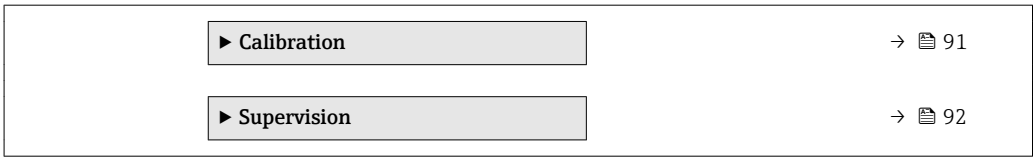
Only available for Promass I.

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

3.2 "Sensor" submenu

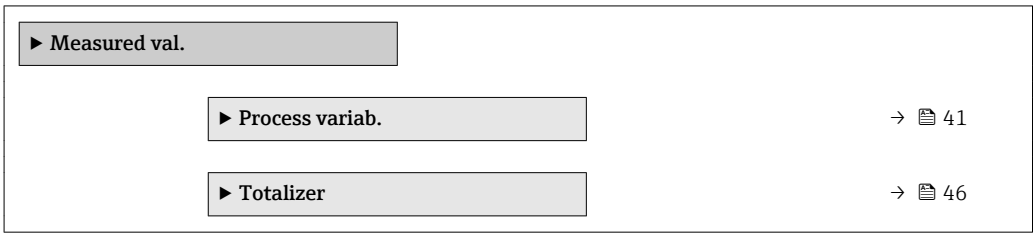
Navigation Expert → Sensor

▶ Sensor	
▶ Measured val.	→ 41
▶ System units	→ 48
▶ Process param.	→ 63
▶ Measurement mode	→ 71
▶ External comp.	→ 73
▶ Calculated value	→ 77
▶ Sensor adjustm.	→ 82



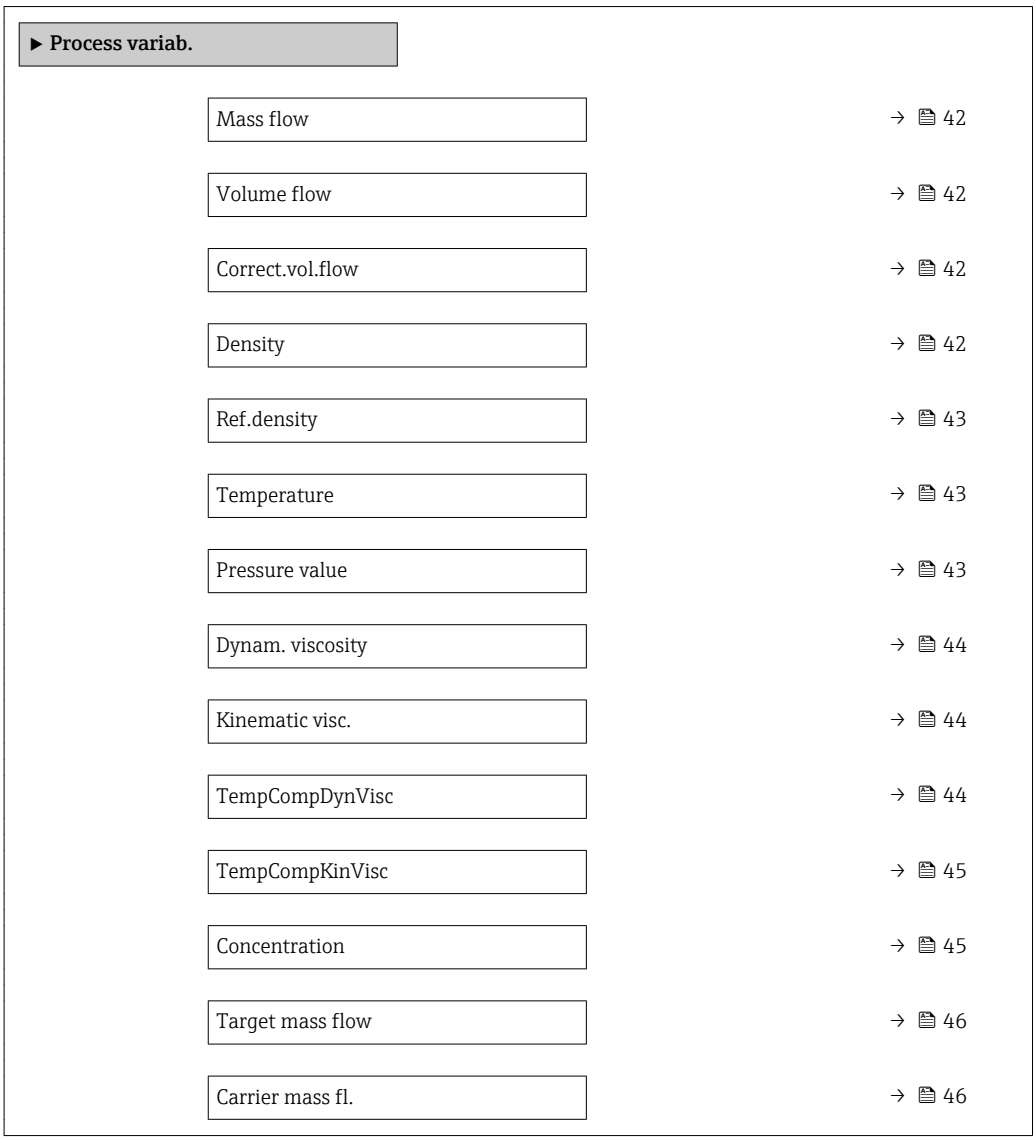
3.2.1 "Measured val." submenu

Navigation Expert → Sensor → Measured val.



"Process variab." submenu

Navigation Expert → Sensor → Measured val. → Process variab.



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 (→ 49)

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 (→ 50)

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 (→ 52)

Density

Navigation Expert → Sensor → Measured val. → Process variab. → Density

Description Displays the density currently measured.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Density unit** parameter (→ 53)

Ref.density

Navigation Expert → Sensor → Measured val. → Process variab. → Ref.density

Description Displays the reference density currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Ref. dens. unit** parameter (→ 54)

Temperature

Navigation Expert → Sensor → Measured val. → Process variab. → Temperature

Description Displays the medium temperature currently measured.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 55)

Pressure value

Navigation Expert → Sensor → Measured val. → Process variab. → Pressure value

Description Displays the fixed or external pressure value.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Pressure unit** parameter (→ 55)

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 (→ 40).

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 (→ 40).

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

Navigation Expert → Sensor → Measured val. → Process variab. → TempCompDynVisc

Prerequisite
For the following order code:
"Application package", option **EG** "Viscosity"

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 40).

Description
Displays the temperature compensation currently calculated for the viscosity.

User interface
Signed floating-point number

Additional information *Dependency*

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

TempCompKinVisc

Navigation Expert → Sensor → Measured val. → Process variab. → TempCompKinVisc

Prerequisite For the following order code:
"Application package", option **EG** "Viscosity"

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 40).

Description Displays the temperature compensation currently calculated for the kinetic viscosity.

User interface Signed floating-point number

Additional information *Dependency*

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

Concentration

Navigation Expert → Sensor → Measured val. → Process variab. → Concentration

Prerequisite For the following order code:
"Application package", option **ED** "Concentration"

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 40).

Description Displays the concentration currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

Target mass flow

Navigation 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 (→ 40).

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 (→ 49)

Carrier mass fl.

Navigation 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 (→ 40).

Description Displays the mass flow currently measured for the carrier medium.

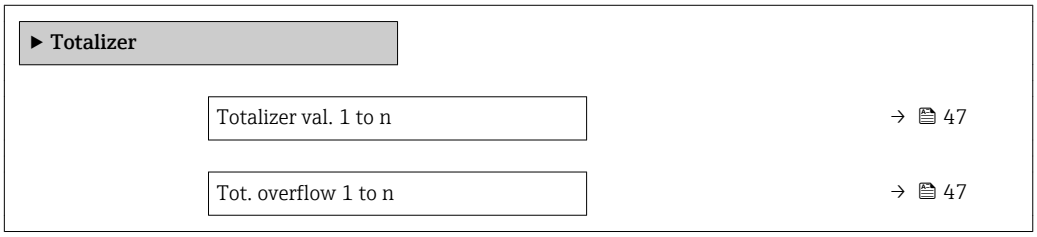
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 49)

"Totalizer" submenu

Navigation Expert → Sensor → Measured val. → Totalizer



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 (→ 100)**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 (→ 104).

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 (→ 102).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 100).

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^3
- Value in the **Tot. overflow 1** parameter: $1 \cdot 10^7$ (1 overflow) = 10 000 000 [m^3]
- Current totalizer reading: 11 968 457 m^3

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 (→ 100)**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 (→ 100).

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

3.2.2 "System units" submenu

Navigation Expert → Sensor → System units

▶ **System units**	
Mass flow unit	→ 49
Mass unit	→ 49
Volume flow unit	→ 50
Volume unit	→ 52
Cor.volflow unit	→ 52
Corr. vol. unit	→ 53
Density unit	→ 53
Ref. dens. unit	→ 54
Temperature unit	→ 55
Pressure unit	→ 55
Date/time format	→ 56
▶ **User-spec. units**	→ 57

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: → 136

Mass unit

Navigation Expert → Sensor → System units → Mass unit

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

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Custom-specific units
User mass

Factory setting

Country-specific:
- kg (DN > 150 (6"): t)
- lb

Additional information

Selection

For an explanation of the abbreviated units: → 136

Volume flow unit

Navigation

Expert → Sensor → System units → Volume flow unit

Description

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

Selection

SI units
- cm^3/s
- cm^3/min
- cm^3/h
- cm^3/d
- dm^3/s
- dm^3/min
- dm^3/h
- dm^3/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d

US units
- af/s
- af/min
- af/h
- af/d
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- 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)

Imperial units
- 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)
- bbl/s (imp;oil)
- bbl/min (imp;oil)
- bbl/h (imp;oil)
- bbl/d (imp;oil)

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^3/h)
- gal/min (us)

Additional information

Result

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

Selection

For an explanation of the abbreviated units: → 136

Volume unit

Navigation Expert → Sensor → System units → Volume unit

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

Selection

SI units
- cm^3
- dm^3
- m^3
- ml
- l
- hl
- Ml Mega

US units
- af
- ft^3
- 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^3)
- gal (us)

Additional information *Selection*

For an explanation of the abbreviated units: → 136

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

SI units
- Nl/s
- Nl/min
- Nl/h
- Nl/d
- Nm^3/s
- Nm^3/min
- Nm^3/h
- Nm^3/d
- Sm^3/s
- Sm^3/min
- Sm^3/h
- Sm^3/d

US units
- Sft^3/s
- Sft^3/min
- Sft^3/h
- Sft^3/d
- Sgal/s (us)
- Sgal/min (us)
- Sgal/h (us)
- Sgal/d (us)
- Sbbl/s (us;liq.)
- Sbbl/min (us;liq.)
- Sbbl/h (us;liq.)
- Sbbl/d (us;liq.)

Imperial units
- Sgal/s (imp)
- Sgal/min (imp)
- Sgal/h (imp)
- Sgal/d (imp)

Custom-specific units
- UserCrVol./s
- UserCrVol./min
- UserCrVol./h
- UserCrVol./d

Factory setting

Country-specific:
- Nl/h (DN > 150 (6"): Nm³/h)
- Sft³/min

Additional information

Result

The selected unit applies for:
Correct.vol.flow parameter (→ 42)

Selection

For an explanation of the abbreviated units: → 136

Corr. vol. unit

Navigation

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

Description

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

Selection

SI units
- Nl
- Nm³
- Sm³

US units
- Sft³
- Sgal (us)
- Sbbl (us;liq.)

Imperial units
Sgal (imp)

Custom-specific units
UserCrVol.

Factory setting

Country-specific:
- Nl (DN > 150 (6"): Nm³)
- Sft³

Additional information

Selection

For an explanation of the abbreviated units: → 136

Density unit

Navigation

Expert → Sensor → System units → Density unit

Description

Use this function to select the unit for the density.

Selection

SI units
- g/cm³
- g/m³
- kg/dm³
- kg/l
- kg/m³
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units
- lb/ft³
- 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/ft³

Additional information

Result

The selected unit applies for:
Density parameter (→ 42)

Selection

- SD = specific density
  The specific density is the ratio of the fluid 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 fluid 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: → 136

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
- kg/Nm³
- kg/Nl
- g/Scm³
- kg/Sm³

US units
lb/Sft³

Factory setting

Country-dependent
- kg/Nl
- lb/Sft³

Additional information

Result

The selected unit applies for:
- **Ext. ref.density** parameter (→ 79)
- **Fix ref.density** parameter (→ 79)
- **Ref.density** parameter (→ 43)

Selection

For an explanation of the abbreviated units: → 136

Temperature unit

Navigation Expert → Sensor → System units → Temperature unit

Description Use this function to select the unit for the temperature.

Selection

SI units
- °C
- K

US units
- °F
- °R

Factory setting

Country-specific:
- °C
- °F

Additional information

Result

The selected unit applies for:
- **Maximum value** parameter (→ 120)
- **Minimum value** parameter (→ 120)
- **Maximum value** parameter (→ 121)
- **Minimum value** parameter (→ 121)
- **Maximum value** parameter (→ 122)
- **Minimum value** parameter (→ 122)
- **External temp.** parameter (→ 76)
- **Ref. temperature** parameter
- **Temperature** parameter (→ 43)
- **Ref. temperature** parameter (→ 79)

Selection

For an explanation of the abbreviated units: → 136

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 (→ 74)
- **External press.** parameter (→ 74)
- **Pressure value** parameter (→ 43)

Selection

For an explanation of the abbreviated units: → 136

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

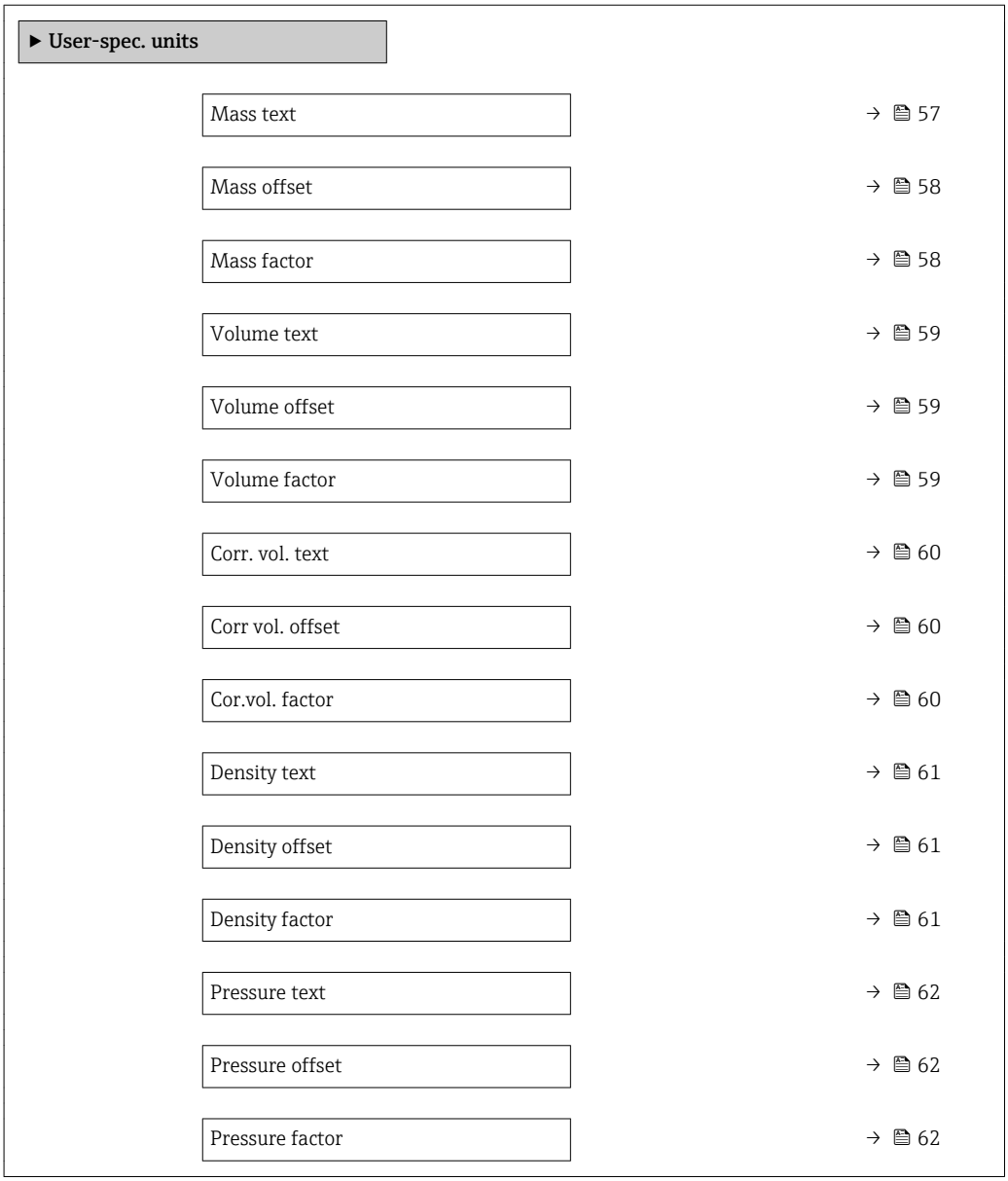
Additional information

Selection

For an explanation of the abbreviated units: → 136

"User-spec. units" submenu

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



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 (→ 49)
- **Mass unit** parameter (→ 49)

Example

If the text CENT for "centner" is entered, the following options are displayed in the picklist for the **Mass flow unit** parameter (→ 49):
- 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 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 (→ 50)
- **Volume unit** parameter (→ 52)

Example

If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→ 50) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

Volume offset

Navigation 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 (→ 52)
- **Corr. vol. unit** parameter (→ 53)

Example

If the text GLAS is entered, the choose list of the **Cor.volflow unit** parameter (→ 52) 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 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 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 (→ 53).

Example

Enter text “CE_L” for centners per liter

Density offset

Navigation 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 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 (→ 55).

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

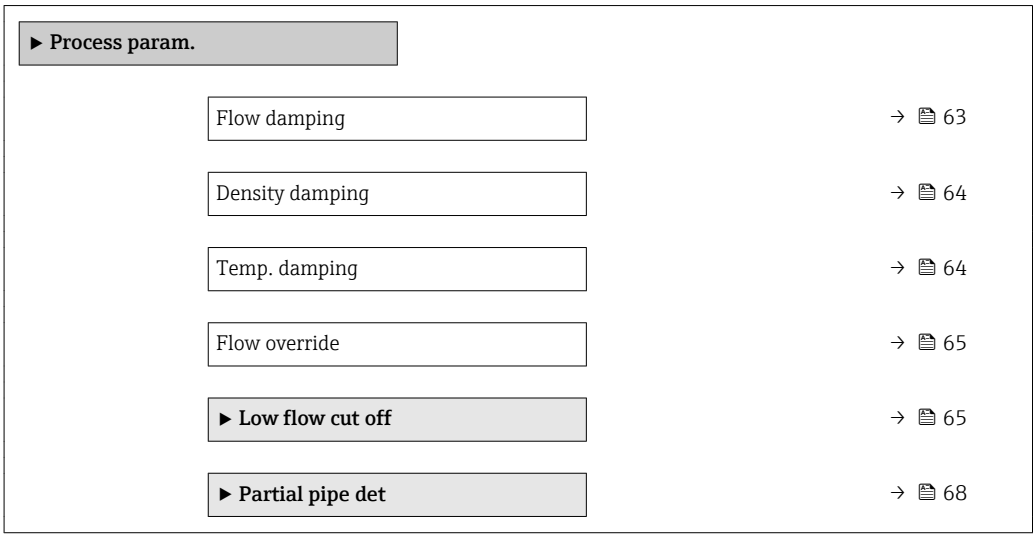
Factory setting 1.0

Additional information *Example*

1 Dyn/cm² = 0.1 Pa → 10 Dyn/cm² = 1 Pa → user entry: 10

3.2.3 "Process param." submenu

Navigation Expert → Sensor → Process param.



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 [2].

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 → 65
- Totalizers → 99

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 [3].

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 [4].

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

▶ **Low flow cut off**

Assign variable	→ 65
On value	→ 66
Off value	→ 66
Pres. shock sup.	→ 67

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.

Selection
- Off
- Mass flow
- Volume flow
- Correct.vol.flow

Factory setting Mass flow

On value

Navigation Expert → Sensor → Process param. → Low flow cut off → On value

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 65):
- Mass flow
- Volume flow
- Correct.vol.flow

Description 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 → 66.

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter → 133

Additional information *Dependency*

The unit depends on the process variable selected in the **Assign variable** parameter (→ 65).

Off value

Navigation Expert → Sensor → Process param. → Low flow cut off → Off value

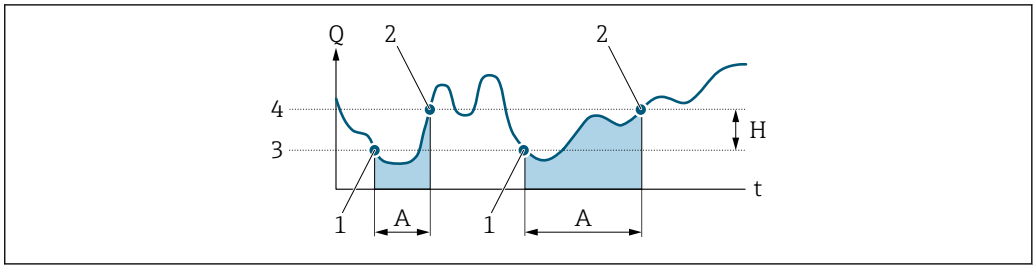
Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 65):
- Mass flow
- Volume flow
- Correct.vol.flow

Description 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→ 66.

User entry 0 to 100.0 %

Factory setting 50 %

Additional information *Example*



A0012887

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 (→ 65):
- 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

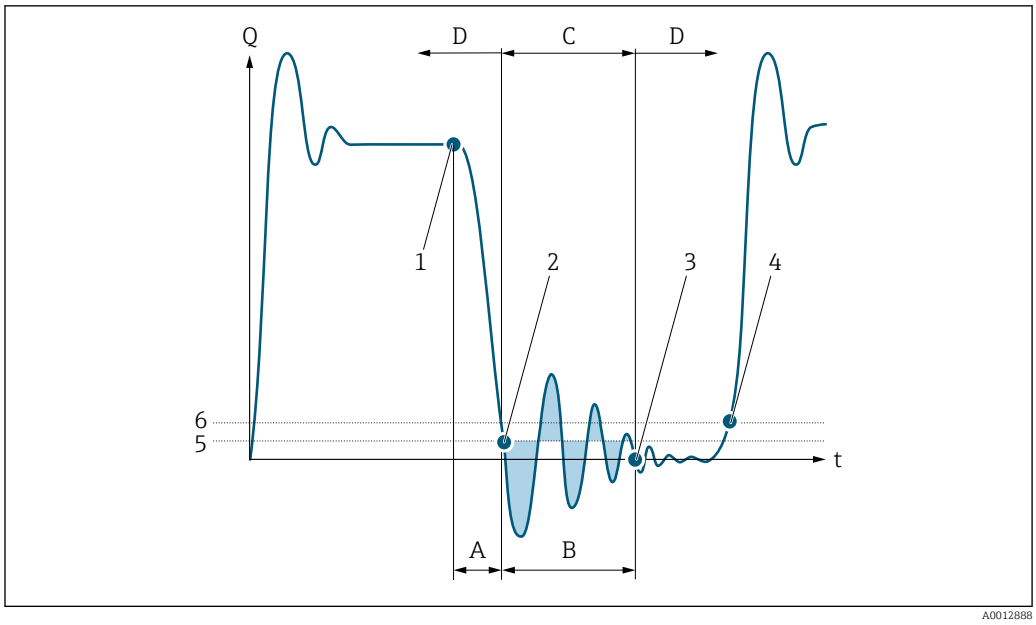
Additional information *Description*

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	→ 69
Low value	→ 69
High value	→ 69
Response time	→ 70
Max. damping	→ 70

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 (→ 69):
- 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 (→ 69).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 69).

Limit value

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 (→ 69):
- Density
- Ref.density

Description 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.

User entry Signed floating-point number

Factory setting 6 000

Additional information

User entry

The upper limit value must be greater than the lower limit value defined in the **Low value** parameter (→ 69).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 69).

Limit value

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

Response time

Navigation Expert → Sensor → Process param. → Partial pipe det → Response time

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 69):
- Density
- Ref.density

Description Use this function to enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message ⚠**S862 Partly filled** to be triggered if the measuring pipe is empty or partially full.

User entry 0 to 100 s

Factory setting 1 s

Max. damping

Navigation Expert → Sensor → Process param. → Partial pipe det → Max. damping

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 69):
- Density
- Ref.density

Description Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes.

User entry Positive floating-point number

Factory setting 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

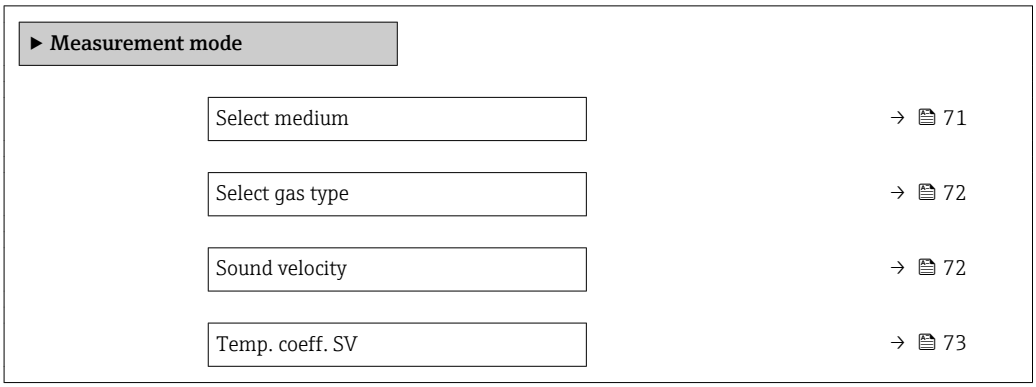
- Damping is disabled if **0** is entered (factory setting).
- Damping is enabled if the value entered is greater than **0**.
- The value entered depends on application-specific influence variables, such as the medium, nominal diameter, sensor etc.

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
- Gas

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 (→ 71).

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

Selection
- Air
- Ammonia NH3
- Argon Ar
- Sulf. hex.fl.SF6
- Oxygen O2
- Ozone O3
- Nitrog. ox. NOx
- Nitrogen N2
- Nitrous ox. N2O
- Methane CH4
- Hydrogen H2
- Helium He
- Hydrog.chlor.HCl
- Hydrog.sulf. H2S
- Ethylene C2H4
- Carbon diox. CO2
- Carbon monox. CO
- Chlorine Cl2
- Butane C4H10
- Propane C3H8
- Propylene C3H6
- Ethane C2H6
- Others

Factory setting Methane CH4

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 (→ 72), 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 (→ 72).

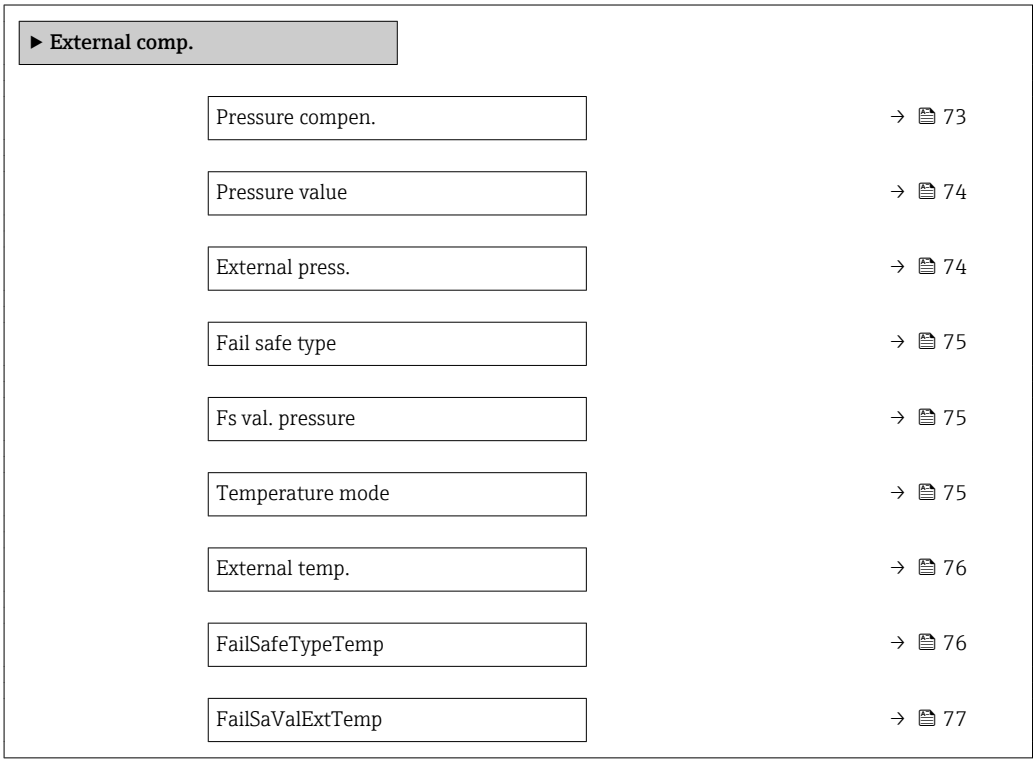
Description Use this function to enter a temperature coefficient for the sound velocity of the gas.

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.

Prerequisite The **Gas** option is selected in the **Select medium** parameter (→ 71).

Description Use this function select the type of pressure compensation.

Selection
- Off
- Fixed value
- External value

Factory setting
Off

Additional information
Selection

Use this function select the type of pressure compensation. When selecting the **External value** option, the pressure value of the cyclical PROFINET communication is used. In addition, the "External pressure " compensation value must be incorporated into the analog output module.

Additional information: Operating Instructions, "Cyclical data transfer" section.

Pressure value

Navigation
Expert → Sensor → External comp. → Pressure value

Prerequisite
The **Fixed value** option is selected in the **Pressure compen.** parameter (→ 73).

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 (→ 55)

External press.

Navigation
Expert → Sensor → External comp. → External press.

Prerequisite
The **External value** option is selected in the **Pressure compen.** parameter (→ 73).

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 (→ 55)

Fail safe type

Navigation Expert → Sensor → External comp. → Fail safe type

Description Use this function to select the failsafe mode for the external density value.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Off

Additional information *Description*

If the status of the input or simulation value is BAD, the failsafe mode defined here is used.

Selection
- Fail safe value
  A substitute value is used. The substitute value is defined in the **Fs val. pressure** parameter (→ 75).
- Fallback value
  The last valid value is used.
- **Off** option: The invalid value continues to be used.

Fs val. pressure

Navigation Expert → Sensor → External comp. → Fs val. pressure

Prerequisite The **Fail safe value** option is selected in the **Fail safe type** parameter (→ 75).

Description Use this function to enter a fixed pressure value that is used for the external pressure in the event of a device alarm.

User entry Signed floating-point number

Factory setting 0 bar

Additional information *Description*

In the event of a device alarm, the pressure value is displayed as an output value in the **Pressure value** parameter (→ 43).

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 *Selection*

Use this function to select the type of temperature compensation. When selecting the **External value** option, the temperature value of the cyclical PROFINET communication is used. In addition, the "External temperature" compensation value must be incorporated into the analog output module.

Additional information: Operating Instructions, "Cyclical data transmission" section.

External temp.

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

Prerequisite The **Temperature** option is selected in the **Temperature mode** parameter (→ 75).

Description Use this function to enter the external temperature.

User entry −273.15 to 99 999 °C

Factory setting 0 °C

Additional information *Description*

The unit is taken from the **Temperature unit** parameter (→ 55)

FailSafeTypeTemp

Navigation Expert → Sensor → External comp. → FailSafeTypeTemp

Description Use this function to select the failsafe mode for the external temperature value.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Off

Additional information *Description*

If the status of the input or simulation value is BAD, the failsafe mode defined here is used.

Selection

- Fail safe value
  A substitute value is used. The substitute value is defined in the **FailSaValExtTemp** parameter (→ 77).
- Fallback value
  The last valid value is used.
- Off
  The invalid value continues to be used.

FailSaValExtTemp

Navigation Expert → Sensor → External comp. → FailSaValExtTemp

Prerequisite The **Fail safe value** option is selected in the **FailSafeTypeTemp** parameter (→ 76).

Description Use this function to enter a fixed temperature value that is used for the external pressure in the event of a device alarm.

User entry Signed floating-point number

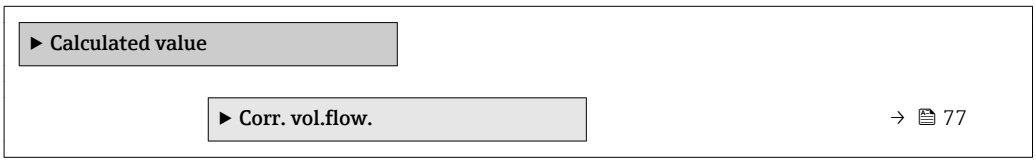
Factory setting 0 °C

Additional information *Description*

In the event of a device alarm, the temperature value is displayed as an output value in the **Temperature** parameter (→ 43).

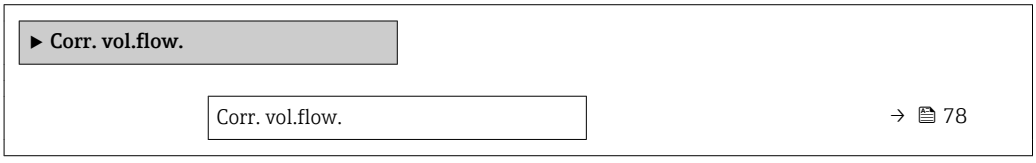
3.2.6 "Calculated value" submenu

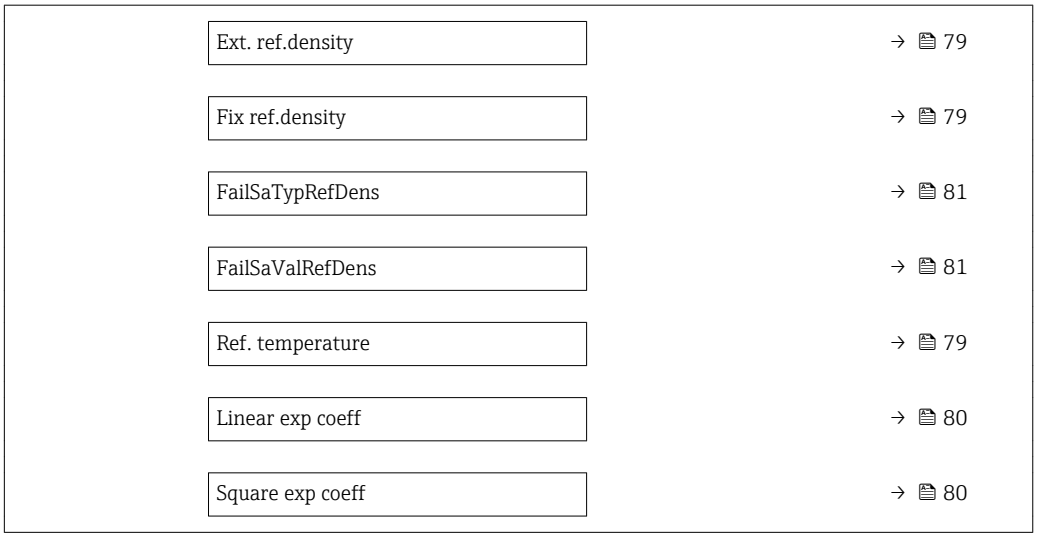
Navigation Expert → Sensor → Calculated value



"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 [5], 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 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
The reference density value of cyclic PROFINET communication is accepted. In addition, the "External reference density" compensation value must be incorporated into the Analog Output module.

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

5) liquefied petroleum gas

Ext. ref.density

Navigation Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density

Prerequisite In the **Corr. vol.flow.** parameter (→ 78), the **Ext. ref.density** option is selected.

Description Displays the reference density which is read in externally, e.g. via the current input.

User interface Floating point number with sign

Additional information *Dependency*

The unit is taken from the **Ref. dens. unit** parameter (→ 54)

Fix ref.density

Navigation Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density

Prerequisite The **Fix ref.density** option is selected in the **Corr. vol.flow.** parameter (→ 78) parameter.

Description Use this function to enter a fixed value for the reference density.

User entry Positive floating-point number

Factory setting 1 kg/Nl

Additional information *Dependency*

The unit is taken from the **Ref. dens. unit** parameter (→ 54)

Ref. temperature

Navigation Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature

Prerequisite The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 78) parameter.

Description Use this function to enter a reference temperature for calculating the reference density.

User entry −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 (→ 55)

Reference density calculation

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

A0023403

- ρ_N: reference density
- ρ: fluid density currently measured
- t: fluid temperature currently measured
- t_N: reference temperature at which the reference density is calculated (e.g. 20 °C)
- Δt: t - t_N
- α: linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- β: square expansion coefficient of the fluid, unit = [1/K²]

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 (→ 78) 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 (→ 78) 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

FailSaTypRefDens

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

Description Use this function to select the failsafe mode for the external reference density value.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Off

Additional information *Description*

If the status of the input or simulation value is BAD, the failsafe mode defined here is used.

Selection

- Fail safe value
  A substitute value is used. The substitute value is defined in the **FailSaValRefDens** parameter (→ 81).
- Fallback value
  The last valid value is used.
- Off
  The invalid value continues to be used.

FailSaValRefDens

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

Prerequisite The **Fail safe value** option is selected in the **FailSaTypRefDens** parameter (→ 81).

Description Use this function to enter a fixed reference density value that is used for the external reference density in the event of a device alarm.

User entry Signed floating-point number

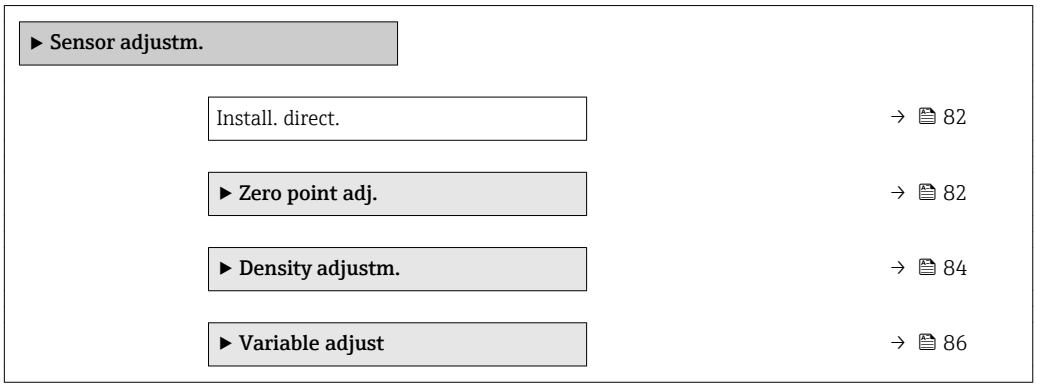
Factory setting 0 kg/Nl

Additional information *Description*

In the event of a device alarm, the reference density value is displayed as an output value in the **Ref.density** parameter (→ 43).

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.

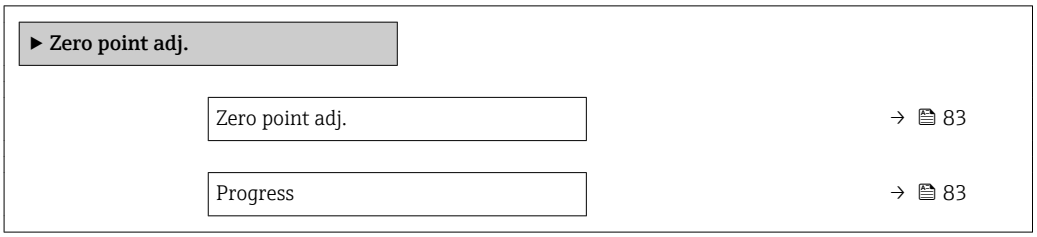
Additional information *Description*

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.

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 → 82.

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

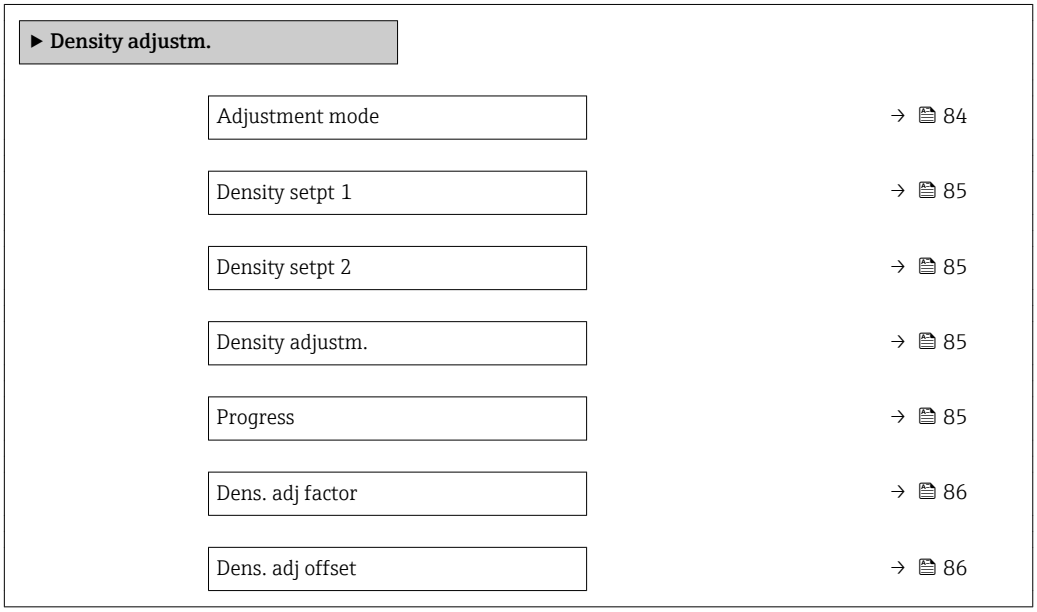
Description The progress of the process is indicated.

User interface 0 to 100 %

"Density adjustment" wizard

Note the following before performing the adjustment:
- A density adjustment only makes sense if there is little variation in the operating conditions and the density adjustment is performed under the operating conditions.
- The density adjustment scales the internally computed density value with a user-specific slope and offset.
- A 1-point or 2-point density adjustment can be performed.
- For a 2-point density adjustment, there must be a difference of at least 0.2 kg/l between the two target density values.
- The reference media must be gas-free or pressurized so that any gas they contain is compressed.
- The reference density measurements must be performed at the same medium temperature that prevails in the process, as otherwise the density adjustment will not be accurate.
- The correction resulting from the density adjustment can be cleared with the **Restore original** option.

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm.



Adjustment mode

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Adjustment mode

Description Displays the method for field density adjustment.

User interface
- 1 point adjustm.
- 2 point adjustm.

Factory setting 1 point adjustm.

Density setpt 1

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Density setpt 1

Description Displays the existing density value.

User interface Input depends on the unit selected in the **Density unit** parameter (→ 53).

Factory setting 1 kg/l

Density setpt 2

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Density setpt 2

Prerequisite The **2 point adjustm.** option is selected in the **Adjustment mode** parameter.

Description Displays the second density setpoint.

User interface Input depends on the unit selected in the **Density unit** parameter (→ 53).

Factory setting 1 kg/l

Density adjustm.

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Density adjustm.

Description Display for performing the density adjustment.

User interface
- Cancel
- Busy
- Ok
- Dens. adj. fail.
- Meas. density 1
- Meas. density 2
- Calculate
- Restore original

Factory setting Ok

Progress

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Progress
Expert → Sensor → Sensor adjustm. → Density adjustm. → Progress

Description The progress of the process is indicated.

User interface 0 to 100 %

Dens. adj factor

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Dens. adj factor

Description Displays the current correction factor for the density.

User interface Signed floating-point number

Factory setting 1

Additional information Manual value adjustment: **Density factor** parameter (→ 89)

Dens. adj offset

Navigation Expert → Sensor → Sensor adjustm. → Density adjustm. → Dens. adj offset

Description Displays the current correction offset for the density.

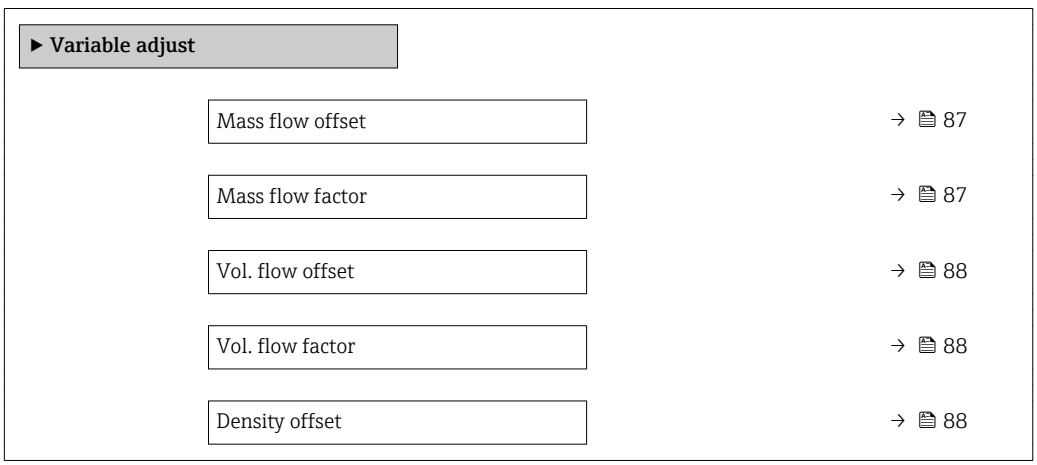
User interface Signed floating-point number

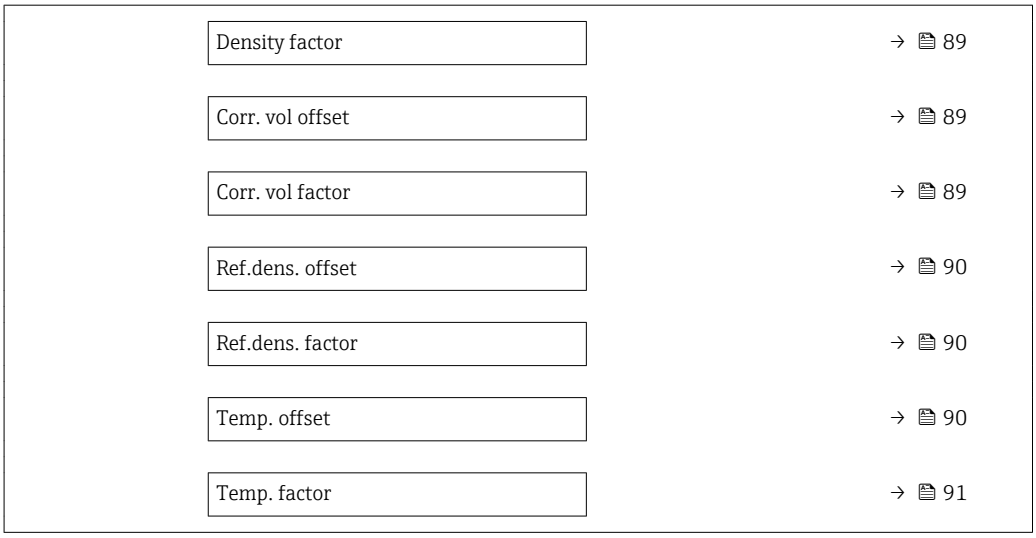
Factory setting 0

Additional information Manual value adjustment: **Density offset** parameter (→ 88)

"Variable adjust" submenu

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust





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^3/s.

User entry Signed floating-point number

Factory setting 0 m^3/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^3.

User entry Signed floating-point number

Factory setting 0 kg/m^3

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^3/s.

User entry Signed floating-point number

Factory setting 0 Nm^3/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/Nm³.

User entry Signed floating-point number

Factory setting 0 kg/Nm³

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

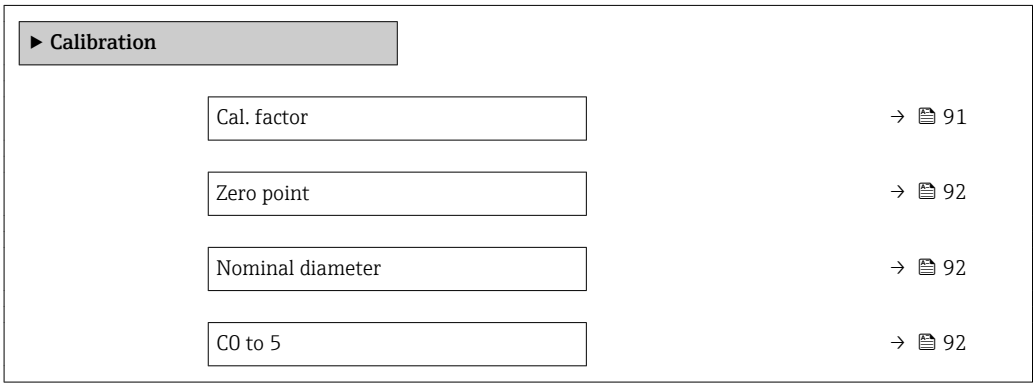
Factory setting 1

Additional information *Description*

Corrected value = (factor × value) + offset

3.2.8 "Calibration" submenu

Navigation Expert → Sensor → Calibration



Cal. factor

Navigation Expert → Sensor → Calibration → Cal. factor

Description Displays the current calibration factor for the sensor.

User interface Signed floating-point number

Factory setting Depends on nominal diameter and calibration.

Zero point

Navigation Expert → Sensor → Calibration → Zero point

Description Use this function to enter the zero point correction value for the sensor.

User entry Signed floating-point number

Factory setting Depends on nominal diameter and calibration.

Nominal diameter

Navigation Expert → Sensor → Calibration → Nominal diameter

Description Displays the nominal diameter of the sensor.

User interface DNxx / x"

Factory setting Depends on the size of the sensor

Additional information *Description*

The value is also specified on the sensor nameplate.

C0 to 5

Navigation Expert → Sensor → Calibration → C0 to 5

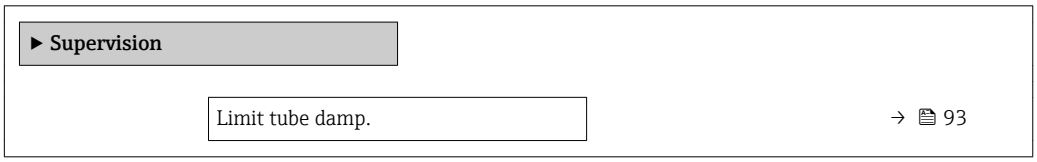
Description Displays the current density coefficients C0 to 5 of the sensor.

User interface Signed floating-point number

Factory setting 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

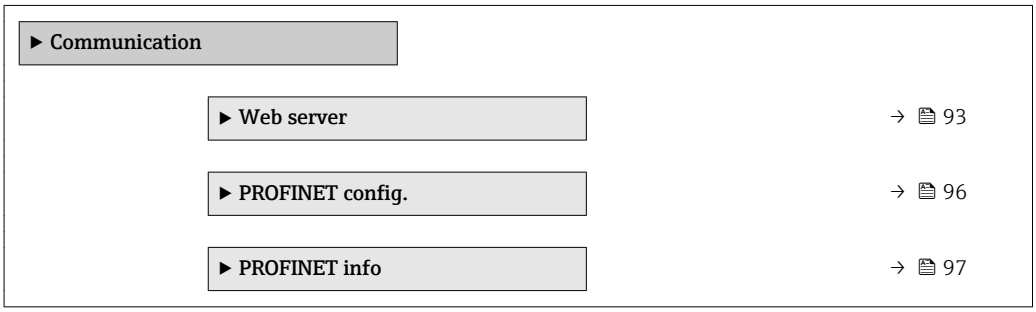
Factory setting Positive floating-point number

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

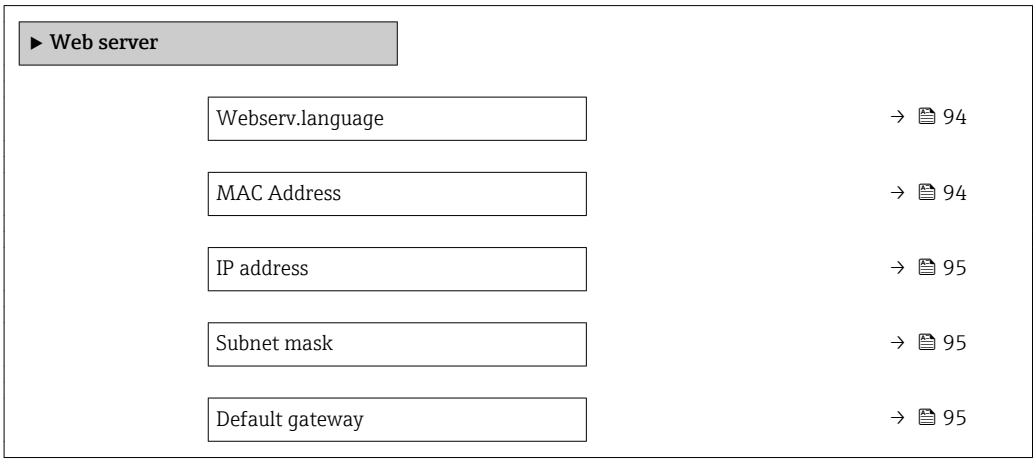
3.3 "Communication" submenu

Navigation Expert → Communication



3.3.1 "Web server" submenu

Navigation Expert → Communication → Web server



Webserver funct.	→ 95
Login page	→ 96

Webserv.language

Navigation Expert → Communication → Web server → 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) *
- العَرَبيّة(Ara) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- tiếng Việt (Vit) *
- čeština (Czech) *

Factory setting English

MAC Address

Navigation Expert → Communication → Web server → MAC Address

Description Displays the MAC [6] address of the measuring device.

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

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

IP address

Navigation Expert → Communication → Web server → IP address

Description Displays the IP address of the device's web server.

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

Factory setting 0.0.0.0

Subnet mask

Navigation Expert → Communication → Web server → Subnet mask

Description Displays the subnet mask.

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

Factory setting 0.0.0.0

Default gateway

Navigation Expert → Communication → Web server → Default gateway

Description Displays the default gateway.

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

Factory setting 0.0.0.0

Webserver funct.

Navigation Expert → Communication → Web server → Webserver funct.

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

Selection
- Off
- HTML 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	▪ The web server is completely disabled. ▪ Port 80 is locked.
HTML Off	The HTML version of the web server is not available.
On	▪ The complete functionality of the web server is available. ▪ JavaScript is used. ▪ The password is transferred in an encrypted state. ▪ Any change to the password is also transferred in an encrypted state.

Login page

Navigation Expert → Communication → Web server → Login page

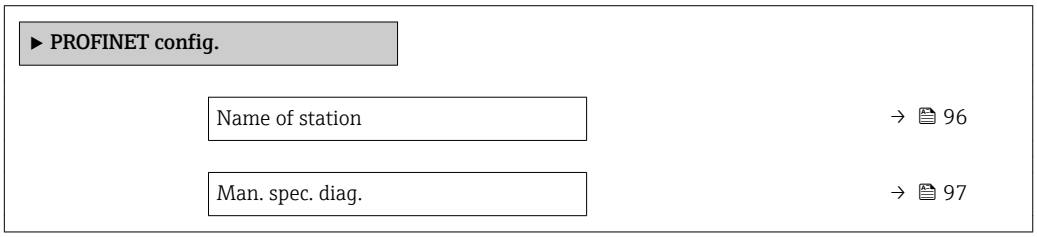
Description Use this function to select the format of the login page.

Selection
- Without header
- With header

Factory setting With header

3.3.2 "PROFINET config." submenu

Navigation Expert → Communication → PROFINET config.



Name of station

Navigation Expert → Communication → PROFINET config. → Name of station

Description Displays a unique name for the measuring point so it can be identified quickly within the plant.

User interface Max. 240 characters such as lower-case letter or numbers

Factory setting eh-promass100-xxxxx

Additional information *Description*

The device tag corresponds to the device name ("Name Of Station" of PROFINET specification) The device name can be adjusted via DIP switch or the automation system.

Factory setting

Structure of the device tag:
eh-promass100-xxxxx
– eh: Endress+Hauser
– promass: Instrument family
– 100: Transmitter
– xxxxx: Serial number of the device

Man. spec. diag.

Navigation Expert → Communication → PROFINET config. → Man. spec. diag.

Description Use this function to enable the transfer of manufacturer-specific diagnostic events.

Selection
- Not active
- Active

Factory setting Active

Additional information *Description*

- Active
  In addition to the PROFINET standard alarms, active manufacturing-specific diagnostic events are also transferred to the automation system. The diagnostic number and the error text of the respective diagnostic event are displayed.
- Not active
  Only the PROFINET standard alarms are transferred to the automation system.

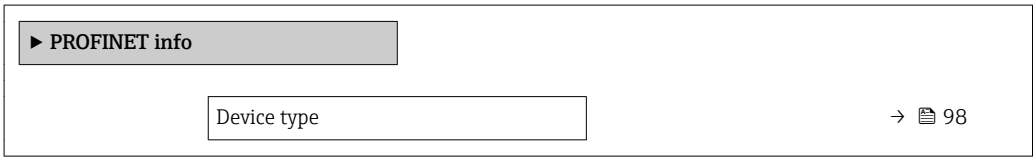
Selection

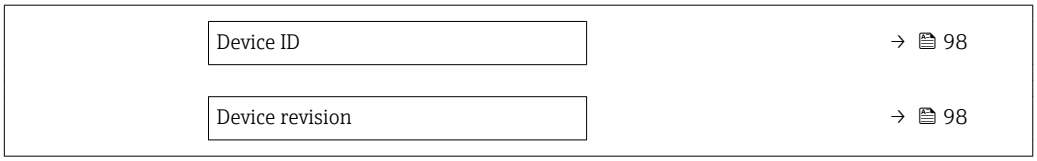
This selection affects PROFINET communication only.

Diagnostic events are displayed in the DTM or web server regardless of the selection made in this parameter. The PROFINET standard alarms (diagnosis and process) for the stack are also unaffected by the selected made.

3.3.3 "PROFINET info" submenu

Navigation Expert → Communication → PROFINET info





Device type

Navigation Expert → Communication → PROFINET info → Device type

Description Use this function to display the device type (device type code).

User interface Max. 16 characters, such as letters, numbers or special characters (e.g. @, %, /).

Factory setting Promass 100

Device ID

Navigation Expert → Communication → PROFINET info → Device ID

Description Use this function to display the device ID.

User interface 0 to 65 535

Device revision

Navigation Expert → Communication → PROFINET info → Device revision

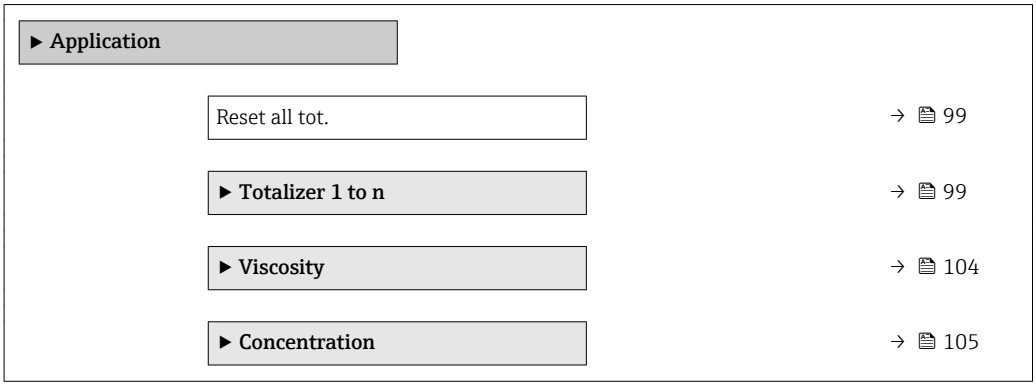
Description Use this function to display the device revision.

User interface 0 to 65 535

Additional information *Description*
The device revision enables the correct assignment of device drivers to the device.

3.4 "Application" submenu

Navigation Expert → Application



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

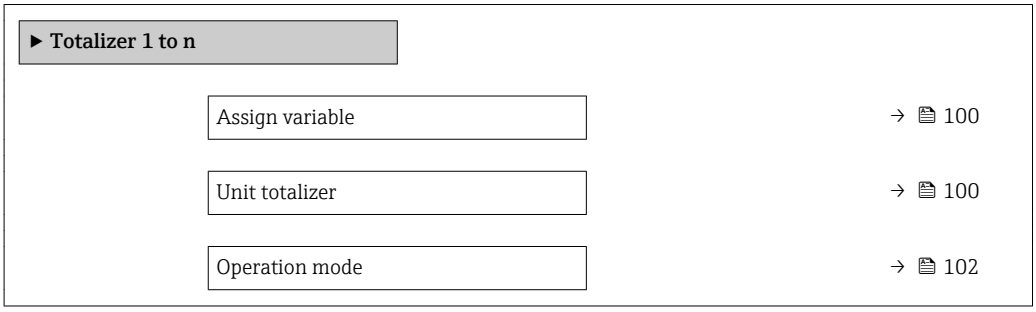
Factory setting Cancel

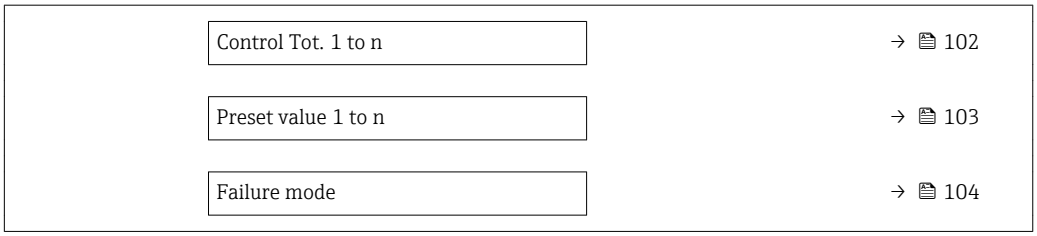
Additional information *Selection*

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





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 *
- Carrier mass fl. *

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 (→ 100) 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 (→ 100) 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 process variable unit for the Totalizer 1 to n (→ 99).

* Visibility depends on order options or device settings

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Custom-specific units
User mass

or

SI units
- cm^3
- dm^3
- m^3
- ml
- l
- hl
- Ml Mega

US units
- af
- ft^3
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;oil)
- bbl (us;tank)

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

Custom-specific units
User vol.

or

SI units
- Nl
- Nm^3
- Sl
- Sm^3

US units
- Sft^3
- Sgal (us)
- Sbbl (us;liq.)

Imperial units
Sgal (imp)

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 (→ 48).

Selection

The selection is dependent on the process variable selected in the **Assign variable** parameter (→ 100).

Operation mode

Navigation Expert → Application → Totalizer 1 to n → Operation mode

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 100) 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 (→ 100) 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
- Hold

* Visibility depends on order options or device settings

Factory setting Totalize

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 **Preset value** 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 **Preset value** 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 (→ 100) 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 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 (→ 100).

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 (→ 100) 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.

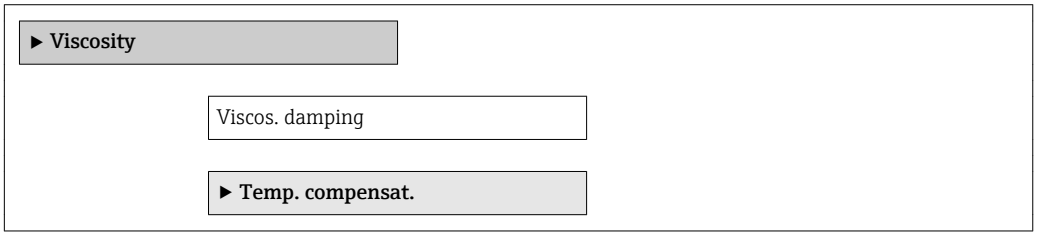
Selection
- Stop
  The totalizer is stopped in the event of a device alarm.
- Actual value
  The totalizer continues to count based on the actual measured value; the device alarm is ignored.
- Last valid value
  The totalizer continues to count based on the last valid measured value before the device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

3.4.2 "Viscosity" submenu

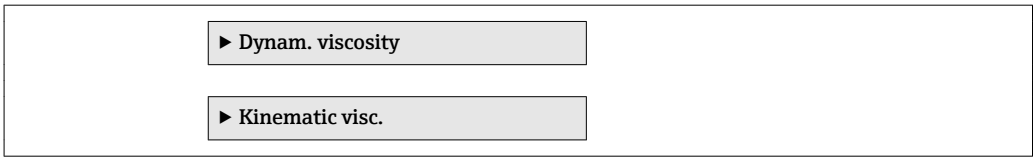
Only available for Promass I.

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



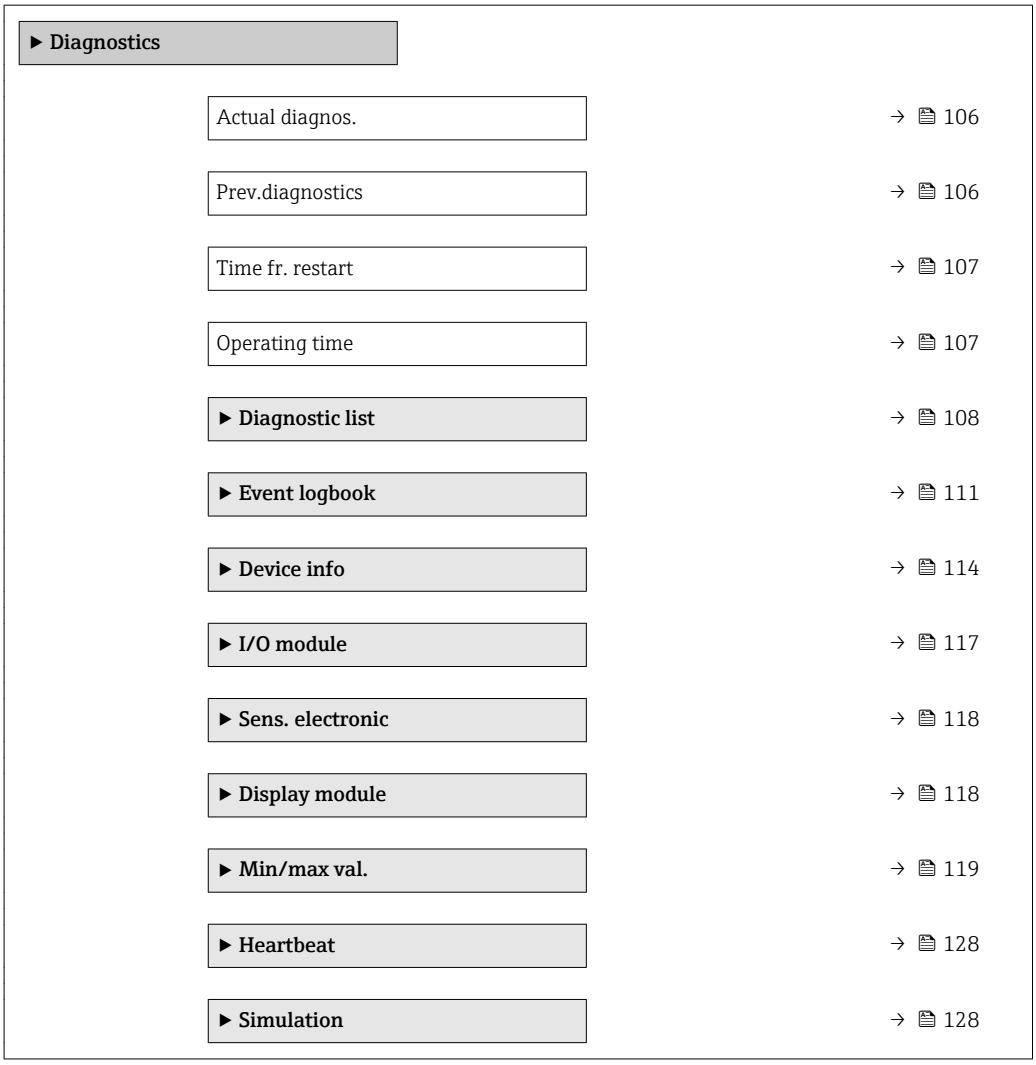
3.4.3 "Concentration" submenu

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

Navigation Expert → Application → Concentration

3.5 "Diagnostics" submenu

Navigation Expert → Diagnostics



Actual diagnos.

Navigation Expert → Diagnostics → Actual diagnos.

Prerequisite A diagnostic event has occurred.

Description Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 108).

Example

For the display format:
F271 Main electronics

Timestamp

Navigation Expert → Diagnostics → Timestamp

Description Displays the operating time when the current diagnostic message occurred.

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

Additional information *Display*

The diagnostic message can be viewed via the **Actual diagnos.** parameter (→ 106).

Example

For the display format:
24d12h13m00s

Prev.diagnostics

Navigation Expert → Diagnostics → Prev.diagnostics

Prerequisite Two diagnostic events have already occurred.

Description Displays the diagnostic message that occurred before the current message.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Example*

For the display format:
⊗F271 Main electronics

Timestamp

Navigation Expert → Diagnostics → Timestamp

Description Displays the operating time when the last diagnostic message before the current message occurred.

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

Additional information *Display*

The diagnostic message can be viewed via the **Prev.diagnostics** parameter (→ 106).

Example

For the display format:
24d12h13m00s

Time fr. restart

Navigation Expert → Diagnostics → Time fr. restart

Description Use this function to display the time the device has been in operation since the last device restart.

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

Operating time

Navigation Expert → Diagnostics → Operating time

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

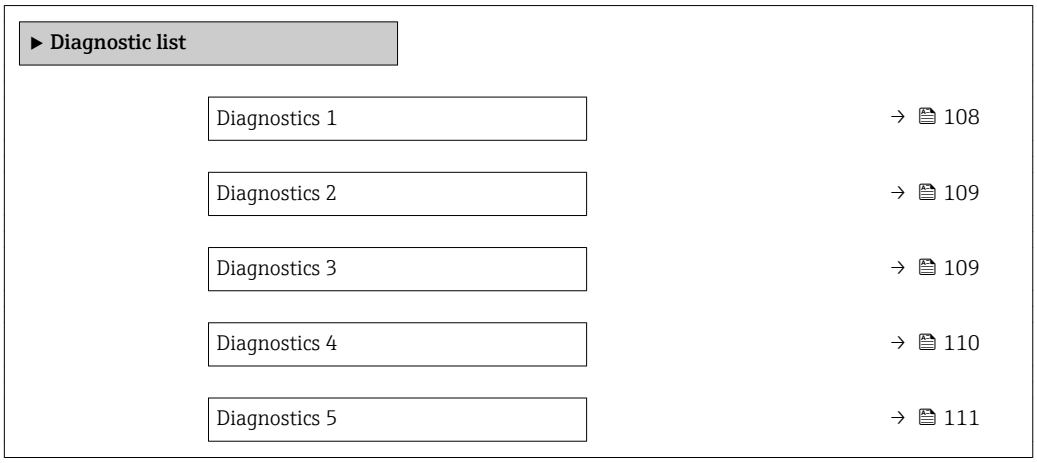
User interface Days (d), hours (h), minutes (m) and seconds (s)

Additional information *User interface*

The maximum number of days is 9999, which is equivalent to 27 years.

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 electronics
- ⊗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 (→ 108).

Example

For the display format:
24d12h13m00s

Diagnostics 2

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 2

Description Displays the current diagnostics message with the second-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⊗F271 Main electronics
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

Description Displays the operating time when the diagnostic message with the second-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 2** parameter (→ 109).

Example

For the display format:
24d12h13m00s

Diagnostics 3

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 3

Description Displays the current diagnostics message with the third-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⊗F271 Main electronics
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

Description Displays the operating time when the diagnostic message with the third-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 3** parameter (→ 109).

Example

For the display format:
24d12h13m00s

Diagnostics 4

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 4

Description Displays the current diagnostics message with the fourth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- F271 Main electronics
- F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

Description Displays the operating time when the diagnostic message with the fourth-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 4** parameter (→ 110).

Example

For the display format:
24d12h13m00s

Diagnostics 5

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 5

Description Displays the current diagnostics message with the fifth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⊗F271 Main electronics
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information *Display*

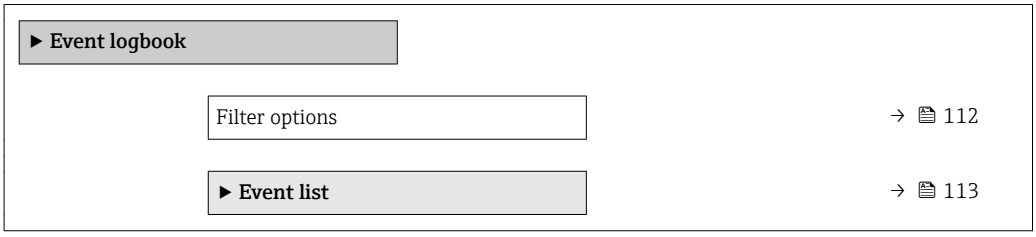
The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 111).

Example

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 local display.

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

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 (→ 112).

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 electronics
  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 tag

Navigation Expert → Diagnostics → Device info → Device tag

Description Displays a unique name for the measuring point so it can be identified quickly within the plant.

User interface Max. 32 characters such as lower-case letter or numbers

Factory setting eh-promass100-xxxxx

Serial number

Navigation Expert → Diagnostics → Device info → Serial number

Description Displays the serial number of the measuring device.

The number can be found on the nameplate of the sensor and transmitter.

User interface A maximum of 11-digit character string comprising letters and numbers.

Additional information *Description*

Uses of the serial number
- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer: www.endress.com/deviceviewer

Firmware version

Navigation Expert → Diagnostics → Device info → Firmware version

Description Displays the device firmware version installed.

User interface Character string in the format xx.yy.zz

Additional information *Display*

The Firmware version is also located:
- On the title page of the Operating instructions
- On the transmitter nameplate

Device name

Navigation Expert → Diagnostics → Device info → Device name

Description Displays a unique name for the measuring point so it can be identified quickly within the plant.

User interface Max. 32 characters such as lower-case letter or numbers

Factory setting eh-promass100-xxxxx

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 For displaying the second part of the extended order code.

User interface Character string

Additional information For additional information, see **Ext. order cd. 1** parameter (→ 116)

Ext. order cd. 3

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

Description For displaying the third part of the extended order code.

User interface Character string

Additional information For additional information, see **Ext. order cd. 1** parameter (→ 116)

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

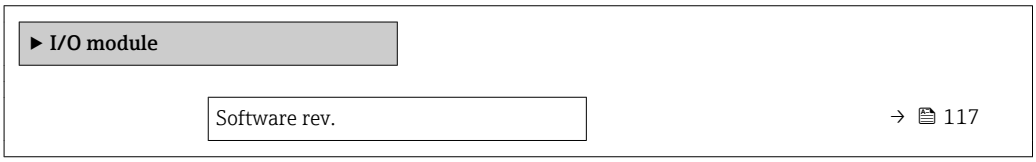
Factory setting 2.02.00

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 "I/O module" submenu

Navigation Expert → Diagnostics → I/O module



Software rev.

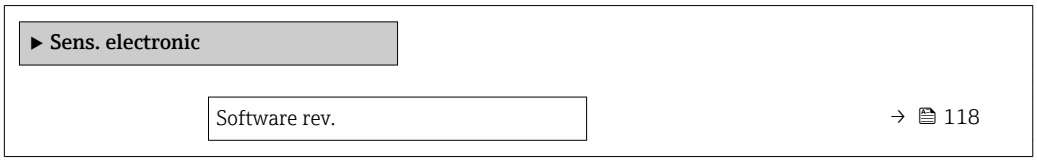
Navigation Expert → Diagnostics → I/O module → Software rev.

Description Use this function to display the software revision of the module.

User interface Positive integer

3.5.5 "Sens. electronic" submenu

Navigation Expert → Diagnostics → Sens. electronic



Software rev.

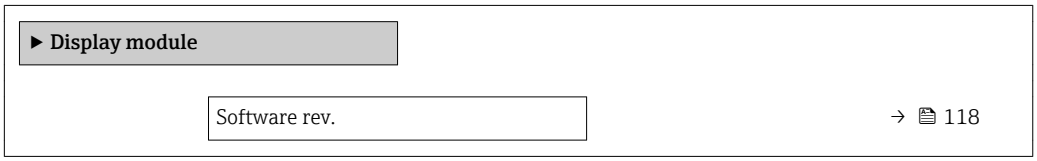
Navigation Expert → Diagnostics → Sens. electronic → Software rev.

Description Use this function to display the software revision of the module.

User interface Positive integer

3.5.6 "Display module" submenu

Navigation Expert → Diagnostics → Display module



Software rev.

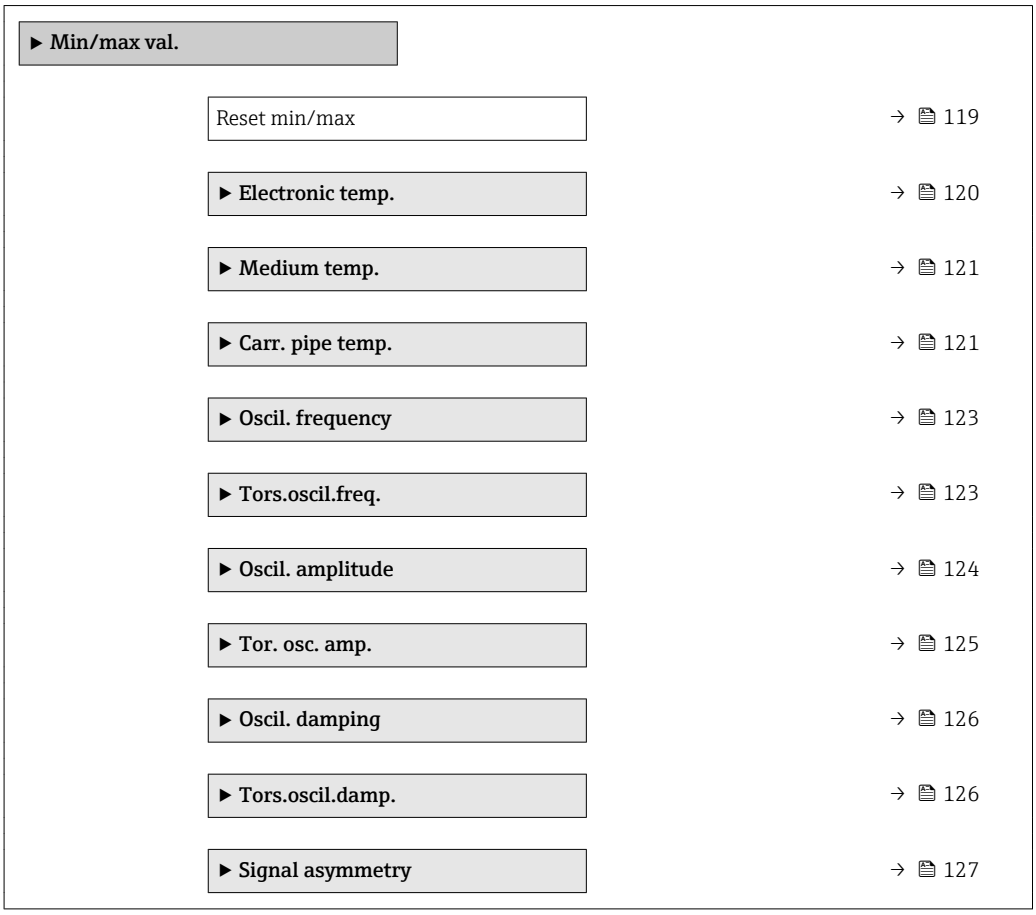
Navigation Expert → Diagnostics → Display module → Software rev.

Description Use this function to display the software revision of the module.

User interface Positive integer

3.5.7 "Min/max val." submenu

Navigation Expert → Diagnostics → Min/max val.



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

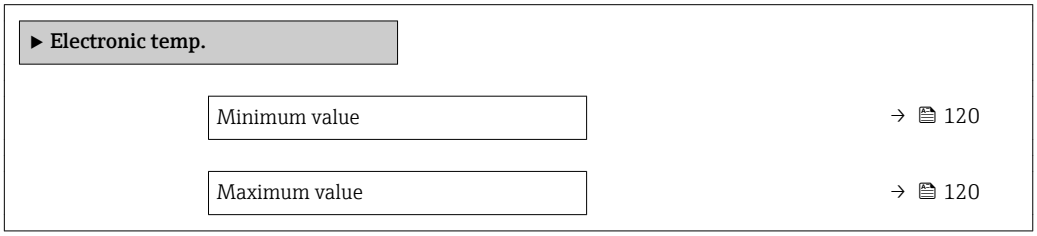
* Visibility depends on order options or device settings

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 (→ 55)

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.

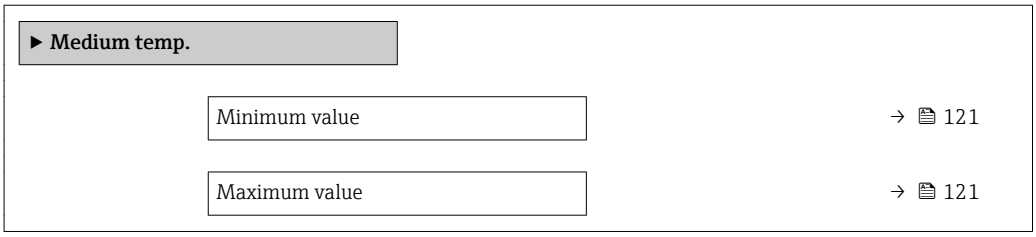
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 55)

"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 (→ 55)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value

Description Displays the highest previously measured medium temperature value.

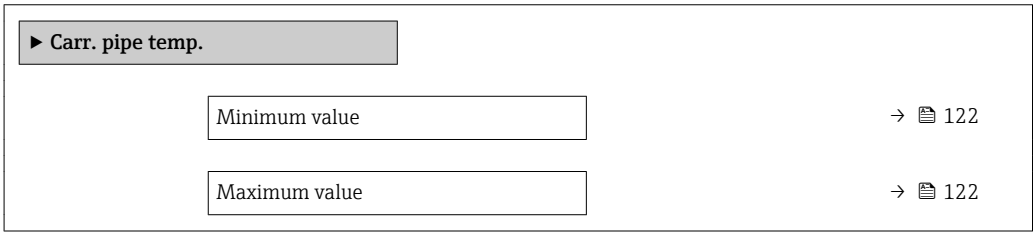
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 55)

"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
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- If the carrier tube temperature is provided:
  - Promass F
  - Promass G
  - Promass H
  - Promass I
  - Promass O
  - Promass P
  - Promass S
  - Promass X

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 (→ 55)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value

Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- If the carrier tube temperature is provided:
  - Promass F
  - Promass G
  - Promass H
  - Promass I
  - Promass O
  - Promass P
  - Promass S
  - Promass X

Description Displays the highest previously measured temperature value of the carrier pipe.

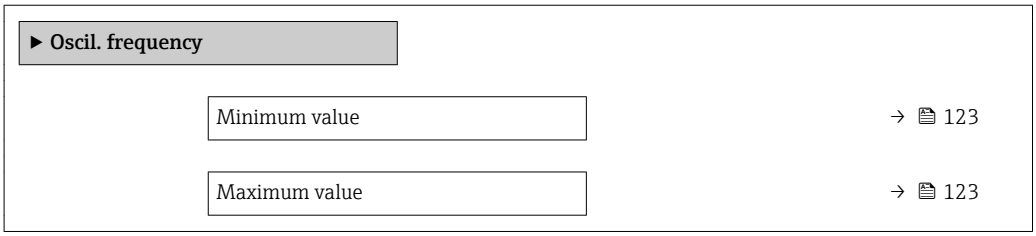
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 55)

"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

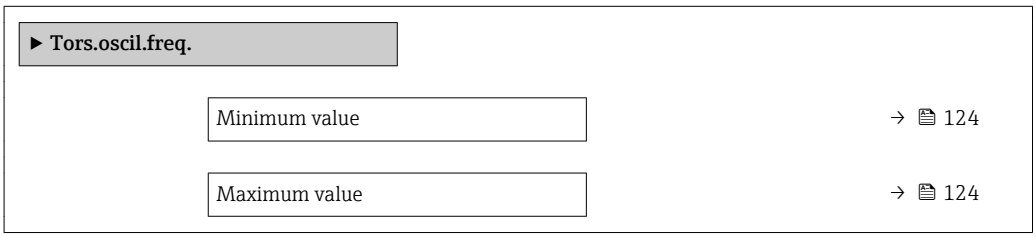
Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value

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

Navigation Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Minimum value

Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

Description Displays the lowest previously measured torsion oscillation frequency.

User interface Signed floating-point number

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Maximum value

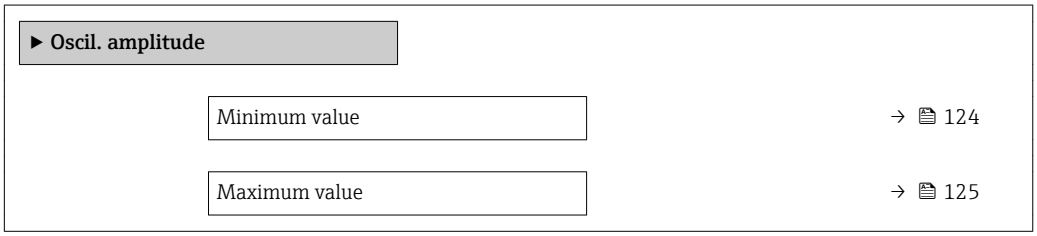
Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

Description Displays the highest previously measured torsion oscillation frequency.

User interface Signed floating-point number

"Oscil. amplitude" submenu

Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value

Description Displays the lowest previously measured oscillation amplitude.

User interface Signed floating-point number

Maximum value

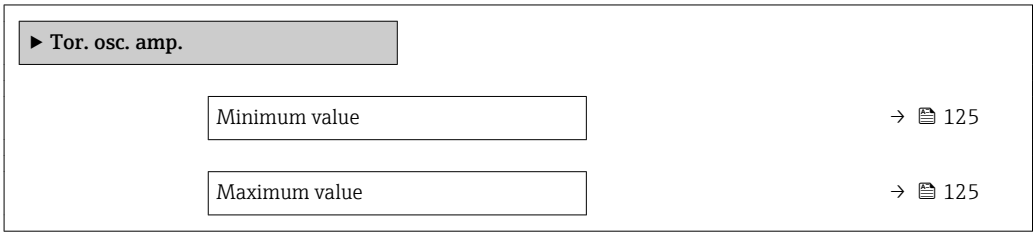
Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value

Description Displays the highest previously measured oscillation amplitude.

User interface Signed floating-point number

"Tor. osc. amp." submenu

Navigation Expert → Diagnostics → Min/max val. → Tor. osc. amp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value

Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

Description Displays the lowest previously measured torsion oscillation amplitude.

User interface Signed floating-point number

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value

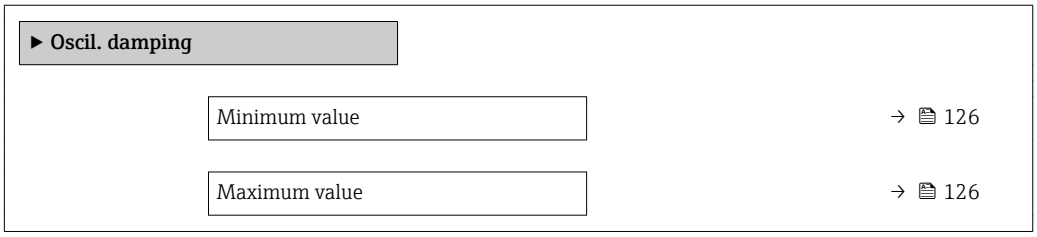
Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

Description 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

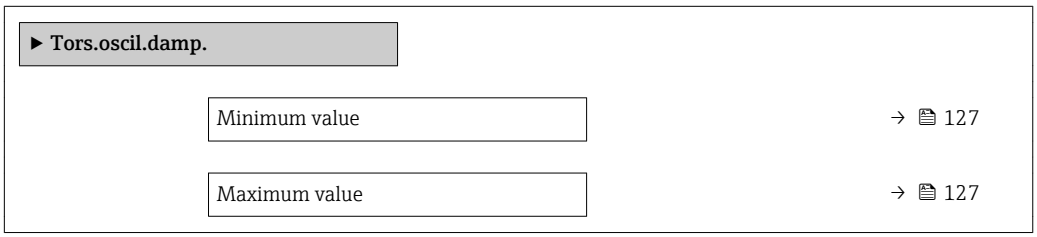
Navigation Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value

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
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

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

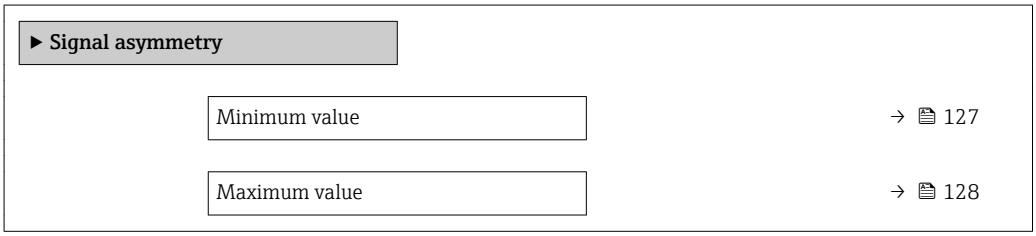
Prerequisite
- Order code for "Application package", option EB "Heartbeat Verification + Monitoring"
- Available only for Promass I.

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

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value

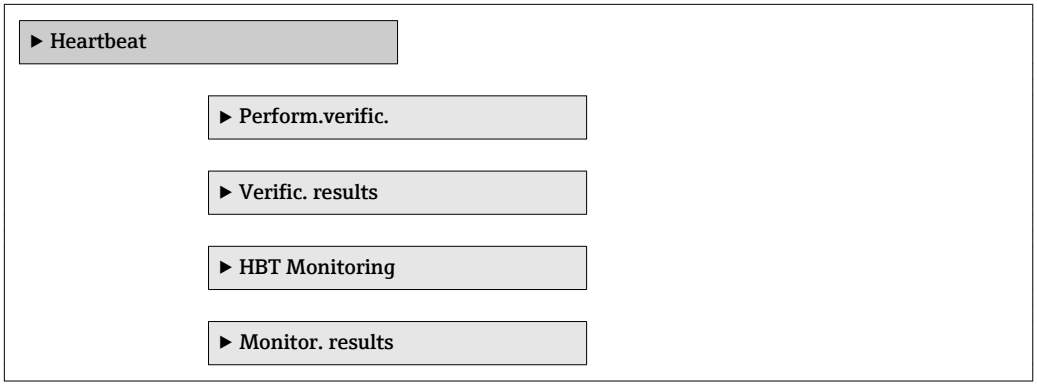
Description Displays the highest previously measured signal asymmetry.

User interface Signed floating-point number

3.5.8 "Heartbeat" submenu

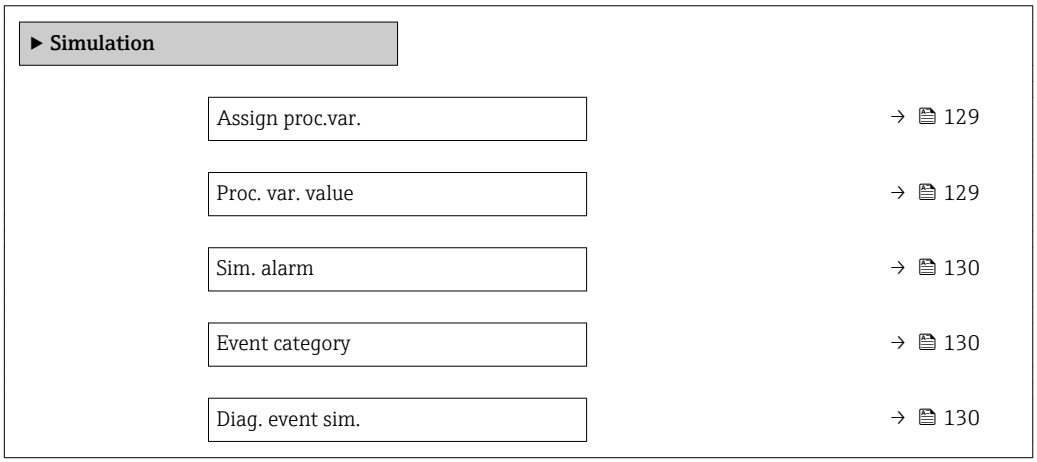
For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring**application package, refer to the Special Documentation for the device

Navigation Expert → Diagnostics → Heartbeat



3.5.9 "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 *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Concentration *
- Target mass flow *
- Carrier mass fl. *

Factory setting Off

Additional information *Description*

The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→ 129).

Proc. var. value

Navigation Expert → Diagnostics → Simulation → Proc. var. value

Prerequisite One of the following options is selected in the **Assign proc.var.** parameter (→ 129):
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Concentration *
- Target mass flow *
- Carrier mass fl. *

* Visibility depends on order options or device settings

Description 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.

User entry Depends on the process variable selected

Factory setting 0

Additional information *User entry*

The unit of the displayed measured value is taken from the **System units** submenu (→ 48).

Sim. alarm

Navigation Expert → Diagnostics → Simulation → Sim. alarm

Description Use this function to switch the device alarm on and off.

Selection
- Off
- On

Factory setting Off

Additional information *Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Event category

Navigation Expert → Diagnostics → Simulation → Event category

Description Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Diag. event sim.** parameter (→ 130).

Selection
- Sensor
- Electronics
- Configuration
- Process

Factory setting Process

Diag. event sim.

Navigation Expert → Diagnostics → Simulation → Diag. event sim.

Description Use this function to select a diagnostic event for the simulation process that is activated.

Selection

- Off
- Diagnostic event picklist (depends on the category selected)

Factory setting

Off

Additional information

Description

For the simulation, you can choose from the diagnostic events of the category selected in the **Event category** parameter (→ 130).

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 applie to the following parameters:
100% bar graph value 1

Nominal diameter [mm]	[kg/h]
1	4
2	20
4	90
8	400
15	1 300
15 FB	3 600
25	3 600
25 FB	9 000
40	9 000
40 FB	14 000
50	14 000
50 FB	36 000
80	36 000
100	60 000
150	130 t/h
250	360 t/h
350	650 t/h

4.1.3 On value low flow cut off

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^3
Corrected volume flow	Sft^3/min
Density	lb/ft^3
Reference density	lb/Sft^3
Temperature	°F
Pressure	psi a

4.2.2 Full scale values

The factory settings applie 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
½	50
½ FB	130
1	130
1 FB	330
1½	330
1½ FB	550
2	550
2 FB	1300
3	1300
4	2200
6	4800
10	13000
14	23500

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
½	1
½ 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
½	0.25
½ 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/cm³, g/m³	Gram/volume unit
	kg/dm³, kg/l, kg/m³	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/Nm³, kg/Nl, g/Scm³, kg/Sm³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm³, Sm³	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm³/s, Nm³/min, Nm³/h, Nm³/d	Normal cubic meter/time unit
	Sm³/s, Sm³/min, Sm³/h, Sm³/d	Standard cubic meter/time unit
Temperature	°C , K	Celsius, Kelvin
Volume	cm³, dm³, m³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm³/s, cm³/min, cm³/h, cm³/d	Cubic centimeter/time unit
	dm³/s, dm³/min, dm³/h, dm³/d	Cubic decimeter/time unit
	m³/s, m³/min, m³/h, m³/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/ft³, 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/Sft³	Weight unit/standard volume unit
Corrected volume	Sft³, Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.flow	Sft³/s, Sft³/min, Sft³/h, Sft³/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
	ft³	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
	ft³/s, ft³/min, ft³/h, ft³/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)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)	Gallon/time unit
	Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)	Mega gallon/time unit
	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	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	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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