Description of Device Parameters

Proline Cubemass 100

EtherNet/IP

Coriolis flowmeter

Menu/Variable
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<td>4.2.3</td>
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<td>Explanation of abbreviated units</td>
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<tr>
<td>5.1</td>
<td>SI units</td>
<td>124</td>
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<td>5.2</td>
<td>US units</td>
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<td>Index</td>
<td></td>
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</tbody>
</table>
1 Document information

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.

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
This document lists the submenus and their parameters according to the structure of the Expert menu (→ 8) menu that are available once the "Operator" user role or the "Maintenance" user role is enabled.

For information on the arrangement of the parameters according to the structure of the Operation menu, Setup menu, Diagnostics menu (→ 99), along with a brief description, see the Operating Instructions for the device.
For information about the operating philosophy, see the "Operating philosophy" chapter in the device's 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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Tip" /></td>
<td>Indicates additional information.</td>
</tr>
<tr>
<td><img src="image" alt="Reference to documentation" /></td>
<td>Reference to documentation</td>
</tr>
<tr>
<td><img src="image" alt="Reference to page" /></td>
<td>Reference to page</td>
</tr>
<tr>
<td><img src="image" alt="Reference to graphic" /></td>
<td>Reference to graphic</td>
</tr>
<tr>
<td><img src="image" alt="Operation via local display" /></td>
<td>Operation via local display</td>
</tr>
<tr>
<td><img src="image" alt="Operation via operating tool" /></td>
<td>Operation via operating tool</td>
</tr>
<tr>
<td><img src="image" alt="Write-protected parameter" /></td>
<td>Write-protected parameter</td>
</tr>
</tbody>
</table>
1.4.2 Symbols in graphics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3 ...</td>
<td>Item numbers</td>
<td>A, B, C, ...</td>
<td>Views</td>
</tr>
<tr>
<td>A-A, B-B, C-C, ...</td>
<td>Sections</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 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.

<table>
<thead>
<tr>
<th>Expert</th>
<th>→</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct access</td>
<td>→</td>
<td>11</td>
</tr>
<tr>
<td>Locking status</td>
<td>→</td>
<td>11</td>
</tr>
<tr>
<td>Access status display</td>
<td>→</td>
<td>12</td>
</tr>
<tr>
<td>Access status tooling</td>
<td>→</td>
<td>13</td>
</tr>
<tr>
<td>Enter access code</td>
<td>→</td>
<td>13</td>
</tr>
<tr>
<td>System</td>
<td>→</td>
<td>13</td>
</tr>
<tr>
<td>Display</td>
<td>→</td>
<td>13</td>
</tr>
<tr>
<td>Diagnostic handling</td>
<td>→</td>
<td>27</td>
</tr>
<tr>
<td>Administration</td>
<td>→</td>
<td>35</td>
</tr>
<tr>
<td>Sensor</td>
<td>→</td>
<td>39</td>
</tr>
<tr>
<td>Measured values</td>
<td>→</td>
<td>39</td>
</tr>
<tr>
<td>System units</td>
<td>→</td>
<td>45</td>
</tr>
<tr>
<td>Process parameters</td>
<td>→</td>
<td>60</td>
</tr>
<tr>
<td>Measurement mode</td>
<td>→</td>
<td>67</td>
</tr>
<tr>
<td>External compensation</td>
<td>→</td>
<td>69</td>
</tr>
<tr>
<td>Calculated values</td>
<td>→</td>
<td>71</td>
</tr>
<tr>
<td>Sensor adjustment</td>
<td>→</td>
<td>74</td>
</tr>
<tr>
<td>Calibration</td>
<td>→</td>
<td>80</td>
</tr>
<tr>
<td>Supervision</td>
<td>→</td>
<td>82</td>
</tr>
</tbody>
</table>
Overview of the Expert operating menu

- **Output**
  - Current output 1
  - Pulse/frequency/switch output 1

- **Communication**
  - HART input
  - HART output
  - Web server
  - Diagnostic configuration

- **Application**
  - Reset all totalizers
  - Totalizer 1 to 3
  - Concentration

- **Diagnostics**
  - Actual diagnostics
  - Previous diagnostics
  - Operating time from restart
  - Operating time
  - Diagnostic list
  - Event logbook
  - Device information
  - Min/max values
  - Heartbeat
  - Simulation

*Endress+Hauser*
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.

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<tr>
<th>Expert</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Direct access</td>
<td>→ 10</td>
</tr>
<tr>
<td>Locking status</td>
<td>→ 11</td>
</tr>
<tr>
<td>Access status display</td>
<td>→ 11</td>
</tr>
<tr>
<td>Access status tooling</td>
<td>→ 12</td>
</tr>
<tr>
<td>Enter access code</td>
<td>→ 13</td>
</tr>
<tr>
<td>▶ System</td>
<td>→ 13</td>
</tr>
<tr>
<td>▶ Sensor</td>
<td>→ 39</td>
</tr>
<tr>
<td>▶ Communication</td>
<td>→ 82</td>
</tr>
<tr>
<td>▶ Application</td>
<td>→ 93</td>
</tr>
<tr>
<td>▶ Diagnostics</td>
<td>→ 99</td>
</tr>
</tbody>
</table>

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 65535
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.
- If no channel number is entered, channel 1 is jumped to automatically.
- If a different channel is jumped to: Enter the direct access code with the corresponding channel number.

Example: Enter 0914-3 \( \rightarrow \) Assign process variable parameter

Locking status

Navigation

Expert → Locking status

Description

Displays the active write protection.

User interface

- Hardware locked
- Temporarily 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.

"Temporarily 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 status display

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 Enter access code parameter (→ 13).

For information on the Enter 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 status tooling

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 Enter access code parameter (→ 13).

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.
Enter 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 9999

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 (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *

* 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. size
- 1 bargraph + 1 value
- 2 values
- 1 value large + 2 values
- 4 values

Factory setting

1 value, max. size

Additional information

Description

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

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

* Visibility depends on order options or device settings
Possible measured values shown on the local display:

**"1 value, max. size" option**

<table>
<thead>
<tr>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>900.00</td>
<td>l/h</td>
</tr>
</tbody>
</table>

**"1 bargraph + 1 value" option**

<table>
<thead>
<tr>
<th>Value</th>
<th>Unit</th>
<th>Bargraph</th>
</tr>
</thead>
<tbody>
<tr>
<td>60.00</td>
<td>%</td>
<td>900.00 l/h</td>
</tr>
</tbody>
</table>

**"2 values" option**

<table>
<thead>
<tr>
<th>Value 1</th>
<th>Unit</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>900.00</td>
<td>l/h</td>
<td>60.00</td>
</tr>
</tbody>
</table>

**"1 value large + 2 values" option**

<table>
<thead>
<tr>
<th>Value 1</th>
<th>Unit</th>
<th>Value 2</th>
<th>Unit 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>900.00</td>
<td>l/h</td>
<td>60.00%</td>
<td>5.98 kWh/Nm³</td>
</tr>
</tbody>
</table>

**"4 values" option**

<table>
<thead>
<tr>
<th>Value 1</th>
<th>Unit</th>
<th>Value 2</th>
<th>Unit 3</th>
<th>Value 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>900.00</td>
<td>l/h</td>
<td>60.00%</td>
<td>5.98 kWh/Nm³</td>
<td>213.94 l</td>
</tr>
</tbody>
</table>
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
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Frequency fluctuation 0
- Oscillation amplitude 0
- Frequency fluctuation 0
- Oscillation damping 0
- Tube damping fluctuation 0
- Signal asymmetry
- Exciter current 0
- None
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting
Mass flow

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.

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

Selection
렌 The unit of the displayed measured value is taken from the System units submenu (→ 45).

Visibility depends on order options or device settings
Description of device parameters

Proline Cubemass 100 EtherNet/IP

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

- Oscillation amplitude
  Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100% under optimum conditions. The value can decrease in the event of low 4 to 20 mA loop currents and/or difficult media (two-phase, high viscosity or high gas velocity).

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

- Signal asymmetry
  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 value 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 (→ 45).

100% bargraph value 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 → 121

### 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 (→ 45).

### 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.

Selection

The unit of the displayed measured value is taken from the System units submenu (→ 45).

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

Picklist, see 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 (→ 45).

### 0% bargraph value 3

**Navigation**

Expert → System → Display → 0% bargraph 3

**Prerequisite**

A selection has been 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 (→ 45).

### 100% bargraph value 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
**Decimal places 3**

**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 (→ 45).

**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**

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**

Picklist, see *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 (→ 45).

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

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

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Display → Display damping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>A local display is provided.</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to enter the reaction time of the local display to fluctuations in the measured value caused by process conditions.</td>
</tr>
<tr>
<td>User entry</td>
<td>0.0 to 999.9 s</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0 s</td>
</tr>
<tr>
<td>Additional information</td>
<td>User entry</td>
</tr>
<tr>
<td>Description</td>
<td>A time constant is entered:</td>
</tr>
<tr>
<td>Description</td>
<td>• If a low time constant is entered, the display reacts particularly quickly to fluctuating measured variables.</td>
</tr>
<tr>
<td>Description</td>
<td>• On the other hand, the display reacts more slowly if a high time constant is entered.</td>
</tr>
</tbody>
</table>

### Header

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Display → Header</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>A local display is provided.</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to select the contents of the header of the local display.</td>
</tr>
<tr>
<td>Selection</td>
<td>• Device tag</td>
</tr>
<tr>
<td>Selection</td>
<td>• Free text</td>
</tr>
<tr>
<td>Factory setting</td>
<td>Device tag</td>
</tr>
<tr>
<td>Additional information</td>
<td>Description</td>
</tr>
<tr>
<td>Description</td>
<td>The header text only appears during normal operation.</td>
</tr>
</tbody>
</table>
Position of the header text on the display

Selection
Free text
Is defined in the **Header text** parameter (→ 25).

<table>
<thead>
<tr>
<th>Header text</th>
</tr>
</thead>
</table>

**Navigation**  
Expert → System → Display → Header text

**Prerequisite**  
The **Free text** option is selected in the **Header** parameter (→ 24).

**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.

Position of the header text on the display

User entry
The number of characters displayed depends on the characters used.

<table>
<thead>
<tr>
<th>Separator</th>
</tr>
</thead>
</table>

**Navigation**  
Expert → System → Display → Separator

**Prerequisite**  
A local display is provided.

**Description**  
Use this function to select the decimal separator.
## Description of device parameters

### Contrast display

<table>
<thead>
<tr>
<th>Selection</th>
<th>. (point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory setting</td>
<td>. (point)</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Selection</th>
<th>Disable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable</td>
<td></td>
</tr>
</tbody>
</table>

**Navigation**

- Expert → System → Display → Backlight

**Prerequisite**

Order code for "Display; operation", option E 'SD03 4-line, illum.; touch control + data backup function'

**Description**

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

**Factory setting**

Enable

### Access status display

<table>
<thead>
<tr>
<th>Selection</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td></td>
</tr>
</tbody>
</table>

**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 Enter access code parameter (→ 13).

For information on the Enter 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.

3.1.2 "Diagnostic handling" submenu

Navigation   Expert → System → Diagn. handling

<table>
<thead>
<tr>
<th>Diagnostic handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm delay         → 27</td>
</tr>
<tr>
<td>Diagnostic behavior → 28</td>
</tr>
</tbody>
</table>

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 Effect
This setting affects the following diagnostic messages:

- 046 Sensor limit exceeded
- 140 Sensor signal
- 144 Measuring error too high
- 190 Special event 1
- 191 Special event 5
Description of device parameters

- 192 Special event 9
- 830 Sensor temperature too high
- 831 Sensor temperature too low
- 832 Electronic temperature too high
- 833 Electronic temperature too low
- 834 Process temperature too high
- 835 Process temperature too low
- 843 Process limit
- 862 Partly filled pipe
- 910 Tubes not oscillating
- 912 Medium inhomogeneous
- 913 Medium unsuitable
- 944 Monitoring failed
- 990 Special event 4
- 991 Special event 8
- 992 Special event 12

"Diagnostic 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 diagnostic behavior submenu (→ 28).

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

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.</td>
</tr>
<tr>
<td>Warning</td>
<td>The device continues to measure. The totalizers are not affected. A diagnostic message is generated.</td>
</tr>
<tr>
<td>Logbook entry only</td>
<td>The device continues to measure. The diagnostic message is entered only in the Event logbook submenu (→ 105)</td>
</tr>
<tr>
<td>Off</td>
<td>The diagnostic event is ignored, and no diagnostic message is generated or entered.</td>
</tr>
</tbody>
</table>

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

Navigation

[Expert] → [System] → [Diagn. handling] → [Diagn. behavior]
Assign behavior of diagnostic no. 140 (Sensor signal)

**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 signal**.

**Selection**
- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**
Warning

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

### Assign behavior of diagnostic no. 046 (Sensor limit exceeded)

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

**Description**
Use this function to change the diagnostic behavior of the diagnostic message **046 Sensor limit exceeded**.
Description of device parameters

Proline Cubemass 100 EtherNet/IP

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

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

Assign behavior of diagnostic no. 144 (Measuring error too high)

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

Description
Use this function to change the diagnostic behavior of the diagnostic message 144 Measuring error too high.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Alarm

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

Assign behavior of diagnostic no. 832 (Electronic temperature too high)

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 temperature too high.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

Additional information
For a detailed description of the options available, see
Assign behavior of diagnostic no. 833 (Electronic temperature too low)

**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 temperature too low**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see

Assign behavior of diagnostic no. 834 (Process temperature too high)

**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 temperature too high**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see

Assign behavior of diagnostic no. 835 (Process temperature too low)

**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 temperature too low**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see
### Assign behavior of diagnostic no. 912 (Medium inhomogeneous)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 912 Medium inhomogeneous.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see Assign behavior of diagnostic no. 913 (Medium unsuitable).

### Assign behavior of diagnostic no. 913 (Medium unsuitable)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 913 Medium unsuitable.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see Assign behavior of diagnostic no. 914 (Monitoring failed).

### Assign behavior of diagnostic no. 944 (Monitoring failed)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 944 Monitoring failed.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see
Assign behavior of diagnostic no. 948 (Tube damping too high)

Navigation

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

Description

Use this function to change the diagnostic behavior of the diagnostic message 948 Tube damping too high.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available, see

Assign behavior of diagnostic no. 192 (Special event 9)

Navigation

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

Description

Use this function to change the diagnostic behavior of the diagnostic message 192 Special event 9.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available, see

Assign behavior of diagnostic no. 274 (Main electronic failure)

Navigation

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

Description

Use this function to change the diagnostic behavior of the diagnostic message 274 Main electronic failure.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available, see
Assign behavior of diagnostic no. 392 (Special event 10)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 392 Special event 10.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see Assign behavior of diagnostic no. 592 (Special event 11).

Assign behavior of diagnostic no. 592 (Special event 11)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 592 Special event 11.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see Assign behavior of diagnostic no. 992 (Special event 12).

Assign behavior of diagnostic no. 992 (Special event 12)

**Navigation**

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

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 992 Special event 12.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning
Additional information

For a detailed description of the options available, see 3.1.3 "Administration" submenu.

3.1.3 "Administration" submenu

Navigation

Expert → System → Administration

"Define access code" wizard

The Define access code wizard (→ 35) is only available when operating via the local display or Web browser.

If operating via the operating tool, the Define access code parameter (→ 36) can be found directly in the Administration submenu. There is no Confirm access code parameter if the device is operated via the operating tool.

Navigation

Expert → System → Administration → Def. access code

Define access code

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 9999

Factory setting

0
Description of device parameters

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 Enter access code parameter (→ 13).

If you lose the access code, please contact your Endress+Hauser Sales Center.

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 access code

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Administration → Def. access code → Confirm code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Enter the defined release code a second time to confirm the release code.</td>
</tr>
<tr>
<td>User entry</td>
<td>0 to 9 999</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
</tbody>
</table>

Additional parameters in the "Administration" submenu

Define access code

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Administration → Def. access code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>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.</td>
</tr>
<tr>
<td>User entry</td>
<td>0 to 9 999</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
</tbody>
</table>
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 **Enter access code** parameter (→ 13).

If you lose the access code, please contact your Endress+Hauser Sales Center.

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 settings
- Restart device

**Factory setting**

Cancel

**Additional information**

"Cancel" option

No action is executed and the user exits the parameter.

"To delivery settings" option

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" option

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 option**

**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
0

Additional information
User entry
Endress+Hauser provides the corresponding activation code for the software option with the order.

NOTICE! This activation code varies depending on the measuring device and the software option. If an incorrect or invalid code is entered, this can result in the loss of software options that are already been activated. After commissioning the measuring device: in this parameter only enter activation codes which Endress+Hauser has provided (e.g. when a new software option was ordered). If an incorrect or invalid activation code is entered, enter the activation code from the parameter protocol again and contact your Endress+Hauser sales organization, quoting the serial number of your device.

Example for a software option
Order code for "Application package", option EB "Heartbeat Verification + Monitoring"

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

Software option overview

Navigation
Expert → System → Administration → SW option overv.

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

User interface
- Heartbeat Verification
- Heartbeat Monitoring
- Concentration

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

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

"Concentration" option
Order code for 'Application package', option ED 'Concentration' and option EF 'Special density + concentration'
3.2 "Sensor" submenu

**Navigation**  
Expert → Sensor

<table>
<thead>
<tr>
<th>► Sensor</th>
</tr>
</thead>
<tbody>
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<td>► Measured values  → 39</td>
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<td>► Process parameters  → 60</td>
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<td>► Measurement mode  → 67</td>
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<td>► External compensation  → 69</td>
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<td>► Calculated values  → 71</td>
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<td>► Sensor adjustment  → 74</td>
</tr>
<tr>
<td>► Calibration  → 80</td>
</tr>
<tr>
<td>► Supervision  → 82</td>
</tr>
</tbody>
</table>

3.2.1 "Measured values" submenu

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

<table>
<thead>
<tr>
<th>► Measured values</th>
</tr>
</thead>
<tbody>
<tr>
<td>► Process variables  → 39</td>
</tr>
<tr>
<td>► Totalizer  → 43</td>
</tr>
</tbody>
</table>

"Process variables" submenu

**Navigation**  

<table>
<thead>
<tr>
<th>► Process variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass flow  → 40</td>
</tr>
<tr>
<td>Volume flow  → 40</td>
</tr>
<tr>
<td>Corrected volume flow  → 40</td>
</tr>
<tr>
<td>Density  → 41</td>
</tr>
</tbody>
</table>
Description of device parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference density</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Pressure value</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Concentration</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Target mass flow</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Carrier mass flow</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

**Mass flow**

**Navigation**


**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 (→ 46)

**Volume flow**

**Navigation**


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

**User interface**
Signed floating-point number

**Additional information**

Dependency

The unit is taken from the **Volume flow unit** parameter (→ 47)

**Corrected volume flow**

**Navigation**


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

**User interface**
Signed floating-point number
Additional information  

**Density**

**Navigation**  


**Description**  

Displays the density currently measured.

**User interface**  

Signed floating-point number

**Additional information**  

*Dependency*

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

**Reference density**

**Navigation**  


**Description**  

Displays the reference density currently calculated.

**User interface**  

Signed floating-point number

**Additional information**  

*Dependency*

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

**Temperature**

**Navigation**  


**Description**  

Displays the medium temperature currently measured.

**User interface**  

Signed floating-point number

**Additional information**  

*Dependency*

The unit is taken from the **Reference density unit** parameter (→  52)
### Pressure value

**Navigation**


**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 (→ 53)

### Concentration

**Navigation**


**Prerequisite**

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

The software options currently enabled are displayed in the **Software option overview** parameter (→ 38).

**Description**

Displays the concentration currently calculated.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

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

### Target mass flow

**Navigation**


**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 **Concentration unit** parameter.

The software options currently enabled are displayed in the **Software option overview** parameter (→ 38).

**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 (→ 46)
Carrier mass flow

Navigation


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 Concentration unit parameter.

The software options currently enabled are displayed in the Software option overview parameter (→ 38).

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 (→ 46)

"Totalizer" submenu

Navigation

Expert → Sensor → Measured val. → Totalizer

Totalizer value 1 to 3

→ 43

Totalizer overflow 1 to 3

→ 44

Totalizer value 1 to 3

Navigation

Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to 3

Prerequisite

One of the following options is selected in the Assign process variable parameter (→ 94) of the Totalizer 1 to 3 submenu:
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *

Description

Displays the current totalizer reading.

User interface

Signed floating-point number

* Visibility depends on order options or device settings
Additional information

Description

As it is only possible to display a maximum of 7 digits, the current counter value is the sum of the totalizer value and the overflow value from the **Totalizer overflow 1 to 3** parameter if the display range is exceeded.

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 98).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Totalizer operation mode** parameter (→ 96).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 94).

Example

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

- Value in the **Totalizer value 1** parameter: 196 845.7 m³
- Value in the **Totalizer overflow 1** parameter: 1 ⋅ 10⁷ (1 overflow) = 10 000 000 [m³]
- Current totalizer reading: 10 196 845.7 m³

**Totalizer overflow 1 to 3**

---

**Navigation**

Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to 3

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 94) of the **Totalizer 1 to 3** submenu:

- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**

Displays the current totalizer overflow.

**User interface**

Integer with sign

**Additional information**

Description

If the current totalizer reading has more than 7 digits, which is the maximum value range that can be displayed, the value above this range is output as an overflow. The current 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 value 1 to 3 parameter.

User interface

The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 94).

Example

Calculation of the current totalizer reading when the value exceeds the 7-digit display range:
- Value in the Totalizer value 1 parameter: 196845.7 m³
- Value in the Totalizer overflow 1 parameter: 2 ⋅ 10⁷ (2 overflows) = 20000000 [m³]
- Current totalizer reading: 20196845.7 m³

3.2.2 "System units" submenu

Navigation   Expert → Sensor → System units

<table>
<thead>
<tr>
<th>System units</th>
</tr>
</thead>
</table>
| Mass flow unit        | → 46  
| Mass unit             | → 46  
| Volume flow unit      | → 47  
| Volume unit           | → 49  
| Corrected volume flow unit | → 49  
| Corrected volume unit | → 50  
| Density unit          | → 51  
| Reference density unit| → 52  
| Temperature unit      | → 52  
| Pressure unit         | → 53  
| Date/time format      | → 53  
| User-specific units   | → 54  

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
  - lb/min

Additional information

**Result**

The selected unit applies for:

**Mass flow** parameter (→ 40)

**Selection**

For an explanation of the abbreviated units: → 124

**Customer-specific units**

The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 55).

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
- lb

**Additional information**

*Selection*

For an explanation of the abbreviated units: → 124

*Customer-specific units*

The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 55).

**Volume flow unit**

**Navigation**

Expert → Sensor → System units → Volume flow unit

**Description**

Use this function to select the unit for the volume flow.
<table>
<thead>
<tr>
<th>Selection</th>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td>• cm³/s</td>
<td>• cm³/min</td>
<td>• cm³/h</td>
<td>• cm³/d</td>
</tr>
<tr>
<td>• dm³/s</td>
<td>• dm³/min</td>
<td>• dm³/h</td>
<td>• dm³/d</td>
</tr>
<tr>
<td>• m³/s</td>
<td>• m³/min</td>
<td>• m³/h</td>
<td>• m³/d</td>
</tr>
<tr>
<td>• l/s</td>
<td>• l/min</td>
<td>• l/h</td>
<td>• l/d</td>
</tr>
<tr>
<td>• ml/s</td>
<td>• ml/min</td>
<td>• ml/h</td>
<td>• ml/d</td>
</tr>
</tbody>
</table>

**SI units**
- • cm³/s
- • cm³/min
- • cm³/h
- • cm³/d
- • dm³/s
- • dm³/min
- • dm³/h
- • dm³/d
- • m³/s
- • m³/min
- • m³/h
- • m³/d
- • l/s
- • l/min
- • l/h
- • l/d
- • ml/s
- • ml/min
- • ml/h
- • ml/d

**US units**
- • af/s
- • af/min
- • af/h
- • af/d
- • ft³/s
- • ft³/min
- • ft³/h
- • ft³/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
- • gal/min (us)
### Volume unit

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

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

#### Selection

- **SI units**
  - cm³
  - dm³
  - m³
  - ml
  - l
  - hl
  - Ml Mega

- **US units**
  - af
  - ft³
  - 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
- gal (us)

### Additional information

- For an explanation of the abbreviated units: → 124

**Customer-specific units**

- The unit for the customer-specific volume is specified in the User volume text parameter (→ 56).

---

### Corrected volume flow unit

**Navigation**  
Expert → Sensor → System units → Cor.volflow unit

**Description**  
Use this function to select the unit for the corrected volume flow.
Description of device parameters

Proline Cubemass 100 EtherNet/IP

Selection

**SI units**
- Nl/s
- Nl/min
- Nl/h
- Nl/d
- Nm³/s
- Nm³/min
- Nm³/h
- Nm³/d
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d

**US units**
- Sft³/s
- Sft³/min
- Sft³/h
- Sft³/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.)
- 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
- Sft³/min

Additional information

**Result**

The selected unit applies for:

**Corrected volume flow** parameter (→  40)

**Selection**

For an explanation of the abbreviated units: →  124

Corrected volume 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
- Sft³
Additional information

Selection

For an explanation of the abbreviated units: → 124

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** (→ 41)

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: → 124

Customer-specific units

The unit for the customer-specific density is specified in the **User density text** parameter (→ 58).
### Reference density 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:

- External reference density parameter (→ 72)
- Fixed reference density parameter (→ 72)
- Reference density parameter (→ 41)

**Selection**

For an explanation of the abbreviated units: → 124

### 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 (→ 112)
- Minimum value parameter (→ 112)
- Maximum value parameter (→ 113)
- Minimum value parameter (→ 113)
- Maximum value parameter (→ 114)
- Minimum value parameter (→ 114)
- **External temperature** parameter (→ 71)
- **Reference temperature** parameter (→ 73)
- **Temperature** parameter (→ 41)

**Selection**

For an explanation of the abbreviated units: → 124

---

### Pressure unit

**Navigation**

縠  Expert → Sensor → System units → Pressure unit

**Description**

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

**Selection**

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pa a</td>
<td>psi a</td>
</tr>
<tr>
<td>kPa a</td>
<td>psi g</td>
</tr>
<tr>
<td>MPa a</td>
<td></td>
</tr>
<tr>
<td>bar</td>
<td></td>
</tr>
<tr>
<td>Pa g</td>
<td></td>
</tr>
<tr>
<td>kPa g</td>
<td></td>
</tr>
<tr>
<td>MPa g</td>
<td></td>
</tr>
<tr>
<td>bar g</td>
<td></td>
</tr>
</tbody>
</table>

*Custom-specific units*

User pres.

**Factory setting**

Country-specific:

- bar a
- psi a

**Additional information**

*Result*

The unit is taken from:

- **Pressure value** parameter (→ 42)
- **External pressure** parameter (→ 70)
- **Pressure value** parameter (→ 70)

**Selection**

For an explanation of the abbreviated units: → 124

---

### Date/time format

**Navigation**

縠  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 hh:mm am/pm
- mm/dd/yy hh:mm
- mm/dd/yy hh:mm am/pm
Factory setting

dd.mm.yy hh:mm

Additional information

Selection

For an explanation of the abbreviated units: → 124

"User-specific units" submenu

Navigation

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

<table>
<thead>
<tr>
<th>User-specific units</th>
<th>→</th>
</tr>
</thead>
<tbody>
<tr>
<td>User mass text</td>
<td>55</td>
</tr>
<tr>
<td>User mass offset</td>
<td>55</td>
</tr>
<tr>
<td>User mass factor</td>
<td>55</td>
</tr>
<tr>
<td>User volume text</td>
<td>56</td>
</tr>
<tr>
<td>User volume offset</td>
<td>56</td>
</tr>
<tr>
<td>User volume factor</td>
<td>57</td>
</tr>
<tr>
<td>User corrected volume text</td>
<td>57</td>
</tr>
<tr>
<td>User corrected volume offset</td>
<td>57</td>
</tr>
<tr>
<td>User corrected volume factor</td>
<td>58</td>
</tr>
<tr>
<td>User density text</td>
<td>58</td>
</tr>
<tr>
<td>User density offset</td>
<td>58</td>
</tr>
<tr>
<td>User density factor</td>
<td>58</td>
</tr>
<tr>
<td>User pressure text</td>
<td>59</td>
</tr>
<tr>
<td>User pressure offset</td>
<td>59</td>
</tr>
<tr>
<td>User pressure factor</td>
<td>59</td>
</tr>
</tbody>
</table>
User 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 (→ 46)
- Mass unit parameter (→ 46)

Example
If the text CENT for "centner" is entered, the following options are displayed in the picklist for the Mass flow unit parameter (→ 46):
- CENT/s
- CENT/min
- CENT/h
- CENT/d

User 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

User 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
**User 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 (→ 47)
  - Volume unit parameter (→ 49)

**Example**
If the text GLAS is entered, the choose list of the Volume flow unit parameter (→ 47) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

**User 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
User 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

User corrected volume 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:
  - Corrected volume flow unit parameter (→ 49)
  - Corrected volume unit parameter (→ 50)

*Example*
If the text GLAS is entered, the choose list of the Corrected volume flow unit parameter (→ 49) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

User corrected volume 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
User corrected volume 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

User 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 (→ 51).

Example
Enter text “CE_L” for centners per liter

User 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

User 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

### User 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 (→ 53).

### User 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

### User 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 parameters" submenu

Navigation  

Expert → Sensor → Process param. → Flow damping

Description

Use this function to enter a time constant for flow damping. 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

User entry

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

Result

The damping affects the following variables of the device:

- Outputs
- Low flow cut off → 62
- Totalizers → 93

Density damping

Navigation  

Expert → Sensor → Process param. → Density damping

Description

Use this function to enter the time constant for density damping.
User entry 0 to 999.9 s
Factory setting 0 s

Temperature damping

Description Use this function to enter a time constant for temperature damping.
User entry 0 to 999.9 s
Factory setting 0 s

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
"Low flow cut off" submenu

**Navigation**

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

---

**Assign process 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
- Corrected volume flow

**Factory setting**

Mass flow

---

**On value low flow cutoff**

**Navigation**

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

**Prerequisite**

One of the following options is selected in the Assign process variable parameter (→ 62):

- Mass flow
- Volume flow
- Corrected volume flow

**Description**

Use this function to enter a switch-on value for low flow cutoff. Low flow cutoff is activated if the value entered is not equal to 0 or pressure shock suppression is active → 63.

**User entry**

Positive floating-point number

**Factory setting**

Depends on country and nominal diameter → 121
**Off value low flow cutoff**

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

**Prerequisite**
One of the following options is selected in the **Assign process variable** parameter (→ 62):
- Mass flow
- Volume flow
- Corrected volume 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 (→ 62).

**User entry**
0 to 100.0 %

**Factory setting**
50 %

**Additional information**
**Example**

![Diagram](image)

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

**Pressure shock suppression**

**Navigation**

**Prerequisite**
The unit depends on the process variable selected in the **Assign process variable** parameter (→ 62):
- Mass flow
- Volume flow
- Corrected volume flow

**Example**

![Diagram](image)

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
**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
  - 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.

![Diagram](image-url)

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
"Partially filled pipe detection" submenu


### Assign process 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
- Reference density

**Factory setting**

Off

### Low value partial filled pipe detection

**Navigation**

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

**Prerequisite**

One of the following options is selected in the Assign process variable parameter (→ 65):

- Density
- Reference 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 that is specified in the *High value partial filled pipe detection* parameter (→ 66).

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

**Limit value**

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

---

### High value partial filled pipe detection

#### Navigation


#### Prerequisite

One of the following options is selected in the *Assign process variable* parameter (→ 65):

- Density
- Reference 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

6000

#### Additional information

**User entry**
The upper limit value must be greater than the lower limit value that is specified in the *Low value partial filled pipe detection* parameter (→ 65).

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

**Limit value**

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

---

### Response time part. filled pipe detect.

#### Navigation


#### Prerequisite

One of the following options is selected in the *Assign process variable* parameter (→ 65):

- Density
- Reference density

#### Description

Enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message *S862 Partly filled pipe* to be triggered if the measuring pipe is empty or partially full.
Maximum damping partial filled pipe det.

**Navigation**

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

**Prerequisite**
One of the following options is selected in the Assign process variable parameter (→ 65):
- Density
- Reference 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 pipe damping (Testpoints submenu) 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 pipe. In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases.

*User entry*
The function is enabled only if the input value is greater than 0.

### 3.2.4 "Measurement mode" submenu

**Navigation**

Expert → Sensor → Measurement mode

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<td>Select medium</td>
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<tr>
<td>Select gas type</td>
</tr>
<tr>
<td>Reference sound velocity</td>
</tr>
<tr>
<td>Temperature coefficient sound velocity</td>
</tr>
</tbody>
</table>
### 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 (→ 68).

**Description**

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

**Selection**

- Air
- Ammonia NH3
- Argon Ar
- Sulfur hexafluoride SF6
- Oxygen O2
- Ozone O3
- Nitrogen oxide NOx
- Nitrogen N2
- Nitrous oxide N2O
- Methane CH4
- Hydrogen H2
- Helium He
- Hydrogen chloride HCl
- Hydrogen sulfide H2S
- Ethylene C2H4
- Carbon dioxide CO2
- Carbon monoxide CO
- Chlorine Cl2
- Butane C4H10
- Propane C3H8
- Propylene C3H6
- Ethane C2H6
- Others

**Factory setting**

Methane CH4
Reference sound velocity

**Navigation**  
Expert → Sensor → Measurement mode → Sound velocity

**Prerequisite**  
The Others option is selected in the Select gas type parameter (→  68).

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

**User entry**  
1 to 99999.9999 m/s

**Factory setting**  
0 m/s

**Temperature coefficient sound velocity**

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

**Prerequisite**  
The Others option is selected in the Select gas type parameter (→  68).

**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 compensation" submenu

**Navigation**  
Description of device parameters

Proline Cubemass 100 EtherNet/IP

Pressure compensation

Navigation

Prerequisite
The Gas option is selected in the Select medium parameter (→ 68).

Description
Use this function select the type of pressure compensation.

Selection
- Off
- Fixed value
- External value

Factory setting
Off

Pressure value

Navigation
Expert → Sensor → External comp. → Pressure value

Prerequisite
The Fixed value option is selected in the Pressure compensation parameter (→ 70).

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 (→ 53)

External pressure

Navigation

Prerequisite
The External value option is selected in the Pressure compensation parameter (→ 70).

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 (→ 53)
**Proline Cubemass 100 EtherNet/IP**

**Description of device parameters**

### Temperature mode

**Navigation**

[Expert → Sensor → External comp. → Temperature mode]

**Description**

Use this function to select the temperature mode.

**Selection**

- Internal measured value
- External value

**Factory setting**

Internal measured value

### External temperature

**Navigation**


**Prerequisite**

The **External value** option is selected in the **Temperature mode** parameter (→ 71) parameter.

**Description**

Use this function to enter the external temperature.

**User entry**

−273.15 to 99999 °C

**Factory setting**

- 0 °C
- +32 °F

**Additional information**

*Description*

The unit is taken from the **Temperature unit** parameter (→ 52)

---

### "Corrected volume flow calculation" submenu

**Navigation**


**Corrected volume flow calculation**

Corrected volume flow calculation  

[→ 72]
### Corrected volume flow calculation

**Navigation**


**Description**

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

**Selection**

- Fixed reference density
- Calculated reference density
- Reference density by API table 53
- External reference density

**Factory setting**

Calculated reference density

---

### External reference density

**Navigation**


**Prerequisite**

The **External reference density** option is selected in the **Corrected volume flow calculation** parameter (→ 72).

**Description**

Use this function to enter the external reference density.

**User entry**

Floating point number with sign

**Factory setting**

0 kg/Nl

---

### Fixed reference density

**Navigation**


**Prerequisite**

In the **Corrected volume flow calculation** parameter (→ 72) the **Fixed reference density** option is selected.

**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 Reference density unit parameter (→ 52)

### Reference temperature

**Navigation**

**Prerequisite**
- In the Corrected volume flow calculation parameter (→ 72) the Calculated reference density option is selected.

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

**User entry**
- −273.15 to 99999 °C

**Factory setting**
- Country-specific:
  - +20 °C
  - +68 °F

**Additional information**
- **Dependency**
  - The unit is taken from the Temperature unit parameter (→ 52)

**Reference density calculation**

\[ \rho_\text{n} = \rho \cdot (1 + \alpha \cdot \Delta t + \beta \cdot \Delta t^2) \]

- \( \rho_\text{n} \): reference density
- \( \rho \): fluid density currently measured
- \( t \): fluid temperature currently measured
- \( t_\text{N} \): reference temperature at which the reference density is calculated (e.g. 20 °C)
- \( \Delta t \): \( t - t_\text{N} \)
- \( \alpha \): linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- \( \beta \): square expansion coefficient of the fluid, unit = [1/K²]

### Linear expansion coefficient

**Navigation**

**Prerequisite**
- In the Corrected volume flow calculation parameter (→ 72) the Calculated reference density option is selected.

**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 expansion coefficient

Navigation

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

User entry
Signed floating-point number

Factory setting
0.0

3.2.7 "Sensor adjustment" submenu

Installation direction

Navigation

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

Selection
- Flow in arrow direction
- Flow against arrow direction

Factory setting
Flow in arrow direction

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 adjustment” submenu**

**Navigation**  

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**Zero point adjustment control**

**Navigation**  

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

**Note conditions.**

**Selection**  
- Cancel
- Busy
- Zero point adjust failure
- 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 point adjust failure
  
Is displayed if zero point adjustment has failed.

- Start
  
Select this option to start zero point adjustment.

**Progress**

**Navigation**  

**Description**  
The progress of the process is indicated.

**User interface**  
0 to 100 %
"Process variable adjustment" submenu

**Navigation**  ➤ Expert → Sensor → Sensor adjustm. → Variable adjust

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<td>Temperature offset</td>
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<tr>
<td>Temperature factor</td>
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</tr>
</tbody>
</table>

**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**  

**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

### Volume flow offset

**Navigation**  

**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 m³/s.

**User entry**  
Signed floating-point number

**Factory setting**  
0 m³/s

**Additional information**  
Description  
Corrected value = (factor × value) + offset

### Volume flow factor

**Navigation**  

**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/m³.

**User entry**

Signed floating-point number

**Factory setting**

0 kg/m³

**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

### Corrected volume flow offset

**Navigation**


**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 Nm³/s.

**User entry**

Signed floating-point number

**Factory setting**

0 Nm³/s

**Additional information**

*Description*

Corrected value = (factor × value) + offset
Corrected volume flow factor

**Navigation**


**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

Reference density 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 standard 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

Reference density 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
**Temperature 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

---

**Temperature 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

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<td>C0 to 5</td>
<td>→ 81</td>
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</tbody>
</table>
Calibration 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 value measuring tube damping**

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

**3.3 "Communication" submenu**

**Navigation**
Expert → Communication
### 3.3.1 "Configuration" submenu

**Navigation**

Expert → Communication → Configuration

---

**Web server language**

**Description**

Use this function to select the web server language setting.

**Selection**

- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *
- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- العربية (Arabic) *
- Bahasa Indonesia *

* Visibility depends on order options or device settings
**MAC address**

**Navigation**

Expert → Communication → Configuration → MAC Address

**Description**

Displays the MAC 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

---

**Default network settings**

**Navigation**

Expert → Communication → Configuration → Default netw.set

**Description**

Displays the use of default network settings.

**User interface**

- Off
- On

**Factory setting**

Off

**Additional information**

*User interface*

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

---

**DHCP client**

**Navigation**

Expert → Communication → Configuration → DHCP client

**Description**

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

---

* Visibility depends on order options or device settings

1) Media Access Control
Selection

- Off
- On

Factory setting

On

Additional information

Result

If the DHCP client functionality of the Web server is activated, the IP address (→ 85), Subnet mask (→ 85) and Default gateway (→ 85) are set automatically.

Identification is via the MAC address of the measuring device.

### IP address

<table>
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<th>Navigation</th>
<th>Expert → Communication → Configuration → IP address</th>
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<tr>
<td>Description</td>
<td>Use this function to enter the IP address of the device's web server.</td>
</tr>
<tr>
<td>User entry</td>
<td>4 octet: 0 to 255 (in the particular octet)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>192.168.1.212</td>
</tr>
</tbody>
</table>

### Subnet mask

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → Communication → Configuration → Subnet mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to enter the subnet mask.</td>
</tr>
<tr>
<td>User entry</td>
<td>4 octet: 0 to 255 (in the particular octet)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>255.255.255.0</td>
</tr>
</tbody>
</table>

### Default gateway

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → Communication → Configuration → Default gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to enter the default gateway.</td>
</tr>
<tr>
<td>User entry</td>
<td>4 octet: 0 to 255 (in the particular octet)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0.0.0</td>
</tr>
</tbody>
</table>
**Web server functionality**

**Navigation**

Expert → Communication → Configuration → Webserver funct.

**Description**

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

**Selection**

- Off
- On

**Factory setting**

On

**Additional information**

**Description**

Once disabled, the Web server functionality can be re-enabled only via the local display or the FieldCare operating tool.

**Selection**

- Off
  - The web server is completely disabled.
  - Port 80 is locked.
- 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.

"Configurable input assembly" submenu

**Navigation**

Expert → Communication → Configuration → Input assembly

- Input assembly position 1 → 87
- Input assembly position 2 → 88
- Input assembly position 3 → 88
- Input assembly position 4 → 88
- Input assembly position 5 → 88
- Input assembly position 6 → 89
- Input assembly position 7 → 89
- Input assembly position 8 → 89
- Input assembly position 9 → 89
Input assembly position 1

Navigation

Expert → Communication → Configuration → Input assembly → Position 1

Description

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

Selection

- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation amplitude 0 *
- Frequency fluctuation 0
- Oscillation damping 0
- Tube damping fluctuation 0
- Signal asymmetry
- Exciter current 0
- Totalizer 1

* Visibility depends on order options or device settings
Description of device parameters  Proline Cubemass 100 EtherNet/IP

- Totalizer 2
- Totalizer 3
- Sensor integrity

Factory setting  Mass flow

### Input assembly position 2

<table>
<thead>
<tr>
<th>Navigation</th>
<th>🔍  🔍  Expert → Communication → Configuration → Input assembly → Position 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to select a process variable for input value 2.</td>
</tr>
<tr>
<td>Selection</td>
<td>Picklist, see Input assembly position 1 parameter (→ 87)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>Volume flow</td>
</tr>
</tbody>
</table>

### Input assembly position 3

<table>
<thead>
<tr>
<th>Navigation</th>
<th>🔍  🔍  Expert → Communication → Configuration → Input assembly → Position 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to select a process variable for input value 3.</td>
</tr>
<tr>
<td>Selection</td>
<td>Picklist, see Input assembly position 1 parameter (→ 87)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>Corrected volume flow</td>
</tr>
</tbody>
</table>

### Input assembly position 4

<table>
<thead>
<tr>
<th>Navigation</th>
<th>🔍  🔍  Expert → Communication → Configuration → Input assembly → Position 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to select a process variable for input value 4.</td>
</tr>
<tr>
<td>Selection</td>
<td>Picklist, see Input assembly position 1 parameter (→ 87)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>Temperature</td>
</tr>
</tbody>
</table>

### Input assembly position 5

<table>
<thead>
<tr>
<th>Navigation</th>
<th>🔍  🔍  Expert → Communication → Configuration → Input assembly → Position 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to select a process variable for input value 5.</td>
</tr>
<tr>
<td>Selection</td>
<td>Picklist, see Input assembly position 1 parameter (→ 87)</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td><strong>Input assembly position 6</strong></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td><strong>Navigation</strong></td>
<td>Expert → Communication → Configuration → Input assembly → Position 6</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Use this function to select a process variable for input value 6.</td>
</tr>
<tr>
<td><strong>Selection</strong></td>
<td>Picklist, see <strong>Input assembly position 1</strong> parameter (→ 87)</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>Reference density</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Input assembly position 7</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Input assembly position 8</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Input assembly position 9</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>
**Input assembly position 10**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 10

**Description**

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

**Selection**

Picklist, see Input assembly position 1 parameter (→ 87)

**Factory setting**

Totalizer 3

---

**Input assembly position 11**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 11

**Description**

Use this function to select a process variable for input value 11.

**Selection**

- Off
- Actual diagnostics
- Previous diagnostics
- Mass flow unit
- Volume flow unit
- Corrected volume flow unit
- Temperature unit
- Density unit
- Reference density unit
- Concentration unit *
- Dynamic viscosity unit *
- Kinematic viscosity unit *
- Current unit
- Unit totalizer 1
- Unit totalizer 2
- Unit totalizer 3
- Verification results *
- Verification status *

**Factory setting**

Mass flow unit

---

**Input assembly position 12**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 12

**Description**

Use this function to select a process variable for input value 12.

**Selection**

Picklist, see Input assembly position 11 parameter (→ 90)

**Factory setting**

Volume flow unit

* Visibility depends on order options or device settings
<table>
<thead>
<tr>
<th>Input assembly position 13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input assembly position 14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input assembly position 15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input assembly position 16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Selection</strong></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>
Description of device parameters

**Proline Cubemass 100 EtherNet/IP**

---

**Input assembly position 17**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 17

**Description**

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

**Selection**

Picklist, see Input assembly position 11 parameter (→ 90)

**Factory setting**

Current unit

---

**Input assembly position 18**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 18

**Description**

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

**Selection**

Picklist, see Input assembly position 11 parameter (→ 90)

**Factory setting**

Unit totalizer 1

---

**Input assembly position 19**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 19

**Description**

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

**Selection**

Picklist, see Input assembly position 11 parameter (→ 90)

**Factory setting**

Unit totalizer 2

---

**Input assembly position 20**

**Navigation**

Expert → Communication → Configuration → Input assembly → Position 20

**Description**

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

**Selection**

Picklist, see Input assembly position 11 parameter (→ 90)

**Factory setting**

Unit totalizer 3
3.4 "Application" submenu

**Navigation**
Expert → Application

### Reset all totalizers

**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**
  - Cancel
    - No action is executed and the user exits the parameter.
  - Reset + totalize
    - All totalizers are reset to 0 and the totaling process is restarted.

3.4.1 "Totalizer 1 to 3" submenu

**Navigation**
Expert → Application → Totalizer 1 to 3

### Totalizer 1 to 3

**Navigation**
Expert → Application → Totalizer 1 to 3

- Assign process variable
- Unit totalizer
- Totalizer operation mode
- Control Totalizer 1 to 3
Assign process variable

Navigation

Expert → Application → Totalizer 1 to 3 → Assign variable

Description

Use this function to select a process variable for the Totalizer 1 to 3.

Selection

- Off
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

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 the Assign process variable parameter (→ 94) is displayed in the Totalizer 1 to 3 submenu. All other parameters in the submenu are hidden.

Unit totalizer

Navigation

Expert → Application → Totalizer 1 to 3 → Unit totalizer

Prerequisite

One of the following options is selected in the Assign process variable parameter (→ 94) of the Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

Description

Use this function to select the unit for the process variable of totalizer 1-3.

* Visibility depends on order options or device settings
### Selection

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td>g</td>
<td>oz</td>
<td>gal (imp)</td>
</tr>
<tr>
<td>kg</td>
<td>lb</td>
<td>bbl (imp;beer)</td>
</tr>
<tr>
<td>t</td>
<td>STon</td>
<td>bbl (imp;oil)</td>
</tr>
</tbody>
</table>

#### Custom-specific units
- User mass

#### US units
- oz
- lb
- STon

#### SI units
- cm³
- dm³
- m³
- ml
- l
- hl
- Ml Mega

#### Custom-specific units
- User vol.

#### Custom-specific units
- UserCrVol.

### Factory setting

Country-specific:
- kg
- lb

### Additional information

**Description**

The unit is selected separately for each totalizer. The unit is independent of the option selected in the *System units* submenu (→ 45).

**Selection**

The selection depends on the process variable selected in the *Assign process variable* parameter (→ 94).
### Totalizer operation mode

**Navigation**

Expert → Application → Totalizer 1 to 3 → Operation mode

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 94) **Totalizer 1 to 3** submenu:
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**

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

**Selection**

- Net flow total
- Forward flow total
- Reverse flow total

**Factory setting**

Net flow total

**Additional information**

Selection

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

### Control Totalizer 1 to 3

**Navigation**

Expert → Application → Totalizer 1 to 3 → Control Tot. 1 to 3

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 94) **Totalizer 1 to 3** submenu:
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**

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

**Selection**

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

**Factory setting**

Totalize

* Visibility depends on order options or device settings
Additional information

Selection

- Totalize
  The totalizer is started or continues totalizing with the current counter reading.
- 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 (→ 97).
- 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 in Preset value parameter (→ 97) and
  the totaling process is restarted.

Preset value 1 to 3

Navigation

Expert → Application → Totalizer 1 to 3 → Preset value 1 to 3

Prerequisite

One of the following options is selected in the Assign process variable parameter
(→ 94) Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *

Description

Use this function to enter a start value for totalizer 1-3.

User entry

Signed floating-point number

Factory setting

Country-specific:
- 0 kg
- 0 lb

Additional information

User entry

The unit of the selected process variable is specified for the totalizer in the Unit
totalizer parameter (→ 94).

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 3 → Failure mode

Prerequisite

One of the following options is selected in the Assign process variable parameter (→ 94) Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

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
  Totalizing is stopped in the event of a device alarm.
- Actual value
  The totalizer continues to count based on the current 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 "Concentration" submenu

📚 For detailed information on the parameter descriptions for the Concentration application package: Special Documentation for the device

Navigation

📚 📚 Expert → Application → Concentration

Visibility depends on order options or device settings
3.5 "Diagnostics" submenu

**Navigation**  
Expert → Diagnostics

<table>
<thead>
<tr>
<th>▶ Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual diagnostics</td>
</tr>
<tr>
<td>Previous diagnostics</td>
</tr>
<tr>
<td>Operating time from restart</td>
</tr>
<tr>
<td>Operating time</td>
</tr>
<tr>
<td>▶ Diagnostic list</td>
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<tr>
<td>▶ Event logbook</td>
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<td>▶ Device information</td>
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<tr>
<td>▶ Min/max values</td>
</tr>
<tr>
<td>▶ Heartbeat</td>
</tr>
<tr>
<td>▶ Simulation</td>
</tr>
</tbody>
</table>

---

**Actual diagnostics**

**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 (→ 101).

**Example**  
For the display format:  
 Faker F271 Main electronic failure
### 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 diagnostics parameter (→ 99).

*Example*

For the display format:

24d12h13m00s

### Previous 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 electronic failure

### 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 Previous diagnostics parameter (→ 100).

*Example*

For the display format:

24d12h13m00s
Operating time from 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 electronic failure
- F276 I/O module failure

### 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 (→ 101).

*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 electronic failure
- F276 I/O module failure

---

### 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 (→ 102).

**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 electronic failure
- • F276 I/O module failure

---

### 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 (→ 103).

**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

For the display format:
- ☢ F271 Main electronic failure
- ☢ F276 I/O module failure

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 (→ ☑ 103).

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 electronic failure
- ☢ F276 I/O module failure

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 (→ 104).

*Example*

For the display format:
24d12h13m00s

---

### 3.5.2 "Event logbook" submenu

*Navigation*

Expert → Diagnostics → Event logbook

![Event logbook]

Filter options

→ 105

Event list

→ 106

---

**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)
- Function check (C)
- Out of specification (S)
- Maintenance required (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
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)
- Function check (C)
- Out of specification (S)
- Maintenance required (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 (→ 105).
**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.

If the advanced HistoROM function is enabled in the device, the event list can contain up to 100 entries.

The following symbols indicate whether an event has occurred or has ended:
- ☑️: Occurrence of the event
- ☐️: End of the event

*Examples*

For the display format:
- I1091 Configuration modified
  - ☑️ 24d12h13m00s
- ⚽️F271 Main electronic failure
  - ☐️ 01d04h12min30s

*HistoROM*

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

### 3.5.3 "Device information" submenu

**Navigation**

-[ ] Expert → Diagnostics → Device info

<table>
<thead>
<tr>
<th>▶️ Device information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device tag            → 📙 108</td>
</tr>
<tr>
<td>Serial number         → 📙 108</td>
</tr>
<tr>
<td>Firmware version      → 📙 108</td>
</tr>
<tr>
<td>Device name           → 📙 109</td>
</tr>
<tr>
<td>Order code            → 📙 109</td>
</tr>
<tr>
<td>Extended order code 1 → 📙 109</td>
</tr>
<tr>
<td>Extended order code 2 → 📙 110</td>
</tr>
<tr>
<td>Extended order code 3 → 📙 110</td>
</tr>
</tbody>
</table>
Description of device parameters

Proline Cubemass 100 EtherNet/IP

### 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 letters, numbers or special characters (e.g. @, %, /)

**Factory setting**

Cubemass 100

### 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](http://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 the name of the transmitter. It can also be found on the nameplate of the transmitter.

**User interface**  
Cubemass 100

Order code

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

**Description**  
Displays the device order code.

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

**Additional information**  
*Description*  
The order code can be found on the nameplate of the sensor and transmitter in the 'Order code' field.

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

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

Extended order code 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.*
Extended order code 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 Extended order code 1 parameter (→ 109)

Extended order code 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 Extended order code 1 parameter (→ 109)

Configuration 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 65535

ENP version

**Navigation**

Expert → Diagnostics → Device info → ENP version

**Description**

Displays the version of the electronic nameplate.

**User interface**

Character string

**Factory setting**

2.02.00

**Additional information**

*Description*

This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.
3.5.4 "Min/max values" submenu

**Navigation**

Expert → Diagnostics → Min/max val.

---

**Reset min/max values**

**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
- Oscillation amplitude
- Oscillation damping
- Oscillation frequency
- Signal asymmetry

**Factory setting**

Cancel

**Additional information**

Selection

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 17)
"Electronic temperature" submenu

Navigation

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

<table>
<thead>
<tr>
<th>Electronic temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum value</strong></td>
</tr>
<tr>
<td>112</td>
</tr>
<tr>
<td><strong>Maximum value</strong></td>
</tr>
<tr>
<td>112</td>
</tr>
</tbody>
</table>

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 (→ 52)

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 (→ 52)
"Medium temperature" submenu


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 (→ ♦ 52)

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 (→ ♦ 52)

"Carrier pipe temperature" submenu


Minimum value

- Additional information: Dependency
  - The unit is taken from the Temperature unit parameter (→ ♦ 52)
Minimum value

**Navigation**

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

**Prerequisite**

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

**Description**

Displays the lowest previously measured temperature value of the carrier pipe.

**User interface**

Signed floating-point number

**Additional information**

Dependency

The unit is taken from the Temperature unit parameter (→  52)

---

Maximum value

**Navigation**

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

**Prerequisite**

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

**Description**

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

**User interface**

Signed floating-point number

**Additional information**

Dependency

The unit is taken from the Temperature unit parameter (→  52)

---

"Oscillation frequency" submenu

**Navigation**

Expert → Diagnostics → Min/max val. → Oscil. frequency

<table>
<thead>
<tr>
<th>Oscillation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
</tr>
<tr>
<td>Maximum value</td>
</tr>
</tbody>
</table>

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

### "Oscillation amplitude" submenu

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

<table>
<thead>
<tr>
<th>Oscillation amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
</tr>
<tr>
<td>Maximum value</td>
</tr>
</tbody>
</table>

#### 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
"Oscillation damping" submenu

**Navigation**

Expert → Diagnostics → Min/max val. → Oscil. damping

<table>
<thead>
<tr>
<th>Oscillation damping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
</tr>
<tr>
<td>Maximum value</td>
</tr>
</tbody>
</table>

**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

"Signal asymmetry" submenu

**Navigation**

Expert → Diagnostics → Min/max val. → Signal asymmetry

<table>
<thead>
<tr>
<th>Signal asymmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
</tr>
<tr>
<td>Maximum value</td>
</tr>
</tbody>
</table>
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

### 3.5.5 "Heartbeat" submenu

For detailed information on the parameter descriptions of the **Heartbeat Verification** application package, see the Special Documentation for the device

**Navigation**

Expert → Diagnostics → Heartbeat

#### "Heartbeat" submenu

- Performing verification
- Verification results
- Heartbeat Monitoring
- Monitoring results

### 3.5.6 "Simulation" submenu

**Navigation**

Expert → Diagnostics → Simulation

#### "Simulation" submenu

- Assign simulation process variable → 118
- Value process variable → 118
- Simulation device alarm → 119
Assign simulation process variable

**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
- Corrected volume flow
- Density
- Reference density
- Temperature
- Concentration *
- Target mass flow *
- Carrier mass flow *

**Factory setting**

Off

**Additional information**

Description

The simulation value of the process variable selected is defined in the Value process variable parameter (→ 118).

Value process variable

**Navigation**

Expert → Diagnostics → Simulation → Value proc. var.

**Prerequisite**

One of the following options is selected in the Assign simulation process variable parameter (→ 118):

- Mass flow
- Volume flow
- Corrected volume flow
- Density
- Reference density
- Temperature
- Concentration *
- Target mass flow *
- Carrier mass flow *

* 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**

The unit of the displayed measured value is taken from the **System units** submenu (→ 45).

---

**Simulation device 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**

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

---

**Diagnostic 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 **Simulation diagnostic event** parameter (→ 119).

**Selection**

- Sensor
- Electronics
- Configuration
- Process

**Factory setting**

Process

---

**Simulation diagnostic event**

**Navigation**

Expert → Diagnostics → Simulation → Sim. diag. event

**Description**

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

Proline Cubemass 100 EtherNet/IP

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 Diagnostic event category parameter (→ 119).
4 Country-specific factory settings

4.1 SI units

Not valid for USA and Canada.

4.1.1 System units

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SI unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>kg</td>
</tr>
<tr>
<td>Mass flow</td>
<td>kg/h</td>
</tr>
<tr>
<td>Volume</td>
<td>l</td>
</tr>
<tr>
<td>Volume flow</td>
<td>l/h</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Nl</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Nl/h</td>
</tr>
<tr>
<td>Density</td>
<td>kg/l</td>
</tr>
<tr>
<td>Reference density</td>
<td>kg/Nl</td>
</tr>
<tr>
<td>Temperature</td>
<td>ºC</td>
</tr>
<tr>
<td>Pressure</td>
<td>bar a</td>
</tr>
</tbody>
</table>

4.1.2 Full scale values

The factory settings apply to the following parameters:
100% bar graph value 1

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>[kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>200</td>
</tr>
</tbody>
</table>

4.1.3 On value low flow cut off

The switch-on point depends on the type of medium and the nominal diameter.

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>On-value for liquid [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.08</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>Switch-on value for gas [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>0.1</td>
</tr>
</tbody>
</table>
4.2 US units

Only valid for USA and Canada.

### 4.2.1 System units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>lb</td>
</tr>
<tr>
<td>Mass flow</td>
<td>lb/min</td>
</tr>
<tr>
<td>Volume</td>
<td>gal (us)</td>
</tr>
<tr>
<td>Volume flow</td>
<td>gal/min (us)</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Sft³</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Sft³/min</td>
</tr>
<tr>
<td>Density</td>
<td>lb/ft³</td>
</tr>
<tr>
<td>Reference density</td>
<td>lb/Sft³</td>
</tr>
<tr>
<td>Temperature</td>
<td>lb/ft³</td>
</tr>
<tr>
<td>Pressure</td>
<td>psi a</td>
</tr>
</tbody>
</table>

### 4.2.2 Full scale values

The factory settings apply to the following parameters:

100% bar graph value 1

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>[lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/32</td>
<td>0.15</td>
</tr>
<tr>
<td>1/16</td>
<td>0.75</td>
</tr>
<tr>
<td>1/8</td>
<td>3.3</td>
</tr>
<tr>
<td>1/4</td>
<td>7.4</td>
</tr>
</tbody>
</table>

### 4.2.3 On value low flow cut off

The switch-on point depends on the type of medium and the nominal diameter.

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>On-value for liquid [lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/32</td>
<td>0.003</td>
</tr>
<tr>
<td>1/16</td>
<td>0.015</td>
</tr>
<tr>
<td>1/8</td>
<td>0.066</td>
</tr>
<tr>
<td>1/4</td>
<td>0.15</td>
</tr>
<tr>
<td>Nominal diameter [in]</td>
<td>Switch-on value for gas [lb/min]</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>¹/₂₄</td>
<td>0.001</td>
</tr>
<tr>
<td>¹/₁₂</td>
<td>0.004</td>
</tr>
<tr>
<td>¹/₈</td>
<td>0.016</td>
</tr>
<tr>
<td>¹/₄</td>
<td>0.0375</td>
</tr>
</tbody>
</table>
# Explanation of abbreviated units

## 5.1 SI units

<table>
<thead>
<tr>
<th>Process variable</th>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>g/cm³, g/m³</td>
<td>Gram/volume unit</td>
</tr>
<tr>
<td></td>
<td>kg/dm³, kg/l, kg/m³</td>
<td>Kilogram/volume unit</td>
</tr>
<tr>
<td></td>
<td>SD4°C, SD15°C, SD20°C</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>SGA4°C, SG15°C, SG20°C</td>
<td>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).</td>
</tr>
<tr>
<td>Pressure</td>
<td>Pa a, kPa a, MPa a</td>
<td>Pascal, kilopascal, megapascal (absolute)</td>
</tr>
<tr>
<td></td>
<td>bar</td>
<td>Bar</td>
</tr>
<tr>
<td></td>
<td>Pa g, kPa g, MPa g</td>
<td>Pascal, kilopascal, megapascal (relative/gauge)</td>
</tr>
<tr>
<td></td>
<td>bar g</td>
<td>Bar (relative/gauge)</td>
</tr>
<tr>
<td>Mass</td>
<td>g, kg, t</td>
<td>Gram, kilogram, metric ton</td>
</tr>
<tr>
<td>Mass flow</td>
<td>g/s, g/min, g/h, g/d</td>
<td>Gram/time unit</td>
</tr>
<tr>
<td></td>
<td>kg/s, kg/min, kg/h, kg/d</td>
<td>Kilogram/time unit</td>
</tr>
<tr>
<td></td>
<td>t/s, t/min, t/h, t/d</td>
<td>Metric ton/time unit</td>
</tr>
<tr>
<td>Reference density</td>
<td>kg/Nm³, kg/Nl, g/Scm³, kg/Sm³</td>
<td>Kilogram, gram/standard volume unit</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Nl, Nm³, Sm³</td>
<td>Normal liter, normal cubic meter, standard cubic meter</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Nl/s, Nl/min, Nl/h, Nl/d</td>
<td>Normal liter/time unit</td>
</tr>
<tr>
<td></td>
<td>Nm³/s, Nm³/min, Nm³/h, Nm³/d</td>
<td>Normal cubic meter/time unit</td>
</tr>
<tr>
<td></td>
<td>Sm³/s, Sm³/min, Sm³/h, Sm³/d</td>
<td>Standard cubic meter/time unit</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C , K</td>
<td>Celsius, Kelvin</td>
</tr>
<tr>
<td>Volume</td>
<td>cm³, dm³, m³</td>
<td>Cubic centimeter, cubic decimeter, cubic meter</td>
</tr>
<tr>
<td></td>
<td>ml, l, hl, Mi Mega</td>
<td>Milliliter, liter, hectoliter, megaliter</td>
</tr>
<tr>
<td>Volume flow</td>
<td>cm³/s, cm³/min, cm³/h, cm³/d</td>
<td>Cubic centimeter/time unit</td>
</tr>
<tr>
<td></td>
<td>dm³/s, dm³/min, dm³/h, dm³/d</td>
<td>Cubic decimeter/time unit</td>
</tr>
<tr>
<td></td>
<td>m³/s, m³/min, m³/h, m³/d</td>
<td>Cubic meter/time unit</td>
</tr>
<tr>
<td></td>
<td>ml/s, ml/min, ml/h, ml/d</td>
<td>Milliliter/time unit</td>
</tr>
<tr>
<td></td>
<td>l/s, l/min, l/h, l/d</td>
<td>Liter/time unit</td>
</tr>
<tr>
<td></td>
<td>hl/s, hl/min, hl/h, hl/d</td>
<td>Hectoliter/time unit</td>
</tr>
<tr>
<td></td>
<td>Mi/s, Mi/min, Mi/h, Mi/d</td>
<td>Megaliter/time unit</td>
</tr>
<tr>
<td>Time</td>
<td>s, m, h, d, y</td>
<td>Second, minute, hour, day, year</td>
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## 5.2 US units

<table>
<thead>
<tr>
<th>Process variable</th>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>lb/ft³, lb/gal (us)</td>
<td>Pound/cubic foot, pound/gallon</td>
</tr>
<tr>
<td></td>
<td>lb/bbl (us:liq.), lb/bbl (us:beer), lb/bbl (us:oil), lb/bbl (us:tank)</td>
<td>Pound/volume unit</td>
</tr>
</tbody>
</table>
### Process variable

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi a</td>
<td>Pounds per square inch (absolute)</td>
</tr>
<tr>
<td>psi g</td>
<td>Pounds per square inch (gauge)</td>
</tr>
<tr>
<td>oz, lb, STon</td>
<td>Ounce, pound, standard ton</td>
</tr>
</tbody>
</table>

### Mass

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>oz/s, oz/min, oz/h, oz/d</td>
<td>Ounce/time unit</td>
</tr>
<tr>
<td>lb/s, lb/min, lb/h, lb/d</td>
<td>Pound/time unit</td>
</tr>
<tr>
<td>STon/s, STon/min, STon/h, STon/d</td>
<td>Standard ton/time unit</td>
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</tbody>
</table>

### Mass flow

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sft³/s, Sft³/min, Sft³/h, Sft³/d</td>
<td>Standard cubic foot/time unit</td>
</tr>
<tr>
<td>Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)</td>
<td>Standard gallon/time unit</td>
</tr>
<tr>
<td>Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)</td>
<td>Barrel/time unit (normal liquids)</td>
</tr>
</tbody>
</table>

### Reference density

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb/Sft³</td>
<td>Weight unit/standard volume unit</td>
</tr>
</tbody>
</table>

### Corrected volume

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sft³, Sgal (us), Sbbl (us;liq.)</td>
<td>Standard cubic foot, standard gallon, standard barrel</td>
</tr>
</tbody>
</table>

### Corrected volume flow

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sft³/s, Sft³/min, Sft³/h, Sft³/d</td>
<td>Standard cubic foot/time unit</td>
</tr>
<tr>
<td>Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)</td>
<td>Standard gallon/time unit</td>
</tr>
<tr>
<td>Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)</td>
<td>Barrel/time unit (normal liquids)</td>
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### Temperature

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<th>Explanation</th>
</tr>
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<td>°F, °R</td>
<td>Fahrenheit, Rankine</td>
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### Volume

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>af</td>
<td>Acre foot</td>
</tr>
<tr>
<td>ft³</td>
<td>Cubic foot</td>
</tr>
<tr>
<td>fl oz (us), gal (us), kgal (us), Mgal (us)</td>
<td>Fluid ounce, gallon, kilogallon, million gallon</td>
</tr>
<tr>
<td>bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)</td>
<td>Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)</td>
</tr>
</tbody>
</table>

### Volume flow

<table>
<thead>
<tr>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>af/s, af/min, af/h, af/d</td>
<td>Acre foot/time unit</td>
</tr>
<tr>
<td>ft³/s, ft³/min, ft³/h, ft³/d</td>
<td>Cubic foot/time unit</td>
</tr>
<tr>
<td>fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)</td>
<td>Fluid ounce/time unit</td>
</tr>
<tr>
<td>gal/s (us), gal/min (us), gal/h (us), gal/d (us)</td>
<td>Gallon/time unit</td>
</tr>
<tr>
<td>kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)</td>
<td>Kilogallon/time unit</td>
</tr>
<tr>
<td>Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)</td>
<td>Million gallon/time unit</td>
</tr>
<tr>
<td>bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)</td>
<td>Barrel/time unit (normal liquids)</td>
</tr>
<tr>
<td>Normal liquids: 31.5 gal/bbl</td>
<td></td>
</tr>
<tr>
<td>bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)</td>
<td>Barrel/time unit (beer)</td>
</tr>
<tr>
<td>Beer: 31.0 gal/bbl</td>
<td></td>
</tr>
<tr>
<td>bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)</td>
<td>Barrel/time unit (petrochemicals)</td>
</tr>
<tr>
<td>Petrochemicals: 42.0 gal/bbl</td>
<td></td>
</tr>
<tr>
<td>bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)</td>
<td>Barrel/time unit (filling tank)</td>
</tr>
<tr>
<td>Filling tanks: 55.0 gal/bbl</td>
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</tr>
</tbody>
</table>

### Time

<table>
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<th>Units</th>
<th>Explanation</th>
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</thead>
<tbody>
<tr>
<td>s, m, h, d, y</td>
<td>Second, minute, hour, day, year</td>
</tr>
<tr>
<td>am, pm</td>
<td>Ante meridiem (before midday), post meridiem (after midday)</td>
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</tbody>
</table>
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<table>
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<tr>
<th>Process variable</th>
<th>Units</th>
<th>Explanation</th>
</tr>
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<tbody>
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<td>Density</td>
<td>lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)</td>
<td>Pound/volume unit</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Sgal (imp)</td>
<td>Standard gallon</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)</td>
<td>Standard gallon/time unit</td>
</tr>
<tr>
<td>Volume</td>
<td>gal (imp), Mgal (imp)</td>
<td>Gallon, mega gallon</td>
</tr>
<tr>
<td></td>
<td>bbl (imp;beer), bbl (imp;oil)</td>
<td>Barrel (beer), barrel (petrochemicals)</td>
</tr>
<tr>
<td>Volume flow</td>
<td>gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)</td>
<td>Gallon/time unit</td>
</tr>
<tr>
<td></td>
<td>Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)</td>
<td>Mega gallon/time unit</td>
</tr>
<tr>
<td></td>
<td>bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)</td>
<td>Barrel /time unit (beer)</td>
</tr>
<tr>
<td></td>
<td>Bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)</td>
<td>Barrel/time unit (petrochemicals)</td>
</tr>
<tr>
<td>Time</td>
<td>s, m, h, d, y</td>
<td>Second, minute, hour, day, year</td>
</tr>
<tr>
<td></td>
<td>am, pm</td>
<td>Ante meridiem (before midday), post meridiem (after midday)</td>
</tr>
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Assign behavior of diagnostic no. 836 .......... 31
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