Description of Device Parameters

Proline Promag 100
PROFINET

Electromagnetic flowmeter
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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.

![Diagram of Expert menu structure]

For information on the arrangement of the parameters according to the structure of the Operation menu, Setup menu, Diagnostics menu (→  84), 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:

<table>
<thead>
<tr>
<th>Complete parameter name</th>
<th>Write-protected parameter = ☑</th>
</tr>
</thead>
</table>

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>
</table>
| ☑ | Tip
  Indicates additional information. |
| 📚 | Reference to documentation |
| 📖 | Reference to page |
| ☑ | Reference to graphic |
| 🖥 | Operation via local display |
| 🖥 | Operation via operating tool |
| ☑ | Write-protected parameter |
### 1.4.2 Symbols in graphics

<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>Direct access</th>
<th>→ 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Locking status</td>
<td>→ 11</td>
</tr>
<tr>
<td></td>
<td>Access status tooling</td>
<td>→ 12</td>
</tr>
<tr>
<td></td>
<td>Enter access code</td>
<td>→ 12</td>
</tr>
<tr>
<td>System</td>
<td>Display</td>
<td>→ 13</td>
</tr>
<tr>
<td></td>
<td>Diagnostic handling</td>
<td>→ 26</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>→ 30</td>
</tr>
<tr>
<td>Sensor</td>
<td>Measured values</td>
<td>→ 34</td>
</tr>
<tr>
<td></td>
<td>System units</td>
<td>→ 38</td>
</tr>
<tr>
<td></td>
<td>Process parameters</td>
<td>→ 50</td>
</tr>
<tr>
<td></td>
<td>External compensation</td>
<td>→ 62</td>
</tr>
<tr>
<td></td>
<td>Sensor adjustment</td>
<td>→ 67</td>
</tr>
<tr>
<td></td>
<td>Calibration</td>
<td>→ 72</td>
</tr>
<tr>
<td>Communication</td>
<td>Web server</td>
<td>→ 73</td>
</tr>
<tr>
<td></td>
<td>PROFINET configuration</td>
<td>→ 76</td>
</tr>
<tr>
<td></td>
<td>PROFINET information</td>
<td>→ 78</td>
</tr>
</tbody>
</table>
Overview of the Expert operating menu

<table>
<thead>
<tr>
<th>▶ Application</th>
<th>→ 79</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset all totalizers</td>
<td>→ 79</td>
</tr>
<tr>
<td>▶ Totalizer 1 to 3</td>
<td>→ 79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>▶ Diagnostics</th>
<th>→ 84</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual diagnostics</td>
<td>→ 85</td>
</tr>
<tr>
<td>Previous diagnostics</td>
<td>→ 85</td>
</tr>
<tr>
<td>Operating time from restart</td>
<td>→ 86</td>
</tr>
<tr>
<td>Operating time</td>
<td>→ 86</td>
</tr>
<tr>
<td>▶ Diagnostic list</td>
<td>→ 87</td>
</tr>
<tr>
<td>▶ Event logbook</td>
<td>→ 90</td>
</tr>
<tr>
<td>▶ Device information</td>
<td>→ 93</td>
</tr>
<tr>
<td>▶ I/O module</td>
<td>→ 96</td>
</tr>
<tr>
<td>▶ Sensor electronic module</td>
<td>→ 97</td>
</tr>
<tr>
<td>▶ Display module</td>
<td>→ 97</td>
</tr>
<tr>
<td>▶ Min/max values</td>
<td>→ 98</td>
</tr>
<tr>
<td>▶ Heartbeat</td>
<td>→ 100</td>
</tr>
<tr>
<td>▶ Simulation</td>
<td>→ 100</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Expert</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Direct access</td>
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<tr>
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</tr>
<tr>
<td>Enter access code</td>
<td>→ 12</td>
</tr>
<tr>
<td>▶ System</td>
<td>→ 13</td>
</tr>
<tr>
<td>▶ Sensor</td>
<td>→ 34</td>
</tr>
<tr>
<td>▶ Communication</td>
<td>→ 73</td>
</tr>
<tr>
<td>▶ Application</td>
<td>→ 79</td>
</tr>
<tr>
<td>▶ Diagnostics</td>
<td>→ 84</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.
  Example: Input of "914" instead of "0914"
- If no channel number is entered, channel 1 is jumped to automatically.
  Example: Enter 0914 → Assign process variable parameter
- If a different channel is jumped to: Enter the direct access code with the corresponding channel number.
  Example: Enter 0914-3 → 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
Description of device parameters

Proline Promag 100 PROFINET

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 (→ 12).

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 (→ 12).

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

Display

Information on access authorization is provided in the 'User roles and associated access authorization' and 'Operating concept' sections of the Operations Instructions for the device.

Enter access code

Navigation

Expert → Ent. access code

Description

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

Navigation  
Experts → System

- Display  →  
- Diagnostic handling  →  
- Administration  →  

3.1.1 "Display" submenu

Navigation  
Experts → System → Display

- Display language  →  
- Format display  →  
- Value 1 display  →  
- 0% bargraph value 1  →  
- 100% bargraph value 1  →  
- Decimal places 1  →  
- Value 2 display  →  
- Decimal places 2  →  
- Value 3 display  →  
- 0% bargraph value 3  →  
- 100% bargraph value 3  →  
- Decimal places 3  →  
- Value 4 display  →  

User entry  
0 to 9999
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)*
- 한국어 (Korean)*
- العربية (Arabic)*
- Bahasa Indonesia*
- ภาษาไทย (Thai)*
- tiếng Việt (Vietnamese)*
- čeština (Czech)*

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

* Visibility depends on order options or device settings
Format display

Navigation

Expert → System → Display → Format display

Prerequisite

A local display is provided.

Description

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

Selection

- 1 value, max. 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 (→ 16) to Value 4 display parameter (→ 21) 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 (→ 22).

Possible measured values shown on the local display:

*1 value, max. size* option

![Image of 1 value, max. size option]

*1 bargraph + 1 value* option

![Image of 1 bargraph + 1 value option]
Description of device parameters  Proline Promag 100 PROFINET

"2 values' option

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"1 value large + 2 values" option

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"4 values' option

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</tbody>
</table>

Value 1 display

Evaluation

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  |  
- Volume flow
- Mass flow
- Corrected volume flow
- Flow velocity
- Conductivity *
- Corrected conductivity *
- Temperature *
- Electronic temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- None

* Visibility depends on order options or device settings
**Factory setting**
Volume 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.

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 (→ 38).

### 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 l/h
- 0 gal/min (us)

**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 (→ 38).

### 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 → 103
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 (→  38).

---

**Decimal places 1**

**Navigation**

Expert → System → Display → Decimal places 1

**Prerequisite**

A measured value is specified in the **Value 1 display** parameter (→  16).

**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**

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 (→  16)

**Factory setting**

None

**Additional information**

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 (→ 38).

Decimal places 2

Navigation

Expert → System → Display → Decimal places 2

Prerequisite

A measured value is specified in the Value 2 display parameter (→ 18).

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 (→ 16)

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 (→ 38).
0% bargraph value 3

Navigation

Expert → System → Display → 0% bargraph 3

Prerequisite

A selection has been made in the Value 3 display parameter (→ 19).

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 l/h
- 0 gal/min (US)

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 (→ 38).

100% bargraph value 3

Navigation

Expert → System → Display → 100% bargraph 3

Prerequisite

A selection was made in the Value 3 display parameter (→ 19).

Description

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

User entry

Signed floating-point number

Factory setting

0

Additional information

Description

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

User entry

The unit of the displayed measured value is taken from the System units submenu (→ 38).
Decimal places 3

**Navigation**

Expert → System → Display → Decimal places 3

**Prerequisite**

A measured value is specified in the **Value 3 display** parameter (→ 19).

**Description**

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

**Selection**

- x
- x.x
- x.xx
- x.xxx
- x.xxxx

**Factory setting**

x.xx

**Additional information**

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

Value 4 display

**Navigation**

Expert → System → Display → Value 4 display

**Prerequisite**

A local display is provided.

**Description**

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

**Selection**

Picklist, see **Value 1 display** parameter (→ 16)

**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 (→ 38).
Decimal places 4

Navigation

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Expert → System → Display → Decimal places 4

Prerequisite

A measured value is specified in the Value 4 display parameter (→ 21).

Description

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

Selection

• x
• x.x
• x.xx
• x.xxx
• x.xxxx

Factory setting

x.xx

Additional information

Description

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

Display interval

Navigation

Expert → System → Display → Display interval

Prerequisite

A local display is provided.

Description

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

User entry

1 to 10 s

Factory setting

5 s

Additional information

Description

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

• The Value 1 display parameter (→ 16) to Value 4 display parameter (→ 21) are used to specify which measured values are shown on the local display.
• The display format of the displayed measured values is specified using the Format display parameter (→ 15).

Display damping

Navigation

Expert → System → Display → Display damping

Prerequisite

A local display is provided.
**Description**

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

**User entry**

0.0 to 999.9 s

**Factory setting**

0.0 s

**Additional information**

*User entry*

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

---

**Header**

**Navigation**

Expert → System → Display → Header

**Prerequisite**

A local display is provided.

**Description**

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

**Selection**

- Device tag
- Free text

**Factory setting**

Device tag

**Additional information**

*Description*

The header text only appears during normal operation.

![](image)

1 Position of the header text on the display

**Selection**

Free text

Is defined in the **Header text** parameter (→ 23).

---

**Header text**

**Navigation**

Expert → System → Display → Header text

**Prerequisite**

The **Free text** option is selected in the **Header** parameter (→ 23).
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

The header text only appears during normal operation.

User entry

The number of characters displayed depends on the characters used.

Separator

Navigation

Expert → System → Display → Separator

Prerequisite

A local display is provided.

Description

Use this function to select the decimal separator.

Selection

• . (point)
• , (comma)

Factory setting

. (point)

Contrast display

Navigation

Expert → System → Display → Contrast display

Prerequisite

A local display is provided.

Description

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

User entry

20 to 80 %

Factory setting

Depends on the display
Backlight

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

**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.

**Selection**
- Disable
- Enable

**Factory setting**
Enable

Access status display

**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 (→ 12).
- 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</td>
</tr>
<tr>
<td>Diagnostic behavior</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:

- 832 Electronic temperature too high
- 833 Electronic temperature too low
- 834 Process temperature too high
- 835 Process temperature too low
- 862 Partly filled pipe

"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 (→  26).

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

<table>
<thead>
<tr>
<th>Diagnostic behavior</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 measured value output via PROFINET and the totalizers are not affected. A diagnostic message is generated.</td>
</tr>
</tbody>
</table>
Description of device parameters

### Diagnostic behavior

<table>
<thead>
<tr>
<th>Diagnostic behavior</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logbook entry only</td>
<td>The device continues to measure. The diagnostic message is displayed only in the Event logbook (→ 90) (Event list submenu (→ 92)) and not in alternation with the operational display.</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. 531 (Empty pipe detection)

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 531

**Description**

Use this function to change the diagnostic behavior of the diagnostic message 531 Empty pipe detection.

**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. 832 (Electronic temperature too high)

Navigation

Expand 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

Expand 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

Expand 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. 862 (Empty pipe)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862

Description
Use this function to change the diagnostic behavior of the diagnostic message **862 Empty pipe**.

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. 937 (EMC interference)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 937

Description
Use this function to change the diagnostic behavior of the diagnostic message **937 EMC interference**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

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

Endress+Hauser
Assign behavior of diagnostic no. 302 (Device verification active)

**Navigation**
- Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 302

**Description**
Use this function to change the diagnostic behavior of the diagnostic message *302 Device verification active*.

**Selection**
- Alarm
- Warning

**Factory setting**
Warning

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

---

### 3.1.3 "Administration" submenu

**Navigation**
- Expert → System → Administration

```
[▸] Administration

▸ Define access code → 30
Device reset → 32
Activate SW option → 33
Software option overview → 33
```

**"Define access code" wizard**

The **Define access code** wizard (→ 30) is only available when operating via the local display or Web browser.

If operating via the operating tool, the **Define access code** parameter (→ 32) 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

Define access code → 31
Confirm access code → 31
```
### Define access code

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Administration → Def. access code → 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 local display or Web browser.</td>
</tr>
<tr>
<td>User entry</td>
<td>0 to 9 999</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
<tr>
<td>Additional information</td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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 (→ 12).</td>
</tr>
<tr>
<td></td>
<td>If you lose the access code, please contact your Endress+Hauser Sales Center.</td>
</tr>
<tr>
<td></td>
<td>User entry</td>
</tr>
<tr>
<td></td>
<td>A message is displayed if the access code is not in the input range.</td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td>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 &quot;Maintenance&quot; role.</td>
</tr>
</tbody>
</table>

### 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

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

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

**User entry**  
0 to 9999

**Factory setting**  
0

**Additional information**  
*Description*  
The write protection affects all parameters in the document marked with the symbol.  

- Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Enter access code** parameter (→ 12).
- 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
- Delete factory data

**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

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to enter an activation code to enable an additional, ordered software option.</td>
</tr>
<tr>
<td>User entry</td>
<td>Max. 10-digit string consisting of numbers.</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
<tr>
<td>Additional information</td>
<td>User entry</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Administration → SW option overv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Displays all the software options that are enabled in the device.</td>
</tr>
<tr>
<td>User interface</td>
<td>• Electrode cleaning circuit</td>
</tr>
<tr>
<td></td>
<td>• Heartbeat Verification</td>
</tr>
<tr>
<td></td>
<td>• Heartbeat Monitoring</td>
</tr>
</tbody>
</table>
**Description of device parameters**

**Proline Promag 100 PROFINET**

**Additional information**

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

*“Electrode cleaning circuit” option*
Order code for “Application package”, option EC “ECC electrode cleaning”

*“Heartbeat Verification” option and “Heartbeat Monitoring” option*
Order code for “Application package”, option EB “Heartbeat Verification + Monitoring”

### 3.2 "Sensor" submenu

**Navigation**

Expert → Sensor

![Diagram of "Sensor" submenu]

- **Measured values** → 34
- **System units** → 38
- **Process parameters** → 50
- **External compensation** → 62
- **Sensor adjustment** → 67
- **Calibration** → 72

### 3.2.1 "Measured values" submenu

**Navigation**

Expert → Sensor → Measured val.

![Diagram of "Measured values" submenu]

- **Process variables** → 34
- **Totalizer** → 37

### "Process variables" submenu

**Navigation**


![Diagram of "Process variables" submenu]

- **Volume flow** → 35
**Volume flow**

**Navigation**


**Description**

Displays the volume flow currently measured.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

The unit is taken from the **Volume flow unit** parameter (→ 39)

---

**Mass flow**

**Navigation**


**Description**

Displays the mass flow currently calculated.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 42)

---

**Conductivity**

**Navigation**


**Prerequisite**

In the **Conductivity measurement** parameter (→ 53), the **On** option is selected.

**Description**

Displays the conductivity currently measured.

**User interface**

Signed floating-point number
Description of device parameters

### Corrected volume flow

**Navigation**


**Description**

Displays the corrected volume flow currently measured.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

The unit is taken from the **Corrected volume flow unit** parameter (→ 44)

### Temperature

**Navigation**


**Prerequisite**

For the following order code:

'Sensor Option', option CI 'Fluid temperature probe'

**Description**

Displays the temperature currently calculated.

**User interface**

Positive floating-point number

**Additional information**

*Dependency*

The unit is taken from the **Temperature unit** parameter (→ 42)

### Corrected conductivity

**Navigation**


**Prerequisite**

One of the following conditions is satisfied:

- Order code for 'Sensor Option', option CI 'Fluid temperature probe'
- The temperature is read into the flowmeter from an external device.

**Description**

Displays the conductivity currently corrected.

**User interface**

Positive floating-point number
Additional information

Dependency

The unit is taken from the Conductivity unit parameter (→ 41)

"Totalizer" submenu

Navigation

Expert → Sensor → Measured val. → Totalizer

Totalizer value 1 to 3

Totalizer value 1 to 3

Totalizer overflow 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 (→ 80) of the Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow

Description

Displays the current totalizer reading.

User interface

Signed floating-point number

Additional information

Description

As it is only possible to display a maximum of 7 digits, 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 (→ 83).

Display

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 (→ 81).

The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 80).
Description of device parameters

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 ⋅ 10⁶ (2 overflows) = 2000000 [m³]
- Current totalizer reading: 2196845.7 m³

### Totalizer overflow 1 to 3

<table>
<thead>
<tr>
<th>Navigation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One of the following options is selected in the <strong>Assign process variable</strong> parameter (→ 80) of the <strong>Totalizer 1 to 3</strong> submenu:</td>
<td></td>
</tr>
<tr>
<td>• Volume flow</td>
<td></td>
</tr>
<tr>
<td>• Mass flow</td>
<td></td>
</tr>
<tr>
<td>• Corrected volume flow</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the current totalizer overflow.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User interface</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer with sign</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional information</th>
<th></th>
</tr>
</thead>
</table>
| **Display**

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 80).

**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 ⋅ 10⁶ (2 overflows) = 2000000 [m³]
- Current totalizer reading: 2196845.7 m³

### 3.2.2 "System units" submenu

<table>
<thead>
<tr>
<th>Navigation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert → Sensor → System units</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System units</strong></td>
<td></td>
</tr>
<tr>
<td>Volume flow unit</td>
<td></td>
</tr>
<tr>
<td>Volume unit</td>
<td></td>
</tr>
</tbody>
</table>

Endress+Hauser
Volume flow unit

**Navigation**

Expert → Sensor → System units → Volume flow unit

**Description**

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

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm³/s</td>
<td>af/s</td>
<td>gal/s (imp)</td>
</tr>
<tr>
<td>cm³/min</td>
<td>af/min</td>
<td>gal/min (imp)</td>
</tr>
<tr>
<td>cm³/h</td>
<td>af/h</td>
<td>gal/h (imp)</td>
</tr>
<tr>
<td>cm³/d</td>
<td>af/d</td>
<td>gal/d (imp)</td>
</tr>
<tr>
<td>dm³/s</td>
<td>ft³/s</td>
<td>Mgal/s (imp)</td>
</tr>
<tr>
<td>dm³/min</td>
<td>ft³/min</td>
<td>Mgal/min (imp)</td>
</tr>
<tr>
<td>dm³/h</td>
<td>ft³/h</td>
<td>Mgal/h (imp)</td>
</tr>
<tr>
<td>dm³/d</td>
<td>ft³/d</td>
<td>Mgal/d (imp)</td>
</tr>
<tr>
<td>m³/s</td>
<td>fl oz/s (us)</td>
<td>bbl/s (imp;beer)</td>
</tr>
<tr>
<td>m³/min</td>
<td>fl oz/min (us)</td>
<td>bbl/min (imp;beer)</td>
</tr>
<tr>
<td>m³/h</td>
<td>fl oz/h (us)</td>
<td>bbl/h (imp;beer)</td>
</tr>
<tr>
<td>m³/d</td>
<td>fl oz/d (us)</td>
<td>bbl/d (imp;beer)</td>
</tr>
<tr>
<td>ml/s</td>
<td>gal/s (us)</td>
<td>bbl/s (imp;oil)</td>
</tr>
<tr>
<td>ml/min</td>
<td>gal/min (us)</td>
<td>bbl/min (imp;oil)</td>
</tr>
<tr>
<td>ml/h</td>
<td>gal/h (us)</td>
<td>bbl/h (imp;oil)</td>
</tr>
<tr>
<td>ml/d</td>
<td>gal/d (us)</td>
<td>bbl/d (imp;oil)</td>
</tr>
<tr>
<td>l/s</td>
<td>kgal/s (us)</td>
<td></td>
</tr>
<tr>
<td>l/min</td>
<td>kgal/min (us)</td>
<td></td>
</tr>
<tr>
<td>l/h</td>
<td>kgal/h (us)</td>
<td></td>
</tr>
<tr>
<td>l/d</td>
<td>kgal/d (us)</td>
<td></td>
</tr>
<tr>
<td>hl/s</td>
<td>Mgal/s (us)</td>
<td></td>
</tr>
<tr>
<td>hl/min</td>
<td>Mgal/min (us)</td>
<td></td>
</tr>
<tr>
<td>hl/h</td>
<td>Mgal/h (us)</td>
<td></td>
</tr>
<tr>
<td>hl/d</td>
<td>Mgal/d (us)</td>
<td></td>
</tr>
<tr>
<td>Ml/s</td>
<td>bbl/s (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Ml/min</td>
<td>bbl/min (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Ml/h</td>
<td>bbl/h (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Ml/d</td>
<td>bbl/d (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Custom-specific units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User vol./s</td>
<td>bbl/s (us;beer)</td>
<td></td>
</tr>
<tr>
<td>User vol./min</td>
<td>bbl/min (us;beer)</td>
<td></td>
</tr>
<tr>
<td>User vol./h</td>
<td>bbl/h (us;beer)</td>
<td></td>
</tr>
<tr>
<td>User vol./d</td>
<td>bbl/d (us;beer)</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country-specific:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l/h</td>
<td>bbl/s (us;oil)</td>
<td></td>
</tr>
<tr>
<td>gal/min (us)</td>
<td>bbl/min (us;oil)</td>
<td></td>
</tr>
<tr>
<td>Additional information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Result**

The selected unit applies for:

**Volume flow** parameter (→ 35)

**Selection**

For an explanation of the abbreviated units: → 107
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
- Mi Mega

**US units**
- af
- ft³
- fl oz (us)
- gal (us)
- kgal (us)
- bbl (us;oil)
- bbl (us;liquor)
- 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:
- m³
- gal (us)

**Additional information**

For an explanation of the abbreviated units: → 107

Conductivity unit

**Navigation**

Expert → Sensor → System units → Conductiv. unit

**Prerequisite**

In the Conductivity measurement parameter (→ 53), the On option is selected.

**Description**

Use this function to select the unit for the conductivity.

**Selection**

**SI units**
- nS/cm
- µS/cm
- µS/m
- µS/mm
- mS/m
- mS/cm
- S/cm
- S/m
- kS/m
- MS/m

**Factory setting**

µS/cm
Additional information

Result

The selected unit applies for:
- Conductivity parameter (→ 35)
- Corrected conductivity parameter (→ 36)

Selection

For an explanation of the abbreviated units: → 107

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:
- Temperature parameter (→ 36)
- Maximum value parameter (→ 99)
- Minimum value parameter (→ 98)
- External temperature parameter (→ 63)
- Maximum value parameter (→ 100)
- Minimum value parameter (→ 99)
- Fail safe value of external temperature parameter (→ 64)

Selection

For an explanation of the abbreviated units: → 107

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

Selection

The selected unit applies for:

Mass flow parameter (→ 35)

For an explanation of the abbreviated units: → 107
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)

**Factory setting**

Country-specific:
- kg/l
- lb/ft³

**Additional information**

**Result**

The selected unit applies for:
- External density parameter (→ 65)
- Fixed density parameter (→ 65)

**Selection**

- **SD** = 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).

- **SG** = 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).

  For an explanation of the abbreviated units: → 107

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.
**Selection**

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nl/s</td>
<td>Sft³/s</td>
<td>Sgal/s (imp)</td>
</tr>
<tr>
<td>Nl/min</td>
<td>Sft³/min</td>
<td>Sgal/min (imp)</td>
</tr>
<tr>
<td>Nl/h</td>
<td>Sft³/h</td>
<td>Sgal/h (imp)</td>
</tr>
<tr>
<td>Nl/d</td>
<td>Sft³/d</td>
<td>Sgal/d (imp)</td>
</tr>
<tr>
<td>Nm³/s</td>
<td>Sgal/s (us)</td>
<td></td>
</tr>
<tr>
<td>Nm³/min</td>
<td>Sgal/min (us)</td>
<td></td>
</tr>
<tr>
<td>Nm³/h</td>
<td>Sgal/h (us)</td>
<td></td>
</tr>
<tr>
<td>Nm³/d</td>
<td>Sgal/d (us)</td>
<td></td>
</tr>
<tr>
<td>Sm³/s</td>
<td>Sbbl/s (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Sm³/min</td>
<td>Sbbl/min (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Sm³/h</td>
<td>Sbbl/h (us;liq.)</td>
<td></td>
</tr>
<tr>
<td>Sm³/d</td>
<td>Sbbl/d (us;liq.)</td>
<td></td>
</tr>
</tbody>
</table>

*Custom-specific units*

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

**Factory setting**

Country-specific:

- Nl/h
- Sft³/h

**Additional information**

**Result**

The selected unit applies for: Corrected volume flow parameter (→ 36)

**Selection**

For an explanation of the abbreviated units: → 107

---

**Corrected volume unit**

**Navigation**

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

**Description**

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

**Selection**

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nl</td>
<td>Sft³</td>
<td>Sgal (imp)</td>
</tr>
<tr>
<td>Nm³</td>
<td>Sgal (us)</td>
<td>Sbbl (us;liq.)</td>
</tr>
</tbody>
</table>

*Custom-specific units*

UserCrVol.

**Factory setting**

Country-specific:

- Nm³
- Sft³

**Additional information**

Selection

For an explanation of the abbreviated units: → 107

---

Endress+Hauser
Description of device parameters

Proline Promag 100 PROFINET

Date/time format

Navigation

Expert → Sensor → System units → Date/time format

Description

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

Selection

- dd.mm.yy hh:mm
- dd.mm.yy 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:  →  107

"User-specific units" submenu

Navigation

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

User-specific units

User volume text  →  47
User volume offset  →  47
User volume factor  →  47
User mass text  →  48
User mass offset  →  48
User mass factor  →  49
User corrected volume text  →  49
User corrected volume offset  →  49
User corrected volume factor  →  50
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 (→ 39)
- Volume unit parameter (→ 41)

*Example*

If the text GLAS is entered, the choose list of the Volume flow unit parameter (→ 39) 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
### 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** (→ 42)
- **Mass unit parameter** (→ 43)

*Example*

If the text GLAS is entered, the following options are displayed in the picklist for the **Mass flow unit** parameter (→ 42):

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

---

### User mass offset

**Navigation**

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

**Description**

Use this function to enter the offset for adapting the user-specific mass unit and mass 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 mass factor

**Navigation**

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

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

1.0

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 (→ 44)
- Corrected volume unit parameter (→ 45)

**Example**

If the text GLAS is entered, the choose list of the Corrected volume flow unit parameter (→ 44) 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

3.2.3 "Process parameters" submenu

**Navigation**


<table>
<thead>
<tr>
<th>Process parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter options</td>
</tr>
<tr>
<td>Flow damping</td>
</tr>
<tr>
<td>Flow override</td>
</tr>
<tr>
<td>Conductivity damping</td>
</tr>
<tr>
<td>Temperature damping</td>
</tr>
<tr>
<td>Conductivity measurement</td>
</tr>
<tr>
<td>Low flow cut off</td>
</tr>
<tr>
<td>Empty pipe detection</td>
</tr>
<tr>
<td>Electrode cleaning circuit</td>
</tr>
</tbody>
</table>

Filter options

**Navigation**

Expert → Sensor → Process param. → Filter options

**Description**

Use this function to select a filter option.
Selection
- Standard
- Standard CIP on
- Dynamic
- Dynamic CIP on
- Binomial filter

Factory setting
Standard

Additional information

Description
The user can choose from a range of filter combinations which can optimize the measurement result depending on the application. Each change in the filter setting affects the output signal of the measuring device. The response time of the output signal increases as the filter depth increases.

Selection
- Standard
  - Strong flow damping with a short output signal response time.
  - Some time is needed before a stable output signal can be generated.
  - Not suitable for pulsating flow as the average flow can be different here.
- Dynamic
  - Average flow damping with a delayed output signal response time.
  - The average flow is displayed correctly over a measuring interval determined over a long period.
- Binomial
  - Weak flow damping with a short output signal response time.
  - The average flow is displayed correctly over a measuring interval determined over a long period.
- CIP
  - This filter is also available for the Standard and Dynamic filter options.
  - If the CIP filter has detected a change in the medium (abrupt increase in the noise level, e.g. quickly changing medium conductivity values during CIP cleaning), flow damping is greatly increased and the raw value (before flow damping) is limited by the mean value (delimiter). This eliminates extremely high measured errors (up to several 100 m/s).
  - If the CIP filter is enabled, the response time of the entire measuring system increases and the output signal is delayed accordingly.

Examples

Possible applications for the filters

<table>
<thead>
<tr>
<th>Application</th>
<th>Standard</th>
<th>Standard CIP</th>
<th>Dynamic</th>
<th>Dynamic CIP</th>
<th>Binomial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulsating flow (flow is negative intermittently)</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>--</td>
<td>++</td>
</tr>
<tr>
<td>Flow changes frequently (flow is dynamic)</td>
<td>-</td>
<td>--</td>
<td>++</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>Clear signal, quick control loop (&lt; 1 s)</td>
<td>--</td>
<td>--</td>
<td>+ 1</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Poor signal, slow control loop (response time of a few seconds)</td>
<td>++</td>
<td>-</td>
<td>--</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Permanently bad signal</td>
<td>++</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-</td>
</tr>
<tr>
<td>Short and severe signal distortion after a while</td>
<td>++</td>
<td></td>
<td></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Promag 50/53 replacement: Promag 100 system damping = 0.5 * Promag 50/53</td>
<td></td>
<td></td>
<td></td>
<td>++</td>
<td>+++</td>
</tr>
</tbody>
</table>
**Flow damping**

**Navigation**

expert → Sensor → Process param. → Flow damping

**Description**

Use this function to enter 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 15

**Factory setting**

7

**Additional information**

*User entry*

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

- 0 is a weak damping and 15 a strong one.
- A damping of 0 is not recommended, as the measuring signal is then so noisy that it is almost impossible to carry out a measurement.
- The damping depends on the measuring period and the filter type selected.
- An increase or decrease in the damping depends on the application.

**Effect**

The damping affects the following variables of the device:

- Outputs
  - Low flow cut off → 54
  - Totalizers → 79

**Flow override**

**Navigation**

expert → Sensor → Process param. → Flow override

**Description**

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

**Selection**

- Off
- On

**Factory setting**

Off

---

**Table:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Standard CIP</th>
<th>Standard CIP</th>
<th>Dynamic CIP</th>
<th>Dynamic CIP</th>
<th>Binomial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promag 10 replacement: Promag 100 system damping = Promag 10 + 2</td>
<td></td>
<td></td>
<td>+++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a stable flow signal (no other requirements)</td>
<td>+++</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Flow damping value < 6
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 \( \Delta C453 \) Flow override is displayed.
- Output values
  - Output: Value at zero flow
  - Temperature: proceeding output
  - Totalizers 1-3: Stop being totalized

Conductivity damping

Navigation


Prerequisite

In the Conductivity measurement parameter (→ 53), the On option is selected.

Description

Use this function to enter the time constant for conductivity damping.

User entry

0 to 999.9 s

Factory setting

0 s

Temperature damping

Navigation


Prerequisite

For the following order code:
'Sensor Option', option CI 'Fluid temperature probe'

Description

Use this function to enter the time constant for temperature damping.

User entry

0 to 999.9 s

Factory setting

0 s

Conductivity measurement

Navigation


Description

Use this function to enable and disable conductivity measurement.

Selection

- Off
- On
**Factory setting**
Off

**Additional information**

*Description*

For conductivity measurement to work, the medium must have a minimum conductivity of 5 µS/cm.

**"Low flow cut off" submenu**

*Navigation*

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

<table>
<thead>
<tr>
<th>Function</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign process variable</td>
<td>54</td>
</tr>
<tr>
<td>On value low flow cutoff</td>
<td>54</td>
</tr>
<tr>
<td>Off value low flow cutoff</td>
<td>55</td>
</tr>
<tr>
<td>Pressure shock suppression</td>
<td>56</td>
</tr>
</tbody>
</table>

**Assign process variable**

*Navigation*

偏远 → 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
- Volume flow
- Mass flow
- Corrected volume flow

*Factory setting*

Volume flow

**On value low flow cutoff**

*Navigation*

偏远 → Sensor → Process param. → Low flow cut off → On value

*Prerequisite*

One of the following options is selected in the Assign process variable parameter (偏远 54):

- Volume flow
- Mass flow
- Corrected volume flow
**Description**

Use this function to enter a switch-on value for low flow cut off. Low flow cut off is activated if the value entered is not equal to 0 → 55.

**User entry**

Signed floating-point number

**Factory setting**

Depends on country and nominal diameter → 104

**Additional information**

*Dependency*

The unit depends on the process variable selected in the Assign process variable parameter (→ 54).

---

**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 (→ 54):

- Volume flow
- Mass 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 → 54.

**User entry**

0 to 100.0 %

**Factory setting**

50 %

**Additional information**

*Example*

<table>
<thead>
<tr>
<th>Q</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>Time</td>
</tr>
<tr>
<td>H</td>
<td>Hysteresis</td>
</tr>
<tr>
<td>A</td>
<td>Low flow cut off active</td>
</tr>
<tr>
<td>1</td>
<td>Low flow cut off is activated</td>
</tr>
<tr>
<td>2</td>
<td>Low flow cut off is deactivated</td>
</tr>
<tr>
<td>3</td>
<td>On value entered</td>
</tr>
<tr>
<td>4</td>
<td>Off value entered</td>
</tr>
</tbody>
</table>
Pressure shock suppression

Navigation  

Prerequisite  
One of the following options is selected in the Assign process variable parameter (→ 54):
- Volume flow
- Mass flow
- Corrected volume flow

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

User entry  
0 to 100 s

Factory setting  
0 s

Additional information  
Description

Pressure shock suppression is enabled
- Prerequisite:
  Flow rate < on-value of low flow cut off
- Output values
  - Flow displayed: 0
  - Totalizer: the totalizers are pegged at the last correct value

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

Example

When closing a valve, momentarily strong fluid movements may occur in the pipeline, which are registered by the measuring system. These totalized flow values lead to a false totalizer status, particularly during batching processes.
Q  Flow
  t  Time
A  Drip
B  Pressure shock
C  Pressure shock suppression active as specified by the time entered
D  Pressure shock suppression inactive
1  Valve closes
2  Flow falls below the on-value of the low flow cut off; pressure shock suppression is activated
3  The time entered has elapsed; pressure shock suppression is deactivated
4  The actual flow value is now displayed and output
5  On value for low flow cut off
6  Off value for low flow cut off

"Empty pipe detection" submenu


- Empty pipe detection → 58
- Switch point empty pipe detection → 58
- Response time empty pipe detection → 58
- New adjustment → 59
- Progress → 59
- Empty pipe adjust value → 59
Empty pipe detection

Navigation


Description
Use this function to switch empty pipe detection on and off.

Selection
- Off
- On

Factory setting
Off

Switch point empty pipe detection

Navigation

Expert → Sensor → Process param. → Empty pipe det. → Switch point EPD

Prerequisite
The On option is selected in the Empty pipe detection parameter (→ 58).

Description
Use this function to enter the percentage threshold value of the resistance in relation to the adjustment values.

User entry
0 to 100 %

Factory setting
10 %

Response time empty pipe detection

Navigation


Prerequisite
In the Empty pipe detection parameter (→ 58), the On option is selected.

Description
Enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message S862 Empty pipe to be triggered if the measuring pipe is empty or partially full.

User entry
0 to 100 s

Factory setting
1 s
New adjustment

Prerequisite
The On option is selected in the Empty pipe detection parameter (→ 58).

Description
For selecting whether to perform an empty pipe or full pipe adjustment.

Selection
- Cancel
- Empty pipe adjust
- Full pipe adjust

Factory setting
Cancel

Progress

Prerequisite
The On option is selected in the Empty pipe detection parameter (→ 58).

Description
Use this function to view the progress.

User interface
- Ok
- Busy
- Not ok

Empty pipe adjust value

Prerequisite
- In the Empty pipe detection parameter (→ 58), the On option is selected.
- Adjustment value > full pipe value.

Description
Displays the adjustment value when the measuring pipe is empty.

User interface
Positive floating-point number

Full pipe adjust value

Prerequisite
- In the Empty pipe detection parameter (→ 58), the On option is selected.
- Adjustment value < empty pipe value.

Description
Displays the adjustment value when the measuring pipe is full.
User interface
Positive floating-point number

Measured value EPD

Navigation

Prerequisite
In the Empty pipe detection parameter (→ 58), the On option is selected.

Description
Displays the current measured value.

User interface
Positive floating-point number

"Electrode cleaning circuit" submenu

Navigation
Expert → Sensor → Process param. → ECC

Prerequisite
For the following order code:
*Application package*, option EC "ECC electrode cleaning"

Description
Use this function to enable and disable cyclic electrode cleaning.

Selection
- Off
- On

Factory setting
Off
**ECC duration**

**Navigation**

Expert → Sensor → Process param. → ECC → ECC duration

**Prerequisite**

For the following order code:
"Application package", option EC "ECC electrode cleaning"

**Description**

Use this function to enter the duration of electrode cleaning in seconds.

**User entry**

0.01 to 30 s

**Factory setting**

2 s

---

**ECC recovery time**

**Navigation**

Expert → Sensor → Process param. → ECC → ECC recov. time

**Prerequisite**

For the following order code:
"Application package", option EC "ECC electrode cleaning"

**Description**

Use this function to enter the recovery time after electrode cleaning to prevent signal output interference. The current output values are frozen in the meanwhile.

**User entry**

Positive floating-point number

**Factory setting**

60 s

---

**ECC cleaning cycle**

**Navigation**

Expert → Sensor → Process param. → ECC → ECC clean. cycle

**Prerequisite**

For the following order code:
"Application package", option EC "ECC electrode cleaning"

**Description**

Use this function to enter the pause duration until the next electrode cleaning.

**User entry**

0.5 to 168 h

**Factory setting**

0.5 h
ECC Polarity

Navigation

Expert → Sensor → Process param. → ECC → ECC Polarity

Prerequisite

For the following order code:
"Application package", option EC "ECC electrode cleaning"

Description

Displays the polarity of the electrode cleaning circuit.

User interface

• Positive
• Negative

Factory setting

Depends on the electrode material:
• Platinum: Negative option
• Tantalum, Alloy C22, stainless steel: Positive option

3.2.4 "External compensation" submenu

Navigation


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</tbody>
</table>
Temperature source

**Navigation**

Expert → Sensor → External comp. → Temp. source

**Description**

Use this function to select the temperature source.

**Selection**

- Internal temperature sensor
- Off
- External value

**Factory setting**

Off

**Additional information**

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

For additional information, see the Operating Instructions, 'Cyclical data transmission' section

External temperature

**Navigation**


**Prerequisite**

The **External value** option is selected in the **Temperature source** parameter (→ 63).

**Description**

Displays the temperature read in by the external device.

**User interface**

Floating point number with sign

**Additional information**

- **Dependency**
  
  The unit is taken from the **Temperature unit** parameter (→ 42)

Fail safe type of external temperature

**Navigation**

Expert → Sensor → External comp. → FailSafeTypeTemp

**Description**

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

**Selection**

- Fail safe value
- Fallback value
- Off

**Factory setting**

Off
Additional information

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

Selection
- Fail safe value
  A substitute value is used. The substitute value is defined in the **Fail safe value of external temperature** parameter (→ 64).
- Fallback value
  The last valid value is used.
- Off
  The invalid value continues to be used.

**Fail safe value of external temperature**

**Navigation**

Expert → Sensor → External comp. → FailSaValExtTemp

**Prerequisite**
The **Fail safe value** option is selected in the **Fail safe type of external temperature** parameter (→ 63).

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

**User entry**
Signed floating-point number

**Factory setting**
0 °C

**Additional information**
In the event of a device alarm, the temperature value is displayed as an output value in the **Temperature** parameter (→ 36).

**Density source**

**Navigation**

Expert → Sensor → External comp. → Density source

**Description**
Use this function to select the density source.

**Selection**
- Fixed density
- External density

**Factory setting**
Fixed density

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

Additional information: Operating Instructions, "Cyclical data transmission" section
External density

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

**Description**
Displays the density read in from the external device.

**User interface**
Positive floating-point number

**Additional information**
*Dependency*

The unit is taken from the **Density unit** parameter (→ 44)

---

Fixed density

**Navigation**
Expert → Sensor → External comp. → Fixed density

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

**User entry**
Positive floating-point number

**Factory setting**
Country-specific:
- 1000 kg/l
- 1000 lb/ft³

**Additional information**
*Dependency*

The unit is taken from the **Density unit** parameter (→ 44)

---

Reference density

**Navigation**
Expert → Sensor → External comp. → Ref.density

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

**User entry**
Positive floating-point number

**Factory setting**
Country-specific:
- 1 kg/l
- 1 lb/ft³

**Additional information**
*Dependency*

The unit is taken from the **Density unit** parameter (→ 44)
Fail safe type of external ref. density

Navigation

Expert → Sensor → External comp. → FailSaTypRefDens

Description

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

Selection

- Fail safe value
- Fallback value
- Off

Factory setting

Off

Additional information

Description

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

Selection

- Fail safe value
  A substitute value is used. The substitute value is defined in the Fail safe value of external ref. density parameter (→ 66).
- Fallback value
  The last valid value is used.
- Off
  The invalid value continues to be used.

Fail safe value of external ref. density

Navigation

Expert → Sensor → External comp. → FailSaValRefDens

Prerequisite

The Fail safe value option is selected in the Fail safe type of external ref. density parameter (→ 66).

Description

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

User entry

Signed floating-point number

Factory setting

0 kg/l

Additional information

Description

In the event of a device alarm, the density value is displayed as an output value in the Density parameter (→ 35).
3.2.5 "Sensor adjustment" submenu

**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**

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

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

**Integration time**

**Navigation**

Expert → Sensor → Sensor adjustm. → Integration time

**Description**

Display the duration of an integration cycle.

**User interface**

1 to 65 ms

**Measuring period**

**Navigation**

Expert → Sensor → Sensor adjustm. → Measuring period

**Description**

Display the time of a full measuring period.
Description of device parameters

User interface  
50 to 1000 ms

"Process variable adjustment" submenu

Navigation  
Expert → Sensor → Sensor adjustm. → Variable adjust

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<tr>
<td>Temperature factor</td>
<td>71</td>
</tr>
</tbody>
</table>

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

### Mass flow offset

**Navigation**


**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
### Conductivity offset

**Navigation**
Expert → Sensor → Sensor adjustm. → Variable adjust → Conduct. offset

**Prerequisite**
In the Conductivity measurement parameter (→ 53), the On option is selected.

**Description**
Use this function to enter the zero point shift for the conductivity trim. The conductivity unit on which the shift is based is S/m.

**User entry**
Signed floating-point number

**Factory setting**
0 S/m

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

---

### Conductivity factor

**Navigation**
Expert → Sensor → Sensor adjustm. → Variable adjust → Conduct. factor

**Prerequisite**
In the Conductivity measurement parameter (→ 53), the On option is selected.

**Description**
Use this function to enter a quantity factor for the conductivity. This multiplication factor is applied over the conductivity 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*

\[
\text{Corrected value} = (\text{factor} \times \text{value}) + \text{offset}
\]

Temperature offset

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

**Prerequisite**
For the following order code:
'Sensor Option', option CI 'Fluid temperature probe'

**Description**
Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is 1 K.

**User entry**
Signed floating-point number

**Factory setting**
0 K

**Additional information**
*Description*

\[
\text{Corrected value} = (\text{factor} \times \text{value}) + \text{offset}
\]

Temperature factor

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

**Prerequisite**
For the following order code:
'Sensor Option', option CI 'Fluid temperature probe'

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

**User entry**
Positive floating-point number

**Factory setting**
1
### Description of device parameters

**Proline Promag 100 PROFINET**

#### Additional information

**Description**

Corrected value = (factor × value) + offset

---

### 3.2.6 "Calibration" submenu

**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**

The value is also specified on the sensor nameplate.

**Calibration factor**

**Description**
Displays the current calibration factor for the sensor.

**User interface**
Positive floating-point number

**Factory setting**
Depends on nominal diameter and calibration.

---
Zero point

Navigation
Expert → Sensor → Calibration → Zero point

Description
This function shows the zero point correction value for the sensor.

User interface
Signed floating-point number

Factory setting
Depends on nominal diameter and calibration

Conductivity calibration factor

Navigation
Expert → Sensor → Calibration → Cond. cal. fact.

Prerequisite
In the Conductivity measurement parameter (→ 53), the On option is selected.

Description
Displays the calibration factor for the conductivity measurement.

User interface
0 to 10000

3.3 "Communication" submenu

Navigation
Expert → Communication

3.3.1 "Web server" submenu

Navigation
Expert → Communication → Web server

Web server language  → 74
MAC address  → 74
IP address  → 75
### Web server language

**Navigation**

[专家] → [Communication] → [Web server] → [Webserv.language]

**Description**

Use this function to select the web server language setting.

**Selection**

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

**Factory setting**

English

### MAC address

**Navigation**

[专家] → [Communication] → [Web server] → [MAC Address]

**Description**

Displays the MAC \(^1\) 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.

---

* Visibility depends on order options or device settings
1) Media Access Control
### IP address

**Navigation**

[Expert → Communication → Web server → IP address](#)

**Description**

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

**User interface**

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

**Factory setting**

0.0.0.0

---

### Subnet mask

**Navigation**

[Expert → Communication → Web server → Subnet mask](#)

**Description**

Displays the subnet mask.

**User interface**

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

**Factory setting**

0.0.0.0

---

### Default gateway

**Navigation**

[Expert → Communication → Web server → Default gateway](#)

**Description**

Displays the default gateway.

**User interface**

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

**Factory setting**

0.0.0.0

---

### Web server functionality

**Navigation**

[Expert → Communication → Web server → Webserver funct.](#)

**Description**

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

**Selection**

- Off
- HTML Off
- On

---

*Example*

For the display format

00:07:05:10:01:5F
### 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.
- **HTML Off**
  - The HTML version of the web server is not available.
- **On**
  - The complete functionality of the web server is available.
  - JavaScript is used.
  - The password is transferred in an encrypted state.
  - Any change to the password is also transferred in an encrypted state.

### Login page

**Navigation**

Expert → Communication → Web server → Login page

**Description**

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

**Selection**

- Without header
- With header

**Factory setting**

With header

### 3.3.2 "PROFINET configuration" submenu

**Navigation**

Expert → Communication → PROFINET config.

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<tr>
<td>Manufacturer-specific diagnostics</td>
</tr>
</tbody>
</table>
**Name of station**

**Navigation**

Expert → Communication → PROFINET config. → Name of station

**Description**

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

**User interface**

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

**Factory setting**

eh-promag100-xxxxx

**Additional information**

*Description*

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

*Factory setting*

Structure of the device tag:

- eh-promag100-xxxxx
- eh: Endress+Hauser
- promag: Instrument family
- 100: Transmitter
- xxxxx: Serial number of the device

---

**Manufacturer-specific diagnostics**

**Navigation**


**Description**

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

**Selection**

- Not active
- Active

**Factory setting**

Active

**Additional information**

*Description*

- **Active**
  
  In addition to the PROFINET standard alarms, active manufacturing-specific diagnostic events are also transferred to the automation system. The diagnostic number and the error text of the respective diagnostic event are displayed.

- **Not active**
  
  Only the PROFINET standard alarms are transferred to the automation system.

*Selection*

This selection affects PROFINET communication only.

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

**Navigation**  
Expert → Communication → PROFINET info

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<th>Description</th>
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<th>Factory setting</th>
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</thead>
<tbody>
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<td>Device type</td>
<td>Use this function to display the device type (device type code).</td>
<td>Max. 16 characters, such as letters, numbers or special characters (e.g. @, %, /).</td>
<td>Promag 100</td>
</tr>
<tr>
<td>Device ID</td>
<td>Use this function to display the device ID.</td>
<td>0 to 65535</td>
<td></td>
</tr>
<tr>
<td>Device revision</td>
<td>Use this function to display the device revision.</td>
<td>0 to 65535</td>
<td></td>
</tr>
</tbody>
</table>

**Additional information**  
*Description*

The device revision enables the correct assignment of device drivers to the device.
3.4 "Application" submenu

**Navigation**

Expert → Application

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<table>
<thead>
<tr>
<th>Button</th>
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<tbody>
<tr>
<td>Totalizer 1 to 3</td>
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<tr>
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</tbody>
</table>

**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

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<th>Button</th>
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<tr>
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<tr>
<th>Button</th>
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<tbody>
<tr>
<td>Control Totalizer 1 to 3</td>
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<td>→ 82</td>
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</tbody>
</table>
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

Factory setting

Volume flow

Additional information

Description

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

Selection

If the Off option is selected, only Assign process variable parameter (→ 80) is still 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 (→ 80) of the Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow

Description

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

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Custom-specific units
User mass

or
The unit is selected separately for each totalizer. The unit is independent of the option selected in the System units submenu (→ 38).

Selection
The selection depends on the process variable selected in the Assign process variable parameter (→ 80).

Factory setting
Country-specific:
- l
- gal (us)

Additional information
Description
The unit is selected separately for each totalizer. The unit is independent of the option selected in the System units submenu (→ 38).

Selection
The selection depends on the process variable selected in the Assign process variable parameter (→ 80).

Factory setting
Net flow total

Navigation
Expert → Application → Totalizer 1 to 3 → Operation mode

Prerequisite
One of the following options is selected in the Assign process variable parameter (→ 80) of the Totalizer 1 to 3 submenu:
- Volume flow
- Mass flow
- Corrected volume 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 (→  80) of the Totalizer 1 to 3 submenu:
- Volume flow
- Mass flow
- Corrected volume flow

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

Selection
- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Preset + totalize
- Hold

Factory setting
Totalize

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 (→  83).
- 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 the Preset value parameter (→  83) 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 (→ 80) of the Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume flow

Description

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

User entry

Signed floating-point number

Factory setting

0 l

Additional information

User entry

The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 80).

Example

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

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 (→ 80) of the Totalizer 1 to 3 submenu:

- Volume flow
- Mass flow
- Corrected volume 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 when a device alarm occurs.
- **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.

### 3.5 "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>
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<tr>
<td>▶ Diagnostic list</td>
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<td>▶ Event logbook</td>
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<td>▶ Device information</td>
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<td>▶ I/O module</td>
</tr>
<tr>
<td>▶ Sensor electronic module</td>
</tr>
<tr>
<td>▶ Display module</td>
</tr>
<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 (→ 87).

*Example*  
For the display format: 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 (→ 85).

*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.
Description of device parameters

Proline Promag 100 PROFINET

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 (→ ☐ 85).

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

| Diagnostic List |  
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Diagnostics 1   | → 87            |
| Diagnostics 2   | → 88            |
| Diagnostics 3   | → 88            |
| Diagnostics 4   | → 89            |
| Diagnostics 5   | → 90            |

**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 (→ 87).

*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 (→ 88).

*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 (→ 88).

**Example**

For the display format:

24d12h13m00s

## Diagnostics 4

### Navigation

- Expert → Diagnostics → Diagnostic list → Diagnostics 4

### Description

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

### User interface

- Symbol for diagnostic behavior, diagnostic code and short message.

### Additional information

**Examples**

For the display format:

- F271 Main 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 (→ 89).

**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 ( → 90).

Example
For the display format:
24d12h13m00s

3.5.2 "Event logbook" submenu

Navigation

Expert → Diagnostics → Event logbook

Filter options

Event list
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
"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

Description
Displays the history of event messages of the category selected in the Filter options parameter (→ 91).

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

### Device information

- **Device tag**
  - **Description**: Displays a unique name for the measuring point so it can be identified quickly within the plant.
  - **User interface**: Max. 32 characters such as lower-case letter or numbers
  - **Factory setting**: eh-promag100-xxxxx

- **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

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

---

**Firmware version**

**Navigation**

Expert → Diagnostics → Device info → Firmware version

**Description**
Displays the device firmware version installed.

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

**Additional information**

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

---

**Device name**

**Navigation**

Expert → Diagnostics → Device info → Device name

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

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

**Factory setting**
eh-promag100-xxxxx

---

**Order code**

**Navigation**

Expert → Diagnostics → Device info → Order code

**Description**
Displays the device order code.

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

**Additional information**

- 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.

*Additional information*

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 (→ 95)

---

### 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 (→ 95)
### 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 "I/O module" submenu

**Navigation**

Expert → Diagnostics → I/O module

#### Software revision

**Navigation**

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

**Description**

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

**User interface**

Positive integer
3.5.5 "Sensor electronic module" submenu

**Navigation**  
Expert → Diagnostics → Sens. electronic

```
Sensor electronic module

Software revision → 97
```

**Software revision**

**Navigation**  

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

**User interface**  
Positive integer

3.5.6 "Display module" submenu

**Navigation**  
Expert → Diagnostics → Display module

```
Display module

Software revision → 97
```

**Software revision**

**Navigation**  
Expert → Diagnostics → Display module → Software rev.

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

**User interface**  
Positive integer
3.5.7 "Min/max values" submenu

**Navigation**

Expert → Diagnostics → Min/max val.

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset min/max values</td>
<td>Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.</td>
</tr>
<tr>
<td>Main electronic temperature</td>
<td>Displays the lowest previously measured temperature value of the main electronics module.</td>
</tr>
</tbody>
</table>

**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value

**Description**

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

**User interface**

Signed floating-point number
**Maximum value**

**Navigation**

▶ Expert → Diagnostics → Min/max val. → Main elect.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 (➔ 42)

---

**"Temperature" submenu**

**Navigation**

▶ Expert → Diagnostics → Min/max val. → Temperature

---

<table>
<thead>
<tr>
<th>Temperature</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
<td>➔ 99</td>
</tr>
<tr>
<td>Maximum value</td>
<td>➔ 100</td>
</tr>
</tbody>
</table>

---

**Minimum value**

**Navigation**

▶ Expert → Diagnostics → Min/max val. → Temperature → Minimum value

**Prerequisite**

For the following order code:
'Sensor Option', option CI 'Fluid temperature probe'

**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 (➔ 42)
Maximum value

Navigation

Expert → Diagnostics → Min/max val. → Temperature → Maximum value

Prerequisite

For the following order code:
"Sensor Option", option CI "Fluid temperature probe"

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 → 42

3.5.8 "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

3.5.9 "Simulation" submenu

Navigation

Expert → Diagnostics → Simulation

Assign simulation process variable → 101

Process variable value → 101

Simulation device alarm → 102

Diagnostic event category → 102

Diagnostic event simulation → 102
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
- Volume flow
- Mass flow
- Corrected volume flow
- Conductivity
- Corrected conductivity
- Temperature

**Factory setting**

Off

**Additional information**

The simulation value of the process variable selected is defined in the Process variable value parameter (→ 101).

Process variable value

**Navigation**

Expert → Diagnostics → Simulation → Proc. var. value

**Prerequisite**

One of the following options is selected in the Assign simulation process variable parameter (→ 101):

- Volume flow
- Mass flow
- Corrected volume flow
- Conductivity
- Corrected conductivity
- Temperature

**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 (→ 38).

* Visibility depends on order options or device settings
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**

*Description*
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 Diagnostic event simulation parameter (→ 102).

**Selection**
- Sensor
- Electronics
- Configuration
- Process

**Factory setting**
Process

Diagnostic event simulation

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

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

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

**Factory setting**
Off

**Additional information**

*Description*
For the simulation, you can choose from the diagnostic events of the category selected in the Diagnostic event category parameter (→ 102).
4 Country-specific factory settings

4.1 SI units

Not valid for USA and Canada.

4.1.1 System units

<table>
<thead>
<tr>
<th>Volume flow</th>
<th>l/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>m³</td>
</tr>
<tr>
<td>Conductivity</td>
<td>µS/cm</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Mass flow</td>
<td>kg/h</td>
</tr>
<tr>
<td>Mass</td>
<td>kg</td>
</tr>
<tr>
<td>Density</td>
<td>kg/l</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Nl/h</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Nm³</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>( v \sim 2.5 \text{ m/s} ) [dm³/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>32</td>
<td>125</td>
</tr>
<tr>
<td>40</td>
<td>200</td>
</tr>
<tr>
<td>50</td>
<td>300</td>
</tr>
<tr>
<td>65</td>
<td>500</td>
</tr>
<tr>
<td>80</td>
<td>750</td>
</tr>
<tr>
<td>100</td>
<td>1200</td>
</tr>
<tr>
<td>125</td>
<td>1850</td>
</tr>
<tr>
<td>150</td>
<td>150 m³/h</td>
</tr>
<tr>
<td>200</td>
<td>300 m³/h</td>
</tr>
<tr>
<td>250</td>
<td>500 m³/h</td>
</tr>
<tr>
<td>300</td>
<td>750 m³/h</td>
</tr>
<tr>
<td>350</td>
<td>1000 m³/h</td>
</tr>
<tr>
<td>400</td>
<td>1200 m³/h</td>
</tr>
<tr>
<td>450</td>
<td>1500 m³/h</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>(v ~ 2.5 m/s) [dm³/min]</th>
<th>(v ~ 0.04 m/s) [m³/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>8</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>15</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>65</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>80</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>100</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>125</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>150</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>250</td>
<td>7.5</td>
<td>7.5</td>
</tr>
<tr>
<td>300</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>350</td>
<td>15</td>
<td>15</td>
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<tr>
<td>400</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>450</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>500</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>600</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

### 4.2 US units

Only valid for USA and Canada.

#### 4.2.1 System units

<table>
<thead>
<tr>
<th>Volume flow</th>
<th>gal/min (us)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>gal (us)</td>
</tr>
<tr>
<td>Temperature</td>
<td>°F</td>
</tr>
<tr>
<td>Mass flow</td>
<td>lb/min</td>
</tr>
<tr>
<td>Mass</td>
<td>lb</td>
</tr>
<tr>
<td>Density</td>
<td>lb/ft³</td>
</tr>
</tbody>
</table>
Corrected volume flow: \( \text{Sft}^3/\text{h} \)
Corrected volume: \( \text{Sft}^3 \)

### 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 [\text{in}]</th>
<th>(v \sim 2.5 \text{ m/s} ) [gal/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1/12)</td>
<td>0.1</td>
</tr>
<tr>
<td>(1/8)</td>
<td>0.5</td>
</tr>
<tr>
<td>(1/6)</td>
<td>2</td>
</tr>
<tr>
<td>(1/4)</td>
<td>6</td>
</tr>
<tr>
<td>(1)</td>
<td>18</td>
</tr>
<tr>
<td>(1\frac{1}{2})</td>
<td>50</td>
</tr>
<tr>
<td>(2)</td>
<td>75</td>
</tr>
<tr>
<td>(3)</td>
<td>200</td>
</tr>
<tr>
<td>(4)</td>
<td>300</td>
</tr>
<tr>
<td>(5)</td>
<td>450</td>
</tr>
<tr>
<td>(6)</td>
<td>600</td>
</tr>
<tr>
<td>(8)</td>
<td>1200</td>
</tr>
<tr>
<td>(10)</td>
<td>1500</td>
</tr>
<tr>
<td>(12)</td>
<td>2400</td>
</tr>
<tr>
<td>(14)</td>
<td>3600</td>
</tr>
<tr>
<td>(16)</td>
<td>4800</td>
</tr>
<tr>
<td>(18)</td>
<td>6000</td>
</tr>
<tr>
<td>(20)</td>
<td>7500</td>
</tr>
<tr>
<td>(24)</td>
<td>10500</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 [\text{in}]</th>
<th>(v \sim 0.04 \text{ m/s} ) [gal/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1/12)</td>
<td>0.002</td>
</tr>
<tr>
<td>(1/8)</td>
<td>0.008</td>
</tr>
<tr>
<td>(1/6)</td>
<td>0.025</td>
</tr>
<tr>
<td>(1/4)</td>
<td>0.15</td>
</tr>
<tr>
<td>(1)</td>
<td>0.25</td>
</tr>
<tr>
<td>(1\frac{1}{2})</td>
<td>0.75</td>
</tr>
<tr>
<td>(2)</td>
<td>1.25</td>
</tr>
<tr>
<td>(3)</td>
<td>2.5</td>
</tr>
<tr>
<td>(4)</td>
<td>4</td>
</tr>
<tr>
<td>(5)</td>
<td>7</td>
</tr>
<tr>
<td>Nominal diameter [in]</td>
<td>(v \sim 0.04 \text{ m/s} ) [gal/min]</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>45</td>
</tr>
<tr>
<td>14</td>
<td>60</td>
</tr>
<tr>
<td>16</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>24</td>
<td>180</td>
</tr>
</tbody>
</table>


5 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), respectively.</td>
</tr>
<tr>
<td></td>
<td>SG4°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), respectively.</td>
</tr>
<tr>
<td>Conductivity</td>
<td>µS/mm</td>
<td>Microsiemens/length unit</td>
</tr>
<tr>
<td></td>
<td>nS/cm, µS/cm, mS/cm, S/cm</td>
<td>Nano-, Micro-, Milli-, Siemens/length unit</td>
</tr>
<tr>
<td></td>
<td>µS/m, mS/m, S/m, kS/m, MS/m</td>
<td>Micro-, Milli-, Siemens, Kilo-, Megasiemens/length unit</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>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>
</tr>
</tbody>
</table>

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,coil), lb/bbl (us,tank)</td>
<td>Pound/volume unit</td>
</tr>
<tr>
<td>Mass</td>
<td>oz, lb, STon</td>
<td>Ounce, pound, standard ton</td>
</tr>
<tr>
<td>Mass flow</td>
<td>oz/s, oz/min, oz/h, oz/d</td>
<td>Ounce/time unit</td>
</tr>
</tbody>
</table>
### Explanation of abbreviated units

#### Process variable | Units | Explanation
--- | --- | ---
Density | lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil) | Pound/volume unit
Corrected volume | Sgal (imp) | Standard gallon
Corrected volume flow | Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp) | Standard gallon/time unit
Volume | gal (imp), Mgal (imp) | Gallon, mega gallon

#### Imperial units

<table>
<thead>
<tr>
<th>Process variable</th>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| Density | lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil) | Pound/volume unit
| Corrected volume | Sgal (imp) | Standard gallon
| Corrected volume flow | Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp) | Standard gallon/time unit
| Volume | gal (imp), Mgal (imp) | Gallon, mega gallon
| | bbl (imp;beer), bbl (imp;oil) | Barrel (beer), barrel (petrochemicals)
### Explanation of abbreviated units

<table>
<thead>
<tr>
<th>Process variable</th>
<th>Units</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>
|                  | bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer) | Barrel /time unit (beer)  
Beer: 36.0 gal/bbl |
|                  | bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil) | Barrel/time unit (petrochemicals)  
Petrochemicals: 34.97 gal/bbl |
| Time             | s, m, h, d, y | Second, minute, hour, day, year |
|                  | am, pm | Ante meridiem (before midday), post meridiem (after midday) |
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Assign behavior of diagnostic no. 833 ......................... 28
Assign behavior of diagnostic no. 834 ......................... 28
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Corrected volume flow unit ............................................. 44
Corrected volume unit .................................................... 45

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<thead>
<tr>
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</tr>
</thead>
</table>

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