Description of Device Parameters

Proline Promass 300

HART

Coriolis 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.

It is used to perform tasks that require detailed knowledge of the function of the device:
• Commissioning measurements under difficult conditions
• Optimal adaptation of the measurement to difficult conditions
• Detailed configuration of the communication interface
• Error diagnostics in difficult cases

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

1.3 Using this document

1.3.1 Information on the document structure
The document lists the submenus and their parameters according to the structure from the Expert menu (→ 8), which is displayed when the "Maintenance" user role is enabled.
Detailed information concerning:

- Arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu along with a brief description, see the Operating Instructions for the device →  

- Operating philosophy of the operating menu: "Operating philosophy" chapter of the Operating Instructions for the device →
### 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>
<tbody>
<tr>
<td>Navigation</td>
<td>Navigation path to the parameter via the local display (direct access code) or web browser</td>
</tr>
<tr>
<td></td>
<td>Navigation path to the parameter via the operating tool</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

**Prerequisite**
The parameter is only available under these specific conditions

**Description**
Description of the parameter function

**Selection**
List of the individual options for the parameter
- Option 1
- Option 2

**User entry**
Input range for the parameter

**User interface**
Display value/data for the parameter

**Factory setting**
Default setting ex works

**Additional information**
Additional explanations (e.g. in examples):
- On individual options
- On display values/data
- On the input range
- On the factory setting
- On the parameter function

### 1.4 Symbols used

#### 1.4.1 Symbols for certain types of information

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

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

1.5 Documentation

1.5.1 Standard documentation

Operating Instructions

<table>
<thead>
<tr>
<th>Measuring device</th>
<th>Documentation code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promass A 300</td>
<td>BA01482D</td>
</tr>
<tr>
<td>Promass E 300</td>
<td>BA01484D</td>
</tr>
<tr>
<td>Promass F 300</td>
<td>BA01485D</td>
</tr>
<tr>
<td>Promass H 300</td>
<td>BA01486D</td>
</tr>
<tr>
<td>Promass I 300</td>
<td>BA01487D</td>
</tr>
<tr>
<td>Promass O 300</td>
<td>BA01488D</td>
</tr>
<tr>
<td>Promass P 300</td>
<td>BA01489D</td>
</tr>
<tr>
<td>Promass Q 300</td>
<td>BA01490D</td>
</tr>
<tr>
<td>Promass S 300</td>
<td>BA01491D</td>
</tr>
<tr>
<td>Promass X 300</td>
<td>BA01492D</td>
</tr>
</tbody>
</table>

1.5.2 Supplementary device-dependent documentation

Special documentation

<table>
<thead>
<tr>
<th>Contents</th>
<th>Documentation code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information on the Pressure Equipment Directive</td>
<td>SD01614D</td>
</tr>
<tr>
<td>Functional Safety Manual</td>
<td>SD01727D</td>
</tr>
<tr>
<td>Remote display and operating module DKX001</td>
<td>SD01763D</td>
</tr>
<tr>
<td>Web server</td>
<td>SD01662D</td>
</tr>
<tr>
<td>Heartbeat Technology</td>
<td>SD01642D</td>
</tr>
<tr>
<td>Concentration measurement</td>
<td>SD01644D</td>
</tr>
<tr>
<td>Viscosity Measurement</td>
<td>SD01646D</td>
</tr>
<tr>
<td>Custody transfer</td>
<td>SD01688D</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 (0106)</th>
<th>→ 11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Locking status (0004)</td>
<td>→ 12</td>
</tr>
<tr>
<td></td>
<td>Access status (0005)</td>
<td>→ 13</td>
</tr>
<tr>
<td></td>
<td>Enter access code (0003)</td>
<td>→ 13</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td>→ 14</td>
</tr>
<tr>
<td></td>
<td>Display</td>
<td>→ 14</td>
</tr>
<tr>
<td></td>
<td>Configuration backup</td>
<td>→ 29</td>
</tr>
<tr>
<td></td>
<td>Diagnostic handling</td>
<td>→ 32</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>→ 41</td>
</tr>
<tr>
<td>Sensor</td>
<td></td>
<td>→ 47</td>
</tr>
<tr>
<td></td>
<td>Measured values</td>
<td>→ 47</td>
</tr>
<tr>
<td></td>
<td>System units</td>
<td>→ 60</td>
</tr>
<tr>
<td></td>
<td>Process parameters</td>
<td>→ 75</td>
</tr>
<tr>
<td></td>
<td>Measurement mode</td>
<td>→ 83</td>
</tr>
<tr>
<td></td>
<td>External compensation</td>
<td>→ 85</td>
</tr>
<tr>
<td></td>
<td>Calculated values</td>
<td>→ 88</td>
</tr>
<tr>
<td></td>
<td>Sensor adjustment</td>
<td>→ 91</td>
</tr>
<tr>
<td></td>
<td>Calibration</td>
<td>→ 98</td>
</tr>
<tr>
<td></td>
<td>I/O configuration</td>
<td>→ 99</td>
</tr>
<tr>
<td></td>
<td>I/O module 1 to n terminal numbers (3902–1 to n)</td>
<td>→ 100</td>
</tr>
<tr>
<td></td>
<td>I/O module 1 to n information (3906–1 to n)</td>
<td>→ 100</td>
</tr>
</tbody>
</table>
### Overview of the Expert operating menu

<table>
<thead>
<tr>
<th>I/O module 1 to n type (3901–1 to n)</th>
<th>→ 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply I/O configuration (3907)</td>
<td>→ 101</td>
</tr>
<tr>
<td>Conversion code (2762)</td>
<td>→ 101</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>→ 102</td>
</tr>
<tr>
<td>Current input 1 to n</td>
<td>→ 102</td>
</tr>
<tr>
<td>Status input 1 to n</td>
<td>→ 105</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>→ 107</td>
</tr>
<tr>
<td>Current output 1 to n</td>
<td>→ 108</td>
</tr>
<tr>
<td>Pulse/frequency/switch output 1 to n</td>
<td>→ 123</td>
</tr>
<tr>
<td>Relay output 1 to n</td>
<td>→ 148</td>
</tr>
<tr>
<td>Double pulse output</td>
<td>→ 155</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>→ 159</td>
</tr>
<tr>
<td>HART input</td>
<td>→ 160</td>
</tr>
<tr>
<td>HART output</td>
<td>→ 165</td>
</tr>
<tr>
<td>Web server</td>
<td>→ 182</td>
</tr>
<tr>
<td>WLAN settings</td>
<td>→ 185</td>
</tr>
<tr>
<td>Diagnostic configuration</td>
<td>→ 189</td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td>→ 197</td>
</tr>
<tr>
<td>Reset all totalizers (2806)</td>
<td>→ 198</td>
</tr>
<tr>
<td>Totalizer 1 to n</td>
<td>→ 198</td>
</tr>
<tr>
<td>Viscosity</td>
<td>→ 203</td>
</tr>
</tbody>
</table>
Overview of the Expert operating menu

Proline Promass 300 HART

- Concentration → 203
- Custody transfer → 203
- Diagnostics → 204
  - Actual diagnostics (0691) → 205
  - Previous diagnostics (0690) → 206
  - Operating time from restart (0653) → 206
  - Operating time (0652) → 207
- Diagnostic list → 207
- Event logbook → 211
- Custody transfer logbook → 213
- Device information → 214
- Mainboard module → 218
- Sensor electronic module (ISEM) → 218
- I/O module 1 → 219
- I/O module 2 → 219
- I/O module 3 → 220
- Display module → 221
- Min/max values → 221
- Data logging → 232
- Heartbeat → 241
- Simulation → 241
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>
</tr>
</thead>
<tbody>
<tr>
<td>Direct access (0106)</td>
<td>→ 11</td>
</tr>
<tr>
<td>Locking status (0004)</td>
<td>→ 12</td>
</tr>
<tr>
<td>Access status (0005)</td>
<td>→ 13</td>
</tr>
<tr>
<td>Enter access code (0003)</td>
<td>→ 13</td>
</tr>
<tr>
<td>System</td>
<td>→ 14</td>
</tr>
<tr>
<td>Sensor</td>
<td>→ 47</td>
</tr>
<tr>
<td>I/O configuration</td>
<td>→ 99</td>
</tr>
<tr>
<td>Input</td>
<td>→ 102</td>
</tr>
<tr>
<td>Output</td>
<td>→ 107</td>
</tr>
<tr>
<td>Communication</td>
<td>→ 159</td>
</tr>
<tr>
<td>Application</td>
<td>→ 197</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>→ 204</td>
</tr>
</tbody>
</table>

Direct access

**Navigation**

Expert → Direct access (0106)

**Description**

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

**User entry**

0 to 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. In the navigation view, this appears on the right-hand side in the header of the selected parameter.
1 Direct access code

Note the following when entering the direct access code:
• The leading zeros in the direct access code do not have to be entered.
  Example: 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 0914-2 → Assign process variable parameter

Locking status

Navigation

Expert → Locking status (0004)

Description

Displays the active write protection.

User interface

• Hardware locked
• SIL locked
• CT active - all parameters
• CT active - defined parameters
• Temporarily locked

Additional information

User interface

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

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device →  7

Selection

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>The access status displayed in the Access status parameter (→  13) applies . Only appears on local display.</td>
</tr>
<tr>
<td>Hardware locked</td>
<td>The DIP switch for hardware locking is activated on the PCB board. This locks write access to the parameters (e.g. via local display or operating tool).</td>
</tr>
<tr>
<td>(priority 1)</td>
<td></td>
</tr>
<tr>
<td>SIL locked</td>
<td>The SIL mode is enabled. This locks write access to the parameters (e.g. via local display or operating tool).</td>
</tr>
<tr>
<td>(priority 2)</td>
<td></td>
</tr>
</tbody>
</table>
## Description of device parameters

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT active - all parameters (priority 3)</td>
<td>Only available for Promass F, O, Q and X.</td>
</tr>
<tr>
<td></td>
<td>The DIP switch for custody transfer mode is activated on the PCB board. This locks write access to all parameters (e.g. via local display or operating tool).</td>
</tr>
<tr>
<td></td>
<td>For detailed information on custody transfer mode, see the Special Documentation for the device → 7</td>
</tr>
<tr>
<td>CT active - defined parameters (Priority 4)</td>
<td>Only available for Promass F, O, Q and X.</td>
</tr>
<tr>
<td></td>
<td>The DIP switch for custody transfer mode is activated on the PCB board. This locks write access to the defined parameters (e.g. via local display or operating tool).</td>
</tr>
<tr>
<td></td>
<td>For detailed information on custody transfer mode, see the Special Documentation for the device → 7</td>
</tr>
<tr>
<td>Temporarily locked (priority 5)</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Access status

**Navigation**

- Expert → Access status (0005)

**Description**

Displays the access authorization to the parameters via the local display, Web browser or operating tool.

**User interface**

- Operator
- Maintenance

**Factory setting**

- Maintenance

**Additional information**

**Description**

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

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

**User interface**

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device → 7

### Enter access code

**Navigation**

- Expert → Ent. access code (0003)

**Description**

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

**Navigation**

Expert → System

- System
  - Display
    - Display language (0104)
    - Format display (0098)
    - Value 1 display (0107)
    - 0% bargraph value 1 (0123)
    - 100% bargraph value 1 (0125)
    - Decimal places 1 (0095)
    - Value 2 display (0108)
    - Decimal places 2 (0117)
    - Value 3 display (0110)
    - 0% bargraph value 3 (0124)
    - 100% bargraph value 3 (0126)
    - Decimal places 3 (0118)

- Configuration backup
- Diagnostic handling
- Administration
Display language

**Navigation**  
Expert → System → Display → Display language (0104)

**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) *
- Bahasa Indonesia *
- 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 (0098)

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 (→ 18) to Value 4 display parameter (→ 24) 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 (→ 25).

Custody transfer measurement

Only available for Promass F, O, Q and X.

- Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch between showing the relevant information and the custody transfer counter.
- In addition, a padlock symbol appears in the header of the display (⃗).

For detailed information on custody transfer mode, see the Special Documentation for the device → 7
Possible measured values shown on the local display:

"1 value, max. size" option

![1 value, max. size option]

"1 bargraph + 1 value" option

![1 bargraph + 1 value option]

"2 values" option

![2 values option]

"1 value large + 2 values" option

![1 value large + 2 values option]

"4 values" option

![4 values option]
Value 1 display

Navigation

Expert → System → Display → Value 1 display (0107)

Prerequisite

A local display is provided.

Description

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

Selection

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0 *
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0 *
- Frequency fluctuation 1 *
- Oscillation damping 0 *
- Oscillation damping 1 *
- Oscillation damping fluctuation 0 *
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0 *
- Exciter current 1 *
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current output 1 *
- Current output 2 *
- Current output 3 *

Factory setting

Mass flow

* Visibility depends on order options or device settings
Additional information

Description

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

The **Format display** parameter (→ 16) is used to specify how many measured
values are displayed simultaneously and how.

**Custody transfer measurement**

Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the
custody transfer approval selected the display can switch to show the relevant information.

For detailed information on custody transfer mode, see the Special Documentation for
the device → 7

**Dependency**

The unit of the displayed measured value is taken from the **System units** submenu
(→ 60).

**Selection**

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

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

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

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

---

**0% bargraph value 1**

**Navigation**

Expert → System → Display → 0% bargraph 1 (0123)

**Prerequisite**

A local display is provided.

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg/h
- 0 lb/min
Description of device parameters

Additional information

Description

The **Format display** parameter (→ 16) 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 (→ 60).

100% bargraph value 1

Navigation

Expert → System → Display → 100% bargraph 1 (0125)

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 (→ 252)

Additional information

Description

The **Format display** parameter (→ 16) 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 (→ 60).

Decimal places 1

Navigation

Expert → System → Display → Decimal places 1 (0095)

Prerequisite

A measured value is specified in the **Value 1 display** parameter (→ 18).

Description

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

Selection

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

Factory setting

x.xx
Additional information

Description

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

Value 2 display

Navigation

Expert → System → Display → Value 2 display (0108)

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

- None
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current output 1
- Current output 2 *
- Current output 3 *
- Custody transfer counter *

Factory setting

None

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

Additional information

*Description*

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

The Format display parameter (→ 16) is used to specify how many measured values are displayed simultaneously and how.

*Custody transfer measurement*

Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch to showing the custody transfer counter.

For detailed information on custody transfer mode, see the Special Documentation for the device → 7

*Dependency*

The unit of the displayed measured value is taken from the System units submenu (→ 60).

---

### Decimal places 2

**Navigation**

Expert → System → Display → Decimal places 2 (0117)

**Prerequisite**

A measured value is specified in the Value 2 display parameter (→ 21).

**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
- x.xxxxx

**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 3 display

**Navigation**

Expert → System → Display → Value 3 display (0110)

**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 2 display parameter (→ 21)

### 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 (→ 16) 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 (→ 60).

### 0% bargraph value 3

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Display → 0% bargraph 3 (0124)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>A selection was made in the Value 3 display parameter (→ 22).</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to enter the 0% bar graph value to be shown on the display for the measured value 3.</td>
</tr>
<tr>
<td>User entry</td>
<td>Signed floating-point number</td>
</tr>
</tbody>
</table>
| Factory setting | Country-specific:  
- 0 kg/h  
- 0 lb/min |
| Additional information | **Description**  
> The **Format display** parameter (→ 16) 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 (→ 60). |

### 100% bargraph value 3

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Display → 100% bargraph 3 (0126)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>A selection was made in the Value 3 display parameter (→ 22).</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to enter the 100% bar graph value to be shown on the display for the measured value 3.</td>
</tr>
<tr>
<td>User entry</td>
<td>Signed floating-point number</td>
</tr>
</tbody>
</table>
### Description of device parameters

**Proline Promass 300 HART**

**Factory setting** 0

**Additional information**

- **Description**
  The **Format display** parameter (→ 16) 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 (→ 60).

**Decimal places 3**

**Navigation**
Expert → System → Display → Decimal places 3 (0118)

**Prerequisite**
A measured value is specified in the **Value 3 display** parameter (→ 22).

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

**Selection**
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

**Factory setting** x.xx

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

**Value 4 display**

**Navigation**
Expert → System → Display → Value 4 display (0109)

**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 2 display** parameter (→ 21)

**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 (→ 16) 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 (→ 60).

---

**Decimal places 4**

**Navigation**

Expert → System → Display → Decimal places 4 (0119)

**Prerequisite**

A measured value is specified in the **Value 4 display** parameter (→ 24).

**Description**

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

**Selection**

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

**Factory setting**

x.xx

**Additional information**

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

---

**Display interval**

**Navigation**

Expert → System → Display → Display interval (0096)

**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 (→ 18) to Value 4 display parameter (→ 24) 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 (→ 16).

Custody transfer measurement

Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch between showing the relevant information and the custody transfer counter.

For detailed information on custody transfer mode, see the Special Documentation for the device → 7

Display damping

Navigation  

Expert → System → Display → Display damping (0094)

Prerequisite

A local display is provided.

Description

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

User entry

0.0 to 999.9 s

Factory setting

0.0 s

Additional information  

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

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

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

Header

Navigation  

Expert → System → Display → Header (0097)

Prerequisite

A local display is provided.

Description

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

---

1) proportional transmission behavior with first order delay
Selection
- Device tag
- Free text

Factory setting
Device tag

Additional information
Description
The header text only appears during normal operation.

![Header text on display](image-url)

1 Position of the header text on the display

Selection
- Device tag
  Is defined in the Device tag parameter (→ 214).
- Free text
  Is defined in the Header text parameter (→ 27).

Header text

Navigation
Expert → System → Display → Header text (0112)

Prerequisite
In the Header parameter (→ 26), the Free text option is selected.

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

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

Factory setting
-----------

Additional information
Description
The header text only appears during normal operation.

![Header text on display](image-url)

1 Position of the header text on the display

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

**Navigation**

Expert → System → Display → Separator (0101)

**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 (0105)

**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 (0111)

**Prerequisite**

One of the following conditions is met:

- Order code for "Display; operation", option F "4-line, illum.; touch control"
- Order code for "Display; operation", option G "4-line, illum.; touch control +WLAN"
- Order code for "Display; operation", option O "remote 4-line display, illum; 10m/30ft cable; touch control"

**Description**

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

**Selection**

- Disable
- Enable

**Factory setting**

Enable
### 3.1.2 "Configuration backup" submenu

**Navigation**

[ ] [ ] Expert → System → Config. backup

<table>
<thead>
<tr>
<th>Configuration backup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating time</td>
</tr>
<tr>
<td>Last backup</td>
</tr>
<tr>
<td>Configuration management</td>
</tr>
<tr>
<td>Backup state</td>
</tr>
<tr>
<td>Comparison result</td>
</tr>
</tbody>
</table>

#### Operating time

**Navigation**

[ ] [ ] Expert → System → Config. backup → Operating time (0652)

**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.

#### Last backup

**Navigation**

[ ] [ ] Expert → System → Config. backup → Last backup (2757)

**Description**

Displays the time since a backup copy of the data was last saved to the device memory.

**User interface**

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

#### Configuration management

**Navigation**

[ ] [ ] Expert → System → Config. backup → Config. management (2758)

**Description**

Use this function to select an action to save the data to the device memory.
Selection

- Cancel
- Execute backup
- Restore
- Compare
- Clear backup data

Factory setting

Cancel

Additional information

Selection

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancel</td>
<td>No action is executed and the user exits the parameter.</td>
</tr>
<tr>
<td>Execute backup</td>
<td>A backup copy of the current device configuration is saved from the integrated HistoROM to the memory of the device. The backup copy includes the transmitter data of the device. The following message appears on local display: Backup active, please wait!</td>
</tr>
<tr>
<td>Restore</td>
<td>The last backup copy of the device configuration is restored from the device memory to the device's integrated HistoROM. The backup copy includes the transmitter data of the device. The following message appears on local display: Restore active! Do not interrupt power supply!</td>
</tr>
<tr>
<td>Compare</td>
<td>The device configuration saved in the device memory is compared with the current device configuration of the integrated HistoROM. The following message appears on local display: Comparing files The result can be viewed in Comparison result parameter.</td>
</tr>
<tr>
<td>Clear backup data</td>
<td>The backup copy of the device configuration is deleted from the memory of the device. The following message appears on local display: Deleting file</td>
</tr>
</tbody>
</table>

HistoROM

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

Backup state

Navigation

רכים Expert → System → Config. backup → Backup state (2759)

Description

Displays the status of the data backup process.

User interface

- None
- Backup in progress
- Restoring in progress
- Delete in progress
- Compare in progress
- Restoring failed
- Backup failed

Factory setting

None
**Comparison result**

**Navigation**

Expert → System → Config. backup → Compar. result (2760)

**Description**
Displays the last result of the comparison of the data records in the device memory and in the HistoROM.

**User interface**
- Settings identical
- Settings not identical
- No backup available
- Backup settings corrupt
- Check not done
- Dataset incompatible

**Factory setting**
Check not done

**Additional information**

*Description*

The comparison is started via the **Compare** option in the **Configuration management** parameter (→  29).

**Selection**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settings identical</td>
<td>The current device configuration of the HistoROM is identical to the backup copy in the device memory. The settings for the transmitter are not identical.</td>
</tr>
<tr>
<td>Settings not identical</td>
<td>The current device configuration of the HistoROM is not identical to the backup copy in the device memory.</td>
</tr>
<tr>
<td>No backup available</td>
<td>There is no backup copy of the device configuration of the HistoROM in the device memory.</td>
</tr>
<tr>
<td>Backup settings corrupt</td>
<td>The current device configuration of the HistoROM is corrupt or not compatible with the backup copy in the device memory.</td>
</tr>
<tr>
<td>Check not done</td>
<td>The device configuration of the HistoROM has not yet been compared to the backup copy in the device memory.</td>
</tr>
<tr>
<td>Dataset incompatible</td>
<td>The backup copy in the device memory is not compatible with the device.</td>
</tr>
</tbody>
</table>

**HistoROM**

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

**Navigation**

Expert → System → Diagn. handling

---

**Alarm delay (0651)**

**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**

This setting affects the following diagnostic messages:

- 046 Sensor limit exceeded
- 140 Sensor signal asymmetrical
- 144 Measuring error too high
- 830 Sensor temperature too high
- 831 Sensor temperature too low
- 832 Electronic temperature too high
- 833 Electronic temperature too low
- 834 Process temperature too high
- 835 Process temperature too low
- 843 Process limit
- 862 Partly filled pipe
- 912 Medium inhomogeneous
- 913 Medium unsuitable
- 944 Monitoring failed

---

"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 (→ 32).
The following options are available in the **Assign behavior of diagnostic no. xxx** parameters:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alarm</strong></td>
<td>The device stops measurement. The signal outputs and totalizers assume the defined alarm condition. A diagnostic message is generated. The background lighting changes to red.</td>
</tr>
<tr>
<td><strong>Warning</strong></td>
<td>The device continues to measure. The signal outputs and totalizers are not affected. A diagnostic message is generated.</td>
</tr>
<tr>
<td><strong>Logbook entry only</strong></td>
<td>The device continues to measure. The diagnostic message is displayed only in the Event logbook submenu (→ 211) (Event list submenu (→ 212)) and is not displayed in alternation with the operational display.</td>
</tr>
<tr>
<td><strong>Off</strong></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**  
 Canonical  
 Expert → System → Diagn. handling → Diagn. behavior

### Diagnostic behavior

- Assign behavior of diagnostic no. 046 (0709)  → 34
- Assign behavior of diagnostic no. 140 (0708)  → 35
- Assign behavior of diagnostic no. 144 (0731)  → 35
- Assign behavior of diagnostic no. 374 (0710)  → 35
- Assign behavior of diagnostic no. 441 (0657)  → 36
- Assign behavior of diagnostic no. 442 (0658)  → 36
- Assign behavior of diagnostic no. 443 (0659)  → 36
- Assign behavior of diagnostic no. 444 (0740)  → 37
- Assign behavior of diagnostic no. 543 (0643)  → 37
- Assign behavior of diagnostic no. 830 (0800)  → 37
- Assign behavior of diagnostic no. 831 (0641)  → 38
Assign behavior of diagnostic no. 046 (Sensor limit exceeded)

Navigation

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046 (0709)

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available, see → 32
### Assign behavior of diagnostic no. 140 (Sensor signal asymmetrical)

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0708)

**Description**

Use this function to change the diagnostic behavior of the diagnostic message **140 Sensor signal asymmetrical**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see → 32

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

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144 (0731)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **144 Measuring error too high**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Alarm

**Additional information**

For a detailed description of the options available, see → 32

### Assign behavior of diagnostic no. 374 (Sensor electronic (ISEM) faulty)

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 374 (0710)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **374 Sensor electronic (ISEM) faulty**.

**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

**Factory setting**

Warning

**Additional information**

For a detailed description of the options available, see → 32
Assign behavior of diagnostic no. 441 (Current output 1 to n)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)

Description
Use this function to change the diagnostic behavior of the diagnostic message
441 Current output 1 to n.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

Additional information
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 442 (Frequency output 1 to n)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 442 (0658)

Prerequisite
The measuring device has a pulse/frequency/switch output.

Description
Use this function to change the diagnostic behavior of the diagnostic message
442 Frequency output 1 to n.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

Additional information
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 443 (Pulse output 1 to n)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 443 (0659)

Prerequisite
The measuring device has a pulse/frequency/switch output.

Description
Use this function to change the diagnostic behavior of the diagnostic message
443 Pulse output 1 to n.

Selection
- Off
- Alarm
- Warning
- Logbook entry only
Assign behavior of diagnostic no. 444 (Current input 1 to n)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 444 (0740)

Prerequisite
The device has one current input.

Description
Use this function to change the diagnostic behavior of the diagnostic message 444 Current input 1 to n.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

Additional information
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 543 (Double pulse output)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 543 (0643)

Description
Use this function to change the diagnostic behavior of the diagnostic message 543 Double pulse output.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting
Warning

Additional information
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 830 (Sensor temperature too high)

Navigation
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0800)

Description
Use this function to change the diagnostic behavior of the diagnostic message 830 Sensor temperature too high.
### Description of device parameters

#### Proline Promass 300 HART

<table>
<thead>
<tr>
<th>Selection</th>
<th>Off</th>
<th>Alarm</th>
<th>Warning</th>
<th>Logbook entry only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factory setting</strong></td>
<td>Alarm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional information**

For a detailed description of the options available, see → 32

---

### Assign behavior of diagnostic no. 831 (Sensor temperature too low)

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 831 (0641)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to change the diagnostic behavior of the diagnostic message <strong>831 Sensor temperature too low</strong>.</td>
</tr>
<tr>
<td>Selection</td>
<td>Off</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>Alarm</td>
</tr>
</tbody>
</table>

**Additional information**

For a detailed description of the options available, see → 32

---

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

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0681)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Use this function to change the diagnostic behavior of the diagnostic message <strong>832 Electronic temperature too high</strong>.</td>
</tr>
<tr>
<td>Selection</td>
<td>Off</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>Logbook entry only</td>
</tr>
</tbody>
</table>

**Additional information**

For a detailed description of the options available, see → 32
### Assign behavior of diagnostic no. 833 (Electronic temperature too low)

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0682)

**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**

Logbook entry only

**Additional information**

For a detailed description of the options available, see → 32

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

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0700)

**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 → 32

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

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0702)

**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 → 32
Description of device parameters

Assign behavior of diagnostic no. 862 (Empty pipe)

Navigation  
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862 (0679)

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 → 32

Assign behavior of diagnostic no. 912 (Medium inhomogeneous)

Navigation  
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912 (0703)

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

Selection  
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting  
Warning

Additional information  
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 913 (Medium unsuitable)

Navigation  
Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0712)

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

Selection  
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting  
Warning

Additional information  
For a detailed description of the options available, see → 32
Assign behavior of diagnostic no. 944 (Monitoring failed)

Navigation  

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944 (0732)

Description  
Option for changing the diagnostic behavior of the diagnostic message 944 Monitoring failed.

Selection  
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting  
Warning

Additional information  
For a detailed description of the options available, see → 32

Assign behavior of diagnostic no. 948 (Oscillation damping too high)

Navigation  

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948 (0744)

Description  
Option for changing the diagnostic behavior of the diagnostic message 948 Oscillation damping too high.

Selection  
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting  
Warning

Additional information  
For a detailed description of the options available, see → 32

3.1.4 "Administration" submenu

Navigation  

Expert → System → Administration

- Define access code  
  → 42
- Reset access code  
  → 43
- Device reset (0000)  
  → 44
- Activate SW option (0029)  
  → 44
"Define access code" wizard

The Define access code wizard (→ 42) is only available when operating via the local display or Web browser.

If operating via the operating tool, the Define access code parameter 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

**Description**

Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the device configuration against any inadvertent modifications via the local display, Web browser, FieldCare or DeviceCare (via CDI-RJ45 service interface).

**User entry**

Max. 16-digit character string comprising numbers, letters and special characters

**Additional information**

*Description*

The write protection affects all parameters in the document marked with the symbol. On the local display, the symbol in front of a parameter indicates that the parameter is write-protected.

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

*User entry*

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

*Factory setting*

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

**Navigation**

Expert \(\rightarrow\) System \(\rightarrow\) Administration \(\rightarrow\) Def. access code \(\rightarrow\) Confirm code

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

**User entry**
Max. 16-digit character string comprising numbers, letters and special characters

### "Reset access code" submenu

**Navigation**

Expert \(\rightarrow\) System \(\rightarrow\) Administration \(\rightarrow\) Reset acc. code

**Reset access code**

- Operating time (0652) \(\rightarrow\) 43
- Reset access code (0024) \(\rightarrow\) 43

### Operating time

**Navigation**

Expert \(\rightarrow\) System \(\rightarrow\) Administration \(\rightarrow\) Reset acc. code \(\rightarrow\) Operating time (0652)

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

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

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

### Reset access code

**Navigation**

Expert \(\rightarrow\) System \(\rightarrow\) Administration \(\rightarrow\) Reset acc. code \(\rightarrow\) Reset acc. code (0024)

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

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

**Factory setting**
0x00
Additional information

**Description**

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

**User entry**

The reset code can only be entered via:
- Web browser
- DeviceCare, FieldCare (via CDI RJ45 interface)
- Fieldbus

---

**Additional parameters in the "Administration" submenu**

---

**Device reset**

**Navigation**

Expert → System → Administration → Device reset (0000)

**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
- Restore S-DAT backup

**Factory setting**

Cancel

**Additional information**

**Selection**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancel</td>
<td>No action is executed and the user exits the parameter.</td>
</tr>
<tr>
<td>To delivery settings</td>
<td>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.</td>
</tr>
<tr>
<td>Restart device</td>
<td>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.</td>
</tr>
<tr>
<td>Restore S-DAT backup</td>
<td>Restore the data that are saved on the S-DAT. The data record is restored from the electronics memory to the S-DAT.</td>
</tr>
</tbody>
</table>

---

**Activate SW option**

**Navigation**

Expert → System → Administration → Activate SW opt. (0029)

**Description**

Use this function to enter an activation code to enable an additional, ordered software option.
### User entry
Max. 10-digit string consisting of numbers.

### Factory setting
Depends on the software option ordered

### Additional information

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

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

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

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

- Before you enter a new activation code, make a note of the current activation code.
- Enter the new activation code provided by Endress+Hauser when the new software option was ordered.
- Once the activation code has been entered, check if the new software option is displayed in the Software option overview parameter (→ 45).
  - The new software option is active if it is displayed.
  - If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.
  - If the code entered is incorrect or invalid, enter the old activation code.
  - Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

#### Example for a software option
Order code for "Application package", option EA "Extended HistoROM"

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

#### Web browser
Once a software option has been activated, the page must be loaded again in the Web browser.
Description of device parameters

- Concentration
- Viscosity
- Custody transfer

Additional information

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

"Extended HistoROM" option
Order code for "Application package", option EA "Extended HistoROM"

"SIL" option
Order code for "Additional approval", option LA "SIL"

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

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

"Viscosity" option
Only available for Promass I.
Order code for "Application package", option EG "Viscosity"

"Custody transfer" option
The measuring device has an approval for custody transfer measurement.
Detailed information on the national and international approvals for custody transfer that are currently available can be supplied by your Endress+Hauser sales organization.

Reset write protection

Navigation
Expert → System → Administration → Res. write prot.

Prerequisite
The SIL mode has been enabled.

Description
Use this function to enter the SIL locking code to reset write protection and disable the SIL mode.

User entry
0 to 65535

Factory setting
0
Additional information

Prerequisite

For detailed information about enabling and disabling the SIL mode, see the Special Documentation for the device → 7

Description

Once the SIL mode has been activated, the process-related parameters are write protected, and thereby locked, for security reasons. It is still possible to read the parameters. When SIL locking is enabled, restrictions apply on all communication options, such as the service interface, the HART protocol and the local display.

3.2 "Sensor" submenu

Navigation

Expert → Sensor

3.2.1 "Measured values" submenu

Navigation

Expert → Sensor → Measured val.
"Process variables" submenu

Navigation  

<table>
<thead>
<tr>
<th>Process variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass flow (1838)</td>
</tr>
<tr>
<td>Volume flow (1847)</td>
</tr>
<tr>
<td>Corrected volume flow (1851)</td>
</tr>
<tr>
<td>Density (1850)</td>
</tr>
<tr>
<td>Reference density (1852)</td>
</tr>
<tr>
<td>Temperature (1853)</td>
</tr>
<tr>
<td>Pressure value (6129)</td>
</tr>
<tr>
<td>Dynamic viscosity (1854)</td>
</tr>
<tr>
<td>Kinematic viscosity (1857)</td>
</tr>
<tr>
<td>Temp. compensated dynamic viscosity (1872)</td>
</tr>
<tr>
<td>Temp. compensated kinematic viscosity (1863)</td>
</tr>
<tr>
<td>Concentration (1887)</td>
</tr>
<tr>
<td>Target mass flow (1864)</td>
</tr>
<tr>
<td>Carrier mass flow (1865)</td>
</tr>
</tbody>
</table>

Mass flow

Navigation  

Description  
Displays the mass flow that is currently measured.

User interface  
Signed floating-point number

Additional information  
Dependency  
The unit is taken from the Mass flow unit parameter (→ 61)
### Volume flow

**Navigation**  

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

**User interface**  
Signed floating-point number

**Additional information**  
*Description*  
The volume flow is calculated from the mass flow currently measured and the density currently measured.

*Dependency*  
The unit is taken from the [Volume flow unit parameter](#).

### 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](#).

### Density

**Navigation**  

**Description**  
Displays the density currently measured.

**User interface**  
Signed floating-point number

**Additional information**  
*Dependency*  
The unit is taken from the [Density unit parameter](#).

### Reference density

**Navigation**  

**Description**  
Displays the reference density currently calculated.
Description of device parameters

Proline Promass 300 HART

User interface
Signed floating-point number

Additional information
Dependency

Temperature

Navigation

Description
Displays the medium temperature currently measured.

User interface
Signed floating-point number

Additional information
Dependency

Pressure value

Navigation

Description
Displays the fixed or external pressure value.

User interface
Signed floating-point number

Additional information
Dependency

Dynamic viscosity

Navigation

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

Description
Displays the dynamic viscosity currently calculated.

User interface
Signed floating-point number

Additional information
Dependency

Endress+Hauser
### Kinematic viscosity

**Navigation**


**Prerequisite**

For the following order code:

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

- The software options currently enabled are displayed in the Software option overview parameter (→  45).

**Description**

Displays the kinematic viscosity currently calculated.

**User interface**

Signed floating-point number

**Additional information**

- **Dependency**

  - The unit is taken from the Kinematic viscosity unit parameter (0578).

### Temp. compensated dynamic viscosity

**Navigation**


**Prerequisite**

For the following order code:

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

- The software options currently enabled are displayed in the Software option overview parameter (→  45).

**Description**

Displays the temperature compensation currently calculated for the viscosity.

**User interface**

Signed floating-point number

**Additional information**

- **Dependency**

  - The unit is taken from the Dynamic viscosity unit parameter.

### Temp. compensated kinematic viscosity

**Navigation**


**Prerequisite**

For the following order code:

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

- The software options currently enabled are displayed in the Software option overview parameter (→  45).

**Description**

Displays the temperature compensation currently calculated for the kinetic viscosity.

**User interface**

Signed floating-point number
### Concentration

**Navigation**

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

- The software options currently enabled are displayed in the **Software option overview** parameter (→ 45).

**Description**
Displays the concentration currently calculated.

**User interface**
Signed floating-point number

**Additional information**
- The unit is taken from the **Concentration unit** parameter (0613).

### Target mass flow

**Navigation**

**Prerequisite**
With the following conditions:
- Order code for "Application package", option **ED** 'Concentration'
- The **WT-%** option or the **User conc.** option is selected in the **Concentration unit** parameter.

- The software options currently enabled are displayed in the **Software option overview** parameter (→ 45).

**Description**
Displays the mass flow currently measured for the target medium.

**User interface**
Signed floating-point number

**Additional information**
- The unit is taken from the **Mass flow unit** parameter (→ 61)
Carrier mass flow

Navigation


Prerequisite

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

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

Description

Displays the mass flow currently measured for the carrier medium.

User interface

Signed floating-point number

Additional information

Dependency

The unit is taken from the Mass flow unit parameter (→ 61)

"Totalizer" submenu

Navigation

Expert → Sensor → Measured val. → Totalizer

Totalizer value 1 to n (0911–1 to n) → 53

Totalizer overflow 1 to n (0910–1 to n) → 54

Totalizer value 1 to n

Navigation

Expert → Sensor → Measured val. → Totalizer → Totalizer value 1 to n (0911–1 to n)

Prerequisite

A process variable is selected in the Assign process variable parameter (→ 199) of the Totalizer 1 to n submenu.

Description

Displays the current totalizer reading.

User interface

Signed floating-point number
Additional information

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

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 202).

User interface
The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Totalizer operation mode** parameter (→ 200).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 199).

Example
Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:
- Value in the **Totalizer value 1** parameter: 1968457 m$^3$
- Value in the **Totalizer overflow 1** parameter: $1 \cdot 10^7$ (1 overflow) = 10,000,000 [m$^3$]
- Current totalizer reading: 11968457 m$^3$

### Totalizer overflow 1 to n

#### Navigation
Endress+Hauser → Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to n (0910–1 to n)

#### Prerequisite
A process variable is selected in the **Assign process variable** parameter (→ 199) of the **Totalizer 1 to n** submenu.

#### Description
Displays the current totalizer overflow.

#### User interface
Integer with sign

#### Additional information

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

User interface

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 199).

Example
Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:
- Value in the **Totalizer value 1** parameter: 1968457 m$^3$
- Value in the **Totalizer overflow 1** parameter: $2 \cdot 10^7$ (2 overflows) = 20,000,000 [m$^3$]
- Current totalizer reading: 21968457 m$^3$
"Input values" submenu

Navigation  
Expert → Sensor → Measured val. → Input values

- Current input 1 to n
  - Measured values 1 to n (1603–1 to n)
  - Measured current 1 to n (1604–1 to n)

'Current input 1 to n' submenu

Navigation  
Expert → Sensor → Measured val. → Input values → Current input 1 to n

- Current input 1 to n
  - Measured values 1 to n (1603–1 to n)
  - Measured current 1 to n (1604–1 to n)

Measured values 1 to n

Navigation  
Expert → Sensor → Measured val. → Input values → Current input 1 to n 
→ Measured val. 1 to n (1603–1 to n)

Description  
Displays the current input value.

User interface  
Signed floating-point number

Measured current 1 to n

Navigation  
Expert → Sensor → Measured val. → Input values → Current input 1 to n → Measur. curr. 1 to n (1604–1 to n)

Description  
Displays the current value of the current input.

User interface  
0 to 22.5 mA
“Value status input 1 to n” submenu

**Navigation**

 Witness Expert → Sensor → Measured val. → Input values → Val.stat.inp. 1 to n

**Description**

Displays the current input signal level.

**User interface**

- High
- Low

"Output values" submenu

**Navigation**

 Witness Expert → Sensor → Measured val. → Output values

**Output values**

- Value current output 1 to n → 56
- Pulse/frequency/switch output 1 to n → 57
- Relay output 1 to n → 59
- Double pulse output → 60

"Value current output 1 to n" submenu

**Navigation**

 Witness Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n

- Value current output 1 to n
  - Output current 1 to n (0361–1 to n) → 57
  - Measured current 1 to n (0366–1 to n) → 57
### Output current 1 to n

**Navigation**
> Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Output curr. 1 to n (0361–1 to n)

**Description**
Displays the current value currently calculated for the current output.

**User interface**
0 to 22.5 mA

---

### Measured current 1 to n

**Navigation**
> Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Measur. curr. 1 to n (0366–1 to n)

**Description**
Use this function to display the actual measured value of the output current.

**User interface**
0 to 30 mA

---

### ’Pulse/frequency/switch output 1 to n’ submenu

**Navigation**
> Expert → Sensor → Measured val. → Output values → PFS output 1 to n

#### Output frequency 1 to n

**Prerequisite**
In the Operating mode parameter (→ 125), the Frequency option is selected.

**Description**
Displays the actual value of the output frequency which is currently measured.

**User interface**
0.0 to 12 500.0 Hz
**Value per pulse**

**Navigation**

SmartExpert → Sensor → Measured val. → Output values → PFS output 1 to n → Value per pulse (0455–1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 125), the Pulse option is selected and one of the following options is selected in the **Assign pulse output** parameter (→ 127):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**

Use this function to enter the value for the measured value that a pulse is equivalent to.

**User entry**

Signed floating-point number

**Factory setting**

Depends on country and nominal diameter → 253

**Additional information**

*User entry*

Weighting of the pulse output with a quantity.

The lower the pulse value, the
- better the resolution.
- the higher the frequency of the pulse response.

---

**Switch status 1 to n**

**Navigation**

SmartExpert → Sensor → Measured val. → Output values → PFS output 1 to n → Switch status 1 to n (0461–1 to n)

**Prerequisite**

The **Switch** option is selected in the **Operating mode** parameter (→ 125).

**Description**

Displays the current switch status of the status output.

**User interface**

- Open
- Closed

**Additional information**

*User interface*

- Open
  - The switch output is not conductive.
- Closed
  - The switch output is conductive.

* Visibility depends on order options or device settings*
'Relay output 1 to n' submenu

Navigation  
Expert → Sensor → Measured val. → Output values → Relay output 1 to n

Switch status

Navigation  
Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch status (0801–1 to n)

Description  
Displays the current status of the relay output.

User interface  
• Open
• Closed

Additional information  
User interface  
• Open  
The relay output is not conductive.  
• Closed  
The relay output is conductive.

Switch cycles

Navigation  
Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch cycles (0815–1 to n)

Description  
Displays all the switch cycles performed.

User interface  
Positive integer

Max. switch cycles number

Navigation  
Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Max. cycles no. (0817–1 to n)

Description  
Displays the maximum number of guaranteed switch cycles.
**User interface**
Positive integer

"Double pulse output" submenu

**Navigation**
Expert → Sensor → Measured val. → Output values → Double pulse out

```
Double pulse output

Pulse output (0987) → 60
```

**Pulse output**

**Navigation**
Expert → Sensor → Measured val. → Output values → Double pulse out → Pulse output (0987)

**Description**
Displays the pulse frequency of the double pulse output which is currently output.

**User interface**
Positive floating-point number

**Additional information**
For a detailed description and example: Pulse output parameter (→ 130)

3.2.2 "System units" submenu

**Navigation**
Expert → Sensor → System units

```
System units

Mass flow unit (0554) → 61
Mass unit (0574) → 62
Volume flow unit (0553) → 62
Volume unit (0563) → 64
Corrected volume flow unit (0558) → 64
Corrected volume unit (0575) → 65
Density unit (0555) → 66
```
**Mass flow unit**

**Navigation**

| Expert → Sensor → System units → Mass flow unit (0554) |

**Description**

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

**Selection**

- **SI units**
  - g/s
  - g/min
  - g/h
  - g/d
  - kg/s
  - kg/min
  - kg/h
  - kg/d
  - t/s
  - t/min
  - t/h
  - t/d

- **US units**
  - oz/s
  - oz/min
  - oz/h
  - oz/d
  - lb/s
  - lb/min
  - lb/h
  - lb/d
  - STon/s
  - STon/min
  - STon/h
  - STon/d

- **Custom-specific units**
  - User mass/s
  - User mass/min
  - User mass/h
  - User mass/d

**Factory setting**

Country-specific:
- kg/h (DN > 150 (6”): t/h)
- lb/min
**Additional information**

*Result*

The selected unit applies for:
- **Target mass flow** parameter (→ 52)
- **Carrier mass flow** parameter (→ 53)
- **Mass flow** parameter (→ 48)

**Selection**

For an explanation of the abbreviated units: → 258

**Customer-specific units**

The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 70).

---

**Mass unit**

**Navigation**

[Expert → Sensor → System units → Mass unit (0574)]

**Description**

Use this function to select the unit for the mass.

**Selection**

- **SI units**
  - g
  - kg
  - t
- **US units**
  - oz
  - lb
  - STon

**Customer-specific units**

User mass

**Factory setting**

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

**Additional information**

**Selection**

For an explanation of the abbreviated units: → 258

**Customer-specific units**

The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 70).

---

**Volume flow unit**

**Navigation**

[Expert → Sensor → System units → Volume flow unit (0553)]

**Description**

Use this function to select the unit for the volume flow.
<table>
<thead>
<tr>
<th>Selection</th>
<th>SI units</th>
<th>US units</th>
<th>Imperial units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cm³/s</td>
<td>af/s</td>
<td>gal/s (imp)</td>
</tr>
<tr>
<td></td>
<td>cm³/min</td>
<td>af/min</td>
<td>gal/min (imp)</td>
</tr>
<tr>
<td></td>
<td>cm³/h</td>
<td>af/h</td>
<td>gal/h (imp)</td>
</tr>
<tr>
<td></td>
<td>cm³/d</td>
<td>af/d</td>
<td>gal/d (imp)</td>
</tr>
<tr>
<td></td>
<td>dm³/s</td>
<td>ft³/s</td>
<td>Mgal/s (imp)</td>
</tr>
<tr>
<td></td>
<td>dm³/min</td>
<td>ft³/min</td>
<td>Mgal/min (imp)</td>
</tr>
<tr>
<td></td>
<td>dm³/h</td>
<td>ft³/h</td>
<td>Mgal/h (imp)</td>
</tr>
<tr>
<td></td>
<td>dm³/d</td>
<td>ft³/d</td>
<td>Mgal/d (imp)</td>
</tr>
<tr>
<td></td>
<td>m³/s</td>
<td>fl oz/s (us)</td>
<td>bbl/s (imp;beer)</td>
</tr>
<tr>
<td></td>
<td>m³/min</td>
<td>fl oz/min (us)</td>
<td>bbl/min (imp;beer)</td>
</tr>
<tr>
<td></td>
<td>m³/h</td>
<td>fl oz/h (us)</td>
<td>bbl/h (imp;beer)</td>
</tr>
<tr>
<td></td>
<td>m³/d</td>
<td>fl oz/d (us)</td>
<td>bbl/d (imp;beer)</td>
</tr>
<tr>
<td></td>
<td>ml/s</td>
<td>gal/s (us)</td>
<td>bbl/s (imp;oil)</td>
</tr>
<tr>
<td></td>
<td>ml/min</td>
<td>gal/min (us)</td>
<td>bbl/min (imp;oil)</td>
</tr>
<tr>
<td></td>
<td>ml/h</td>
<td>gal/h (us)</td>
<td>bbl/h (imp;oil)</td>
</tr>
<tr>
<td></td>
<td>ml/d</td>
<td>gal/d (us)</td>
<td>bbl/d (imp;oil)</td>
</tr>
<tr>
<td></td>
<td>l/s</td>
<td>kgal/s (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>l/min</td>
<td>kgal/min (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>l/h</td>
<td>kgal/h (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>l/d</td>
<td>kgal/d (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hl/s</td>
<td>Mgal/s (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hl/min</td>
<td>Mgal/min (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hl/h</td>
<td>Mgal/h (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hl/d</td>
<td>Mgal/d (us)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ml/s</td>
<td>bbl/s (us;liq.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ml/min</td>
<td>bbl/min (us;liq.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ml/h</td>
<td>bbl/h (us;liq.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ml/d</td>
<td>bbl/d (us;liq.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Custom-specific units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>User vol./s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>User vol./min</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>User vol./h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>User vol./d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country-specific:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>l/h (DN &gt; 150 (6°): m³/h)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>gal/min (us)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Additional information

Result

The selected unit applies for:
Volume flow parameter (→ 49)

Selection

For an explanation of the abbreviated units: → 258

Customer-specific units

The unit for the customer-specific volume is specified in the User volume text parameter (→ 71).

Volume unit

Navigation

Expert → Sensor → System units → Volume unit (0563)

Description

Use this function to select the unit for the volume.

Selection

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

US units
- af
- ft³
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;oil)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;tank)

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

Custom-specific units

User vol.

Factory setting

Country-specific:
- l (DN > 150 (6\(^{\circ}\)): m³)
- gal (us)

Additional information

Selection

For an explanation of the abbreviated units: → 258

Customer-specific units

The unit for the customer-specific volume is specified in the User volume text parameter (→ 71).

Corrected volume flow unit

Navigation

Expert → Sensor → System units → Cor.volflow unit (0558)

Description

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

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

**US units**
- Sft³/s
- Sft³/min
- Sft³/h
- Sft³/d

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

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

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

**Additional information**

**Selection**

For an explanation of the abbreviated units: → 258

**Corrected volume unit**

**Navigation**

Expert → Sensor → System units → Corr. vol. unit (0575)

**Description**

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

**Selection**

**SI units**
- Nl
- Nm³
- Sm³

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

**Imperial units**
- Sgal (imp)

**Custom-specific units**
- UserCrVol.

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

**Additional information**

Selection

For an explanation of the abbreviated units: → 258
Density unit

Navigation  
Expert → Sensor → System units → Density unit (0555)

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

Selection  

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

US units  
- lb/ft³  
- lb/gal (us)  
- lb/bbl (us,liq.)  
- lb/bbl (us,beer)  
- lb/bbl (us,oil)  
- lb/bbl (us,tank)

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

Custom-specific units  
User dens.

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

Additional information  
Result  
The selected unit applies for:  
- Density setpoint 1 parameter  
- Density setpoint 2 parameter  
- Density parameter (→ 49)

Selection  
- SD = specific density  
The specific density is the ratio of the fluid density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).  
- SG = specific gravity  
The specific gravity is the ratio of the fluid density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).  

For an explanation of the abbreviated units: → 258

Customer-specific units  
The unit for the customer-specific density is specified in the User density text parameter (→ 73).

Reference density unit

Navigation  
Expert → Sensor → System units → Ref. dens. unit (0556)

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

**SI units**
- kg/Nm³
- kg/Nl
- g/Scm³
- kg/Sm³

**US units**
- lb/Sft³

Factory setting

Country-dependent
- kg/Nl
- lb/Sft³

Additional information

**Result**
The selected unit applies for:
- **External reference density** parameter (→ 89)
- **Fixed reference density** parameter (→ 89)
- **Reference density** parameter (→ 49)

Selection

For an explanation of the abbreviated units: → 258

Temperature unit

Navigation

Expert → Sensor → System units → Temperature unit (0557)

Description

Use this function to select the unit for the temperature.

Selection

**SI units**
- °C
- K

**US units**
- °F
- °R

Factory setting

Country-specific:
- °C
- °F

Additional information

**Result**
The selected unit applies for:
- **Maximum value** parameter (→ 223)
- **Minimum value** parameter (→ 223)
- **Maximum value** parameter (→ 224)
- **Minimum value** parameter (→ 224)
- **Maximum value** parameter (→ 225)
- **Minimum value** parameter (→ 225)
- **External temperature** parameter (→ 87)
- **Reference temperature** parameter (6222)
- **Temperature** parameter (→ 50)
- **Reference temperature** parameter (→ 90)

Selection

For an explanation of the abbreviated units: → 258
**Pressure unit**

- **Navigation**: Expert → Sensor → System units → Pressure unit (0564)
- **Description**: Use this function to select the unit for the pipe pressure.
- **Selection**:
  - **SI units**
    - Pa a
    - kPa a
    - MPa a
    - bar
    - Pa g
    - kPa g
    - MPa g
    - bar g
  - **US units**
    - psi a
    - psi g
  - **Custom-specific units**
    - User pres.
- **Factory setting**: Country-specific:
  - bar a
  - psi a
- **Additional information**:
  - **Result**: The unit is taken from:
    - Pressure value parameter (→  86)
    - External pressure parameter (→  86)
    - Pressure value parameter (→  50)
  - **Selection**: For an explanation of the abbreviated units: →  258
  - **Customer-specific units**: The unit for the customer-specific energy is defined in the User pressure text parameter (→  74).

**Date/time format**

- **Navigation**: Expert → Sensor → System units → Date/time format (2812)
- **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: →  258

"User-specific units" submenu

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

<table>
<thead>
<tr>
<th>User-Specific Units</th>
<th></th>
</tr>
</thead>
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<td>User mass text (0560)</td>
<td>→ 70</td>
</tr>
<tr>
<td>User mass factor (0561)</td>
<td>→ 70</td>
</tr>
<tr>
<td>User mass offset (0562)</td>
<td>→ 70</td>
</tr>
<tr>
<td>User volume text (0567)</td>
<td>→ 71</td>
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<td>User corrected volume text (0592)</td>
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<td>→ 72</td>
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<td>→ 73</td>
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<td>User volume offset (0569)</td>
<td>→ 71</td>
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<tr>
<td>User density text (0570)</td>
<td>→ 73</td>
</tr>
<tr>
<td>User density factor (0572)</td>
<td>→ 73</td>
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<td>→ 74</td>
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<tr>
<td>User pressure offset (0580)</td>
<td>→ 74</td>
</tr>
</tbody>
</table>
### User mass text

**Navigation**
Expert → Sensor → System units → User-spec. units → Mass text (0560)

**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 (→ 61)
  - Mass unit parameter (→ 62)

- **Example**
If the text CENT for "centner" is entered, the following options are displayed in the picklist for the Mass flow unit parameter (→ 61):
  - CENT/s
  - CENT/min
  - CENT/h
  - CENT/d

### User mass factor

**Navigation**
Expert → Sensor → System units → User-spec. units → Mass factor (0561)

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

**User entry**
Signed floating-point number

**Factory setting**
1.0

**Additional information**

- **Example**
Mass of 1 Zentner = 50 kg → 0.02 Zentner = 1 kg → entry: 0.02

### User mass offset

**Navigation**
Expert → Sensor → System units → User-spec. units → Mass offset (0562)

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

**User entry**
Signed floating-point number

**Factory setting**
0
### Additional information

**Description**

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

### User volume text

**Navigation**

Expert → Sensor → System units → User-spec. units → Volume text (0567)

**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**

The defined unit is shown as an option in the choose list of the following parameters:

- Volume flow unit parameter (→ 62)
- Volume unit parameter (→ 64)

**Example**

If the text GLAS is entered, the choose list of the Volume flow unit parameter (→ 62) shows the following options:

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

### User volume factor

**Navigation**

Expert → Sensor → System units → User-spec. units → Volume factor (0568)

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

1.0

### User volume offset

**Navigation**

Expert → Sensor → System units → User-spec. units → Volume offset (0569)

**Description**

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

User entry
Signed floating-point number

Factory setting
0

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

User corrected volume text

Navigation
Expert → Sensor → System units → User-spec. units → Corr. vol. text (0592)

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 (→ 64)
- Corrected volume unit parameter (→ 65)

Example
If the text GLAS is entered, the choose list of the Corrected volume flow unit parameter (→ 64) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

User corrected volume factor

Navigation
Expert → Sensor → System units → User-spec. units → Corr. vol. factor (0590)

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

User entry
Signed floating-point number

Factory setting
1.0
User corrected volume offset

**Navigation**
Expert → Sensor → System units → User-spec. units → Corr vol. offset (0602)

**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 density text

**Navigation**
Expert → Sensor → System units → User-spec. units → Density text (0570)

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

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

**Factory setting**
User dens.

**Additional information**

Result

The defined unit is shown as an option in the choose list of the **Density unit** parameter (→ 66).

**Example**
Enter text “CE_L” for centners per liter

User density factor

**Navigation**
Expert → Sensor → System units → User-spec. units → Density factor (0572)

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

**User entry**
Signed floating-point number

**Factory setting**
1.0
Endress+Hauser

**User density offset**

**Navigation**
Expert → Sensor → System units → User-spec. units → Density offset (0571)

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

\[ \text{Value in user-specific unit} = (\text{factor} \times \text{value in base unit}) + \text{offset} \]

**User entry**
Signed floating-point number

**Factory setting**
0

**User pressure text**

**Navigation**
Expert → Sensor → System units → User-spec. units → Pressure text (0581)

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

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

**Factory setting**
User pres.

**Additional information**
Result

The defined unit is shown as an option in the choose list of the Pressure unit parameter (→ 68).

**User pressure factor**

**Navigation**
Expert → Sensor → System units → User-spec. units → Pressure factor (0579)

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

**User entry**
Signed floating-point number

**Factory setting**
1.0

**Additional information**
Example

\[ 1 \text{ Dyn/cm}^2 = 0.1 \text{ Pa} \rightarrow 10 \text{ Dyn/cm}^2 = 1 \text{ Pa} \rightarrow \text{user entry: 10} \]

**User pressure offset**

**Navigation**
Expert → Sensor → System units → User-spec. units → Pressure offset (0580)

**Description**
Use this function to enter the offset for adapting the user-specific pressure unit.
3.2.3 "Process parameters" submenu

Navigation


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<th>Process parameters</th>
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</thead>
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<td>Partially filled pipe detection → 81</td>
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</table>

Flow damping

Navigation

Expert → Sensor → Process param. → Flow damping (1802)

Description

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

User entry

0 to 100.0 s

Factory setting

0 s
Additional information

Description

The damping is performed by a PT1 element \(^2\).

User entry

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

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

Result

The damping affects the following variables of the device:

- Outputs → 107
- Low flow cut off → 77
- Totalizers → 198

Density damping

Navigation


Description

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

User entry

0 to 999.9 s

Factory setting

0 s

Additional information

Description

The damping is performed by a PT1 element \(^3\).

User entry

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

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

Temperature damping

Navigation


Description

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

User entry

0 to 999.9 s

---

2) Proportional behavior with first-order lag
3) Proportional behavior with first-order lag
Factory setting 0 s

Additional information

* Description
  The damping is performed by a PT1 element 4).

* User entry
  - Value = 0: no damping
  - Value > 0: damping is increased
  Damping is switched off if 0 is entered (factory setting).

Flow override

**Navigation**


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

**Selection**
- Off
- On

**Factory setting**
Off

**Additional information**

* Description
  Flow override is active
  - The diagnostic message diagnostic message C453 Flow override is displayed.
  - Output values
    - Temperature: proceeding output
    - Totalizers 1-3: Stop being totalized
  Positive zero return can also be enabled via the Status input: Assign status input parameter (→ 106).

"Low flow cut off" submenu

**Navigation**

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

<table>
<thead>
<tr>
<th>► Low flow cut off</th>
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</thead>
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4) Proportional behavior with first-order lag
**Assign process variable**

**Navigation**
Expert → Sensor → Process param. → Low flow cut off → Assign variable (1837)

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

**Selection**
- Off
- Mass flow
- Volume flow
- Corrected volume flow

**Factory setting**
Mass flow

**On value low flow cutoff**

**Navigation**
Expert → Sensor → Process param. → Low flow cut off → On value (1805)

**Prerequisite**
One of the following options is selected in the Assign process variable parameter (→ 78):
- Mass flow
- Volume flow
- Corrected volume flow

**Description**
Use this function to enter a switch-on value for low flow cutoff. Low flow cutoff is activated if the value entered is not equal to 0 → 79.

**User entry**
Positive floating-point number

**Factory setting**
Depends on country and nominal diameter → 253

**Additional information**
*Dependency*
The unit depends on the process variable selected in the Assign process variable parameter (→ 78).
Off value low flow cutoff

**Navigation**

Expert → Sensor → Process param. → Low flow cut off → Off value (1804)

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter

- Mass flow
- Volume flow
- Corrected volume flow

**Description**

Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → 78.

**User entry**

0 to 100.0 %

**Factory setting**

50 %

**Additional information**

Example

![Diagram](A001288)

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

Pressure shock suppression

**Navigation**


**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter

- Mass flow
- Volume 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
  - Changing the flow direction
- Output values
  - Current output: outputs the current corresponding to zero flow.
  - Flow displayed: 0
  - Totalizer: the totalizers are pegged at the last correct value

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

**Example**

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

![Diagram showing flow and time](A0012888)

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

**Navigation**


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### Assign process variable

**Navigation**


**Description**

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

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

**Selection**

- Off
- Density
- Reference density

**Factory setting**

Off

### Low value partial filled pipe detection

**Navigation**

Expert → Sensor → Process param. → Partial pipe det → Low value (1861)

**Prerequisite**

One of the following options is selected in the Assign process variable parameter (→ 81):

- Density
- Reference density

**Description**

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

**User entry**

Signed floating-point number
**Proline Promass 300 HART**

**Factory setting**  
200

**Additional information**  
*User entry*

The lower limit value must be less than the upper limit value defined in the **High value partial filled pipe detection** parameter (→ 82).

The unit depends on the process variable selected in the **Assign process variable** parameter (→ 81).

**Limit value**

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

---

### High value partial filled pipe detection

**Navigation**  
Expert → Sensor → Process param. → Partial pipe det → High value (1858)

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 81):

- Density
- Reference density

**Description**

Use this function to enter an upper limit value to enable detection of empty or partially filled measuring tubes. If the measured density exceeds this value, detection is enabled.

**User entry**

Signed floating-point number

**Factory setting**  
6 000

**Additional information**  
*User entry*

The upper limit value must be greater than the lower limit value defined in the **Low value partial filled pipe detection** parameter (→ 81).

The unit depends on the process variable selected in the **Assign process variable** parameter (→ 81).

**Limit value**

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

---

### Response time part. filled pipe detect.

**Navigation**  

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 81):

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

User entry
0 to 100 s

Factory setting
1 s

Maximum damping partial filled pipe det.

Navigation
Expert → Sensor → Process param. → Partial pipe det → Max. damping (6040)

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

User entry
Positive floating-point number

Factory setting
0

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

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

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

3.2.4 "Measurement mode" submenu

Navigation
Expert → Sensor → Measurement mode

Select medium (6062) → S84
Select gas type (6074) → S84
Description of device parameters

Proline Promass 300 HART

| Reference sound velocity (6147) | → 85 |
| Temperature coefficient sound velocity (6181) | → 85 |

### Select medium

**Navigation**

Expert → Sensor → Measurement mode → Select medium (6062)

**Description**

Use this function to select the type of medium.

**Selection**

- Liquid
- Gas

**Factory setting**

Liquid

### Select gas type

**Navigation**

Expert → Sensor → Measurement mode → Select gas type (6074)

**Prerequisite**

The **Gas** option is selected in the **Select medium** parameter (→ 84).

**Description**

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

**Selection**

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

**Factory setting**

Methane CH4
**Reference sound velocity**

**Navigation**

Expert → Sensor → Measurement mode → Sound velocity (6147)

**Prerequisite**
In the **Select gas type** parameter (→ 84), the **Others** option is selected.

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

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

**Factory setting**
415.0 m/s

**Temperature coefficient sound velocity**

**Navigation**

Expert → Sensor → Measurement mode → Temp. coeff. SV (6181)

**Prerequisite**
The **Others** option is selected in the **Select gas type** parameter (→ 84).

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

**User entry**
Positive floating-point number

**Factory setting**
0 (m/s)/K

### 3.2.5 "External compensation" submenu

**Navigation**


**Navigation**

- Pressure compensation (6130) → 86
- Pressure value (6059) → 86
- External pressure (6209) → 86
- Temperature mode (6184) → 87
- External temperature (6080) → 87
Description of device parameters

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**Pressure compensation**

**Navigation**

Expert → Sensor → External comp. → Pressure compen. (6130)

**Description**

Use this function to select the type of pressure compensation.

**Selection**

- Off
- Fixed value
- External value
- Current input 1 *
- Current input 2 *

**Factory setting**

Off

**Additional information**

*Selection*

- Fixed value
  A fixed pressure value is used for compensation: **Pressure value** parameter (→ 86)
- External value
  The pressure value read in via HART is used for compensation.
- Current input 1...n
  The pressure value read in via the current input is used for compensation.

**Pressure value**

**Navigation**

Expert → Sensor → External comp. → Pressure value (6059)

**Prerequisite**

The **Fixed value** option is selected in the **Pressure compensation** parameter (→ 86).

**Description**

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

**User entry**

Positive floating-point number

**Factory setting**

0 bar

**Additional information**

**User entry**

The unit is taken from the **Pressure unit** parameter (→ 68)

**External pressure**

**Navigation**


**Prerequisite**

The **External value** option is selected in the **Pressure compensation** parameter (→ 86).

* Visibility depends on order options or device settings
**Proline Promass 300 HART**

**Description of device parameters**

**Description**
Use this function to enter an external pressure value.

**User interface**
Positive floating-point number

**Factory setting**
0 bar

**Additional information**

* User entry

The unit is taken from the **Pressure unit** parameter (→ 68)

---

### Temperature mode

<table>
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</table>

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

**Selection**

- Internal measured value
- External value
- Current input 1 *
- Current input 2 *
- Current input 3 *

**Factory setting**
Internal measured value

**Additional information**

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

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

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

---

### External temperature

|------------|-------------------------------------------------------------|

**Prerequisite**
In the **Temperature mode** parameter (→ 87), the **External value** option is selected.

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

**User interface**
-273.15 to 99 999 °C

* Visibility depends on order options or device settings
Factory setting

Country-specific:
- 0 °C
- +32 °F

Additional information

Description

The unit is taken from the Temperature unit parameter (→ 67)

3.2.6 "Calculated values" submenu

Navigation

Expert → Sensor → Calculated value

"Corrected volume flow calculation" submenu

Navigation


Corrected volume flow calculation

(1812)

External reference density (6198)

Fixed reference density (1814)

Reference temperature (1816)

Linear expansion coefficient (1817)

Square expansion coefficient (1818)

Description

Use this function to select the reference density for calculating the corrected volume flow.
Selection
- Fixed reference density
- Calculated reference density
- Reference density by API table 53
- Current input 1 *
- Current input 2 *

Factory setting
Calculated reference density

External reference density

Navigation
Expert → Sensor → Calculated value → Corr. vol. flow. → Ext. ref. density (6198)

Prerequisite
One of the following options is selected in the Corrected volume flow calculation parameter (→ 88):
- Current input 1 *
- Current input 2 *

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

User interface
Floating point number with sign

Additional information
Dependency
The unit is taken from the Reference density unit parameter (→ 66)

Fixed reference density

Navigation
Expert → Sensor → Calculated value → Corr. vol. flow. → Fix ref. density (1814)

Prerequisite
In the Corrected volume flow calculation parameter (→ 88), the Fixed reference density option is selected.

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

User entry
Positive floating-point number

Factory setting
1 kg/Nl

Additional information
Dependency
The unit is taken from the Reference density unit parameter (→ 66)

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

Proline Promass 300 HART

Reference temperature

**Navigation**


**Prerequisite**

In the Corrected volume flow calculation parameter (→ 88), the Calculated reference density option is selected.

**Description**

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

**User entry**

-273.15 to 99 999 °C

**Factory setting**

Country-specific:
- +20 °C
- +68 °F

**Additional information**

**Dependency**

The unit is taken from the Temperature unit parameter (→ 67)

Reference density calculation

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

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

Linear expansion coefficient

**Navigation**

Expert → Sensor → Calculated value → Corr. vol.flow. → Linear exp coeff (1817)

**Prerequisite**

In the Corrected volume flow calculation parameter (→ 88), the Calculated reference density option is selected.

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

0.0
Square expansion coefficient

**Navigation**

**Prerequisite**
In the Corrected volume flow calculation parameter (→ 88), the Calculated reference density option is selected.

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

**User entry**
Signed floating-point number

**Factory setting**
0.0

3.2.7 "Sensor adjustment" submenu

**Navigation**

**Installation direction**

**Navigation**
Expert → Sensor → Sensor adjustm. → Install. direct. (1809)

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

**Navigation**

Expert → Sensor → Sensor adjustm. → Inst. angle roll (6282)

**Prerequisite**

Only available on Promass Q.

**Description**

Use this function to enter the roll installation angle in degrees.

**User entry**

−180 to 180°

**Factory setting**

0°

---

**Installation angle pitch**

**Navigation**

Expert → Sensor → Sensor adjustm. → Inst. angle pitch (6236)

**Prerequisite**

Only available on Promass Q.

**Description**

Use this function to enter the installation angle pitch in degrees.

**User entry**

−180 to 180°

**Factory setting**

0°

---

"Zero point adjustment" submenu

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

**Navigation**


---

Zero point adjustment control (6196)

Progress (2808)
Zero point adjustment control

Navigation

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

Variables
- Cancel
- Busy
- Zero point adjust failure
- Start

Factory setting
Cancel

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

Progress

Navigation

Description
The progress of the process is indicated.

User interface
0 to 100 %

"Process variable adjustment" submenu

Navigation
Expert → Sensor → Sensor adjustm. → Variable adjust

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<td>Temperature factor (1871)</td>
<td>→ 98</td>
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</table>

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**

Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow factor (1832)

**Description**

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

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information**

Description

Corrected value = (factor × value) + offset
### Volume flow offset

**Navigation**  

**Description**  
Use this function to enter the zero point shift for the volume flow trim. The volume flow unit on which the shift is based is m³/s.

**User entry**  
Signed floating-point number

**Factory setting**  
0 m³/s

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

### Volume flow factor

**Navigation**  

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

**User entry**  
Positive floating-point number

**Factory setting**  
1

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

### Density offset

**Navigation**  
Expert → Sensor → Sensor adjustm. → Variable adjust → Density offset (1848)

**Description**  
Use this function to enter the zero point shift for the density trim. The density unit on which the shift is based is kg/m³.

**User entry**  
Signed floating-point number

**Factory setting**  
0 kg/m³

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

**Navigation**  
Expert → Sensor → Sensor adjustm. → Variable adjust → Density factor (1849)

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

**User entry**  
Positive floating-point number

**Factory setting**  
1

**Additional information**  
*Description*

Corrected value = (factor × value) + offset

---

### Corrected volume flow offset

**Navigation**  

**Description**  
Use this function to enter the zero point shift for the corrected volume flow trim. The corrected volume flow unit on which the shift is based is 1 Nm³/s.

**User entry**  
Signed floating-point number

**Factory setting**  
0 Nm³/s

**Additional information**  
*Description*

Corrected value = (factor × value) + offset

---

### Corrected volume flow factor

**Navigation**  

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

**User entry**  
Positive floating-point number

**Factory setting**  
1

**Additional information**  
*Description*

Corrected value = (factor × value) + offset
### Reference density offset

**Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. offset (1868)

**Description**

Use this parameter to enter the zero point shift for the reference density trim. The reference density unit on which the shift is based is 1 kg/Nm³.

**User entry**

Signed floating-point number

**Factory setting**

0 kg/Nm³

**Additional information**

Description

Corrected value = (factor × value) + offset

### Reference density factor

**Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. factor (1869)

**Description**

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

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information**

Description

Corrected value = (factor × value) + offset

### Temperature offset

**Navigation**


**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

0 K

**Additional information**

Description

Corrected value = (factor × value) + offset
**Temperature factor**

**Navigation**

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

**User entry**
Positive floating-point number

**Factory setting**
1

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

---

**3.2.8 "Calibration" submenu**

**Navigation**
Expert → Sensor → Calibration

-Calibration factor (6025)
- Zero point (6195)
- Nominal diameter (2807)
- C0 to 5 (6022)

**Calibration factor**

**Navigation**
Expert → Sensor → Calibration → Cal. factor (6025)

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

**User interface**
Signed floating-point number

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

**Navigation**

Expert → Sensor → Calibration → Zero point (6195)

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

Depends on nominal diameter and calibration.

---

Nominal diameter

**Navigation**

Expert → Sensor → Calibration → Nominal diameter (2807)

**Description**

Displays the nominal diameter of the sensor.

**User interface**

DNxx / x" 

**Factory setting**

Depends on the size of the sensor

**Additional information**

*Description*

The value is also specified on the sensor nameplate.

---

C0 to 5

**Navigation**

Expert → Sensor → Calibration → C0 to 5 (6022)

**Description**

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

**User interface**

Signed floating-point number

**Factory setting**

0

---

3.3 "I/O configuration" submenu

**Navigation**

Expert → I/O config.

**[I/O configuration]**

I/O module 1 to n terminal numbers (3902–1 to n) → 100
Description of device parameters

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| Conversion code (2762) | → 101 |

### I/O module 1 to n terminal numbers

**Navigation**
- Expert → I/O config. → I/O 1 to n terminals (3902–1 to n)

**Description**
Displays the terminal numbers used by the I/O module.

**User interface**
- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

### I/O module 1 to n information

**Navigation**
- Expert → I/O config. → I/O 1 to n info (3906–1 to n)

**Description**
Displays information about the plugged in I/O module.

**User interface**
- Not plugged
- Invalid
- Not configurable
- Configurable
- Fieldbus

**Additional information**

*Not plugged* option
The I/O module is not plugged in.

*Invalid* option
The I/O module is not plugged correctly.

*Not configurable* option
The I/O module is not configurable.

*Configurable* option
The I/O module is configurable.

*Fieldbus* option
The I/O module is configured for the fieldbus.
I/O module 1 to n type

**Navigation**

Expert → I/O config. → I/O 1 to n type (3901–1 to n)

**Prerequisite**

For the following order code:
- "Output; input 2", option D "Configurable I/O initial setting off"
- "Output; input 3", option D "Configurable I/O initial setting off"

**Description**

Use this function to select the I/O module type for the configuration of the I/O module.

**Selection**

- Off
- Current output
- Current input
- Status input
- Pulse/frequency/switch output

**Factory setting**

Off

Apply I/O configuration

**Navigation**

Expert → I/O config. → Apply I/O config (3907)

**Description**

Use this function to restart the device in order to activate the newly configured I/O module type.

**Selection**

- No
- Yes

**Factory setting**

No

Conversion code

**Navigation**

Expert → I/O config. → Conversion code (2762)

**Description**

Use this function to enter the ordered activation code to activate the I/O configuration change.

**User entry**

Positive integer

**Factory setting**

0

**Additional information**

*Description*

The I/O configuration is changed in the **I/O module type** parameter (→ 101).
3.4  "Input" submenu

**Navigation**

Expert → Input

![Diagram](image)

- **Current input 1 to n** → 102
- **Status input 1 to n** → 105

3.4.1  "Current input 1 to n" submenu

**Navigation**

Expert → Input → Current input 1 to n

![Diagram](image)

- **Terminal number (1611–1 to n)** → 102
- **Signal mode (1610–1 to n)** → 103
- **Current span (1605–1 to n)** → 103
- **0/4 mA value (1606–1 to n)** → 103
- **20 mA value (1607–1 to n)** → 104
- **Failure mode (1601–1 to n)** → 104
- **Failure value (1602–1 to n)** → 105

### Terminal number

**Navigation**

Expert → Input → Current input 1 to n → Terminal no. (1611–1 to n)

**Description**

Displays the terminal numbers used by the current input module.

**User interface**

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Additional information**

"Not used" option

The current input module does not use any terminal numbers.
**Signal mode**

**Navigation**
[/expert] → Input → Current input 1 to n → Signal mode (1610–1 to n)

**Prerequisite**
The measuring device is **not** approved for use in the hazardous area with type of protection Ex-i.

**Description**
Use this function to select the signal mode for the current input.

**Selection**
- Passive
- Active

**Factory setting**
Passive

---

**Current span**

**Navigation**
[/expert] → Input → Current input 1 to n → Current span (1605–1 to n)

**Description**
Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.

**Selection**
- 4...20 mA
- 4...20 mA NAMUR
- 4...20 mA US
- 0...20 mA

**Factory setting**
Country-specific:
- 4...20 mA NAMUR
- 4...20 mA US

**Additional information**
**Examples**
Sample values for the current range: Current span parameter (→ 110)

---

**0/4 mA value**

**Navigation**
[/expert] → Input → Current input 1 to n → 0/4 mA value (1606–1 to n)

**Description**
Use this function to enter a value for the 4 mA current.

**User entry**
Signed floating-point number

**Factory setting**
0
Additional information  

Current input behavior

The current input behaves differently depending on the settings configured in the following parameters:
- Current span (→ 103)
- Failure mode (→ 104)

Configuration examples

Pay attention to the configuration examples for 4 mA value parameter (→ 111).

20 mA value

Navigation

Expert → Input → Current input 1 to n → 20 mA value (1607–1 to n)

Description

Use this function to enter a value for the 20 mA current.

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Configuration examples

Pay attention to the configuration examples for 4 mA value parameter (→ 111).

Failure mode

Navigation

Expert → Input → Current input 1 to n → Failure mode (1601–1 to n)

Description

Use this function to select the input behavior when measuring a current outside the configured Current span parameter (→ 103).

Selection

- Alarm
- Last valid value
- Defined value

Factory setting

Alarm

Additional information

Options

- Alarm
  An error message is set.
- Last valid value
  The last valid measured value is used.
- Defined value
  A user-defined measured value is used (Failure value parameter (→ 105)).
Failure value

**Navigation**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expert → Input → Current input 1 to n → Failure value (1602–1 to n)</td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisite**

In the **Failure mode** parameter (→ 104), the **Defined value** option is selected.

**Description**

Use this function to enter the value that the device uses if it does not receive an input signal from the external device, or if the input signal is invalid.

**User entry**

Signed floating-point number

**Factory setting**

0

---

### 3.4.2 "Status input 1 to n" submenu

**Navigation**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expert → Input → Status input 1 to n</td>
<td></td>
</tr>
</tbody>
</table>

#### Terminal number

**Navigation**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expert → Input → Status input 1 to n → Terminal no. (1358–1 to n)</td>
<td></td>
</tr>
</tbody>
</table>

**Description**

Displays the terminal numbers used by the status input module.

**User interface**

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Additional information**

"Not used" option

The status input module does not use any terminal numbers.
Assign status input

Navigation  

Expert → Input → Status input 1 to n → Assign stat.inp. (1352–1 to n)

Description  

Use this function to select the function for the status input.

Selection  

- Off
- Reset totalizer 1
- Reset totalizer 2
- Reset totalizer 3
- Reset all totalizers
- Flow override

Factory setting  

Off

Additional information  

Custody transfer measurement

Only available for Promass F, O, Q and X.

NOTE!

Before enabling the measuring device for custody transfer mode, make sure that the Off option is selected in the Assign status input.

For detailed information on custody transfer mode, see the Special Documentation for the device →  7

Additional information  

Selection

- Off
  The status input is switched off.
- Reset totalizer 1…3
  The individual totalizers are reset.
- Reset all totalizers
  All totalizers are reset.
- Flow override
  The Flow override (→ 77) is activated.

Note on the Flow override (→ 77):

- The Flow override (→ 77) is enabled as long as the level is at the status input (continuous signal).
- All other assignments react to a change in level (pulse) at the status input.

Value status input

Navigation  

Expert → Input → Status input 1 to n → Val.stat.inp. (1353–1 to n)

Description  

Displays the current input signal level.

User interface  

- High
- Low
**Active level**

**Navigation**  
Expert → Input → Status input 1 to n → Active level (1351–1 to n)

**Description**  
Use this function to determine the input signal level at which the assigned function is activated.

**Selection**  
- High
- Low

**Factory setting**  
High

**Response time status input**

**Navigation**  
Expert → Input → Status input 1 to n → Response time (1354–1 to n)

**Description**  
Use this function to enter the minimum time period for which the input signal level must be present before the selected function is activated.

**User entry**  
5 to 200 ms

**Factory setting**  
50 ms

### 3.5 "Output" submenu

**Navigation**  
Expert → Output

```
Output

- Current output 1 to n  →  108
- Pulse/frequency/switch output 1 to n  →  123
- Relay output 1 to n  →  148
- Double pulse output  →  155
```
3.5.1 "Current output 1 to n" submenu

Navigation  
Expert → Output → Curr.output 1 to n

<table>
<thead>
<tr>
<th>Description</th>
<th>Terminal number (0379–1 to n)</th>
<th>108</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Signal mode (0377–1 to n)</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Assign current output 1 to n</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>(0359–1 to n)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current span (0353–1 to n)</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Fixed current (0365–1 to n)</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>0/4 mA value (0367–1 to n)</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>20 mA value (0372–1 to n)</td>
<td>113</td>
</tr>
<tr>
<td></td>
<td>Measuring mode (0351–1 to n)</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Damping output 1 to n (0363–1 to n)</td>
<td>118</td>
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<td>Response time (0378–1 to n)</td>
<td>119</td>
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<tr>
<td></td>
<td>Failure mode (0364–1 to n)</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Failure current (0352–1 to n)</td>
<td>122</td>
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<tr>
<td></td>
<td>Output current 1 to n (0361–1 to n)</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>Measured current 1 to n (0366–1 to n)</td>
<td>123</td>
</tr>
</tbody>
</table>

Terminal number

Navigation  
Expert → Output → Curr.output 1 to n → Terminal no. (0379–1 to n)

Description  
Displays the terminal numbers used by the current output module.

User interface  
- Not used
- 26–27 (I/O 1)
- 24–25 (I/O 2)
- 22–23 (I/O 3)

Additional information  
"Not used" option
The current output module does not use any terminal numbers.
**Signal mode**

**Navigation**

Expert → Output → Curr.output 1 to n → Signal mode (0377–1 to n)

**Description**

Use this function to select the signal mode for the current output.

**Selection**

- Passive
- Active

**Factory setting**

Passive

---

**Assign current output 1 to n**

**Navigation**

Expert → Output → Curr.output 1 to n → Assign curr. 1 to n (0359–1 to n)

**Description**

Use this function to select a process variable for the current output.

*Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)*

**Selection**

- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1
- HBSI

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

### Current span

**Navigation**

Expert → Output → Curr.output 1 to n → Current span (0353–1 to n)

**Description**

Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.

**Selection**

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA
- Fixed current

**Factory setting**

Country-specific:

- 4...20 mA NAMUR
- 4...20 mA US

**Additional information**

**Description**

- In the event of a device alarm, the current output adopts the value specified in the Failure mode parameter (→ 121).
- If the measured value is outside the measuring range, the diagnostic message S441 Current output 1 to n is displayed.
- The measuring range is specified via the 0/4 mA value parameter (→ 111) and 20 mA value parameter (→ 113).

*Fixed current* option

- This option is used for a HART Multidrop network.
- It can only be used for the 4...20 mA HART current output (current output 1).
- The current value is set via the Fixed current parameter (→ 111).

**Example**

Shows the relationship between the current span for the output of the process variable and the lower and upper alarm levels:

![Diagram showing current span and alarm levels](image)

1. Current
2. Current span for process value
3. Lower level for signal on alarm
4. Upper level for signal on alarm

**Selection**

<table>
<thead>
<tr>
<th>Selection</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4...20 mA NAMUR</td>
<td>3.8 to 20.5 mA</td>
<td>&lt; 3.6 mA</td>
<td>&gt; 21.95 mA</td>
</tr>
<tr>
<td>4...20 mA US</td>
<td>3.9 to 20.8 mA US</td>
<td>&lt; 3.6 mA</td>
<td>&gt; 21.95 mA</td>
</tr>
</tbody>
</table>
If the flow exceeds or falls below the upper or lower signal on alarm level, the diagnostic message \textit{S441 Current output 1 to n} is displayed.

### Fixed current

**Navigation**

Expert → Output → Curr.output 1 to n → Fixed current (0365–1 to n)

**Prerequisite**

In the \textit{Current span} parameter (→ 110), the \textit{Fixed current} option is selected.

**Description**

Use this function to enter a constant current value for the current output.

**User entry**

0 to 22.5 mA

**Factory setting**

22.5 mA

### 0/4 mA value

**Navigation**

Expert → Output → Curr.output 1 to n → 0/4 mA value (0367–1 to n)

**Prerequisite**

One of the following options is selected in the \textit{Current span} parameter (→ 110):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

**Description**

Use this function to enter a value for the 0/4 mA current.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:
- 0 kg/h
- 0 lb/min

**Additional information**

\textit{Description}

Positive and negative values are permitted depending on the process variable assigned in the \textit{Assign current output} parameter (→ 109). In addition, the value can be greater
than or smaller than the value assigned for the 20 mA current in the **20 mA value** parameter (→ 113).

**Dependency**

The unit depends on the process variable selected in the **Assign current output** parameter (→ 109).

**Current output behavior**

The current output behaves differently depending on the settings configured in the following parameters:
- Current span (→ 110)
- Failure mode (→ 121)

**Configuration examples**

Some examples of parameter settings and their effect on the current output are given in the following section.

**Configuration example A**

Measuring mode with **Forward flow** option

- **0/4 mA value** parameter (→ 111) = not equal to zero flow (e.g. -250 m³/h)
- **20 mA value** parameter (→ 113) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow

![Graph showing current output behavior for Forward flow option](image)

Q: Flow  
I: Current  
1: Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ 111) and **20 mA value** parameter (→ 113). If the effective flow exceeds or falls below this operational range, the diagnostic message **S441 Current output 1 to n** is displayed.

**Configuration example B**

Measuring mode with **Forward/Reverse flow** option

![Graph showing current output behavior for Forward/Reverse flow option](image)

1: Current  
Q: Flow  
1: Value assigned to the 0/4 mA current  
2: Forward flow  
3: Reverse flow
The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the 0/4 mA value parameter (→ 111) and 20 mA value parameter (→ 113) must have the same sign. The value for the 20 mA value parameter (→ 113) (e.g. reverse flow) corresponds to the mirrored value for the 20 mA value parameter (→ 113) (e.g. forward flow).

**Configuration example C**

Measuring mode with **Reverse flow compensation** option

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → 114.

<table>
<thead>
<tr>
<th><strong>20 mA value</strong></th>
</tr>
</thead>
</table>

**Navigation**

Expert → Output → Curr.output 1 to n → 20 mA value (0372–1 to n)

**Prerequisite**

One of the following options is selected in the Current span parameter (→ 110):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

**Description**

Use this function to enter a value for the 20 mA current.

**User entry**

Signed floating-point number

**Factory setting**

Depends on country and nominal diameter → 252

**Additional information**

*Description*

Positive and negative values are permitted depending on the process variable assigned in the Assign current output parameter (→ 109). In addition, the value can be greater than or smaller than the value assigned for the 0/4 mA current in the 0/4 mA value parameter (→ 111).

**Dependency**

The unit depends on the process variable selected in the Assign current output parameter (→ 109).

**Example**

- Value assigned to 0/4 mA = -250 m³/h
- Value assigned to 20 mA = +750 m³/h
- Calculated current value = 8 mA (at zero flow)

If the Forward/Reverse flow option is selected in the Measuring mode parameter (→ 114), different signs cannot be entered for the values of the 0/4 mA value parameter (→ 111) and 20 mA value parameter (→ 113). The diagnostic message S441 Current output 1 to n is displayed.

**Configuration examples**

Observe the configuration examples for the 0/4 mA value parameter (→ 111).
Description of device parameters

Proline Promass 300 HART

Measuring mode

Navigation

Expert → Output → Curr.output 1 to n → Measuring mode (0351–1 to n)

Prerequisite

One of the following options is selected in the Assign current output parameter (→ 109):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation damping 0 *
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0 *
- Exciter current 1 *
- HBSI *

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

One of the following options is selected in the Current span parameter (→ 110):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

Description

Use this function to select the measuring mode for the current output.

Selection

- Forward flow
- Forward/Reverse flow
- Reverse flow compensation

Factory setting

Forward flow

* Visibility depends on order options or device settings
Additional information  

**Description**

The process variable that is assigned to the current output via the **Assign current output** parameter (→ 109) is displayed below the parameter.

"Forward flow" option

The current output signal is proportional to the process variable assigned. The measuring range is defined by the values that are assigned to the 0/4 mA and 20 mA current value. The flow components outside the scaled measuring range are taken into account for signal output as follows:

- Both values are defined such that they are not equal to zero flow e.g.:
  - 0/4 mA current value = –5 m³/h
  - 20 mA current value = 10 m³/h

- If the effective flow exceeds or falls below this measuring range, the diagnostic message △S441 Current output 1 to n is displayed.

"Forward/Reverse flow" option

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the 0/4 mA value parameter (→ 111) and 20 mA value parameter (→ 113) must have the same sign.

- The value for the 20 mA value parameter (→ 113) (e.g. reverse flow) corresponds to the mirrored value for the 20 mA value parameter (→ 113) (e.g. forward flow).

"Reverse flow compensation" option

The **Reverse flow compensation** option is primarily used to compensate for abrupt reverse flow which can occur in connection with positive displacement pumps as a result of wear or high viscosity. The reverse flows are recorded in a buffer and balanced against forward flow the next time flow is in the forward direction.

If buffering cannot be processed within approx. 60 s, the diagnostic message △S441 Current output 1 to n is displayed.

Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

If this option is set, the measuring device does not attenuate the flow signal. The flow signal is not attenuated.

**Examples of how the current output behaves**

**Example 1**

Defined measuring range: lower range value and upper range value with the **same** sign
2 Measuring range

1 Current
Q Flow
1 Lower range value (value assigned to 0/4 mA current)
2 Upper range value (value assigned to 20 mA current)

With the following flow response:

3 Flow response

Q Flow
t Time

With the Forward flow option

The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output.

With the Forward/Reverse flow option

The current output signal is independent of the direction of flow.

With the Reverse flow compensation option
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

\[
S = A
\]

1  Current
\( t \)  Time
S  Flow components saved
A  Balancing of saved flow components

**Example 2**

Defined measuring range: lower range value and upper range value with different signs

\[
\begin{align*}
I &\quad \text{Current} \\
Q &\quad \text{Flow} \\
1 &\quad \text{Lower range value (value assigned to 0/4 mA current)} \\
2 &\quad \text{Upper range value (value assigned to 20 mA current)}
\end{align*}
\]

With flow a (—) outside, b (- -) inside the measuring range

\[
Q
\]

1  Flow
\( t \)  Time
1  Lower range value (value assigned to 0/4 mA current)
2  Upper range value (value assigned to 20 mA current)

With the **Forward flow** option

- a (—): The flow components outside the scaled measuring range cannot be taken into account for signal output.
  The diagnostic message **S441 Current output 1 to n** is displayed.
- b (- -): The current output signal is proportional to the process variable assigned.
With the **Forward/Reverse flow** option

This option is not possible in this case as the values for the **0/4 mA value** parameter (→ 111) and **20 mA value** parameter (→ 113) have different signs.

With the **Reverse flow compensation** option

Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

---

**Damping output 1 to n**

---

**Navigation**

[Expert → Output → Curr.output 1 to n → Damping out. 1 to n (0363–1 to n)]

**Prerequisite**

One of the following options is selected in the **Assign current output** parameter (→ 109):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature

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

- Oscillation frequency 0
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- HBSI *

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

One of the following options is selected in the Current span parameter (→ 110):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

Description

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

User entry

0.0 to 999.9 s

Factory setting

1.0 s

Additional information

Use this function to enter a time constant (PT1 element 5) for current output damping:
- If a low time constant is entered, the current output reacts particularly quickly to fluctuating measured variables.
- On the other hand, the current output reacts more slowly if a high time constant is entered.

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

Response time

Navigation

Expert → Output → Curr.output 1 to n → Response time (0378–1 to n)

Prerequisite

One of the following options is selected in the Assign current output parameter (→ 109):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density

* Visibility depends on order options or device settings
5) Proportional transmission behavior with first order delay
• Reference density
• Concentration *
• Dynamic viscosity *
• Kinematic viscosity *
• Temp. compensated dynamic viscosity *
• Temp. compensated kinematic viscosity *
• Temperature
• Carrier pipe temperature *
• Electronic temperature
• Oscillation frequency 0 *
• Oscillation frequency 1 *
• Oscillation amplitude 0 *
• Oscillation amplitude 1 *
• Frequency fluctuation 0 *
• Frequency fluctuation 1 *
• Oscillation damping 0 *
• Oscillation damping 1 *
• Oscillation damping fluctuation 0 *
• Oscillation damping fluctuation 1 *
• Signal asymmetry
• Exciter current 0 *
• Exciter current 1 *
• HBSI *

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

One of the following options is selected in the Current span parameter (→ 110):
• 4...20 mA NAMUR
• 4...20 mA US
• 4...20 mA
• 0...20 mA

Description
Displays the response time. This specifies how quickly the current output reaches the measured value change of 63 % of 100 % of the measured value change.

User interface
Positive floating-point number

Additional information
Description

The response time is made up of the time specified for the following dampings:
• Current output damping (→ 118)
and
• Depending on the measured variable assigned to the output.
  – Flow damping
  or
  – Density damping
  or
  – Temperature damping

* Visibility depends on order options or device settings
Failure mode

Navigation

Expert → Output → Curr.output 1 to n → Failure mode (0364–1 to n)

Prerequisite

One of the following options is selected in the Assign current output parameter (→ 109):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1
- HBSI

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry. Value 1 display parameter (→ 18)

One of the following options is selected in the Current span parameter (→ 110):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

Description

Use this function to select the value of the current output in the event of a device alarm.

Selection

- Min.
- Max.
- Last valid value
- Actual value
- Defined value

Factory setting

Max.

* Visibility depends on order options or device settings
Additional information

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

**"Min." option**
The current output adopts the value of the lower level for signal on alarm.

The signal on alarm level is defined via the **Current span** parameter (→  110).

**"Max." option**
The current output adopts the value of the upper level for signal on alarm.

The signal on alarm level is defined via the **Current span** parameter (→  110).

**"Last valid value" option**
The current output adopts the last measured value that was valid before the device alarm occurred.

**"Actual value" option**
The current output adopts the measured value on the basis of the current flow measurement; the device alarm is ignored.

**"Defined value" option**
The current output adopts a defined measured value.

The measured value is defined via the **Failure current** parameter (→  122).

---

**Failure current**

**Navigation**

Expert → Output → Curr.output 1 to n → Failure current (0352–1 to n)

**Prerequisite**

In the **Failure mode** parameter (→  121), the **Defined value** option is selected.

**Description**

Use this function to enter a fixed value that the current output adopts in the event of a device alarm.

**User entry**

0 to 22.5 mA

**Factory setting**

22.5 mA

---

**Output current 1 to n**

**Navigation**

Expert → Output → Curr.output 1 to n → Output curr. 1 to n (0361–1 to n)

**Description**

Displays the current value currently calculated for the current output.

**User interface**

3.59 to 22.5 mA
Proline Promass 300 HART

Description of device parameters

Measured current 1 to n

Navigation

Expert → Output → Curr.output 1 to n → Measur. curr. 1 to n (0366–1 to n)

Description

Use this function to display the actual measured value of the output current.

User interface

0 to 30 mA

3.5.2 "Pulse/frequency/switch output 1 to n" submenu

Navigation

Expert → Output → PFS output 1 to n

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### Terminal number

**Navigation**

- Expert → Output → PFS output 1 to n → Terminal no. (0492–1 to n)

**Description**

Displays the terminal numbers used by the pulse/frequency/switch output module.

**User interface**

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)
**Signal mode**

**Navigation**
Expert → Output → PFS output 1 to n → Signal mode (0490–1 to n)

**Description**
Use this function to select the signal mode for the pulse/frequency/switch output.

**Selection**
- Passive
- Active

**Factory setting**
Passive

**Operating mode**

**Navigation**
Expert → Output → PFS output 1 to n → Operating mode (0469–1 to n)

**Description**
Use this function to select the operating mode of the output as a pulse, frequency or switch output.

**Selection**
- Pulse
- Frequency
- Switch

**Factory setting**
Pulse

**Additional information**

*Pulse* option
Quantity-dependent pulse with configurable pulse width
- Whenever a specific mass, volume, corrected volume, target mass or carrier mass is reached (pulse value), a pulse is output, the duration of which was set previously (pulse width).
- The pulses are never shorter than the set duration.

**Example**
- Flow rate approx. 100 g/s
- Pulse value 0.1 g
- Pulse width 0.05 ms
- Pulse rate 1000 Impuls/s
Proline Promass 300 HART

Description of device parameters

**5** Quantity-proportional pulse (pulse value) with pulse width to be configured

- **B** Pulse width entered
- **P** Pauses between the individual pulses

"Frequency" option

Flow-proportional frequency output with 1:1 on/off ratio

An output frequency is output that is proportional to the value of a process variable, such as mass flow, volume flow, corrected volume flow, target mass flow, carrier mass flow, density, reference density, concentration, dynamic viscosity, kinematic viscosity, temperature-compensated dynamic viscosity, temperature-compensated kinematic viscosity, temperature, carrier tube temperature, electronic temperature, vibration frequency, frequency fluctuation, oscillation amplitude, oscillation damping, oscillation damping fluctuation, signal asymmetry or excitation current.

Example
- Flow rate approx. 100 g/s
- Max. frequency 10 kHz
- Flow rate at max. frequency 1000 g/s
- Output frequency approx. 1000 Hz

**6** Flow-proportional frequency output

"Switch" option

Contact for displaying a condition (e.g. alarm or warning if a limit value is reached)

Example
- Alarm response without alarm

**7** No alarm, high level

Example
- Alarm response in case of alarm
Assign pulse output 1 to n

**Navigation**

Expert → Output → PFS output 1 to n → Assign pulse 1 to n (0460–1 to n)

**Prerequisite**

In the Operating mode parameter (→ 125), the Pulse option is selected.

**Description**

Use this function to select the process variable for the pulse output.

**Selection**

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

**Factory setting**

Off

Value per pulse

**Navigation**

Expert → Output → PFS output 1 to n → Value per pulse (0455–1 to n)

**Prerequisite**

In the Operating mode parameter (→ 125), the Pulse option is selected and one of the following options is selected in the Assign pulse output parameter (→ 127):

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

**Description**

Use this function to enter the value for the measured value that a pulse is equivalent to.

**User entry**

Signed floating-point number

**Factory setting**

Depends on country and nominal diameter → 253

**Additional information**

User entry

Weighting of the pulse output with a quantity.

* Visibility depends on order options or device settings
The lower the pulse value, the
- better the resolution.
- the higher the frequency of the pulse response.

**Pulse width**

**Navigation**
Expert → Output → PFS output 1 to n → Pulse width (0452–1 to n)

**Prerequisite**
In the Operating mode parameter (→ 125), the Pulse option is selected and one of the following options is selected in the Assign pulse output parameter (→ 127):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**
Use this function to enter the duration of the output pulse.

**User entry**
0.05 to 2 000 ms

**Factory setting**
100 ms

**Additional information**
*Define how long a pulse is (duration).*
*The maximum pulse rate is defined by $f_{\text{max}} = 1 / (2 \times \text{pulse width})$.*
*The interval between two pulses lasts at least as long as the set pulse width.*
*The maximum flow is defined by $Q_{\text{max}} = f_{\text{max}} \times \text{pulse value}$. *
*If the flow exceeds these limit values, the measuring device displays the diagnostic message Δ.S443 Pulse output 1 to n.*

---

**Example**
- Pulse value: 0.1 g
- Pulse width: 0.1 ms
- $f_{\text{max}}$: $1 / (2 \times 0.1 \text{ ms}) = 5 \text{ kHz}$
- $Q_{\text{max}}$: $5 \text{ kHz} \times 0.1 \text{ g} = 0.5 \text{ kg/s}$

* Visibility depends on order options or device settings
**Measuring mode**

**Navigation**  
Expert → Output → PFS output 1 to n → Measuring mode (0457–1 to n)

**Prerequisite**  
In the Operating mode parameter (→ 125), the Pulse option is selected and one of the following options is selected in the Assign pulse output parameter (→ 127):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**  
Use this function to select the measuring mode for the pulse output.

**Selection**  
- Forward flow
- Forward/Reverse flow
- Reverse flow
- Reverse flow compensation

**Factory setting**  
Forward flow

**Additional information**  
**Selection**
- Forward flow
  Positive flow is output, negative flow is not output.
- Forward/Reverse flow
  Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.
- Reverse flow
  Negative flow is output, positive flow is not output.
- Reverse flow compensation
  The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

For a detailed description of the options available, see the Measuring mode parameter (→ 114)

**Examples**

For a detailed description of the configuration examples, see the Measuring mode parameter (→ 114)

---

**Failure mode**

**Navigation**  
Expert → Output → PFS output 1 to n → Failure mode (0480–1 to n)

**Prerequisite**  
In the Operating mode parameter (→ 125), the Pulse option is selected and one of the following options is selected in the Assign pulse output parameter (→ 127):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

* Visibility depends on order options or device settings
Description
Use this function to select the failure mode of the pulse output in the event of a device alarm.

Selection
- Actual value
- No pulses

Factory setting
No pulses

Additional information
Description
The dictates of safety render it advisable to ensure that the pulse output shows a predefined behavior in the event of a device alarm.

Selection
- Actual value
  In the event of a device alarm, the pulse output continues on the basis of the current flow measurement. The fault is ignored.
- No pulses
  In the event of a device alarm, the pulse output is "switched off".

NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The Actual value option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Pulse output 1 to n

Navigation
Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)

Prerequisite
In the Operating mode parameter (→ 125), the Pulse option is selected.

Description
Displays the pulse frequency currently output.

User interface
Positive floating-point number

Additional information
Description
- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.

The output behavior can be reversed via the Invert output signal parameter (→ 148)
i.e. the transistor does not conduct for the duration of the pulse.
In addition, the behavior of the output in the event of a device alarm (Failure mode parameter (→ 129)) can be configured.

Assign frequency output

Navigation  
Expert → Output → PFS output 1 to n → Assign freq. (0478–1 to n)

Prerequisite  
In the Operating mode parameter (→ 125), the Frequency option is selected.

Description  
Use this function to select the process variable for the frequency output.

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Selection  
- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

Factory setting  
Off

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

**Minimum frequency value**

**Navigation**

[Expert → Output → PFS output 1 to n → Min. freq. value (0453–1 to n)]

**Prerequisite**

In the [Operating mode](#) parameter (→ 125), the [Frequency](#) option is selected and one of the following options is selected in the [Assign frequency output](#) parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

* Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

**Description**

Use this function to enter the start value frequency.

**User entry**

0.0 to 10000.0 Hz

**Factory setting**

0.0 Hz

* Visibility depends on order options or device settings
Maximum frequency value

**Navigation**

Expert → Output → PFS output 1 to n → Max. freq. value (0454–1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 125), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow*
- Carrier mass flow*
- Density
- Reference density
- Concentration*
- Dynamic viscosity*
- Kinematic viscosity*
- Temp. compensated dynamic viscosity*
- Temp. compensated kinematic viscosity*
- Temperature
- Carrier pipe temperature*
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1*
- Frequency fluctuation 0
- Frequency fluctuation 1*
- Oscillation amplitude 0*
- Oscillation amplitude 1*
- Oscillation damping 0
- Oscillation damping 1*
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1*
- Signal asymmetry
- Exciter current 0
- Exciter current 1*

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

**Description**

Use this function to enter the end value frequency.

**User entry**

0.0 to 10000.0 Hz

**Factory setting**

10000.0 Hz

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

Proline Promass 300 HART

Measuring value at minimum frequency

Navigation

Expert → Output → PFS output 1 to n → Val. at min.freq (0476–1 to n)

Prerequisite

In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Description

Use this function to enter the measured value for the start value frequency.

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Dependency

The entry depends on the process variable selected in the Assign frequency output parameter (→ 131).

* Visibility depends on order options or device settings
### Measuring value at maximum frequency

**Navigation**

Expert → Output → PFS output 1 to n → Val. at max. freq (0475–1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 125), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

* Visibility depends on order options or device settings

**Description**

Use this function to enter the measured value for the end value frequency.

**User entry**

Signed floating-point number

**Factory setting**

Depends on country and nominal diameter

**Additional information**

Description

Use this function to enter the maximum measured value at the maximum frequency. The selected process variable is output as a proportional frequency.

**Dependency**

The entry depends on the process variable selected in the **Assign frequency output** parameter (→ 131).
Measuring mode

Navigation

Expert → Output → PFS output 1 to n → Measuring mode (0479–1 to n)

Prerequisite

In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Description

Use this function to select the measuring mode for the frequency output.

Selection

- Forward flow
- Forward/Reverse flow
- Reverse flow compensation

Factory setting

Forward flow

Additional information

Selection

For a detailed description of the options available, see the Measuring mode parameter (→ 114)

Examples

For a detailed description of the configuration examples, see the Measuring mode parameter (→ 114)

* Visibility depends on order options or device settings
Damping output 1 to n

Navigation

Expert → Output → PFS output 1 to n → Damping out. 1 to n (0477–1 to n)

Prerequisite

In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Description

Use this function to enter a time constant for the reaction time of the output signal to fluctuations in the measured value.

User entry

0 to 999.9 s

Factory setting

0.0 s

Additional information

Use this function to enter a time constant (PT1 element 6) for frequency output damping:

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

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

* Visibility depends on order options or device settings
6) Proportional transmission behavior with first order delay
The frequency output is subject to separate damping that is independent of all preceding time constants.

### Response time

#### Navigation

Expert → Output → PFS output 1 to n → Response time (0491–1 to n)

#### Prerequisite

In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

#### Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter

#### Description

Displays the response time. This specifies how quickly the pulse/frequency/switch output reaches the measured value change of 63 % of 100 % of the measured value change.

#### User interface

Positive floating-point number

* Visibility depends on order options or device settings
Additional information

Description

The response time is made up of the time specified for the following dampings:

- Damping of pulse/frequency/switch output → 118 and
- Depending on the measured variable assigned to the output.
  - Flow damping
  or
  - Density damping
  or
  - Temperature damping

Failure mode

Navigation

Expert → Output → PFS output 1 to n → Failure mode (0451–1 to n)

Prerequisite

In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Carrier pipe temperature
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1
- Frequency fluctuation 0
- Frequency fluctuation 1
- Oscillation amplitude 0
- Oscillation amplitude 1
- Oscillation damping 0
- Oscillation damping 1
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1
- Signal asymmetry
- Exciter current 0
- Exciter current 1

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Description

Use this function to select the failure mode of the frequency output in the event of a device alarm.

* Visibility depends on order options or device settings
Selection
- Actual value
- Defined value
- 0 Hz

Factory setting
0 Hz

Additional information
Selection
- Actual value
  In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored.
- Defined value
  In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure frequency (→ 140) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm.
- 0 Hz
  In the event of a device alarm, the frequency output is "switched off".

NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The Actual value option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Failure frequency

Navigation
Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)

Prerequisite
In the Operating mode parameter (→ 125), the Frequency option is selected and one of the following options is selected in the Assign frequency output parameter (→ 131):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow*
- Carrier mass flow*
- Density
- Reference density
- Concentration*
- Dynamic viscosity*
- Kinematic viscosity*
- Temp. compensated dynamic viscosity*
- Temp. compensated kinematic viscosity*
- Temperature
- Carrier pipe temperature*
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1*
- Frequency fluctuation 0
- Frequency fluctuation 1*
- Oscillation amplitude 0*
- Oscillation amplitude 1*
- Oscillation damping 0
- Oscillation damping 1*

* Visibility depends on order options or device settings
• Oscillation damping fluctuation 0
• Oscillation damping fluctuation 1 *
• Signal asymmetry
• Exciter current 0
• Exciter current 1 *

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

Description
Use this function to enter the value for the frequency output in the event of a device alarm in order to bypass the alarm.

User entry
0.0 to 12 500.0 Hz

Factory setting
0.0 Hz

Output frequency 1 to n

Navigation
Expert → Output → PFS output 1 to n → Output freq. 1 to n (0471–1 to n)

Prerequisite
In the Operating mode parameter (→ 125), the Frequency option is selected.

Description
Displays the actual value of the output frequency which is currently measured.

User interface
0.0 to 12 500.0 Hz

Switch output function

Navigation
Expert → Output → PFS output 1 to n → Switch out funct (0481–1 to n)

Prerequisite
In the Operating mode parameter (→ 125) the Switch option is selected.

Description
Use this function to select a function for the switch output.

Selection
• Off
• On
• Diagnostic behavior
• Limit
• Flow direction check
• Status

Factory setting
Off

* Visibility depends on order options or device settings
### Additional information

**Selection**

- **Off**
  The switch output is permanently switched off (open, non-conductive).
- **On**
  The switch output is permanently switched on (closed, conductive).
- **Diagnostic behavior**
  Indicates if the diagnostic event is present or not. Is used to output diagnostic information and to react to it appropriately at the system level.
- **Limit**
  Indicates if a specified limit value has been reached for the process variable. Is used to output diagnostic information relating to the process and to react to it appropriately at the system level.
- **Flow direction check**
  Indicates the flow direction (forward or reverse flow).
- **Status**
  Indicates the device status depending on whether empty pipe detection or low flow cutoff is selected.

### Assign diagnostic behavior

**Navigation**

Expert → Output → PFS output 1 to n → Assign diag. beh (0482–1 to n)

**Prerequisite**

- In the **Operating mode** parameter (→ 125), the **Switch** option is selected.
- In the **Switch output function** parameter (→ 141), the **Diagnostic behavior** option is selected.

**Description**

Use this function to select the diagnostic event category that is displayed for the switch output.

**Selection**

- **Alarm**
- **Alarm or warning**
- **Warning**

**Factory setting**

Alarm

**Additional information**

**Description**

If no diagnostic event is pending, the switch output is closed and conductive.

**Selection**

- **Alarm**
  The switch output signals only diagnostic events in the alarm category.
- **Alarm or warning**
  The switch output signals diagnostic events in the alarm and warning category.
- **Warning**
  The switch output signals only diagnostic events in the warning category.
Assign limit

**Navigation**

Expert → Output → PFS output 1 to n → Assign limit (0483–1 to n)

**Prerequisite**

- In the **Operating mode** parameter (→ 125), the **Switch** option is selected.
- In the **Switch output function** parameter (→ 141), the **Limit** option is selected.

**Description**

Use this function to select a process variable for the limit function.

**Selection**

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Dynamic viscosity *
- Concentration *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Oscillation damping

**Factory setting**

Mass flow

**Additional information**

**Description**

Behavior of status output when Switch-on value > Switch-off value:

- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive

* Visibility depends on order options or device settings
Behavior of status output when Switch-on value < Switch-off value:
- Process variable < Switch-on value: transistor is conductive
- Process variable > Switch-off value: transistor is non-conductive

Behavior of status output when Switch-on value = Switch-off value:
- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive

Switch-on value

Navigation
Expert → Output → PFS output 1 to n → Switch-on value (0466–1 to n)

Prerequisite
- In the Operating mode parameter (→ 125), the Switch option is selected.
- In the Switch output function parameter (→ 141), the Limit option is selected.

Description
Use this function to enter the measured value for the switch-on point.

User entry
Signed floating-point number
**Factory setting**

Country-specific:
- 0 kg/h
- 0 lb/min

**Additional information**

*Description*

Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).

- When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

- The unit depends on the process variable selected in the **Assign limit** parameter (→ 143).

---

**Switch-off value**

**Navigation**

Expert → Output → PFS output 1 to n → Switch-off value (0464–1 to n)

**Prerequisite**

- In the **Operating mode** parameter (→ 125), the **Switch** option is selected.
- In the **Switch output function** parameter (→ 141), the **Limit** option is selected.

**Description**

Use this function to enter the measured value for the switch-off point.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:
- 0 kg/h
- 0 lb/min

**Additional information**

*Description*

Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).

- When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

- The unit depends on the process variable selected in the **Assign limit** parameter (→ 143).

---

**Assign flow direction check**

**Navigation**

Expert → Output → PFS output 1 to n → Assign dir.check (0484–1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ 125).
- The **Flow direction check** option is selected in the **Switch output function** parameter (→ 141).

**Description**

Use this function to select a process variable for monitoring the flow direction.
Selection

- Off
- Volume flow
- Mass flow
- Corrected volume flow

Factory setting
Mass flow

Assign status

Navigation

Expert → Output → PFS output 1 to n → Assign status (0485–1 to n)

Prerequisite

- The Switch option is selected in the Operating mode parameter (→ 125).
- The Status option is selected in the Switch output function parameter (→ 141).

Description
Use this function to select a device status for the switch output.

Selection

- Partially filled pipe detection
- Low flow cut off

Factory setting
Partially filled pipe detection

Additional information

Options
If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.

Switch-on delay

Navigation

Expert → Output → PFS output 1 to n → Switch-on delay (0467–1 to n)

Prerequisite

- The Switch option is selected in the Operating mode parameter (→ 125).
- The Limit option is selected in the Switch output function parameter (→ 141).

Description
Use this function to enter a delay time for switching on the switch output.

User entry
0.0 to 100.0 s

Factory setting
0.0 s

Switch-off delay

Navigation

Expert → Output → PFS output 1 to n → Switch-off delay (0465–1 to n)

Prerequisite

- The Switch option is selected in the Operating mode parameter (→ 125).
- The Limit option is selected in the Switch output function parameter (→ 141).

Description
Use this function to enter a delay time for switching off the switch output.
**Failure mode**

**Navigation**

Expert → Output → PFS output 1 to n → Failure mode (0486–1 to n)

**Description**
Use this function to select a failsafe mode for the switch output in the event of a device alarm.

**Selection**
- Actual status
- Open
- Closed

**Factory setting**
Open

**Additional information**

*Options*
- Actual status
  In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the switch output. The Actual status option behaves in the same way as the current input value.
- Open
  In the event of a device alarm, the switch output's transistor is set to **non-conductive**.
- Closed
  In the event of a device alarm, the switch output's transistor is set to **conductive**.

**Switch status 1 to n**

**Navigation**

Expert → Output → PFS output 1 to n → Switch status 1 to n (0461–1 to n)

**Prerequisite**
The **Switch** option is selected in the **Operating mode** parameter (→ 125).

**Description**
Displays the current switch status of the status output.

**User interface**
- Open
- Closed

**Additional information**

*User interface*
- Open
  The switch output is not conductive.
- Closed
  The switch output is conductive.
Description of device parameters

Proline Promass 300 HART

Invert output signal

**Navigation**

Expert → Output → PFS output 1 to n → Invert outp.sig. (0470–1 to n)

**Description**

Use this function to select whether to invert the output signal.

**Selection**

- No
- Yes

**Factory setting**

No

**Additional information**

*Selection*

No option (passive - negative)

![Diagram showing no option (passive - negative)](image)

Yes option (passive - positive)

![Diagram showing yes option (passive - positive)](image)

### 3.5.3 "Relay output 1 to n" submenu

**Navigation**

Expert → Output → Relay output 1 to n

**Relay output 1 to n**

- Terminal number
- Relay output function
- Assign flow direction check
- Assign limit
- Assign diagnostic behavior
- Assign status
- Switch-off value

![Diagram showing relay output 1 to n options](image)
Terminal number

Navigation

Expert → Output → Relay output 1 to n → Terminal no. (0812–1 to n)

Description
Displays the terminal numbers used by the relay output module.

User interface
- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

Additional information
"Not used" option
The relay output module does not use any terminal numbers.

Relay output function

Navigation

Expert → Output → Relay output 1 to n → Relay outp.func. (0804–1 to n)

Description
Use this function to select an output function for the relay output.

Selection
- Closed
- Open
- Diagnostic behavior
- Limit
- Flow direction check
- Digital Output

Factory setting
Closed
**Additional information**

*Selection*

- **Closed**
  The relay output is permanently switched on (closed, conductive).
- **Open**
  The relay output is permanently switched off (open, non-conductive).
- **Diagnostic behavior**
  Indicates if the diagnostic event is present or not. Is used to output diagnostic information and to react to it appropriately at the system level.
- **Limit**
  Indicates if a specified limit value has been reached for the process variable. Is used to output diagnostic information relating to the process and to react to it appropriately at the system level.
- **Flow direction check**
  Indicates the flow direction (forward or reverse flow).
- **Digital Output**
  Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.

---

**Assign flow direction check**

**Navigation**

[Expert → Output → Relay output 1 to n → Assign dir.check (0808–1 to n)]

**Prerequisite**

In the **Relay output function** parameter (→ 149), the **Flow direction check** option is selected.

**Description**

Use this function to select a process variable for monitoring the flow direction.

**Selection**

- Off
- Volume flow
- Mass flow
- Corrected volume flow

**Factory setting**

Mass flow

---

**Assign limit**

**Navigation**

[Expert → Output → Relay output 1 to n → Assign limit (0807–1 to n)]

**Prerequisite**

In the **Relay output function** parameter (→ 149), the **Limit** option is selected.

**Description**

Use this function to select a process variable for the limit value function.

**Selection**

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

* Visibility depends on order options or device settings
• Reference density
• Dynamic viscosity *
• Concentration
• Kinematic viscosity *
• Temp. compensated dynamic viscosity *
• Temp. compensated kinematic viscosity *
• Temperature
• Totalizer 1
• Totalizer 2
• Totalizer 3
• Oscillation damping

**Factory setting**  
Mass flow

### Assign diagnostic behavior

**Navigation**  
Expert → Output → Relay output 1 to n → Assign diag. beh (0806–1 to n)

**Prerequisite**  
In the **Relay output function** parameter (→ 149), the **Diagnostic behavior** option is selected.

**Description**  
Use this function to select the category of the diagnostic events that are displayed for the relay output.

**Selection**  
- Alarm
- Alarm or warning
- Warning

**Factory setting**  
Alarm

**Additional information**  
*Description*

If no diagnostic event is pending, the relay output is closed and conductive.

**Selection**  
- Alarm
  The relay output signals only diagnostic events in the alarm category.
- Alarm or warning
  The relay output signals diagnostic events in the alarm and warning category.
- Warning
  The relay output signals only diagnostic events in the warning category.

### Assign status

**Navigation**  
Expert → Output → Relay output 1 to n → Assign status (0805–1 to n)

**Prerequisite**  
In the **Relay output function** parameter (→ 149), the **Digital Output** option is selected.

* Visibility depends on order options or device settings
Description

Use this function to select the device status for the relay output.

Selection

- Partially filled pipe detection
- Low flow cut off

Factory setting

Partially filled pipe detection

---

Switch-off value

**Navigation**

Expert → Output → Relay output 1 to n → Switch-off value (0809–1 to n)

**Prerequisite**

In the Relay output function parameter (→ 149), the Limit option is selected.

**Description**

Use this function to enter the measured value for the switch-off point.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:
- 0 kg/h
- 0 lb/min

**Additional information**

*Description*

Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).

When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

The unit is dependent on the process variable selected in the Assign limit parameter (→ 150).

---

Switch-off delay

**Navigation**

Expert → Output → Relay output 1 to n → Switch-off delay (0813–1 to n)

**Prerequisite**

In the Relay output function parameter (→ 149), the Limit option is selected.

**Description**

Use this function to enter a delay time for switching off the switch output.

**User entry**

0.0 to 100.0 s

**Factory setting**

0.0 s
**Switch-on value**

**Navigation**  
Expert → Output → Relay output 1 to n → Switch-on value (0810–1 to n)

**Prerequisite**  
In the **Relay output function** parameter (→ 149), the **Limit** option is selected.

**Description**  
Use this function to enter the measured value for the switch-on point.

**User entry**  
Signed floating-point number

**Factory setting**  
Country-specific:
- 0 kg/h
- 0 lb/min

**Additional information**  
*Description*
Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).

*When using a hysteresis: Switch-on value > Switch-off value.*

*Dependency*
The unit is dependent on the process variable selected in the **Assign limit** parameter (→ 150).

---

**Switch-on delay**

**Navigation**  
Expert → Output → Relay output 1 to n → Switch-on delay (0814–1 to n)

**Prerequisite**  
In the **Relay output function** parameter (→ 149), the **Limit** option is selected.

**Description**  
Use this function to enter a delay time for switching on the switch output.

**User entry**  
0.0 to 100.0 s

**Factory setting**  
0.0 s

---

**Failure mode**

**Navigation**  
Expert → Output → Relay output 1 to n → Failure mode (0811–1 to n)

**Description**  
Use this function to select the failure mode of the relay output in the event of a device alarm.

**Selection**  
- Actual status
- Open
- Closed

**Factory setting**  
Open
Description of device parameters

**Additional information**

*Selection*

- **Actual status**
  In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the relay output. The **Actual status** option behaves in the same way as the current input value.
- **Open**
  In the event of a device alarm, the relay output's transistor is set to **non-conductive**.
- **Closed**
  In the event of a device alarm, the relay output's transistor is set to **conductive**.

**Switch status**

**Navigation**

Expert → Output → Relay output 1 to n → Switch status (0801–1 to n)

**Description**

Displays the current status of the relay output.

**User interface**

- **Open**
- **Closed**

**Additional information**

*User interface*

- **Open**
  The relay output is not conductive.
- **Closed**
  The relay output is conductive.

**Actual relay state**

**Navigation**

Expert → Output → Relay output 1 to n → Act. relay state (0816–1 to n)

**Description**

Use this function to select the quiescent state for the relay output.

**Selection**

- **Open**
- **Closed**

**Factory setting**

**Open**

**Additional information**

*Selection*

- **Open**
  The relay output is not conductive.
- **Closed**
  The relay output is conductive.
3.5.4 "Double pulse output" submenu

Navigation Expert → Output → Double pulse out

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Master terminal number

Navigation Expert → Output → Double pulse out → Master term. no. (0981)

Description Displays the master terminal number for the double pulse output.

User interface
- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

Additional information

"Not used" option
The double pulse output does not use any terminal numbers.

Slave terminal number

Navigation Expert → Output → Double pulse out → Slave term. no. (0990)

Description Displays the slave terminal number for the double pulse output.
Description of device parameters

User interface

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

Additional information

"Not used" option

The double pulse output does not use any terminal numbers.

Signal mode

Navigation

Expert → Output → Double pulse out → Signal mode (0991)

Description

Use this function to select the signal mode for the double pulse output.

Selection

- Passive
- Active
- Passive NAMUR

Factory setting

Passive

Assign pulse output 1

Navigation

Expert → Output → Double pulse out → Assign pulse 1 (0982–1)

Description

Use this function to select a process variable for the double pulse output.

Selection

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

Factory setting

Off

Value per pulse

Navigation

Expert → Output → Double pulse out → Value per pulse (0983)

Description

Use this function to enter the value for the measured value that a pulse is equivalent to.

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter → 253

* Visibility depends on order options or device settings
Additional information

User entry

Weighting of the pulse output with a quantity.
The lower the pulse value, the
• better the resolution.
• the higher the frequency of the pulse response.

Pulse width

Navigation

Expert → Output → Double pulse out → Pulse width (0986)

Description

Use this function to enter the duration of the output pulse.

User entry

0.5 to 2 000 ms

Factory setting

0.5 ms

Additional information

For a detailed description and example: Pulse width parameter (→ 128)

Phase shift

Navigation

Expert → Output → Double pulse out → Phase shift (0992)

Description

Use this function to select the degree of phase shift.

Selection

• 90°
• 180°

Factory setting

90°

Additional information

Selection

• 90°
  Phase shift by a quarter period.
• 180°
  Phase shift by a half period, which is equivalent to a phase reversal.

Measuring mode

Navigation

Expert → Output → Double pulse out → Measuring mode (0984)

Description

Use this function to select the measuring mode for the double pulse output.

Selection

• Forward flow
• Forward/Reverse flow
• Reverse flow
• Reverse flow compensation
**Factory setting**

Forward flow

**Additional information**

*Selection*

- Forward flow
  - Positive flow is output, negative flow is not output.
- Forward/Reverse flow
  - Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.
- Reverse flow
  - Negative flow is output, positive flow is not output.
- Reverse flow compensation
  - The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

For a detailed description of the options available, see the **Measuring mode** parameter (→ 114)

*Examples*

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 114)

---

**Failure mode**

**Navigation**

Expert → Output → Double pulse out → Failure mode (0985)

**Description**

Use this function to select the failure mode of the double pulse output in the event of a device alarm.

**Selection**

- Actual value
- No pulses

**Factory setting**

No pulses

**Additional information**

*Description*

The dictates of safety render it advisable to ensure that the double pulse output shows a predefined behavior in the event of a device alarm.

*Selection*

- Actual value
  - In the event of a device alarm, the double pulse output continues on the basis of the current flow measurement. The fault is ignored.
- No pulses
  - In the event of a device alarm, the double pulse output is "switched off".

**NOTICE!** A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The **Actual value** option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.
**Pulse output**

**Navigation**

Expert → Output → Double pulse out → Pulse output (0987)

**Description**

Displays the pulse frequency of the double pulse output which is currently output.

**User interface**

Positive floating-point number

**Additional information**

For a detailed description and example: Pulse output parameter (→ 130)

---

**Invert output signal**

**Navigation**

Expert → Output → Double pulse out → Invert outp.sig. (0993)

**Description**

Use this function to select whether to invert the output signal.

**Selection**

- No
- Yes

**Factory setting**

No

**Additional information**

Selection

No option (passive - negative)

![Diagram of No option](A0026693)

Yes option (passive - positive)

![Diagram of Yes option](A0026692)

---

**3.6 "Communication" submenu**

**Navigation**

Expert → Communication

![Diagram of Communication submenu](A0026691)
Description of device parameters

3.6.1 "HART input" submenu

**Navigation**

Expert → Communication → HART input

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"Configuration" submenu

**Navigation**

Expert → Communication → HART input → Configuration

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Capture mode

Navigation

Expert → Communication → HART input → Configuration → Capture mode (7001)

Description

Use this function to select the capture mode via burst or master communication.

Selection

- Off
- Burst network
- Master network

Factory setting

Off

Additional information

'Burst network' option

The device records data transmitted via burst in the network.

An external pressure sensor must be in the burst mode.

'Master network' option

In this case, the device must be located in a HART network in which a HART master (control) queries the measured values of the up to 64 network participants. The device reacts only to the responses of a specific device in the network. Device ID, device type, manufacturer ID and the HART commands used by the master must be defined.

Device ID

Navigation

Expert → Communication → HART input → Configuration → Device ID (7007)

Prerequisite

The Master network option is selected in the Capture mode parameter (→ 161).

Description

Use this function to enter the device ID of the HART slave device whose data are to be recorded.

User entry

6-digit value:
- Via local operation: enter as hexadecimal or decimal number
- Via operating tool: enter as decimal number

Factory setting

0

Additional information

In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Device type

Navigation

Expert → Communication → HART input → Configuration → Device type (7008)

Prerequisite

In the Capture mode parameter (→ 161), the Master network option is selected.
**Description**

Use this function to enter the device type of the HART slave device whose data are to be recorded.

**User entry**  
2-digit hexadecimal number

**Factory setting**  
0x00

**Additional information**

In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

---

### Manufacturer ID

**Navigation**

Expert → Communication → HART input → Configuration → Manufacturer ID (7009)

**Prerequisite**

The **Master network** option is selected in the **Capture mode** parameter (→ 161).

**Description**

Use this function to enter the manufacturer ID of the HART slave device whose data are to be recorded.

**User entry**  
2-digit value:
- Via local operation: enter as hexadecimal or decimal number
- Via operating tool: enter as decimal number

**Factory setting**  
0

**Additional information**

In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

---

### Burst command

**Navigation**

Expert → Communication → HART input → Configuration → Burst command (7006)

**Prerequisite**

The **Burst network** option or the **Master network** option are selected in the **Capture mode** parameter (→ 161).

**Description**

Use this function to select the burst command to be recorded.

**Selection**

- Command 1
- Command 3
- Command 9
- Command 33

**Factory setting**  
Command 1
Additional information

Selection

- Command 1
  Use this function to capture the primary variable.
- Command 3
  Use this function to capture the dynamic HART variables and the current.
- Command 9
  Use this function to capture the dynamic HART variables including the associated status.
- Command 33
  Use this function to capture the dynamic HART variables including the associated unit.

Slot number

Navigation

Expert → Communication → HART input → Configuration → Slot number (7010)

Prerequisite

The Burst network option or the Master network option is selected in the Capture mode parameter (→ 161).

Description

Use this function to enter the position of the process variable to be recorded in the burst command.

User entry

1 to 8

Factory setting

1

Additional information

User entry

<table>
<thead>
<tr>
<th>Slot</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 3 9 33</td>
</tr>
<tr>
<td>1</td>
<td>PV PV HART variable (slot 1) HART variable (slot 1)</td>
</tr>
<tr>
<td>2</td>
<td>– SV HART variable (slot 2) HART variable (slot 2)</td>
</tr>
<tr>
<td>3</td>
<td>– TV HART variable (slot 3) HART variable (slot 3)</td>
</tr>
<tr>
<td>4</td>
<td>– QV HART variable (slot 4) HART variable (slot 4)</td>
</tr>
<tr>
<td>5</td>
<td>– – HART variable (slot 5) –</td>
</tr>
<tr>
<td>6</td>
<td>– – HART variable (slot 6) –</td>
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<tr>
<td>7</td>
<td>– – HART variable (slot 7) –</td>
</tr>
<tr>
<td>8</td>
<td>– – HART variable (slot 8) –</td>
</tr>
</tbody>
</table>

Timeout

Navigation

Expert → Communication → HART input → Configuration → Timeout (7005)

Prerequisite

The Burst network option or the Master network option is selected in the Capture mode parameter (→ 161).

Description

Use this function to enter the maximum permitted interval between two HART frames.

User entry

1 to 120 s
### Description of device parameters

#### Factory setting

5 s

#### Additional information

*Description*

*If the interval is exceeded, the measuring device displays the diagnostic message **F882 Input signal.***

---

#### Failure mode

**Navigation**

Expert → Communication → HART input → Configuration → Failure mode (7011)

**Prerequisite**

In the **Capture mode** parameter (→ 161), the **Burst network** option or **Master network** option is selected.

**Description**

Use this function to select the device behavior if no data are recorded within the maximum permitted interval.

**Selection**

- Alarm
- Last valid value
- Defined value

**Factory setting**

Alarm

**Additional information**

*Options*

- **Alarm**
  An error message is set.
- **Last valid value**
  The last valid measured value is used.
- **Defined value**
  A user-defined measured value is used: (**Failure value** parameter (→ 164)).

---

#### Failure value

**Navigation**

Expert → Communication → HART input → Configuration → Failure value (7012)

**Prerequisite**

The following conditions are met:

- In the **Capture mode** parameter (→ 161), the **Burst network** option or **Master network** option is selected.
- In the **Failure mode** parameter (→ 164), the **Defined value** option is selected.

**Description**

Use this function to enter the measured value to be used if no data are recorded within the maximum permitted interval.

**User entry**

Signed floating-point number

**Factory setting**

0
"Input" submenu

**Navigation**

Expert → Communication → HART input → Input

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
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<tr>
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<td>165</td>
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<tr>
<td>Status (7004)</td>
<td>165</td>
</tr>
</tbody>
</table>

**Value**

**Navigation**

Expert → Communication → HART input → Input → Value (7003)

**Description**
Displays the value of the device variable recorded by the HART input.

**User interface**

-273.15 to 99 726.8499 °C

**Additional information**

**Dependency**

The unit is taken from the Temperature unit parameter (→ 67)

**Status**

**Navigation**

Expert → Communication → HART input → Input → Status (7004)

**Description**
Displays the value of the device variable recorded by the HART input in accordance with the HART specification.

**User interface**

- Manual/Fixed
- Good
- Poor accuracy
- Bad

3.6.2 "HART output" submenu

**Navigation**

Expert → Communication → HART output

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
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<tr>
<td>Configuration</td>
<td>166</td>
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<tr>
<td>Burst config</td>
<td>168</td>
</tr>
</tbody>
</table>
"Configuration" submenu

**Navigation**
Expert → Communication → HART output → Configuration

**HART short tag**

**Description**
Use this function to enter a brief description for the measuring point. This can be edited and displayed via HART protocol or using the local display.

**User entry**
Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

**Factory setting**
PROMASS

**Device tag**

**Description**
Use this function to enter the name for the measuring point.

**User entry**
Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

**Factory setting**
Promass
HART address

Navigation  
Expert → Communication → HART output → Configuration → HART address (0219)

Description  
Use this function to enter the address via which the data exchange takes place via HART protocol.

User entry  
0 to 63

Factory setting  
0

Additional information  
Description
For addressing in a HART Multidrop network, the Fixed current option must be set in the Current span parameter (→ 110) (current output 1).

No. of preambles

Navigation  
Expert → Communication → HART output → Configuration → No. of preambles (0217)

Description  
Use this function to enter the number of preambles in the HART protocol.

User entry  
2 to 20

Factory setting  
5

Additional information  
User entry
As every modem component can ‘swallow’ a byte, 2-byte preambles at least must be defined.

Fieldbus writing access

Navigation  
Expert → Communication → HART output → Configuration → Fieldb.writ.acc. (0273)

Description  
Use this function to restrict access to the measuring device via fieldbus (HART interface).

Selection  
- Read + write
- Read only

Factory setting  
Read + write
Additional information

Description

If read and/or write protection is enabled, the parameter can only be controlled and reset via local operation. Access is no longer possible via operating tools.

Selection

- Read + write
  The parameters are readable and writable.
- Read only
  The parameters are only readable.

"Burst configuration" submenu

Navigation

Expert → Communication → HART output → Burst config.
→ Burst config. 1 to n

<table>
<thead>
<tr>
<th>Burst configuration 1 to n</th>
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<tbody>
<tr>
<td>Burst mode 1 to n (2032–1 to n)</td>
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<tr>
<td>Burst command 1 to n (2031–1 to n)</td>
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<tr>
<td>Burst variable 0 (2033)</td>
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<td>Burst variable 1 (2034)</td>
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<td>Burst variable 2 (2035)</td>
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<td>Burst variable 3 (2036)</td>
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<td>Burst variable 4 (2037)</td>
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<tr>
<td>Burst variable 5 (2038)</td>
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<tr>
<td>Burst variable 6 (2039)</td>
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<tr>
<td>Burst variable 7 (2040)</td>
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<tr>
<td>Burst trigger mode (2044–1 to n)</td>
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<tr>
<td>Burst trigger level (2043–1 to n)</td>
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<tr>
<td>Min. update period (2042–1 to n)</td>
</tr>
<tr>
<td>Max. update period (2041–1 to n)</td>
</tr>
</tbody>
</table>
### Burst mode 1 to n

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst mode 1 to n (2032–1 to n)

**Description**

Use this function to select whether to activate the HART burst mode for burst message X.

**Selection**

- Off
- On

**Factory setting**

Off

**Additional information**

*Options*

- Off
  - The measuring device transmits data only when requested by the HART master.
- On
  - The measuring device transmits data regularly without being requested.

### Burst command 1 to n

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst command 1 to n (2031–1 to n)

**Description**

Use this function to select the HART command that is sent to the HART master.

**Selection**

- Command 1
- Command 2
- Command 3
- Command 9
- Command 33
- Command 48

**Factory setting**

Command 2

**Additional information**

*Selection*

- Command 1
  - Read out the primary variable.
- Command 2
  - Read out the current and the main measured value as a percentage.
- Command 3
  - Read out the dynamic HART variables and the current.
- Command 9
  - Read out the dynamic HART variables including the related status.
- Command 33
  - Read out the dynamic HART variables including the related unit.
- Command 48
  - Read out the complete device diagnostics.

*"Command 33" option*

The HART device variables are defined via Command 107.
The following measured variables (HART device variables) can be read out:

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Totalizer 1...3
- HBSI
- Pressure
- HART input
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)

**Commands**

- Information about the defined details of the command: HART specifications
- The measured variables (HART device variables) are assigned to the dynamic variables in the **Output** submenu (→ 107).

**Burst variable 0**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 0 (2033)

**Description**

For HART command 9 and 33: select the HART device variable or the process variable.

**Selection**

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity
- Temperature
- Totalizer 1
- Totalizer 2

* Visibility depends on order options or device settings
- Totalizer 3
- HBSI
- HART input
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

**Factory setting**

Volume flow

**Additional information**

*Selection*

The **Not used** option is set if a burst message is not configured.

---

**Burst variable 1**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 1 (2034)

**Description**

For HART command 9 and 33: select the HART device variable or the process variable.

**Selection**

See the **Burst variable 0** parameter (→ 170).

**Factory setting**

Not used

---

**Burst variable 2**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 2 (2035)

**Description**

For HART command 9 and 33: select the HART device variable or the process variable.

**Selection**

See the **Burst variable 0** parameter (→ 170).

**Factory setting**

Not used

---

**Burst variable 3**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 3 (2036)

**Description**

For HART command 9 and 33: select the HART device variable or the process variable.

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

Proline Promass 300 HART

Selection
See the **Burst variable 0** parameter (→ 170).

Factory setting
Not used

### Burst variable 4

**Navigation**
Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 4 (2037)

**Description**
For HART command 33: select the HART device variable or the process variable.

**Selection**
See the **Burst variable 0** parameter (→ 170).

**Factory setting**
Not used

### Burst variable 5

**Navigation**
Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 5 (2038)

**Description**
For HART command 33: select the HART device variable or the process variable.

**Selection**
See the **Burst variable 0** parameter (→ 170).

**Factory setting**
Not used

### Burst variable 6

**Navigation**
Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 6 (2039)

**Description**
For HART command 33: select the HART device variable or the process variable.

**Selection**
See the **Burst variable 0** parameter (→ 170).

**Factory setting**
Not used

### Burst variable 7

**Navigation**
Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 7 (2040)

**Description**
For HART command 33: select the HART device variable or the process variable.
Selection

See the **Burst variable 0** parameter (→ 170).

Factory setting

Not used

---

**Burst trigger mode**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Trigger mode (2044–1 to n)

**Description**

Use this function to select the event that triggers burst message X.

**Selection**

- Continuous
- Window
- Rising
- Falling
- On change

**Factory setting**

Continuous

**Additional information**

*Options*

- Continuous
  The message is sent continuously, at least at intervals corresponding to the time frame specified in the **Burst min period** parameter (→ 174).
- Window
  The message is sent if the specified measured value has changed by the value in the **Burst trigger level** parameter (→ 173).
- Rising
  The message is sent if the specified measured value exceeds the value in the **Burst trigger level** parameter (→ 173).
- Falling
  The message is sent if the specified measured value drops below the value in the **Burst trigger level** parameter (→ 173).
- On change
  The message is sent if a measured value changes in the burst message.

---

**Burst trigger level**

**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Trigger level (2043–1 to n)

**Description**

For entering the burst trigger value.

**User entry**

Positive floating-point number

**Additional information**

*Description*

Together with the option selected in the **Burst trigger mode** parameter (→ 173) the burst trigger value determines the time of burst message X.
## Min. update period

**Navigation**

Navigation: Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Min. upd. per. (2042–1 to n)

**Description**

Use this function to enter the minimum time span between two burst commands of burst message X.

**User entry**

Positive integer

**Factory setting**

1 000 ms

## Max. update period

**Navigation**

Navigation: Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Max. upd. per. (2041–1 to n)

**Description**

Use this function to enter the maximum time span between two burst commands of burst message X.

**User entry**

Positive integer

**Factory setting**

2 000 ms

## "Information" submenu

**Navigation**

Navigation: Expert → Communication → HART output → Information

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<th>Information</th>
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<tr>
<td>Device ID (0221)</td>
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<tr>
<td>Device type (0209)</td>
</tr>
<tr>
<td>Manufacturer ID (0259)</td>
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<tr>
<td>HART revision (0205)</td>
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<tr>
<td>HART descriptor (0212)</td>
</tr>
<tr>
<td>HART message (0216)</td>
</tr>
<tr>
<td>Hardware revision (0206)</td>
</tr>
</tbody>
</table>
### Device revision

**Navigation**

Expert → Communication → HART output → Information → Device revision (0204)

**Description**

Use this function to view the device revision with which the device is registered with the HART Communication Foundation.

**User interface**

2-digit hexadecimal number

**Factory setting**

1

**Additional information**

The device revision is needed to assign the appropriate device description file (DD) to the device.

### Device ID

**Navigation**

Expert → Communication → HART output → Information → Device ID (0221)

**Description**

Use this function to view the device ID for identifying the measuring device in a HART network.

**User interface**

6-digit hexadecimal number

**Additional information**

In addition to the device type and manufacturer ID, the device ID is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

### Device type

**Navigation**

Expert → Communication → HART output → Information → Device type (0209)

**Description**

Displays the device type with which the measuring device is registered with the HART Communication Foundation.

**User interface**

2-digit hexadecimal number

**Factory setting**

0x3B (for Promass 300/500)
Additional information

- **Description**
  
  The device type is specified by the manufacturer. It is needed to assign the appropriate device description file (DD) to the device.

**Manufacturer ID**

- **Navigation**
  
  Expert → Communication → HART output → Information → Manufacturer ID (0259)

- **Description**
  
  Use this function to view the manufacturer ID with which the measuring device is registered with the HART Communication Foundation.

- **User interface**
  
  2-digit hexadecimal number

- **Factory setting**
  
  0x11 (for Endress+Hauser)

**HART revision**

- **Navigation**
  
  Expert → Communication → HART output → Information → HART revision (0205)

- **Description**
  
  Use this function to display the HART protocol revision of the measuring device.

- **User interface**
  
  5 to 7

- **Factory setting**
  
  7

**HART descriptor**

- **Navigation**
  
  Expert → Communication → HART output → Information → HART descriptor (0212)

- **Description**
  
  Use this function to enter a description for the measuring point. This can be edited and displayed via HART protocol or using the local display.

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

- **Factory setting**
  
  Promass300/500

**HART message**

- **Navigation**
  
  Expert → Communication → HART output → Information → HART message (0216)

- **Description**
  
  Use this function to enter a HART message which is sent via the HART protocol when requested by the master.
User entry
Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /)

Factory setting
Promass300/500

Hardware revision

Navigation
Expert → Communication → HART output → Information → Hardware rev. (0206)

Description
Displays the hardware revision of the measuring device.

User interface
0 to 30

Factory setting
1

Software revision

Navigation
Expert → Communication → HART output → Information → Software rev. (0224)

Description
Displays the software revision of the measuring device.

User interface
0 to 255

Factory setting
1

HART date code

Navigation
Expert → Communication → HART output → Information → HART date code (0202)

Description
Use this function to enter the date information for individual use.

User entry
Date entry format: yyyy-mm-dd

Factory setting
2009-07-20

Additional information
Example
Device installation date
**Assign PV**

*Navigation*  
[Expert → Communication → HART output → Output → Assign PV (0234)](178)

*Description*  
Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

*Selection*  
- Off  
- Mass flow  
- Volume flow  
- Corrected volume flow  
- Target mass flow*  
- Carrier mass flow*  
- Density  
- Reference density  
- Concentration*  
- Dynamic viscosity*  
- Kinematic viscosity*  
- Temp. compensated dynamic viscosity*  
- Temp. compensated kinematic viscosity*  
- Temperature  
- Carrier pipe temperature*  
- Electronic temperature  
- Oscillation frequency 0  
- Oscillation frequency 1*  
- Oscillation amplitude 0*  

*Visibility depends on order options or device settings*
• Oscillation amplitude 1 *
• Frequency fluctuation 0
• Frequency fluctuation 1 *
• Oscillation damping 0
• Oscillation damping 1 *
• Oscillation damping fluctuation 0
• Oscillation damping fluctuation 1
• Signal asymmetry
• Exciter current 0
• Exciter current 1 *
• HBSI *

Factory setting  
Mass flow

Additional information  
Selection

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 18)

---

Primary variable (PV)

Navigation  
Expert → Communication → HART output → Output → Primary var (PV) (0201)

Description  
Displays the current measured value of the primary dynamic variable (PV).

User interface  
Signed floating-point number

Additional information  
User interface

The measured value displayed depends on the process variable selected in the Assign PV parameter (→ 178).

Dependency

The unit of the displayed measured value is taken from the System units submenu (→ 60).

---

Assign SV

Navigation  
Expert → Communication → HART output → Output → Assign SV (0235)

Description  
Use this function to select a measured variable (HART device variable) for the secondary dynamic variable (SV).

Selection

• Mass flow
• Volume flow
• Corrected volume flow
• Target mass flow *
• Carrier mass flow *
• Density

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

Proline Promass 300 HART

- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting
Totalizer 1

Secondary variable (SV)

Navigation
Expert → Communication → HART output → Output → Second.var(SV) (0226)

Description
Displays the current measured value of the secondary dynamic variable (SV).

User interface
Signed floating-point number

Additional information
User interface
The measured value displayed depends on the process variable selected in the Assign SV parameter (→ 179).

Dependency
The unit of the displayed measured value is taken from the System units submenu (→ 60).

Assign TV

Navigation
Expert → Communication → HART output → Output → Assign TV (0236)

Description
Use this function to select a measured variable (HART device variable) for the tertiary (third) dynamic variable (TV).

Selection
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *

Visibility depends on options or device settings
Tertiary variable (TV)

Navigation

Expert → Communication → HART output → Output → Tertiary var(TV) (0228)

Description
Displays the current measured value of the tertiary dynamic variable (TV).

User interface
Positive floating-point number

Additional information

User interface
The measured value displayed depends on the process variable selected in the Assign TV parameter (→ 180).

Dependency
The unit of the displayed measured value is taken from the System units submenu (→ 60).

Assign QV

Navigation

Expert → Communication → HART output → Output → Assign QV (0237)

Description
Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).

Selection
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity
- Kinematic viscosity
- Temp. compensated dynamic viscosity
- Temp. compensated kinematic viscosity

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

- Temperature
- Carrier pipe temperature *
- Electronic temperature
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting

Temperature

### Quaternary variable (QV)

**Navigation**

Expert → Communication → HART output → Output → Quaterna.var(QV) (0203)

**Description**

Displays the current measured value of the quaternary dynamic variable (QV).

**User interface**

\[-273.15 \text{ to } 99726.8499 \degree C\]

**Additional information**

*User interface*

The measured value displayed depends on the process variable selected in the Assign QV parameter (→ 181).

*Dependency*

The unit of the displayed measured value is taken from the System units submenu (→ 60).

---

### 3.6.3 "Web server" submenu

**Navigation**

Expert → Communication → Web server

<table>
<thead>
<tr>
<th>Web server</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Web server language (7221)</td>
<td>→ 183</td>
</tr>
<tr>
<td>MAC address (7214)</td>
<td>→ 183</td>
</tr>
<tr>
<td>IP address (7209)</td>
<td>→ 184</td>
</tr>
<tr>
<td>Subnet mask (7211)</td>
<td>→ 184</td>
</tr>
<tr>
<td>Default gateway (7210)</td>
<td>→ 184</td>
</tr>
</tbody>
</table>

* Visibility depends on order options or device settings
Web server language

**Navigation**  
Expert → Communication → Web server → Webserv.language (7221)

**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**  
Expert → Communication → Web server → MAC Address (7214)

**Description**  
Displays the MAC address of the measuring device.

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

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

**Additional information**  
*Example*

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

---

* Visibility depends on order options or device settings

7) Media Access Control
### Description of device parameters

#### IP address

**Navigation**  
Expert → Communication → Web server → IP address (7209)

**Description**  
Displays the IP address of the device’s web server.

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

**Factory setting**  
192.168.1.212

---

#### Subnet mask

**Navigation**  
Expert → Communication → Web server → Subnet mask (7211)

**Description**  
Displays the subnet mask.

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

**Factory setting**  
255.255.255.0

---

#### Default gateway

**Navigation**  
Expert → Communication → Web server → Default gateway (7210)

**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. (7222)

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

**Selection**  
- Off
- On

**Factory setting**  
On
Additional information

Description

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

Selection

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Off    | ● The web server is completely disabled.  
         | ● Port 80 is locked. |
| On     | ● The complete functionality of the web server is available.  
         | ● JavaScript is used.  
         | ● The password is transferred in an encrypted state.  
         | ● Any change to the password is also transferred in an encrypted state. |

Login page

Navigation

Expert → Communication → Web server → Login page (7273)

Description

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

Selection

● Without header

● With header

Factory setting

With header

3.6.4 "WLAN settings" submenu

Navigation

Expert → Communication → WLAN settings

[WLAN settings]

- WLAN (2702) → 186
- WLAN IP address (2711) → 186
- WLAN subnet mask (2709) → 186
- WLAN MAC address (2703) → 187
- Security type (2705) → 187
- WLAN passphrase (2706) → 187
- Assign SSID name (2708) → 188
- SSID name (2707) → 188
WLAN

**Navigation**

Expert → Communication → WLAN settings → WLAN (2702)

**Description**

Use this function to enable and disable the WLAN connection.

**Selection**

- Disable
- Enable

**Factory setting**

Enable

WLAN IP address

**Navigation**

Expert → Communication → WLAN settings → WLAN IP address (2711)

**Description**

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

**User entry**

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

**Factory setting**

192.168.1.212

WLAN subnet mask

**Navigation**

Expert → Communication → WLAN settings → WLAN subnet mask (2709)

**Description**

Use this function to enter the subnet mask.

**User entry**

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

**Factory setting**

255.255.255.0
## WLAN MAC address

### Navigation
Expert → Communication → WLAN settings → WLAN MAC address (2703)

### Description
Displays the MAC address of the measuring device.

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

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

### Additional information
**Example**
For the display format
00:07:05:10:01:5F

## Security type

### Navigation
Expert → Communication → WLAN settings → Security type (2705)

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

### Selection
- Unsecured
- WPA2-PSK

### Factory setting
WPA2-PSK

### Additional information
**Selection**
- Unsecured
  Access the WLAN connection without identification.
- WPA2-PSK
  Access the WLAN connection with a network key.

## WLAN passphrase

### Navigation
Expert → Communication → WLAN settings → WLAN passphrase (2706)

### Prerequisite
In the Security type parameter (→ 187), the WPA2-PSK option is selected.

### Description
Use this function to enter the network key.

### User entry
8 to 32-digit character string comprising numbers, letters and special characters

---

8) Media Access Control
Description of device parameters

Assign SSID name

**Navigation**

Expert → Communication → WLAN settings → Assign SSID name (2708)

**Description**

Use this function to select which name is used for the SSID.

**Selection**

- Device tag
- User-defined

**Factory setting**

User-defined

**Additional information**

*Selection*

- Device tag
  - The device tag name is used as the SSID.
- User-defined
  - A user-defined name is used as the SSID.

SSID name

**Navigation**

Expert → Communication → WLAN settings → SSID name (2707)

**Prerequisite**

In the Assign SSID name parameter (→ 188), the User-defined option is selected.

**Description**

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

**User entry**

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

Select antenna

**Navigation**

Expert → Communication → WLAN settings → Select antenna (2713)

**Description**

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

**Selection**

- External antenna
- Internal antenna

**Factory setting**

Internal antenna

2.4 GHz WLAN channel

**Navigation**

Expert → Communication → WLAN settings → WLAN channel (2704)

**Description**

Use this function to enter the 2.4 GHz WLAN channel.

---

9) Service Set Identifier
User entry 1 to 11
Factory setting 6
Additional information

- It is only necessary to enter a 2.4 GHz WLAN channel if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

Apply changes

Description Use this function to adopt modified WLAN settings.

Selection
- Cancel
- Ok

Factory setting Cancel
Additional information

- Cancel
  No action is executed and the user exits the parameter.
- Ok
  The measuring device adopts the modified WLAN settings.

3.6.5 "Diagnostic configuration" submenu

For a list of all the diagnostic events, see the Operating Instructions for the device → 7

Assign a category to the particular diagnostic event:

<table>
<thead>
<tr>
<th>Category</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure (F)</td>
<td>A device error is present. The measured value is no longer valid.</td>
</tr>
<tr>
<td>Function check (C)</td>
<td>The device is in service mode (e.g. during a simulation).</td>
</tr>
</tbody>
</table>
| Out of specification (S) | The device is being operated:
  - Outside its technical specification limits (e.g. outside the process temperature range)
  - Outside of the configuration carried out by the user (e.g. maximum flow in parameter 20 mA value) |
| Maintenance required (M)  | Maintenance is required. The measured value is still valid.            |
| No effect (N)             | Has no effect on the condensed status 1).                               |

1) Condensed status according to NAMUR recommendation NE107
Event category 046 (Sensor limit exceeded)

**Navigation**
Expert → Communication → Diag. config. → Event category 046 (0246)

**Description**
Use this function to assign a category to the diagnostic message **046 Sensor limit exceeded**.
Proline Promass 300 HART

Description of device parameters

Selection
• Failure (F)
• Function check (C)
• Out of specification (S)
• Maintenance required (M)
• No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: → 189

Event category 140 (Sensor signal asymmetrical)

Navigation
Expert → Communication → Diag. config. → Event category 140 (0244)

Description
Use this function to assign a category to the diagnostic message 140 Sensor signal asymmetrical.

Selection
• Failure (F)
• Function check (C)
• Out of specification (S)
• Maintenance required (M)
• No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: → 189

Event category 274 (Main electronic failure)

Navigation
Expert → Communication → Diag. config. → Event category 374 (0245)

Description
Use this function to assign a category to the diagnostic message 274 Main electronic failure.

Selection
• Failure (F)
• Function check (C)
• Out of specification (S)
• Maintenance required (M)
• No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: → 189
**Event category 441 (Current output 1 to n)**

**Navigation**
Expert → Communication → Diag. config. → Event category 441 (0210)

**Description**
Use this option to select a category for the diagnostic message **441 Current output 1 to n**.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189

**Event category 442 (Frequency output 1 to n)**

**Navigation**
Expert → Communication → Diag. config. → Event category 442 (0230)

**Prerequisite**
The pulse/frequency/switch output is available.

**Description**
Use this option to select a category for the diagnostic message **442 Frequency output 1 to n**.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189

**Event category 443 (Pulse output 1 to n)**

**Navigation**
Expert → Communication → Diag. config. → Event category 443 (0231)

**Prerequisite**
The pulse/frequency/switch output is available.

**Description**
Use this option to select a category for the diagnostic message **443 Pulse output 1 to n**.
**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189

---

**Event category 444 (Current input 1 to n)**

**Navigation**
- Expert → Communication → Diag. config. → Event category 444 (0211)

**Prerequisite**
The current input is available.

**Description**
Use this option to select a category for the diagnostic message **444 Current input 1 to n**.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
Selection
For a detailed description of the event categories available for selection: → 189

---

**Event category 543 (Double pulse output)**

**Navigation**
- Expert → Communication → Diag. config. → Event category 543 (0276)

**Description**
Use this option to select a category for the diagnostic message **543 Double pulse output**.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189
Event category 830 (Sensor temperature too high)

**Navigation**

Expert → Communication → Diag. config. → Event category 830 (0240)

**Description**

Use this function to assign a category to the diagnostic message 830 **Sensor temperature too high**.

**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**

Out of specification (S)

**Additional information**

For a detailed description of the event categories available for selection: →  189

---

Event category 831 (Sensor temperature too low)

**Navigation**

Expert → Communication → Diag. config. → Event category 831 (0241)

**Description**

Use this function to assign a category to the diagnostic message 831 **Sensor temperature too low**.

**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**

Out of specification (S)

**Additional information**

For a detailed description of the event categories available for selection: →  189

---

Event category 832 (Electronic temperature too high)

**Navigation**

Expert → Communication → Diag. config. → Event category 832 (0218)

**Description**

Use this option to select a category for the diagnostic message 832 **Electronic temperature too high**.

**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**

Out of specification (S)
Additional information  For a detailed description of the event categories available for selection: →  189

Event category 833 (Electronic temperature too low)

Navigation  Expert → Communication → Diag. config. → Event category 833 (0225)

Description  Use this option to select a category for the diagnostic message 833 Electronic temperature too low.

Selection  • Failure (F)
          • Function check (C)
          • Out of specification (S)
          • Maintenance required (M)
          • No effect (N)

Factory setting  Out of specification (S)

Additional information  For a detailed description of the event categories available for selection: →  189

Event category 834 (Process temperature too high)

Navigation  Expert → Communication → Diag. config. → Event category 834 (0227)

Description  Use this option to select a category for the diagnostic message 834 Process temperature too high.

Selection  • Failure (F)
          • Function check (C)
          • Out of specification (S)
          • Maintenance required (M)
          • No effect (N)

Factory setting  Out of specification (S)

Additional information  For a detailed description of the event categories available for selection: →  189

Event category 835 (Process temperature too low)

Navigation  Expert → Communication → Diag. config. → Event category 835 (0229)

Description  Use this option to select a category for the diagnostic message 835 Process temperature too low.
Description of device parameters

Proline Promass 300 HART

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: →  189

Event category 862 (Empty pipe)

Navigation
Expert → Communication → Diag. config. → Event category 862 (0214)

Description
Use this option to select a category for the diagnostic message 862 Empty pipe.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: →  189

Event category 912 (Medium inhomogeneous)

Navigation
Expert → Communication → Diag. config. → Event category 912 (0243)

Description
Use this function to assign a category to the diagnostic message 912 Medium inhomogeneous.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting
Out of specification (S)

Additional information
For a detailed description of the event categories available for selection: →  189
Event category 913 (Medium unsuitable)

**Navigation**
Expert → Communication → Diag. config. → Event category 913 (0242)

**Description**
Use this function to assign a category to the diagnostic message 913 Medium unsuitable.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189

Event category 948 (Tube damping too high)

**Navigation**
Expert → Communication → Diag. config. → Event category 948 (0275)

**Description**
Use this function to assign a category to the diagnostic message 948 Tube damping too high.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**Factory setting**
Out of specification (S)

**Additional information**
For a detailed description of the event categories available for selection: → 189

3.7 "Application" submenu

**Navigation**
Expert → Application

- **Application**
  - Reset all totalizers (2806) → 198
  - Totalizer 1 to n → 198
  - Viscosity → 203
Reset all totalizers

Navigation
Expert → Application → Reset all tot. (2806)

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

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancel</td>
<td>No action is executed and the user exits the parameter.</td>
</tr>
<tr>
<td>Reset + totalize</td>
<td>Resets all totalizers to 0 and restarts the totaling process. This deletes all the flow values previously totalized.</td>
</tr>
</tbody>
</table>

3.7.1 "Totalizer 1 to n" submenu

Navigation
Expert → Application → Totalizer 1 to n

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign process variable (0914–1 to n)</td>
<td>→ 199</td>
</tr>
<tr>
<td>Unit totalizer 1 to n (0915–1 to n)</td>
<td>→ 199</td>
</tr>
<tr>
<td>Totalizer operation mode (0908–1 to n)</td>
<td>→ 200</td>
</tr>
<tr>
<td>Control Totalizer 1 to n (0912–1 to n)</td>
<td>→ 201</td>
</tr>
<tr>
<td>Preset value 1 to n (0913–1 to n)</td>
<td>→ 202</td>
</tr>
<tr>
<td>Failure mode (0901–1 to n)</td>
<td>→ 202</td>
</tr>
</tbody>
</table>
Assign process variable

Navigation
Expert → Application → Totalizer 1 to n → Assign variable (0914–1 to n)

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

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

Factory setting
Mass flow

Additional information

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

Selection
If the Off option is selected, only Assign process variable parameter (→ 199) is still displayed in the Totalizer 1 to n submenu. All other parameters in the submenu are hidden.

Unit totalizer 1 to n

Navigation
Expert → Application → Totalizer 1 to n → Unit totalizer 1 to n (0915–1 to n)

Prerequisite
One of the following options is selected in the Assign process variable parameter (→ 199) Totalizer 1 to n submenu:
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *

Description
Use this function to select the process variable unit for the Totalizer 1 to n (→ 198).

Selection
SI units
- g
- kg
- t
- STon

US units
- oz
- lb

Custom-specific units
User mass

or

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

**Proline Promass 300 HART**

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

### US units
- af
- ft³
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;oil)
- bbl (us;tank)

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

### Custom-specific units
- User vol.

or

### SI units
- Nl
- Nm³
- Sl
- Sm³

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

### Imperial units
- Sgal (imp)

### Custom-specific units
- UserCrVol.

### Factory setting
- Country-specific:
  - kg
  - lb

### Additional information

**Description**

The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 60).

**Selection**

The selection is dependent on the process variable selected in the **Assign process variable** parameter (→ 199).

### Totalizer operation mode

**Navigation**

Expert → Application → Totalizer 1 to n → Operation mode (0908→1 to n)

**Prerequisite**

One of the following options is selected in the **Assign process variable** parameter (→ 199)**Totalizer 1 to n** submenu:
- Volume flow
- Mass flow
- Corrected volume flow
- Target mass flow
- Carrier mass flow

**Description**

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

* Visibility depends on order options or device settings
Selection

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

Factory setting

Net flow total

Additional information

Selection

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

Control Totalizer 1 to n

Navigation

Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912–1 to n)

Prerequisite

One of the following options is selected in the Assign process variable parameter (→ 199) Totalizer 1 to n submenu:

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

Description

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

Selection

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

Factory setting

Totalize

Additional information

Selection

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totalize</td>
<td>The totalizer is started or continues running.</td>
</tr>
<tr>
<td>Reset + hold</td>
<td>The totaling process is stopped and the totalizer is reset to 0.</td>
</tr>
<tr>
<td>Preset + hold</td>
<td>The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.</td>
</tr>
<tr>
<td>Reset + totalize</td>
<td>The totalizer is reset to 0 and the totaling process is restarted.</td>
</tr>
<tr>
<td>Preset + totalize</td>
<td>The totalizer is set to the defined start value from the Preset value parameter and the totaling process is restarted.</td>
</tr>
<tr>
<td>Hold</td>
<td>Totalizing is stopped.</td>
</tr>
</tbody>
</table>

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

**Preset value 1 to n**

**Navigation**

Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913–1 to n)

**Prerequisite**

One of the following options is selected in the Assign process variable parameter (→ 199) Totalizer 1 to n submenu:

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

**Description**

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

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg
- 0 lb

**Additional information**

User entry

The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 199).

**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 n → Failure mode (0901–1 to n)

**Prerequisite**

One of the following options is selected in the Assign process variable parameter (→ 199) Totalizer 1 to n submenu:

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

**Description**

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

**Selection**

- Stop
- Actual value
- Last valid value

**Factory setting**

Stop

* Visibility depends on order options or device settings
Additional information

Description

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

Selection

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

3.7.2 "Viscosity" submenu

Only available for Promass I.

For detailed information on the parameter descriptions for the Viscosity application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Viscosity

3.7.3 "Concentration" submenu

For detailed information on the parameter descriptions for the Concentration application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Concentration

3.7.4 "Custody transfer" submenu

Only available for Promass F, O, Q and X.

For detailed information on the parameter descriptions for custody transfer measurement, see the Special Documentation for the device → 7
3.8 "Diagnostics" submenu

**Navigation**  
Expert → Application → Custody transfer

**Custody transfer**
- Custody transfer mode (14405)
- Checksum (14407)
- Custody transfer locking (14406)
- Custody transfer counter (14402)
- Timestamp last custody transfer (14403)

**Navigation**  
Expert → Diagnostics

**Diagnostics**
- Actual diagnostics (0691) ➔ 205
- Previous diagnostics (0690) ➔ 206
- Operating time from restart (0653) ➔ 206
- Operating time (0652) ➔ 207
- Diagnostic list ➔ 207
- Event logbook ➔ 217
- Custody transfer logbook ➔ 213
- Device information ➔ 214
- Mainboard module ➔ 218
- Sensor electronic module (ISEM) ➔ 218
- I/O module 1 ➔ 219
- I/O module 2 ➔ 219
- I/O module 3 ➔ 220
- Display module ➔ 221
### Actual diagnostics

**Navigation**
- Expert → Diagnostics → Actual diagnos. (0691)

**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 (→ 207).
  - Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

**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 (→ 205).

**Example**
- For the display format:

  24d12h13m00s
### Previous diagnostics

**Navigation**

![Link to Expert → Diagnostics → Prev.diagnostics (0690)]

**Prerequisite**

Two diagnostic events have already occurred.

**Description**

Displays the diagnostic message that occurred before the current message.

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information**

**Display**

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

**Example**

For the display format:

![F271 Main electronic failure]

---

### Timestamp

**Navigation**

![Link to 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 (→ 206).

**Example**

For the display format:

24d12h13m00s

---

### Operating time from restart

**Navigation**

![Link to Expert → Diagnostics → Time fr. restart (0653)]

**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 (0652)

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

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

3.8.1 "Diagnostic list" submenu

Navigation

Expert → Diagnostics → Diagnostic list

<table>
<thead>
<tr>
<th>Diagnostic list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics 1 (0692)</td>
</tr>
<tr>
<td>Diagnostics 2 (0693)</td>
</tr>
<tr>
<td>Diagnostics 3 (0694)</td>
</tr>
<tr>
<td>Diagnostics 4 (0695)</td>
</tr>
<tr>
<td>Diagnostics 5 (0696)</td>
</tr>
</tbody>
</table>

Diagnostics 1

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)

Description

Displays the current diagnostics message with the highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

Display

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Examples

For the display format:
- ☘ F271 Main electronic failure
- ☘ F276 I/O module failure
Description of device parameters

**Proline Promass 300 HART**

**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 (→ 207).

*Example*
For the display format:
24d12h13m00s

**Diagnostics 2**

**Navigation**
- Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)

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

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

**Additional information**
- **Display**
  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

*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

1 The diagnostic message can be viewed via the Diagnostics 2 parameter (→ 208).

Example

For the display format:
24d12h13m00s

Diagnostics 3

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

Description

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

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

Display

1 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

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

1 The diagnostic message can be viewed via the Diagnostics 3 parameter (→ 209).

Example

For the display format:
24d12h13m00s
### Diagnostics 4

**Navigation**

Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)

**Description**

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

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information**

**Display**

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the \[\text{key}\] key.

**Examples**

For the display format:

- \[\text{F271 Main electronic failure}\]
- \[\text{F276 I/O module failure}\]

### 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 (→ 210).

**Example**

For the display format:

24d12h13m00s

### Diagnostics 5

**Navigation**

Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

**Description**

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

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.
**Additional information**

*Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

*Examples*

For the display format:
- \( \times F271 \) Main electronic failure
- \( \times F276 \) 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 (→ 210).

*Example*

For the display format:

\( 24d12h13m00s \)

---

### 3.8.2 "Event logbook" submenu

**Navigation**

- Expert → Diagnostics → Event logbook

**Filter options**

**Navigation**

- Expert → Diagnostics → Event logbook → Filter options (0705)

**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

Filter options

Navigation

Expert → Diagnostics → Event logbook → Filter options

Description

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

Selection

- All
- Failure (F)
- 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 (→ 211).

**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 Extended HistoROM application package (order option) 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.

---

3.8.3 "Custody transfer logbook" submenu

- Only available for Promass F, O, Q and X.

- For detailed information on the parameter descriptions for custody transfer measurement, see the Special Documentation for the device → 7
## Description of device parameters

### Proline Promass 300 HART

**Navigation**

- Expert → Diagnostics → Cust.transf.log.

Custody transfer logbook

### 3.8.4 "Device information" submenu

**Navigation**

- Expert → Diagnostics → Device info

Device information

- Device tag (0011)  
- Serial number (0009)  
- Firmware version (0010)  
- Device name (0020)  
- Order code (0008)  
- Extended order code 1 (0023)  
- Extended order code 2 (0021)  
- Extended order code 3 (0022)  
- Configuration counter (0233)  
- ENP version (0012)

---

### Device tag

**Navigation**

- Expert → Diagnostics → Device info → Device tag (0011)

**Description**

Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

**User interface**

Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

**Factory setting**

Promass300/500
### Serial number

<table>
<thead>
<tr>
<th>Navigation</th>
<th>专家 → Diagnostics → Device info → Serial number (0009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Displays the serial number of the measuring device.</td>
</tr>
<tr>
<td></td>
<td>The number can be found on the nameplate of the sensor and transmitter.</td>
</tr>
<tr>
<td>User interface</td>
<td>A maximum of 11-digit character string comprising letters and numbers.</td>
</tr>
<tr>
<td>Additional information</td>
<td>Uses of the serial number</td>
</tr>
<tr>
<td></td>
<td>- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.</td>
</tr>
<tr>
<td></td>
<td>- To obtain specific information on the measuring device using the Device Viewer: <a href="http://www.endress.com/deviceviewer">www.endress.com/deviceviewer</a></td>
</tr>
</tbody>
</table>

### Firmware version

<table>
<thead>
<tr>
<th>Navigation</th>
<th>专家 → Diagnostics → Device info → Firmware version (0010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Displays the device firmware version installed.</td>
</tr>
<tr>
<td>User interface</td>
<td>Character string in the format xx.yy.zz</td>
</tr>
<tr>
<td>Additional information</td>
<td>Display</td>
</tr>
<tr>
<td></td>
<td>The Firmware version is also located:</td>
</tr>
<tr>
<td></td>
<td>- On the title page of the Operating instructions</td>
</tr>
<tr>
<td></td>
<td>- On the transmitter nameplate</td>
</tr>
</tbody>
</table>
Device name

**Navigation**
Expert → Diagnostics → Device info → Device name (0020)

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

**User interface**
Promass300/500

Order code

**Navigation**
Expert → Diagnostics → Device info → Order code (0008)

**Description**
Displays the device order code.

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

**Additional information**

*Description*

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

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

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

Extended order code 1

**Navigation**
Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

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

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

**User interface**
Character string

**Additional information**

*Description*

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

*The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.*
## Extended order code 2

**Navigation**  
[ diarr ] Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)

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

**User interface**  
Character string

**Additional information**  
For additional information, see **Extended order code 1** parameter (→ 216)

## Extended order code 3

**Navigation**  
[ diarr ] Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)

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

**User interface**  
Character string

**Additional information**  
For additional information, see **Extended order code 1** parameter (→ 216)

## Configuration counter

**Navigation**  
[ diarr ] Expert → Diagnostics → Device info → Config. counter (0233)

**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**  
[ diarr ] Expert → Diagnostics → Device info → ENP version (0012)

**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.
3.8.5  "Mainboard module" submenu

Navigation  
Expert → Diagnostics → Mainboard module

Software revision

Navigation  
Expert → Diagnostics → Mainboard module → Software rev. (0072)

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

User interface  
Positive integer

3.8.6  "Sensor electronic module (ISEM)" submenu

Navigation  
Expert → Diagnostics → Sens. electronic

Software revision

Navigation  
Expert → Diagnostics → Sens. electronic → Software rev. (0072)

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

User interface  
Positive integer
3.8.7 "I/O module 1" submenu

**Navigation**

Expert → Diagnostics → I/O module 1

---

**I/O module 1 terminal numbers**

**Navigation**

Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902–1)

**Description**
Displays the terminal numbers used by the I/O module.

**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Software revision**

**Navigation**

Expert → Diagnostics → I/O module 1 → Software rev. (0072)

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

**User interface**
Positive integer

---

3.8.8 "I/O module 2" submenu

**Navigation**

Expert → Diagnostics → I/O module 2

---
**I/O module 2 terminal numbers**

**Navigation**

Expert → Diagnostics → I/O module 2 → I/O 2 terminals (3902–2)

**Description**

Displays the terminal numbers used by the I/O module.

**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Software revision**

**Navigation**

Expert → Diagnostics → I/O module 2 → Software rev. (0072)

**Description**

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

**User interface**

Positive integer

---

**3.8.9  "I/O module 3" submenu**

**Navigation**

Expert → Diagnostics → I/O module 3

**I/O module 3 terminal numbers**

**Navigation**

Expert → Diagnostics → I/O module 3 → I/O 3 terminals (3902–3)

**Description**

Displays the terminal numbers used by the I/O module.

**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)
Software revision

**Navigation**

Navigate to:

Expert → Diagnostics → I/O module 3 → Software rev. (0072)

**Description**

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

**User interface**

Positive integer

---

### 3.8.10 "Display module" submenu

**Navigation**

Navigate to:

Expert → Diagnostics → Display module

![Display module](attachment:image.png)  

Software revision (0072)  

---

Software revision

**Navigation**

Navigate to:

Expert → Diagnostics → Display module → Software rev. (0072)

**Description**

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

**User interface**

Positive integer

---

### 3.8.11 "Min/max values" submenu

**Navigation**

Navigate to:

Expert → Diagnostics → Min/max val.

![Min/max values](attachment:image.png)  

Reset min/max values (6151)  

Electronic temperature  

Medium temperature  

Carrier pipe temperature  

Oscillation frequency
Reset min/max values

Navigation
Expert → Diagnostics → Min/max val. → Reset min/max (6151)

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

Selection
- Cancel
- Oscillation amplitude
- Oscillation amplitude 1 *
- Oscillation damping
- Torsion oscillation damping *
- Oscillation frequency
- Torsion oscillation frequency *
- Signal asymmetry
- Torsion signal asymmetry *

Factory setting
Cancel

Additional information
Selection
Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Value 1 display parameter (→ 22)

* Visibility depends on order options or device settings
"Electronic temperature" submenu

**Navigation**

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

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

**Maximum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp. → Maximum value (6051)

**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 (→ 67)

**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp. → Minimum value (6052)

**Description**

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

**User interface**

Signed floating-point number

**Additional information**

Dependency

The unit is taken from the **Temperature unit** parameter (→ 67)
"Medium temperature" submenu

**Navigation**

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

---

**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (6109)

**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 (→ 67)

---

**Maximum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (6108)

**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 (→ 67)

---

"Carrier pipe temperature" submenu

**Navigation**

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

---

**Minimum value**

Minimum value (6030) → 225

**Maximum value**

Maximum value (6029) → 225
Minimum value

Navigation

[Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (6030)]

Prerequisite

[Only available for:
- Promass A
- Promass F
- Promass H
- Promass I
- Promass O
- Promass P
- PromassQ
- Promass S
- Promass X

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

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

User interface

Signed floating-point number

Additional information

**Dependency**

The unit is taken from the **Temperature unit** parameter (→ 67)

Maximum value

Navigation

[Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)]

Prerequisite

[Only available for:
- Promass A
- Promass F
- Promass H
- Promass I
- Promass O
- Promass P
- PromassQ
- Promass S
- Promass X

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

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

User interface

Signed floating-point number

Additional information

**Dependency**

The unit is taken from the **Temperature unit** parameter (→ 67)
"Oscillation frequency" submenu

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

<table>
<thead>
<tr>
<th>Oscillation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value (6071)  →  226</td>
</tr>
<tr>
<td>Maximum value (6070)  →  226</td>
</tr>
</tbody>
</table>

**Minimum value**

**Navigation**  
Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (6071)

**Description**  
Displays the lowest previously measured oscillation frequency.

**User interface**  
Signed floating-point number

**Maximum value**

**Navigation**  
Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value (6070)

**Description**  
Displays the highest previously measured oscillation frequency.

**User interface**  
Signed floating-point number

"Torsion oscillation frequency" submenu

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

<table>
<thead>
<tr>
<th>Torsion oscillation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value (6069)  →  227</td>
</tr>
<tr>
<td>Maximum value (6068)  →  227</td>
</tr>
</tbody>
</table>
**Minimum value**

**Navigation**

专家 → 对话 → Min/max val. → Tors.oscil.freq → Minimum value (6069)

**Prerequisite**

- 只有 Promass I 可用。
- 仅允许从以下订单代码访问：
  - 应用程序包选项 EB "Heartbeat Verification + Monitoring"。

**Description**

显示最低之前测量的振幅频率。

**User interface**

带符号的浮点数

---

**Maximum value**

**Navigation**

专家 → 对话 → Min/max val. → Tors.oscil.freq → Maximum value (6068)

**Prerequisite**

- 只有 Promass I 可用。
- 仅允许从以下订单代码访问：
  - 应用程序包选项 EB "Heartbeat Verification + Monitoring"。

**Description**

显示最高之前测量的振幅频率。

**User interface**

带符号的浮点数

**"Oscillation amplitude" submenu**

**Navigation**

专家 → 对话 → Min/max val. → Oscil. amplitude

- 振幅频率
  - 最低值 (6010) → 227
  - 最高值 (6009) → 228

**Minimum value**

**Navigation**

专家 → 对话 → Min/max val. → Oscil. amplitude → Minimum value (6010)

**Description**

显示最低之前测量的振幅频率。

**User interface**

带符号的浮点数

---
Description of device parameters

Maximum value

**Navigation**

Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value (6009)

**Description**
Displays the highest previously measured oscillation amplitude.

**User interface**
Signed floating-point number

"Torsion oscillation amplitude" submenu

**Navigation**

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

**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value (6008)

**Prerequisite**
Only available for Promass I.
For the following order code:
*Application package*, option EB "Heartbeat Verification + Monitoring"

**Description**
Displays the lowest previously measured torsion oscillation amplitude.

**User interface**
Signed floating-point number

**Maximum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value (6007)

**Prerequisite**
Only available for Promass I.
For the following order code:
*Application package*, option EB "Heartbeat Verification + Monitoring"

**Description**
Displays the highest previously measured torsion oscillation amplitude.
**User interface**
Signed floating-point number

"Oscillation damping" submenu

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

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<tbody>
<tr>
<td>Minimum value (6122)</td>
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<tr>
<td>Maximum value (6121)</td>
</tr>
</tbody>
</table>

**Minimum value**

**Navigation**
Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value (6122)

**Description**
Displays the lowest previously measured oscillation damping.

**User interface**
Signed floating-point number

**Maximum value**

**Navigation**
Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value (6121)

**Description**
Displays the highest previously measured oscillation damping.

**User interface**
Signed floating-point number

"Torsion oscillation damping" submenu

**Navigation**
Expert → Diagnostics → Min/max val. → Tors.oscil.damp.

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<th>➤ Torsion oscillation damping</th>
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</thead>
<tbody>
<tr>
<td>Minimum value (6120)</td>
</tr>
<tr>
<td>Maximum value (6119)</td>
</tr>
</tbody>
</table>
**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Tors. oscil. damp. → Minimum value (6120)

**Prerequisite**

Only available for Promass I.

For the following order code:
'Application package', option **EB** 'Heartbeat Verification + Monitoring'

**Description**

Displays the lowest previously measured torsion oscillation damping.

**User interface**

Signed floating-point number

---

**Maximum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Tors. oscil. damp. → Maximum value (6119)

**Prerequisite**

Only available for Promass I.

For the following order code:
'Application package', option **EB** 'Heartbeat Verification + Monitoring'

**Description**

Displays the highest previously measured torsion oscillation damping.

**User interface**

Signed floating-point number

---

**“Signal asymmetry” submenu**

**Navigation**

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

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<td>Maximum value (6014) → 231</td>
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</tbody>
</table>

---

**Minimum value**

**Navigation**

Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (6015)

**Description**

Displays the lowest previously measured signal asymmetry.
**User interface**  Signed floating-point number

---

**Maximum value**

**Navigation**  
Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)

**Description**  Displays the highest previously measured signal asymmetry.

**User interface**  Signed floating-point number

---

"Torsion signal asymmetry" submenu

**Navigation**  
Expert → Diagnostics → Min/max val. → Tors.sig.asymm.

**Prerequisite**  Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**  Displays the lowest previously measured torsion signal asymmetry.

**User interface**  Signed floating-point number

---

**Minimum value**

**Navigation**  
Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Minimum value (6284)

**Prerequisite**  Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**  Displays the lowest previously measured torsion signal asymmetry.

**User interface**  Signed floating-point number

---

**Maximum value**

**Navigation**  
Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Maximum value (6283)

**Prerequisite**  Only available for Promass I.
For the following order code:
'Application package', option EB 'Heartbeat Verification + Monitoring'

**Description**
Displays the highest previously measured torsion signal asymmetry.

**User interface**
Signed floating-point number

### 3.8.12 "Data logging" submenu

**Navigation**

```
Expert → Diagnostics → Data logging
```

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<tr>
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</tr>
</tbody>
</table>
Assign channel 1

Navigation

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Prerequisite

The Extended HistOROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

Description

Use this function to select a process variable for the data logging channel.

Selection

- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow
- Density
- Reference density
- Concentration
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation amplitude *
- Oscillation amplitude 1 *
- Oscillation damping 0 *
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- Current output 1
- Current output 2 *
- Current output 3 *

Factory setting

Off

Additional information

Description

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

* Visibility depends on order options or device settings
Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

The log contents are cleared if the option selected is changed.

**Selection**

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry: Assign current output parameter (→ 109)

---

### Assign channel 2

**Navigation**

Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

**Prerequisite**

The Extended HistoROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

**Description**

Options for the assignment of a process variable to the data logging channel.

**Selection**

Picklist, see Assign channel 1 parameter (→ 233)

**Factory setting**

Off

---

### Assign channel 3

**Navigation**

Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

**Prerequisite**

The Extended HistoROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

**Description**

Options for the assignment of a process variable to the data logging channel.

**Selection**

Picklist, see Assign channel 1 parameter (→ 233)

**Factory setting**

Off
Assign channel 4

**Navigation**

Expert → Diagnostics → Data logging → Assign chan. 4 (0854)

**Prerequisite**

The Extended HistoROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

**Description**

Options for the assignment of a process variable to the data logging channel.

**Selection**

Picklist, see Assign channel 1 parameter (→ 233)

**Factory setting**

Off

Logging interval

**Navigation**

Expert → Diagnostics → Data logging → Logging interval (0856)

**Prerequisite**

The Extended HistoROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

**Description**

Use this function to enter the logging interval \(T_{\text{log}}\) for data logging.

**User entry**

0.1 to 999.0 s

**Factory setting**

1.0 s

**Additional information**

This defines the interval between the individual data points in the data log, and thus the maximum loggable process time \(T_{\text{log}}\):

- If 1 logging channel is used: \(T_{\text{log}} = 1000 \times t_{\text{log}}\)
- If 2 logging channels are used: \(T_{\text{log}} = 500 \times t_{\text{log}}\)
- If 3 logging channels are used: \(T_{\text{log}} = 333 \times t_{\text{log}}\)
- If 4 logging channels are used: \(T_{\text{log}} = 250 \times t_{\text{log}}\)

Once this time elapses, the oldest data points in the data log are cyclically overwritten such that a time of \(T_{\text{log}}\) always remains in the memory (ring memory principle).

The log contents are cleared if the length of the logging interval is changed.

**Example**

If 1 logging channel is used:

- \(T_{\text{log}} = 1000 \times 1 \text{ s} = 1000 \text{ s} \approx 15 \text{ min}\)
- \(T_{\text{log}} = 1000 \times 10 \text{ s} = 10000 \text{ s} = 3 \text{ h}\)
- \(T_{\text{log}} = 1000 \times 80 \text{ s} = 80000 \text{ s} = 1 \text{ d}\)
- \(T_{\text{log}} = 1000 \times 3600 \text{ s} = 3600000 \text{ s} = 41 \text{ d}\)
Clear logging data

Navigation
Expert → Diagnostics → Data logging → Clear logging (0855)

Prerequisite
The Extended HistoROM application package is available.
The software options currently enabled are displayed in the Software option overview parameter (→ 45).

Description
Use this function to clear the entire logging data.

Selection
- Cancel
- Clear data

Factory setting
Cancel

Additional information
Selection
- Cancel
  The data is not cleared. All the data is retained.
- Clear data
  The logging data is cleared. The logging process starts from the beginning.

Data logging

Navigation
Expert → Diagnostics → Data logging → Data logging (0860)

Description
Use this function to select the data logging method.

Selection
- Overwriting
- Not overwriting

Factory setting
Overwriting

Additional information
Selection
- Overwriting
  The device memory applies the FIFO principle.
- Not overwriting
  Data logging is canceled if the measured value memory is full (single shot).

Logging delay

Navigation
Expert → Diagnostics → Data logging → Logging delay (0859)

Prerequisite
In the Data logging parameter (→ 236), the Not overwriting option is selected.

Description
Use this function to enter the time delay for measured value logging.

User entry
0 to 999 h
Factory setting 0 h

Additional information
Once measured value logging has been started with the Data logging control parameter (→ 237), the device does not save any data for the duration of the time delay entered.

Data logging control

Navigation  Expert → Diagnostics → Data logging → Data log.control (0857)

Prerequisite In the Data logging parameter (→ 236), the Not overwriting option is selected.

Description Use this function to start and stop measured value logging.

Selection
- None
- Delete + start
- Stop

Factory setting None

Additional information
Selection
- None
  Initial measured value logging status.
- Delete + start
  All the measured values recorded for all the channels are deleted and measured value logging starts again.
- Stop
  Measured value logging is stopped.

Data logging status

Navigation  Expert → Diagnostics → Data logging → Data log. status (0858)

Prerequisite In the Data logging parameter (→ 236), the Not overwriting option is selected.

Description Displays the measured value logging status.

User interface
- Done
- Delay active
- Active
- Stopped

Factory setting Done
Additional information

Selection
- Done
  Measured value logging has been performed and completed successfully.
- Delay active
  Measured value logging has been started but the logging interval has not yet elapsed.
- Active
  The logging interval has elapsed and measured value logging is active.
- Stopped
  Measured value logging is stopped.

Entire logging duration

Navigation
- Expert → Diagnostics → Data logging → Logging duration (0861)

Prerequisite
In the Data logging parameter (→ 236), the Not overwriting option is selected.

Description
Displays the total logging duration.

User interface
Positive floating-point number

Factory setting
0 s

"Display channel 1" submenu

Navigation
- Expert → Diagnostics → Data logging → Displ.channel 1

Display channel 1

Navigation
- Expert → Diagnostics → Data logging → Displ.channel 1

Prerequisite
The Extended HistoROM application package is available.

The software options currently enabled are displayed in the Software option overview parameter (→ 45).

One of the following options is selected in the Assign channel 1 parameter (→ 233):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow*

* Visibility depends on order options or device settings
Description

Displays the measured value trend for the logging channel in the form of a chart.

Additional information

Prerequisite

Detailed description of the options Oscillation frequency, Oscillation amplitude, Oscillation damping and Signal asymmetry. Assign current output parameter (→  109)

Description

A0016357

Chart of a measured value trend

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

* Visibility depends on order options or device settings
"Display channel 2" submenu

Navigation

Expert → Diagnostics → Data logging → Displ.channel 2

Prerequisite

A process variable is defined in the Assign channel 2 parameter.

Description

See the Display channel 1 parameter → 238

"Display channel 3" submenu

Navigation

Expert → Diagnostics → Data logging → Displ.channel 3

Prerequisite

A process variable is defined in the Assign channel 3 parameter.

Description

See the Display channel 1 parameter → 238

"Display channel 4" submenu

Navigation

Expert → Diagnostics → Data logging → Displ.channel 4

Prerequisite

A process variable is defined in the Assign channel 4 parameter.

Description

See the Display channel 1 parameter → 238
Display channel 4

Navigation

Expert → Diagnostics → Data logging → Displ. channel 4

Prerequisite
A process variable is defined in the **Assign channel 4** parameter.

Description
See the **Display channel 1** parameter → 238

3.8.13 "Heartbeat" submenu

For detailed information on the parameter descriptions for the Heartbeat Verification+Monitoring application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Diagnostics → Heartbeat

3.8.14 "Simulation" submenu

Navigation

Expert → Diagnostics → Simulation

- Assign simulation process variable (1810) → 242
- Process variable value (1811) → 243
- Status input simulation (1355) → 243
- Input signal level (1356) → 244
- Current input 1 to n simulation (1608–1 to n) → 244
- Value current input 1 to n (1609–1 to n) → 245
Description of device parameters

**Assign simulation process variable**

**Navigation**
Expert → Diagnostics → Simulation → Assign proc.var. (1810)

**Description**
Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the “Function check” category (C) while simulation is in progress.

**Selection**
- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Density
- Reference density
Proline Promass 300 HART

Description of device parameters

- Temperature
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Concentration *
- Target mass flow *
- Carrier mass flow *

Factory setting
Off

Additional information

Description
The simulation value of the process variable selected is defined in the Process variable value parameter (→ 243).

Process variable value

Navigation
Expert → Diagnostics → Simulation → Proc. var. value (1811)

Description
Use this function to enter a simulation value for the selected process variable. Subsequent measured value processing and the signal output use this simulation value. In this way, users can verify whether the measuring device has been configured correctly.

User entry
Depends on the process variable selected

Factory setting
0

Additional information

User entry
The unit of the displayed measured value is taken from the System units submenu (→ 60).

Status input simulation

Navigation
Expert → Diagnostics → Simulation → Status inp. sim. (1355)

Description
Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- On

Factory setting
Off

* Visibility depends on order options or device settings
Additional information

Description

The desired simulation value is defined in the **Input signal level** parameter (→ 244).

Selection

- **Off**
  Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.
- **On**
  Simulation for the status input is active.

Input signal level

**Navigation**

Expert → Diagnostics → Simulation → Signal level (1356)

**Prerequisite**

In the **Status input simulation** parameter (→ 243), the **On** option is selected.

**Description**

Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.

**Selection**

- **High**
- **Low**

Current input 1 to n simulation

**Navigation**

Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608–1 to n)

**Description**

Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the ‘Function check’ category (C) while simulation is in progress.

The desired simulation value is defined in the **Value current input 1 to n** parameter.

**Selection**

- **Off**
- **On**

**Factory setting**

Off

**Additional information**

Selection

- **Off**
  Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- **On**
  Current simulation is active.
**Value current input 1 to n**

**Navigation**

Expert → Diagnostics → Simulation → Value curr. inp 1 to n (1609–1 to n)

**Prerequisite**
In the **Current input 1 to n simulation** parameter, the **On** option is selected.

**Description**
Use this function to enter the current value for the simulation. In this way, users can verify the correct configuration of the current input and the correct function of upstream feed-in units.

**User entry**
0 to 22.5 mA

**Current output 1 to n simulation**

**Navigation**

Expert → Diagnostics → Simulation → Curr. out. 1 to n sim. (0354–1 to n)

**Description**
Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the 'Function check' category (C) while simulation is in progress.

**Selection**
- Off
- On

**Factory setting**
Off

**Additional information**

*Description*
The desired simulation value is defined in the **Value current output 1 to n** parameter.

*Selection*
- Off
  Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Current simulation is active.

**Value current output 1 to n**

**Navigation**

Expert → Diagnostics → Simulation → Value curr. out 1 to n (0355–1 to n)

**Prerequisite**
In the **Current output 1 to n simulation** parameter, the **On** option is selected.

**Description**
Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.

**User entry**
3.59 to 22.5 mA
Additional information

Dependency
The input range is dependent on the option selected in the Current span parameter (→ 110).

Frequency output simulation 1 to n

Navigation

Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)

Prerequisite
In the Operating mode parameter (→ 125), the Frequency option is selected.

Description
Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- On

Factory setting
Off

Additional information

Description
The desired simulation value is defined in the Frequency value 1 to n parameter.

Selection
- Off
  Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Frequency simulation is active.

Frequency value 1 to n

Navigation

Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)

Prerequisite
In the Frequency output simulation 1 to n parameter, the On option is selected.

Description
Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

User entry
0.0 to 12500.0 Hz
### Pulse output simulation 1 to n

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<tr>
<td>Prerequisite</td>
<td>In the Operating mode parameter (→ 125), the Pulse option is selected.</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the 'Function check' category (C) while simulation is in progress.</td>
</tr>
</tbody>
</table>
| Selection | • Off  
• Fixed value  
• Down-counting value |
| Factory setting | Off |
| Additional information | Description  
The desired simulation value is defined in the Pulse value 1 to n parameter.  
Selection  
• Off  
Pulse simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.  
• Fixed value  
Pulses are continuously output with the pulse width specified in the Pulse width parameter (→ 128).  
• Down-counting value  
The pulses specified in the Pulse value parameter (→ 247) are output. |

### Pulse value 1 to n

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<tr>
<td>Prerequisite</td>
<td>In the Pulse output simulation 1 to n parameter, the Down-counting value option is selected.</td>
</tr>
<tr>
<td>Description</td>
<td>Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.</td>
</tr>
<tr>
<td>User entry</td>
<td>0 to 65535</td>
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</table>

### Switch output simulation 1 to n

<table>
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<tbody>
<tr>
<td>Prerequisite</td>
<td>In the Operating mode parameter (→ 125), the Switch option is selected.</td>
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</tbody>
</table>
Description of device parameters

Proline Promass 300 HART

Description
Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- On

Factory setting
Off

Additional information

Description
The desired simulation value is defined in the Switch status 1 to n parameter.

Selection
- Off
  Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Switch simulation is active.

Switch status 1 to n

Navigation
Expert → Diagnostics → Simulation → Switch status 1 to n (0463–1 to n)

Description
Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

Selection
- Open
- Closed

Additional information

Selection
- Open
  Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed
  Switch simulation is active.

Relay output 1 to n simulation

Navigation
Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)

Description
Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- On

Factory setting
Off
Additional information  

*Description*

The desired simulation value is defined in the **Switch status 1 to n** parameter.

*Selection*

- **Off**
  Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- **On**
  Relay simulation is active.

**Switch status 1 to n**

*Navigation*

Expert → Diagnostics → Simulation → Switch status 1 to n (0803–1 to n)

*Prerequisite*

In the **Switch output simulation 1 to n** parameter, the **On** option is selected.

*Description*

Use this function to select a relay value for the simulation. In this way, users can verify the correct adjustment of the relay output and the correct function of downstream switching units.

*Selection*

- **Open**
- **Closed**

*Additional information*

*Selection*

- **Open**
  Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- **Closed**
  Relay simulation is active.

**Pulse output simulation**

*Navigation*

Expert → Diagnostics → Simulation → Puls.outp.sim. (0988)

*Description*

Use this function to switch simulation of the double pulse output on and off. The display alternates between the measured value and a diagnostic message of the 'Function check' category (C) while simulation is in progress.

*Selection*

- **Off**
- **Fixed value**
- **Down-counting value**

*Factory setting*

Off
Additional information

*Description*

The desired simulation value is defined in the **Pulse value** parameter (→ 250).

*Selection*

- **Off**
  Simulation of the double pulse output is switched off. The device is in normal measuring mode or another process variable is being simulated.
- **Fixed value**
  Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 157).
- **Down-counting value**
  The pulses specified in the **Pulse value** parameter (→ 250) are output.

### Pulse value

**Navigation**

[Expert → Diagnostics → Simulation → Pulse value (0989)]

**Prerequisite**

In the **Pulse output simulation** parameter (→ 249), the **Down-counting value** option is selected.

**Description**

Use this function to enter a pulse value for simulation of the double pulse output. In this way, users can verify the correct adjustment of the double pulse output and the correct function of downstream switching units.

**User entry**

0 to 65,535

### Device alarm simulation

**Navigation**

[Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)]

**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 (0738)

**Description**

Use this function to select the category of the diagnostic events that are displayed for the simulation in the Diagnostic event simulation parameter (→ 251).

**Selection**

- Sensor
- Electronics
- Configuration
- Process

**Factory setting**

Process

---

### Diagnostic event simulation

**Navigation**

Expert → Diagnostics → Simulation → Diag. event sim. (0737)

**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 (→ 251).
4 Country-specific factory settings

4.1 SI units

Not valid for USA and Canada.

4.1.1 System units

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>kg</td>
</tr>
<tr>
<td>Mass flow</td>
<td>kg/h</td>
</tr>
<tr>
<td>Volume</td>
<td>l</td>
</tr>
<tr>
<td>Volume flow</td>
<td>l/h</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Nl</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Nl/h</td>
</tr>
<tr>
<td>Density</td>
<td>kg/l</td>
</tr>
<tr>
<td>Reference density</td>
<td>kg/Nl</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Pressure</td>
<td>bar a</td>
</tr>
</tbody>
</table>

4.1.2 Full scale values

The factory settings apply to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

For detailed information about the full scale value for measuring devices for custody transfer, see the Special Documentation for the device → 7

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>[kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>8</td>
<td>400</td>
</tr>
<tr>
<td>15</td>
<td>1300</td>
</tr>
<tr>
<td>15 FB</td>
<td>3600</td>
</tr>
<tr>
<td>25</td>
<td>3600</td>
</tr>
<tr>
<td>25 FB</td>
<td>9000</td>
</tr>
<tr>
<td>40</td>
<td>9000</td>
</tr>
<tr>
<td>40 FB</td>
<td>14000</td>
</tr>
<tr>
<td>50</td>
<td>14000</td>
</tr>
<tr>
<td>50 FB</td>
<td>36000</td>
</tr>
<tr>
<td>80</td>
<td>36000</td>
</tr>
<tr>
<td>100</td>
<td>60000</td>
</tr>
<tr>
<td>150</td>
<td>130 t/h</td>
</tr>
<tr>
<td>250</td>
<td>360 t/h</td>
</tr>
<tr>
<td>350</td>
<td>650 t/h</td>
</tr>
</tbody>
</table>
4.1.3 Output current span

| Current output 1 to n | 4 to 20 mA NAMUR |

4.1.4 Pulse value

For detailed information about the pulse value for measuring devices for custody transfer, see the Special Documentation for the device → 7

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>On-value for liquid [kg/p]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.001</td>
</tr>
<tr>
<td>2</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>0.01</td>
</tr>
<tr>
<td>8</td>
<td>0.1</td>
</tr>
<tr>
<td>15</td>
<td>0.1</td>
</tr>
<tr>
<td>15 FB</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>25 FB</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>40 FB</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>50 FB</td>
<td>10</td>
</tr>
<tr>
<td>80</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td>350</td>
<td>100</td>
</tr>
</tbody>
</table>

4.1.5 On value low flow cut off

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

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>On-value for liquid [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.08</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>15 FB</td>
<td>72</td>
</tr>
<tr>
<td>25</td>
<td>72</td>
</tr>
<tr>
<td>25 FB</td>
<td>180</td>
</tr>
<tr>
<td>40</td>
<td>180</td>
</tr>
<tr>
<td>40 FB</td>
<td>300</td>
</tr>
<tr>
<td>50</td>
<td>300</td>
</tr>
<tr>
<td>50 FB</td>
<td>720</td>
</tr>
</tbody>
</table>
Country-specific factory settings

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>On-value for liquid [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>720</td>
</tr>
<tr>
<td>100</td>
<td>1200</td>
</tr>
<tr>
<td>150</td>
<td>2.6 t/h</td>
</tr>
<tr>
<td>250</td>
<td>7.2 t/h</td>
</tr>
<tr>
<td>350</td>
<td>13 t/h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal diameter [mm]</th>
<th>Switch-on value for gas [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>4</td>
<td>0.45</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>6.5</td>
</tr>
<tr>
<td>15 FB</td>
<td>18</td>
</tr>
<tr>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>25 FB</td>
<td>45</td>
</tr>
<tr>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>40 FB</td>
<td>75</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>50 FB</td>
<td>180</td>
</tr>
<tr>
<td>80</td>
<td>180</td>
</tr>
<tr>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>150</td>
<td>650</td>
</tr>
<tr>
<td>250</td>
<td>1.8 t/h</td>
</tr>
<tr>
<td>350</td>
<td>3.25 t/h</td>
</tr>
</tbody>
</table>

**4.2 US units**

Only valid for USA and Canada.

**4.2.1 System units**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>lb</td>
</tr>
<tr>
<td>Mass flow</td>
<td>lb/min</td>
</tr>
<tr>
<td>Volume</td>
<td>gal (us)</td>
</tr>
<tr>
<td>Volume flow</td>
<td>gal/min (us)</td>
</tr>
<tr>
<td>Corrected volume</td>
<td>Sft³</td>
</tr>
<tr>
<td>Corrected volume flow</td>
<td>Sft³/min</td>
</tr>
<tr>
<td>Density</td>
<td>lb/ft³</td>
</tr>
<tr>
<td>Reference density</td>
<td>lb/Sft³</td>
</tr>
<tr>
<td>Temperature</td>
<td>°F</td>
</tr>
<tr>
<td>Pressure</td>
<td>psi a</td>
</tr>
</tbody>
</table>
4.2.2 Full scale values

The factory settings apply to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

For detailed information about the full scale value for measuring devices for custody transfer, see the Special Documentation for the device →  7

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>[lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>¹/₂₄</td>
<td>0.15</td>
</tr>
<tr>
<td>¹/₁₂</td>
<td>0.75</td>
</tr>
<tr>
<td>¹/₈</td>
<td>3.3</td>
</tr>
<tr>
<td>³/₈</td>
<td>15</td>
</tr>
<tr>
<td>½</td>
<td>50</td>
</tr>
<tr>
<td>½ FB</td>
<td>130</td>
</tr>
<tr>
<td>1</td>
<td>130</td>
</tr>
<tr>
<td>1 FB</td>
<td>330</td>
</tr>
<tr>
<td>1½</td>
<td>330</td>
</tr>
<tr>
<td>1½ FB</td>
<td>550</td>
</tr>
<tr>
<td>2</td>
<td>550</td>
</tr>
<tr>
<td>2 FB</td>
<td>1300</td>
</tr>
<tr>
<td>3</td>
<td>1300</td>
</tr>
<tr>
<td>4</td>
<td>2200</td>
</tr>
<tr>
<td>6</td>
<td>4800</td>
</tr>
<tr>
<td>10</td>
<td>13000</td>
</tr>
<tr>
<td>¹/₄</td>
<td>23500</td>
</tr>
</tbody>
</table>

4.2.3 Output current span

Current output 1 to n  4 to 20 mA US

4.2.4 Pulse value

For detailed information about the pulse value for measuring devices for custody transfer, see the Special Documentation for the device →  7

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>[lb/p]</th>
</tr>
</thead>
<tbody>
<tr>
<td>¹/₂₄</td>
<td>0.002</td>
</tr>
<tr>
<td>¹/₁₂</td>
<td>0.02</td>
</tr>
<tr>
<td>¹/₈</td>
<td>0.02</td>
</tr>
<tr>
<td>³/₈</td>
<td>0.2</td>
</tr>
<tr>
<td>½</td>
<td>0.2</td>
</tr>
<tr>
<td>½ FB</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 FB</td>
<td>2</td>
</tr>
<tr>
<td>1½</td>
<td>2</td>
</tr>
</tbody>
</table>
Country-specific factory settings

### Proline Promass 300 HART

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>[lb/p]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½ FB</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>2 FB</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>200</td>
</tr>
<tr>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>14</td>
<td>200</td>
</tr>
</tbody>
</table>

#### 4.2.5 On value low flow cut off

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

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>On-value for liquid [lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/24</td>
<td>0.003</td>
</tr>
<tr>
<td>1/12</td>
<td>0.015</td>
</tr>
<tr>
<td>1/8</td>
<td>0.066</td>
</tr>
<tr>
<td>3/8</td>
<td>0.3</td>
</tr>
<tr>
<td>½</td>
<td>1</td>
</tr>
<tr>
<td>1/2 FB</td>
<td>2.6</td>
</tr>
<tr>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>1 FB</td>
<td>6.6</td>
</tr>
<tr>
<td>1½</td>
<td>6.6</td>
</tr>
<tr>
<td>1½ FB</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>2 FB</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
</tr>
<tr>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td>10</td>
<td>260</td>
</tr>
<tr>
<td>14</td>
<td>470</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>Switch-on value for gas [lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/24</td>
<td>0.001</td>
</tr>
<tr>
<td>1/12</td>
<td>0.004</td>
</tr>
<tr>
<td>1/8</td>
<td>0.016</td>
</tr>
<tr>
<td>3/8</td>
<td>0.075</td>
</tr>
<tr>
<td>½</td>
<td>0.25</td>
</tr>
<tr>
<td>1/2 FB</td>
<td>0.65</td>
</tr>
<tr>
<td>1</td>
<td>0.65</td>
</tr>
<tr>
<td>1 FB</td>
<td>1.65</td>
</tr>
</tbody>
</table>
### Proline Promass 300 HART

**Country-specific factory settings**

<table>
<thead>
<tr>
<th>Nominal diameter [in]</th>
<th>Switch-on value for gas [lb/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>1.65</td>
</tr>
<tr>
<td>1½ FB</td>
<td>2.75</td>
</tr>
<tr>
<td>2</td>
<td>2.75</td>
</tr>
<tr>
<td>2 FB</td>
<td>6.5</td>
</tr>
<tr>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>23.75</td>
</tr>
<tr>
<td>10</td>
<td>65</td>
</tr>
<tr>
<td>14</td>
<td>117.5</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><strong>Density</strong></td>
<td>g/cm³, g/m³</td>
<td>Gram/volume unit</td>
</tr>
<tr>
<td></td>
<td>kg/dm³, kg/l, kg/m³</td>
<td>Kilogram/volume unit</td>
</tr>
<tr>
<td></td>
<td>SD4°C, SD15°C, SD20°C</td>
<td>Specific density: The specific density is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).</td>
</tr>
<tr>
<td></td>
<td>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).</td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
<td>Pa a, kPa a, MPa a</td>
<td>Pascal, kilopascal, megapascal (absolute)</td>
</tr>
<tr>
<td></td>
<td>bar</td>
<td>Bar</td>
</tr>
<tr>
<td></td>
<td>Pa g, kPa g, MPa g</td>
<td>Pascal, kilopascal, megapascal (relative/gauge)</td>
</tr>
<tr>
<td></td>
<td>bar g</td>
<td>Bar (relative/gauge)</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>g, kg, t</td>
<td>Gram, kilogram, metric ton</td>
</tr>
<tr>
<td><strong>Mass flow</strong></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><strong>Reference density</strong></td>
<td>kg/Nm³, kg/l, g/Scm³, kg/Sm³</td>
<td>Kilogram, gram/standard volume unit</td>
</tr>
<tr>
<td><strong>Corrected volume</strong></td>
<td>Ni, Nm³, Sm³</td>
<td>Normal liter, normal cubic meter, standard cubic meter</td>
</tr>
<tr>
<td><strong>Corrected volume flow</strong></td>
<td>Ni/s, Ni/min, Ni/h, Ni/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><strong>Temperature</strong></td>
<td>°C, K</td>
<td>Celsius, Kelvin</td>
</tr>
<tr>
<td><strong>Volume</strong></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><strong>Volume flow</strong></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>
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<tr>
<td></td>
<td>ml/s, ml/min, ml/h, ml/d</td>
<td>Milliliter/time unit</td>
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<tr>
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<td>l/s, l/min, l/h, l/d</td>
<td>Liter/time unit</td>
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<td>hl/s, hl/min, hl/h, hl/d</td>
<td>Hectoliter/time unit</td>
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<td>MI/s, MI/min, MI/h, MI/d</td>
<td>Megaliter/time unit</td>
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<td><strong>Time</strong></td>
<td>s, m, h, d, y</td>
<td>Second, minute, hour, day, year</td>
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### 5.2 US units

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<th>Units</th>
<th>Explanation</th>
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<td><strong>Density</strong></td>
<td>lb/ft², lb/gal (us)</td>
<td>Pound/cubic foot, pound/gallon</td>
</tr>
<tr>
<td></td>
<td>lb/bbl (us:liq.), lb/bbl (us:beer), lb/bbl (us:oil), lb/bbl (us:tank)</td>
<td>Pound/volume unit</td>
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<td>Process variable</td>
<td>Units</td>
<td>Explanation</td>
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<tr>
<td>Pressure</td>
<td>psi a</td>
<td>Pounds per square inch (absolute)</td>
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<td>psi g</td>
<td>Pounds per square inch (gauge)</td>
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<td>Mass</td>
<td>oz, lb, STon</td>
<td>Ounce, pound, standard ton</td>
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<tr>
<td>Mass flow</td>
<td>oz/s, oz/min, oz/h, oz/d</td>
<td>Ounce/time unit</td>
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<tr>
<td></td>
<td>lb/s, lb/min, lb/h, lb/d</td>
<td>Pound/time unit</td>
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<td></td>
<td>STon/s, STon/min, STon/h, STon/d</td>
<td>Standard ton/time unit</td>
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<tr>
<td>Reference density</td>
<td>lb/ft³</td>
<td>Weight unit/standard volume unit</td>
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<tr>
<td>Corrected volume</td>
<td>ft³, Sgal (us), Sbbl (us;liq.)</td>
<td>Standard cubic foot, standard gallon, standard barrel</td>
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<tr>
<td>Corrected volume flow</td>
<td>ft³/s, ft³/min, ft³/h, ft³/d</td>
<td>Standard cubic foot/time unit</td>
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<td>Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)</td>
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<td>Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)</td>
<td>Barrel/time unit (normal liquids)</td>
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<td>Temperature</td>
<td>°F, °R</td>
<td>Fahrenheit, Rankine</td>
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<tr>
<td>Volume</td>
<td>af</td>
<td>Acre foot</td>
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<tr>
<td></td>
<td>ft³</td>
<td>Cubic foot</td>
</tr>
<tr>
<td></td>
<td>fl oz (us), gal (us), kgal (us), Mgal (us)</td>
<td>Fluid ounce, gallon, kilogallon, million gallon</td>
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<td></td>
<td>bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)</td>
<td>Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)</td>
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<tr>
<td>Volume flow</td>
<td>af/s, af/min, af/h, af/d</td>
<td>Acre foot/time unit</td>
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<tr>
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<td>ft³/s, ft³/min, ft³/h, ft³/d</td>
<td>Cubic foot/time unit</td>
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<td>fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)</td>
<td>Fluid ounce/time unit</td>
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<td>gal/s (us), gal/min (us), gal/h (us), gal/d (us)</td>
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<td>kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)</td>
<td>Kilogallon/time unit</td>
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<td>Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)</td>
<td>Million gallon/time unit</td>
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<td>bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)</td>
<td>Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl</td>
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<td>bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)</td>
<td>Barrel/time unit (beer) Beer: 31.0 gal/bbl</td>
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<td></td>
<td>bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)</td>
<td>Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl</td>
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<td>bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)</td>
<td>Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl</td>
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<td>Second, minute, hour, day, year</td>
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<td></td>
<td>am, pm</td>
<td>Ante meridiem (before midday), post meridiem (after midday)</td>
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# 5.3 Imperial units

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<th>Units</th>
<th>Explanation</th>
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<td>lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)</td>
<td>Pound/volume unit</td>
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<td>Corrected volume</td>
<td>Sgal (imp)</td>
<td>Standard gallon</td>
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<td>Corrected volume flow</td>
<td>Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)</td>
<td>Standard gallon/time unit</td>
</tr>
<tr>
<td>Volume</td>
<td>gal (imp), Mgal (imp)</td>
<td>Gallon, mega gallon</td>
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<tr>
<td></td>
<td>bbl (imp;beer), bbl (imp;oil)</td>
<td>Barrel (beer), barrel (petrochemicals)</td>
</tr>
<tr>
<td>Volume flow</td>
<td>gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)</td>
<td>Gallon/time unit</td>
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<td>Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)</td>
<td>Mega gallon/time unit</td>
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<td></td>
<td>bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)</td>
<td>Barrel /time unit (beer)</td>
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<td></td>
<td>Beer: 36.0 gal/bbl</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)</td>
<td>Barrel/time unit (petrochemicals)</td>
</tr>
<tr>
<td></td>
<td>Petrochemicals: 34.97 gal/bbl</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>s, m, h, d, y</td>
<td>Second, minute, hour, day, year</td>
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