

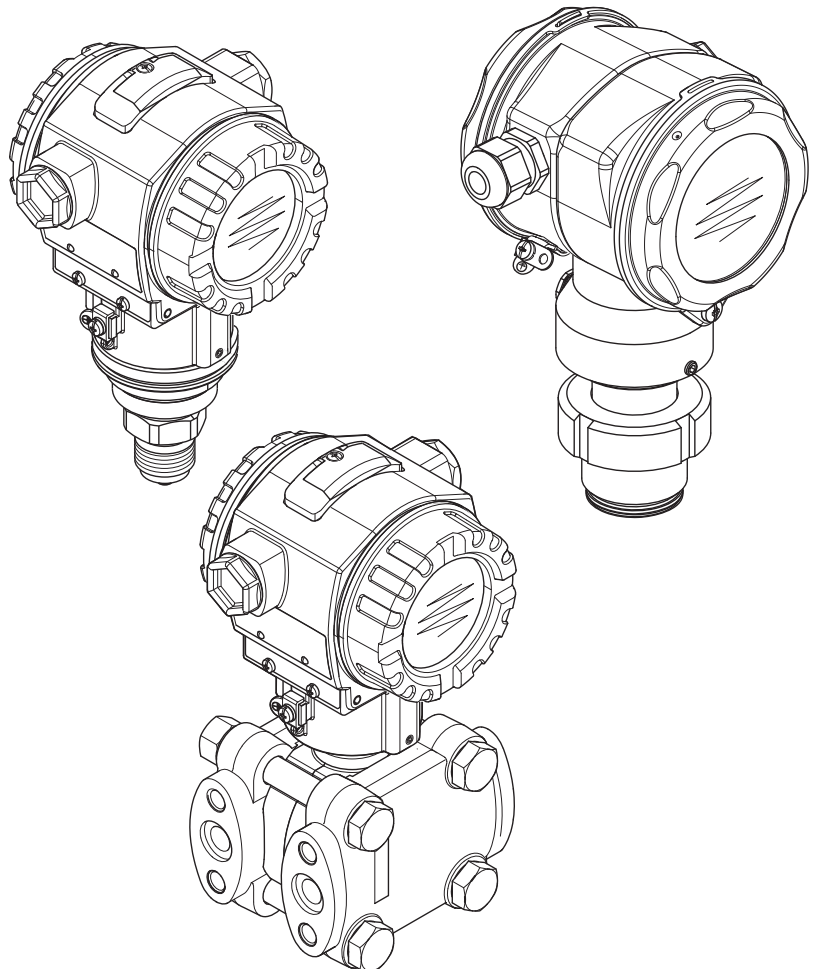
Description of Instrument Functions

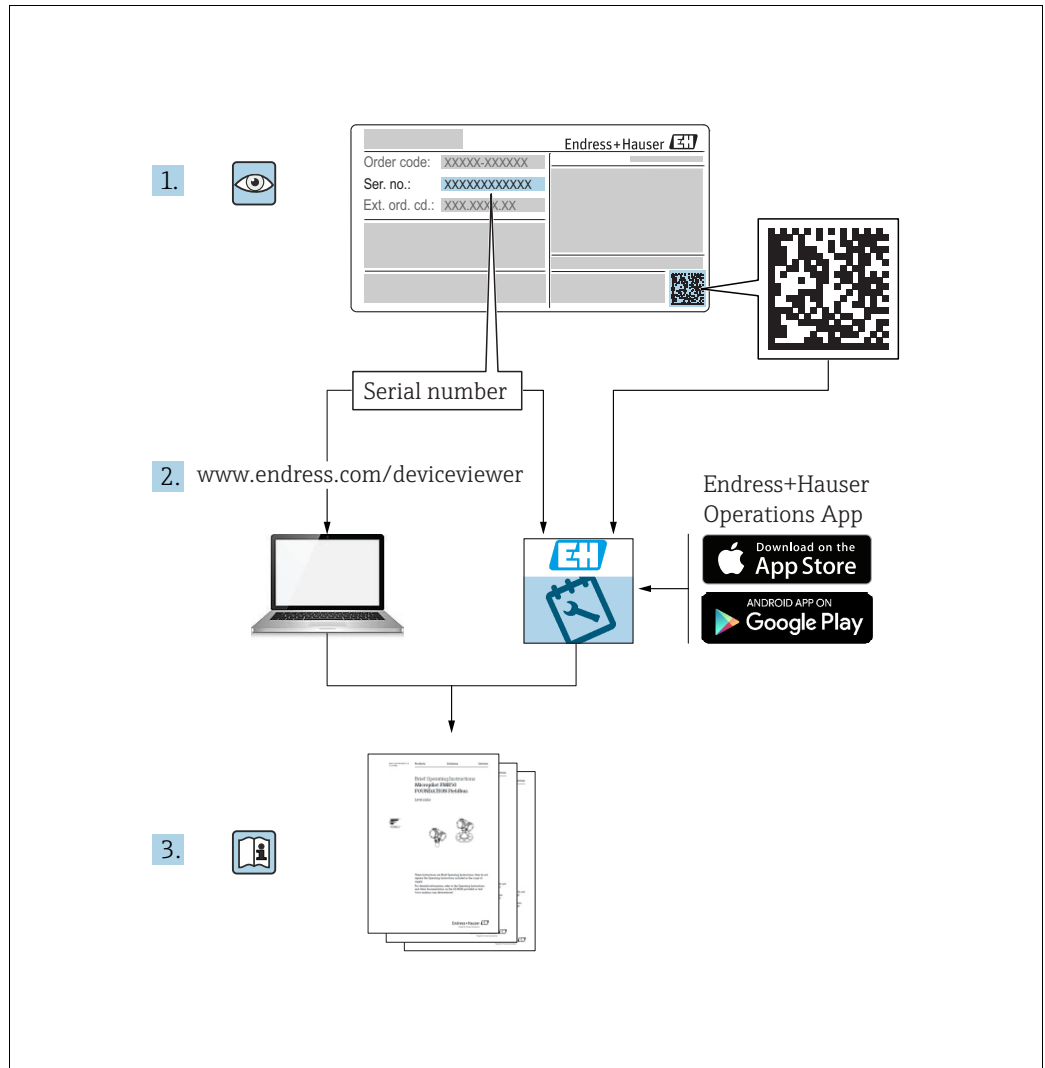
Cerabar S PMC71, PMP71, PMP75

Deltabar S FMD77 / 78, PMD75

Deltapilot S FMB70

Process pressure / Differential pressure, Flow /
Hydrostatic





A0023555

Make sure the document is stored in a safe place such that it is always available when working on or with the device.

To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.

The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser Sales Center will supply you with current information and updates to these Instructions.





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1 Document information

1.1 Symbols used

1.1.1 Safety symbols

Symbol	Meaning
 <small>A0011189-DE</small>	DANGER! This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 <small>A0011190-DE</small>	WARNING! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 <small>A0011191-DE</small>	CAUTION! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 <small>A0011192-DE</small>	NOTICE! This symbol contains information on procedures and other facts which do not result in personal injury.

1.1.2 Symbols for certain types of information

Symbol	Meaning
 <small>A0011193</small>	Tip Indicates additional information.

2 Basic safety instructions

Siehe Betriebsanleitung:

Deltabar S BA00270P

Cerabar S BA00271P

Deltapilot S BA00332P

3 Notes on use

Typical examples of configuration	see chapter 4 to 6
Operating menu of the on-site display	see Chapter 7
FieldCare operating menu	see Chapter 8
Parameter description	see Chapter 9
Finding parameter description using parameter names (index)	see Page 142

4 Pressure measurement

4.1 Calibration with reference pressure

Example:

In this example, a device with a 500 mbar (7.5 psi) sensor is configured for the 0...+300 mbar (4.5 psi) measuring range, i.e. 0 mbar and 300 mbar (4.5 psi) are assigned to the 4 mA value and 20 mA value respectively.

Prerequisite:

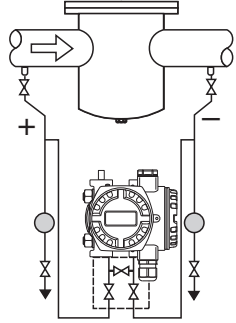
- The pressure values 0 mbar and 300 mbar (4.5 psi) can be specified. The device is already installed, for example.
- See also Operating Instructions Deltabar S (BA00270P), Section "Differential pressure measurement", Cerabar S (BA00271P), Section "Pressure measurement" or Deltapilot S (BA00332P), Section "Pressure measurement".
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 69, Table 7: BASIC SETUP.
- For a description of further relevant parameters, see
 - Page 100, Table 15: EXTENDED SETUP
 - Page 120, Table 25: PROCESS VALUES.

▲ WARNING**Changing the measuring mode can affect the adjustment data!**

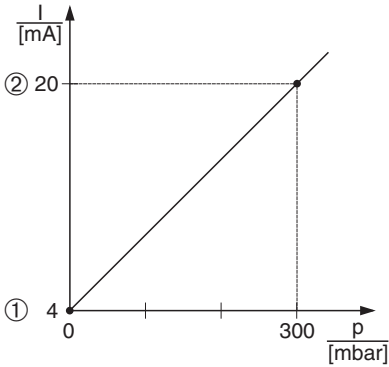
This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Deltabar S: before configuring the device for your application, the pressure piping must be cleaned and filled with fluid. See Operating Instructions BA00270P.
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.
3	If necessary, select the "Pressure" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
4	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP
5	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
6	The pressure for the lower range value (4 mA value) is present at the device, here 0 mbar for example. Select GET LRV parameter. Confirm value present. The pressure value present is assigned to the lower current value (4 mA).
7	The pressure for the upper range value (20 mA value) is present at the device, here 300 mbar (4.5 psi) for example. Select GET URV parameter. Confirm value present. The pressure value present is assigned to the upper current value (20 mA).
8	Result: The measuring range is set for 0...+300 mbar (4.5 psi).



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Fig. 1: Calibration with reference pressure

- 1 See table, step 6.
- 2 See table, step 7.

You can also specify a customer-specific unit. See parameter description for PRESS. ENG. UNIT (→ Page 69).

4.2 Calibration without reference pressure

Example:

In this example, a device with a 400 mbar (6 psi) sensor is configured for the 0...+300 mbar (4.5 psi) measuring range, i.e. 0 mbar and 300 mbar (4.5 psi) are assigned to the 4 mA value and 20 mA value respectively.

Prerequisite:

- This is a theoretical calibration, i.e. the pressure values for the lower range and upper range value are known.
- See also Operating Instructions Deltabar S (BA00270P), Section "Differential pressure measurement", Cerabar S (BA00271P), Section "Pressure measurement" or Deltapilot S (BA00332P), Section "Pressure measurement".
- Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero. → To perform a position adjustment see also Page 68, Table 6: Position adjustment.

- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 69, Table 7: BASIC SETUP.
- For a description of further relevant parameters, see
 - Page 100, Table 15: EXTENDED SETUP
 - Page 120, Table 27: PROCESS VALUES.

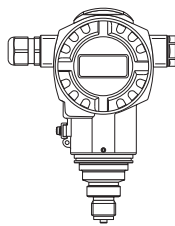
▲ WARNING

Changing the measuring mode can affect the adjustment data!

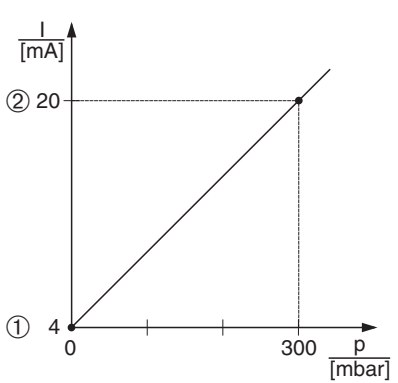
This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	If necessary, select the "Pressure" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
2	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP
3	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
4	Select SET LRV parameter. Enter value, here 0 mbar, for the SET LRV parameter and confirm. This pressure value is assigned to the lower current value (4 mA).
5	Select SET URV parameter. Enter value, here 300 mbar (4.5 psi), for the SET URV parameter and confirm. This pressure value is assigned to the upper current value (20 mA).
6	Result: The measuring range is set for 0...+300 mbar (4.5 psi).



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Fig. 2: Calibration without reference pressure

1 See table, step 4.
 2 See table, step 5.

- You can also perform calibration without reference pressure by means of the QUICK SETUP menu. → See Page 64 ff, Table 3: QUICK SETUP menu.
- You can also specify a customer-specific unit. See parameter description for PRESS. ENG. UNIT (→ Page 69).

5 Level measurement

5.1 Overview of level measurement

Measuring task	LEVEL SELECTION/ LEVEL MODE	Measured variable options	Description	Comment	Measured value display
The measured variable is in direct proportion to the measured pressure. Calibration is performed by entering two pressure-level value pairs.	LEVEL SELECTION: Level Easy Pressure	Via OUTPUT UNIT parameter: %, level, volume or mass units.	<ul style="list-style-type: none"> - Calibration with reference pressure – wet calibration, see Page 9, Section 5.2.1 - Calibration without reference pressure – dry calibration, see Page 11, Section 5.2.2 	<ul style="list-style-type: none"> - Incorrect entries are possible - SIL mode possible - Customised units are not possible 	The measured value display and the LEVEL BEFORE LIN parameter show the measured value.
The measured variable is in direct proportion to the measured pressure. Calibration is performed by entering the density and two height-level value pairs.	LEVEL SELECTION: Level Easy Height	Via OUTPUT UNIT parameter: %, level, volume or mass units.	<ul style="list-style-type: none"> - Calibration with reference pressure – wet calibration, see Page 13, Section 5.3.1 - Calibration without reference pressure – dry calibration, see Page 15, Section 5.3.2 	<ul style="list-style-type: none"> - Incorrect entries are possible - SIL mode not possible - Customised units are not possible 	The measured value display and the LEVEL BEFORE LIN parameter show the measured value.
The measured variable is in direct proportion to the measured pressure.	LEVEL SELECTION: Level standard/ LEVEL MODE: Linear	Via LIN. MEASURAND parameter: <ul style="list-style-type: none"> - % (Level) - Level - Volume - Mass 	<ul style="list-style-type: none"> - Calibration with reference pressure – wet calibration, see Page 17, Section 5.4.1 - Calibration without reference pressure – dry calibration, see Page 19, Section 5.4.2 	<ul style="list-style-type: none"> - Incorrect entries are rejected by the device - SIL mode not possible - Customised level, volume and mass units are possible 	The measured value display and the LEVEL BEFORE LIN parameter show the measured value.
The measured variable is not in direct proportion to the measured pressure as, for example, with containers with a conical outlet. A linearisation table must be entered for the calibration.	LEVEL SELECTION: Level standard/ LEVEL MODE: Pressure Linearized	Via LINd MEASURAND parameter: <ul style="list-style-type: none"> - Pressure + % - Pressure + Volume - Pressure + Mass 	<ul style="list-style-type: none"> - Calibration with reference pressure: semiautomatic entry of linearisation table, see Page 21, Section 5.5.1 - Calibration without reference pressure: manual entry of linearisation table, see Page 24, Section 5.5.2 	<ul style="list-style-type: none"> - Incorrect entries are rejected by the device - SIL mode not possible - Customised level, volume and mass units are possible 	The measured value display and the TANK CONTENT parameter show the measured value.
<ul style="list-style-type: none"> - Two measured variables are required or - The container shape is given by value pairs, such as height and volume. <p>The 1st measured variable %-height or height must be in direct proportion to the measured pressure. The 2nd measured variable volume, mass or % must not be in direct proportion to the measured pressure. A linearisation table must be entered for the 2nd measured variable. The 2nd measured variable is assigned to the 1st measured variable by means of this table.</p>	LEVEL SELECTION: Level standard/ LEVEL MODE: Height Linearized	Via COMB. MEASURAND parameter: <ul style="list-style-type: none"> - Height + Volume - Height + Mass - Height + % - %-Height + Volume - %-Height + Mass - %-Height + % 	<ul style="list-style-type: none"> - Calibration with reference pressure: wet calibration and semiautomatic entry of linearisation table, see Page 26, Section 5.6.1 - Calibration without reference pressure: dry calibration and manual entry of linearisation table, see Page 30, Section 5.6.2 	<ul style="list-style-type: none"> - Incorrect entries are rejected by the device - SIL mode not possible - Customised level, volume and mass units are possible 	<p>The measured value display and the TANK CONTENT parameter show the 2nd measured value (volume, mass or %).</p> <p>The LEVEL BEFORE LIN parameter displays the 1st measured value (%-height or height).</p>

5.2 "Level Easy Pressure" level selection

5.2.1 Calibration with reference pressure – wet calibration

Example:

In this example, the level in a tank should be measured in m. The maximum level is 3 m (9.8 ft). The pressure range is set to 0 to 300 mbar (4.5 psi).

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- The tank can be filled or emptied.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- The values entered for EMPTY CALIB./FULL CALIB. and SET LRV/SET URV must have a minimum interval of 1% for the "Level Easy Pressure" level mode. The value will be rejected with a warning message if the values are too close together. Further limit values are not checked; i.e. the values entered must be appropriate for the sensor and the measuring task so that the measuring device can measure correctly.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 70, Table 8: LEVEL SELECTION "Level Easy Pressure"
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

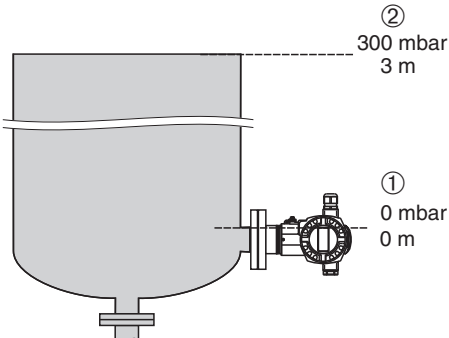
▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Deltabar S: Before you configure the device for your application, the pressure piping must be cleaned and filled with medium. See Operating Instructions BA00270P.
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.
3	If necessary, select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
4	If necessary, select "Level Easy Pressure" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63

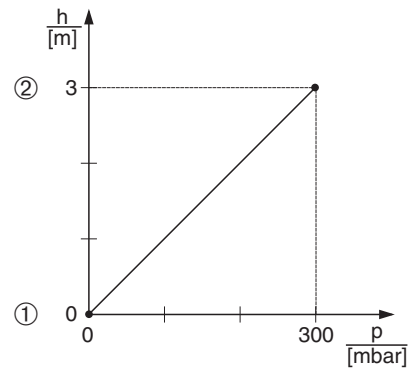


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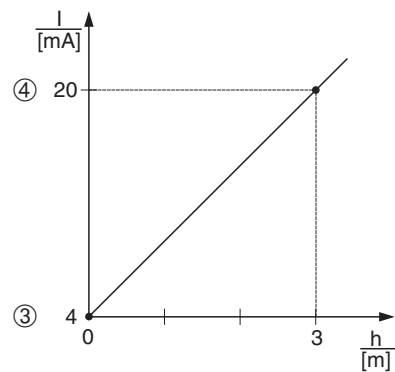
Fig. 3: Calibration with reference pressure – wet calibration

1 See Table, Step 9.
2 See Table, Step 10.

Description	
5	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP
6	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
7	Select a level unit via the OUTPUT UNIT parameter, here m for example.
8	Select the "Wet" option by means of the CALIBRATION MODE parameter.
9	Hydrostatic pressure for the lower calibration point is present at the device, here 0 mbar for example. Select EMPTY CALIB. parameter. Enter the level value, here 0 m for example. Confirm the value to assign the pressure value present to the lower level value. To accept the value displayed you must first switch to the Edit mode (see the "Editing values" section) and then press the \square button to save the value.
10	Hydrostatic pressure for the upper calibration point is present at the device, here 300 mbar (4.5 psi) for example. Select FULL CALIB. parameter. Enter the level value, here 3 m (9.8 ft) for example. Confirm the value to assign the pressure value present to the upper level value. To accept the value displayed you must first switch to the Edit mode (see the "Editing values" section) and then press the \square button to save the value.
11	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.
12	Set the value for the upper current value (20 mA) by means of the SET URV parameter.
13	Result: The measuring range is set for 0 to 3 m (9.8 ft).



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Fig. 4: Calibration with reference pressure – wet calibration

- 1 See Table, Step 9.
- 2 See Table, Step 10.
- 3 See Table, Step 11.
- 4 See Table, Step 12.

1. You can also perform calibration with reference pressure by means of the QUICK SETUP menu. → See Page 65 ff, Table 4: QUICK SETUP menu.
2. For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT, Page 71.
3. For operation using the on-site display, the parameters EMPTY CALIB. (→ Page 72) and FULL CALIB. (→ Page 73) also show the respective pressure present at the device. For operation using Digital communication, the pressure present at the device is displayed in the PROCESS VALUES group (menu path: OPERATING MENU → PROCESSINFO → PROCESS VALUES).

5.2.2 Calibration without reference pressure – dry calibration

Example:

In this example, the volume in a tank should be measured in litres. The maximum volume of 1000 litres (264 US gal) corresponds to a pressure of 450 mbar (6.75 psi). The minimum volume of 0 litres corresponds to a pressure of 50 mbar (0.75 psi), as the device is mounted below the level lower range value. The device is mounted below the level lower range value.

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- This is a theoretical calibration i.e. the pressure and volume values for the lower and upper calibration point must be known.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- The values entered for EMPTY CALIB./FULL CALIB. and SET LRV/SET URV must have a minimum interval of 1% for the "Level Easy Pressure" level mode. The value will be rejected with a warning message if the values are too close together. Further limit values are not checked; i.e. the values entered must be appropriate for the sensor and the measuring task so that the measuring device can measure correctly.
- Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero. → To perform a position adjustment see also Page 68, Table 6: Position adjustment.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 70, Table 8: LEVEL SELECTION "Level Easy Pressure"
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

⚠ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
2	If necessary, select "Level Easy Pressure" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63
3	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP

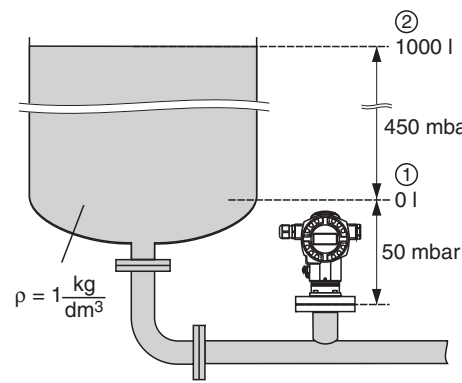


Fig. 5: Calibration without reference pressure – dry calibration
 1 See Table, Steps 7 and 8.
 2 See Table, Steps 9 and 10.

Description	
4	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
5	Select a volume unit via the OUTPUT UNIT parameter, here l (litres) for example..
6	Select the "Dry" option by means of the CALIBRATION MODE parameter.
7	Enter the volume value for the lower calibration point via the EMPTY CALIB. parameter, here 0 l for example.
8	Enter the pressure value for the lower calibration point via the EMPTY PRESSURE parameter, here 50 mbar (0.75 psi) for example.
9	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l (264 gal) for example.
10	Enter the pressure value for the upper calibration point via the FULL PRESSURE parameter, here 450 mbar (6.75 psi) for example.
11	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.
12	Set the value for the upper current value (20 mA) by means of the SET URV parameter.
13	Result: The measuring range is set for 0 to 1000 l (264 gal).

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P01-xxxxxxx-05-xx-xx-xx-028

Fig. 6: Calibration with reference pressure – wet calibration

- 1 See Table, Step 7.
- 2 See Table, Step 8.
- 3 See Table, Step 9.
- 4 See Table, Step 10.
- 5 See Table, Step 11.
- 6 See Table, Step 12.

For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT, Page 71.

5.3 "Level Easy Height" level selection

5.3.1 Calibration with reference pressure – wet calibration

Example:

In this example, the volume in a tank should be measured in litres. The maximum volume of 1000 litres (264 US gal) corresponds to a level of 4.5 m (15 ft). The minimum volume of 0 litres corresponds to a level of 0.5 m (1.6 ft), as the device is mounted below the level lower range value. The density of the medium is 1 kg/dm³.

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- The tank can be filled or emptied.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- The values entered for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE, EMPTY HEIGHT/FULL HEIGHT and SET LRV/SET URV must have a minimum interval of 1% for the "Level Easy Height" level mode. The value will be rejected with a warning message if the values are too close together. Further limit values are not checked; i.e. the values entered must be appropriate for the sensor and the measuring task so that the measuring device can measure correctly.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 73, Table 9: LEVEL SELECTION "Level Easy Height"
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.



▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- Check calibration data when the measuring mode is changed.

	Description	
1	Deltabar S: Before you configure the device for your application, the pressure piping must be cleaned and filled with medium. See Operating Instructions BA00270P.	<p style="text-align: right; font-size: small;">P01-PMC71xxx-19-xx-xx-xx-001</p> <p>Fig. 7: Calibration with reference pressure – wet calibration</p> <p>1 See Table, Steps 10 and 11. 2 See Table, Step 12. 3 See Table, Step 13.</p>
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.	
3	Select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62	
4	If necessary, select the "Level Easy Height" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63	
5	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP	

Description	
6	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
7	Select a volume unit via the OUTPUT UNIT parameter, here l (litres) for example..
8	Select a height unit via the HEIGHT UNIT parameter, here m for example.
9	Select the "Wet" option via the CALIBRATION MODE parameter.
10	Select a density unit via the DENSITY UNIT parameter, here kg/dm ³ for example.
11	Enter the density of the fluid using the ADJUST DENSITY parameter, here kg/dm ³ for example.
12	Enter the volume value for the lower calibration point via the EMPTY CALIB. parameter, here 0 l for example. (The currently measured hydrostatic pressure is displayed as height, here 0.5 m (1.6 ft) for example.) To accept the value displayed you must first switch to the Edit mode (see the "Editing values" section) and then press the  button to save the value.
13	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l (264 US gal) for example. (The currently measured hydrostatic pressure is displayed as height, here 4.5 m (15 ft) for example.) To accept the value displayed you must first switch to the Edit mode (see the "Editing values" section) and then press the  button to save the value.
14	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.
15	Set the value for the upper current value (20 mA) by means of the SET URV parameter.
16	Result: The measuring range is set for 0 to 1000 l (264 US gal).

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P01-xxxxxxx-05-xx-xx-xx-030

P01-xxxxxxx-05-xx-xx-xx-031

Fig. 8: Calibration with reference pressure – wet calibration

- 1 See Table, Steps 10 and 11.
- 2 See Table, Step 12.
- 3 See Table, Step 13.
- 4 See Table, Step 14.
- 5 See Table, Step 15.

For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT, Page 75.

5.3.2 Calibration without reference pressure – dry calibration

Example:

In this example, the volume in a tank should be measured in litres. The maximum volume is 1000 l (264 US gal), and the maximum height is 4.5 m (15 ft). The minimum volume of 0 litres corresponds to a level of 0.5 m (1.6 ft), as the device is mounted below the level lower range value. The density of the fluid is 1 kg/dm³.

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- This is a theoretical calibration i.e. the height and volume values for the lower and upper calibration point must be known.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- The values entered for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE, EMPTY HEIGHT/FULL HEIGHT and SET LRV/SET URV must have a minimum interval of 1% for the "Level Easy Height" level mode. The value will be rejected with a warning message if the values are too close together. Further limit values are not checked; i.e. the values entered must be appropriate for the sensor and the measuring task so that the measuring device can measure correctly.
- Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero. → To perform a position adjustment see also Page , Table 6: Position adjustment.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 73, Table 9: LEVEL SELECTION "Level Easy Height"
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

⚠ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
2	If necessary, select "Level Easy Height" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63
3	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP

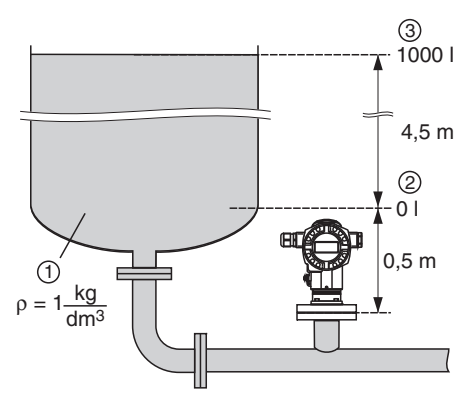


Fig. 9: Calibration without reference pressure – dry calibration

1 See Table, Steps 8 and 9.
 2 See Table, Steps 10 and 11.
 3 See Table, Steps 12 and 13.

	Description		
4	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.	<p style="text-align: right; font-size: small;">P01-xxxxxxx-05-xx-xx-xx-029</p> <p style="text-align: right; font-size: small;">P01-xxxxxxx-05-xx-xx-xx-032</p> <p style="text-align: right; font-size: small;">P01-xxxxxxx-05-xx-xx-xx-033</p>	
5	Select a volume unit via the OUTPUT UNIT parameter, here l (litres) for example.		
6	Select a height unit via the HEIGHT UNIT parameter, here m for example.		
7	Select the "Dry" option via the CALIBRATION MODE parameter.		
8	Select a density unit via the DENSITY UNIT parameter, here kg/dm ³ for example.		
9	Enter the density of the fluid using the ADJUST DENSITY parameter, here kg/dm ³ for example.		
10	Enter the volume value for the lower calibration point via the EMPTY CALIB. parameter, here 0 l for example.		
11	Enter the height value for the lower calibration point via the EMPTY HEIGHT parameter, here 0.5 m (1.6 ft) for example.		
12	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l (litres) (264 US gal) for example.		
13	Enter the height value for the upper calibration point via the FULL HEIGHT parameter, here 4.5 m (15 ft) for example.		
14	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.		
15	Set the value for the upper current value (20 mA) by means of the SET URV parameter.		
16	Result: The measuring range is set for 0 to 1000 l (litres) (264 US gal).		<p data-bbox="954 1552 1348 1597">Fig. 10: Calibration with reference pressure – wet calibration</p> <ol style="list-style-type: none"> <li data-bbox="954 1608 1214 1635">1 See Table, Steps 8 and 9. <li data-bbox="954 1635 1166 1662">2 See Table, Step 10. <li data-bbox="954 1662 1166 1688">3 See Table, Step 11. <li data-bbox="954 1688 1166 1715">4 See Table, Step 12. <li data-bbox="954 1715 1166 1742">5 See Table, Step 13. <li data-bbox="954 1742 1166 1769">6 See Table, Step 14. <li data-bbox="954 1769 1166 1796">7 See Table, Step 15.

For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT, Page 75.

5.4 "Level Standard" level selection, "Linear" level type

5.4.1 Calibration with reference pressure – wet calibration

Example:

In this example, the level in a tank should be measured in m. The maximum level is 3 m (9.8 ft). The pressure range is set to 0 to 300 mbar (4.5 psi).

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- The tank can be filled or emptied.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 77, Table 10: BASIC SETUP
 - Page 79, Table 11: BASIC SETUP – "Linear" level type.
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

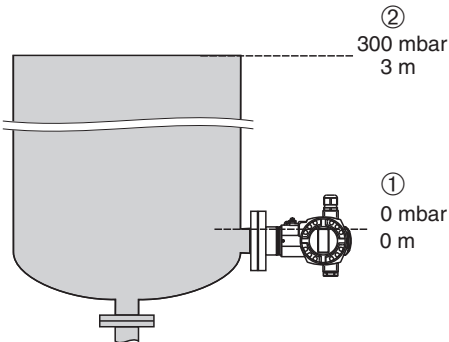
▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Deltabar S: before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA00270P.
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.
3	If necessary, select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
4	If necessary, select "Level Standard" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63



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Fig. 11: Calibration with reference pressure – wet calibration

1 See table, step 11.
 2 See table, step 12.

Description	
5	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP
6	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
7	Select the "Linear" option by means of the LEVEL MODE parameter.
8	Select the "Level" option by means of the LIN. MEASURAND parameter.
9	Select a level unit via the HEIGHT UNIT parameter, here m for example.
10	Select the "Wet" option by means of the CALIBRATION MODE parameter.
11	The pressure for the lower calibration point is present at the device, here 0 mbar for example. Select EMPTY CALIB. parameter.
	Enter the level value, here 0 m for example. Confirm the value to assign the pressure value present to the lower level value.
12	The pressure for the upper calibration point is present at the device, here 450 mbar (6.75 psi) for example. Select FULL CALIB. parameter.
	Enter the level value, here 3 m (9.8 ft) for example. Confirm the value to assign the pressure value present to the upper level value.
13	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.
14	Set the value for the upper current value (20 mA) by means of the SET URV parameter.
15	Result: The measuring range is set for 0...3 m (9.8 ft).

Graph 1: Pressure (p) [mbar] vs Level (h) [m]. A linear relationship is shown from (0,0) to (300, 3). The y-axis is labeled 'h [m]' and the x-axis is labeled 'p [mbar]'. A point at (300, 3) is marked with a circled 2. The origin is marked with a circled 1.

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Graph 2: Current (I) [mA] vs Level (h) [m]. A linear relationship is shown from (0,4) to (3,20). The y-axis is labeled 'I [mA]' and the x-axis is labeled 'h [m]'. A point at (3,20) is marked with a circled 4. The origin is marked with a circled 3.

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Fig. 12: Calibration with reference pressure – wet calibration

- 1 See table, step 11.
- 2 See table, step 12.
- 3 See table, step 13.
- 4 See table, step 14.

1. You can also perform calibration with reference pressure by means of the QUICK SETUP menu. → See Page 65 ff, Table 4: QUICK SETUP menu.
2. You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 79), UNIT VOLUME (→ Page 80) and MASS UNIT (→ Page 81).
3. For this level type, the measured variables %, level, volume and mass are available. → See Page 79 ff.
4. The EMPTY PRESSURE (→ Page 83) and FULL PRESSURE (→ Page 83) parameters display the pressure values belonging to the EMPTY CALIB. and FULL CALIB. parameters.

5.4.2 Calibration without reference pressure – dry calibration

Example:

In this example, the volume in a tank should be measured in m³. The maximum volume is 5 m³ and the maximum height 4 m (13 ft). The density of the fluid is 1 kg/dm³. The device is mounted below the level lower range value.

Prerequisite:

- The measured variable is in direct proportion to the pressure.
- This is a theoretical calibration, i.e. the tank volume, tank height and density of the fluid are known.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero. → To perform a position adjustment see also Page 68, Table 6: Position adjustment.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 77, Table 10: BASIC SETUP
 - Page 79, Table 11: BASIC SETUP – "Linear" level type.
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 26: PROCESS VALUES.

▲ WARNING

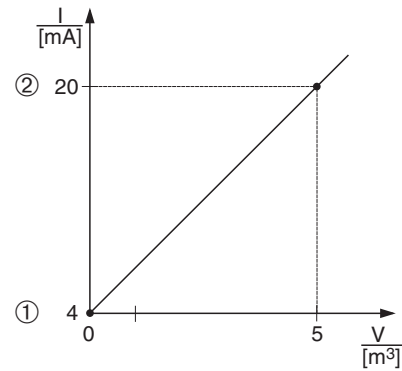
Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
<p>1</p> <p>Select the "Level" measuring mode via the MEASURING MODE parameter.</p> <p>On-site display: Menu path: GROUP SELECTION → MEASURING MODE</p> <p>Digital communication: See Page 62</p>	<p style="text-align: right; font-size: small;">P01-PMP75xxx-19-xx-xx-xx-003</p> <p>Fig. 13: Calibration without reference pressure – dry calibration</p> <p>1 See table, step 9. 2 See table, step 10. 3 See table, step 11. 4 See table, step 12.</p>
<p>2</p> <p>If necessary, select "Level Standard" level mode using the LEVEL SELECTION parameter.</p> <p>On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION</p> <p>Digital communication: See Page 63</p>	
<p>3</p> <p>On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP</p>	

Description	
4	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
5	Select the "Linear" option by means of the LEVEL MODE parameter.
6	Select the "Volume" option by means of the LIN. MEASURAND parameter.
7	Select a volume unit via the UNIT VOLUME parameter, here m ³ for example.
8	Select the "Dry" option by means of the CALIBRATION MODE parameter. See also the following note, point 3.
9	Enter the value for density via the ADJUST DENSITY parameter, here 1 kg/dm ³ for example.
10	Enter the tank volume via the TANK VOLUME parameter, here 5 m ³ for example.
11	Enter the tank height via the TANK HEIGHT parameter, here 4 m (13 ft) for example.
12	Enter the level offset via the ZERO POSITION parameter, here -0.5 m (-1,6 ft) for example.
13	Set the value for the lower current value (4 mA) by means of the SET LRV parameter.
14	Set the value for the upper current value (20 mA) by means of the SET URV parameter.
15	Result: The measuring range is set for 0...5 m ³ .



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Fig. 14: Current output calibration

5 See table, step 13.
6 See table, step 14.

- For this level type, the measured variables %, level, volume and mass are available.
→ See Page 79 ff.
- You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 79), UNIT VOLUME (→ Page 80) and MASS UNIT (→ Page 81).
- A level value is assigned to the lower and upper current value by means of the SET LRV (→ Page 86) and SET URV (→ Page 86) parameters respectively. Once you have selected the "Dry" calibration mode, the error message A711 "LRV or URV out of edit limits" can appear. The error message goes out as soon as level values which are within the editing limits are entered for the SET LRV and SET URV parameters. By means of the ENTER RESET CODE parameter (→ Page 124), you can use the code 2710 to automatically set the SET LRV and SET URV parameters to level values which are within the editing limits.

5.5 "Level Standard" level selection, "Pressure Linearized" level type

5.5.1 Semiautomatic entry of the linearisation table

Example:

In this example, the volume in a tank with a conical outlet should be measured in m³.

Prerequisite:

- The tank can be filled. The linearisation characteristic must rise continuously.
- A minimum gap of 0.5 % of the distance between two points must be maintained. Spans for the "Pressure linearized" option: HYDR. PRESS MAX. – HYDR. PRESS MIN.; TANK CONTENT MAX. – TANK CONTENT MIN. Spans for the "Height linearized" option: LEVEL MAX – LEVEL MIN; TANK CONTENT MAX. – TANK CONTENT MIN.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P) or Deltapilot S (BA00332P).
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 77, Table 10: BASIC SETUP
 - Page 87, Table 11: BASIC SETUP – "Pressure Linearized" level type
 - Page 104, Table 18: LINEARISATION – on-site operation
 - Page 107, Table 19: LINEARISATION – Digital communication.
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 26: PROCESS VALUES.

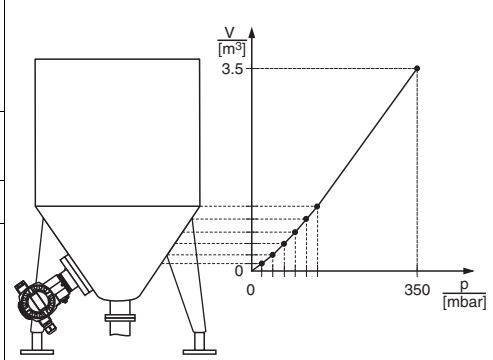
▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Deltabar S: before configuring the device for your application, the pressure piping must be cleaned and filled with fluid. See Operating Instructions BA00270P.
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.
Carry out basic setup:	
3	If necessary, select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62
4	If necessary, select "Level Standard" level mode using the LEVEL SELECTION parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION Digital communication: See Page 63



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	Description
5	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP
6	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.
7	Select the "Pressure Linearized" option by means of the LEVEL MODE parameter. See also the following note, point 3.
8	Select the "Volume" option by means of the LIND. MEASURAND parameter.
9	Select a volume unit via the UNIT VOLUME parameter, here m ³ for example.
10	Select HYDR. PRESS MIN. parameter. Enter the minimum hydrostatic pressure to be expected, here 0 mbar for example.
11	Select HYDR. PRESS MAX. Enter the maximum hydrostatic pressure to be expected.
Carry out linearisation:	
12	Change the function group: Menu path: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION
13	Select TANK CONTENT MIN parameter. Specify the minimum tank contents to be expected, here 0 m ³ for example.
14	Select TANK CONTENT MAX parameter. Specify the maximum tank contents to be expected, here 3.5 m ³ for example.
15	On-site display: Select the "Editor table" option by means of the TABLE SELECTION parameter.
16	Select the "Semiautomatic" option by means of the LIN. EDIT MODE parameter.
17	Select the "New table" option by means of the EDITOR TABLE parameter.

Description	
18	<p>Enter linearisation table (min. 2 points, max. 32 points).</p> <p>Fill the tank to the height of the 1st point.</p> <p>LINE-NUMB: confirm value displayed.</p> <p>X-VAL.: the hydrostatic pressure present is displayed.</p> <p>On-site display, Digital communication: The X-VAL. displayed is saved by confirming the Y-value. See following line, Y-VAL.</p> <p>HART handheld terminal: Confirm X-VAL. displayed.</p> <p>Y-VAL.: enter the volume value, here 0 m³ for example, and confirm the value.</p>
19	<p>On-site display: If you want to enter another point for the linearisation table, select the "Next point" option and enter the point as described in step 18. If you want to finish entering the values and activate the linearisation table, select the "Accept input table" option.</p> <p>Digital communication: You can enter further points for the linearisation table as explained in step 18. Once all the points have been entered, the table must be activated by means of the TAB. ACTIVATE parameter.</p>
19	<p>Result: The linearisation table has been entered.</p>

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Fig. 15: Semiautomatic entry of the linearisation table

- 1 See table, step 10.
- 2 See table, step 11.
- 3 See table, step 13.
- 4 See table, step 14.
- 5 See table, steps 15 – 19.
- 6 See the following note, point 4.
- 7 See the following note, point 4

1. For this level type, the measured variables %, volume and mass are available.
→ See Page 87 ff.
2. You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 87), UNIT VOLUME (→ Page 87) and MASS UNIT (→ Page 88).
3. Once you have selected the "Pressure Linearized" level type, the warning message "W710 Set span too small. Not allowed." can appear. At this stage the linearisation table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-VAL. of the linearisation table, is smaller than the minimum span permitted (→ MINIMUM SPAN, Page 120). The message goes out as soon as the highest X-VAL. is larger than the minimum span.
4. A level value is assigned to both the lower and upper current value with the SET LRV (→ Page 102) and SET URV (→ Page 102) parameters. If you enter values for TANK CONTENT MIN (→ Page 104 or 107) and TANK CONTENT MAX (→ Page 104 or 107), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for TANK CONTENT MIN and TANK CONTENT MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

5.5.2 Manual entry of the linearisation table

Example:

In this example, the volume in a tank with a conical outlet should be measured in m³.

Prerequisite:

- This is a theoretical calibration, i.e. the points for the linearisation table are known.
- A minimum gap of 0.5 % of the distance between two points must be maintained. Spans for the "Pressure linearized" option: HYDR. PRESS MAX. – HYDR. PRESS MIN.; TANK CONTENT MAX. – TANK CONTENT MIN. Spans for the "Height linearized" option: LEVEL MAX – LEVEL MIN; TANK CONTENT MAX. – TANK CONTENT MIN.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 77, Table 10: BASIC SETUP
 - Page 87, Table 12: BASIC SETUP – "Pressure Linearized" level type
 - Page 104, Table 18: LINEARISATION – on-site operation
 - Page 107, Table 19: LINEARISATION – Digital communication.
- For a description of further relevant parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

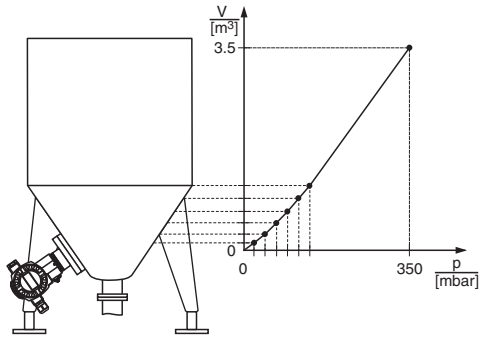
▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

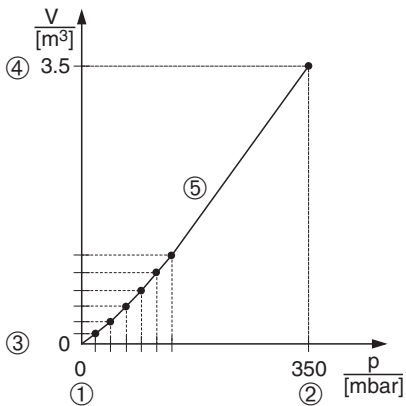
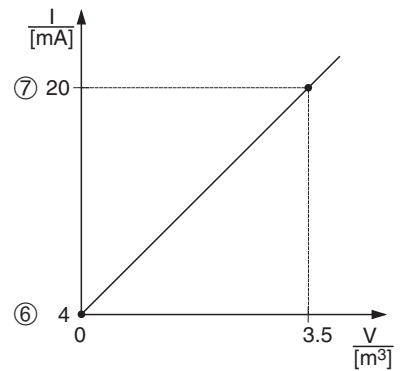
- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Perform basic setup as per Section 5.3.1, steps 2 to 11.
Carry out linearisation:	
2	Change the function group: Menu path: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION
3	Select TANK CONTENT MIN parameter . Specify the minimum tank contents to be expected, here 0 m ³ for example.
4	Select TANK CONTENT MAX parameter . Specify the maximum tank contents to be expected, here 3.5 m ³ for example.



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Description	
5	On-site display: Select the "Editor table" option by means of the TABLE SELECTION parameter.
6	Select the "Manual" option by means of the LIN. EDIT MODE parameter.
7	Select the "New table" option by means of the EDITOR TABLE parameter.
8	Enter linearisation table (min. 2 points, max. 32 points). LINE-NUMB: confirm value displayed. X-VAL.: enter the pressure value and confirm. Y-VAL.: enter the volume value, here 0 m ³ for example, and confirm.
9	On-site display If you want to enter another point for the linearisation table, select the "Next point" option and enter the point as described in step 8. If you want to finish entering the values and activate the linearisation table, select the "Accept input table" option. Digital communication: You can enter further points for the linearisation table as explained in step 8. Once all the points have been entered, the table must be activated by means of the TAB. ACTIVATE parameter.
10	Result: The linearisation table has been entered.

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P01-xxxxxxx-05-xx-xx-xx-016

Fig. 16: Manual entry of the linearisation table

- 1 See Section 5.3.1, table, step 9.
- 2 See Section 5.3.1, table, step 10.
- 3 See table, step 3.
- 4 See table, step 4.
- 5 See table, steps 5 – 9.
- 6 See the following note, point 4.
- 7 See the following note, point 4.

1. For this level type, the measured variables %, volume and mass are available.
→ See Page 87 ff.
2. You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 87), UNIT VOLUME (→ Page 87) and MASS UNIT (→ Page 88).
3. Once you have selected the "Pressure Linearized" level type, the warning message "W710 Set span too small. Not allowed." can appear. At this stage the linearisation table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-VAL. of the linearisation table, is smaller than the minimum span permitted (→ MINIMUM SPAN, Page 120). The message goes out as soon as the highest X-VAL. is larger than the minimum span.
4. A level value is assigned to both the lower and upper current value with the SET LRV (→ Page 102) and SET URV (→ Page 102) parameters. If you enter values for TANK CONTENT MIN (→ Page 104 or 107) and TANK CONTENT MAX (→ Page 104 or 107), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for TANK CONTENT MIN and TANK CONTENT MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

5.6 "Level Standard" level selection, "Height Linearized" level type

5.6.1 Wet calibration and semiautomatic entry of the linearisation table

Example:

In this example, the height and the volume should be measured at the same time.

Prerequisite:

- The tank can be filled. The linearisation characteristic must rise continuously.
- A minimum gap of 0.5 % of the distance between two points must be maintained. Spans for the "Pressure linearized" option: HYDR. PRESS MAX. – HYDR. PRESS MIN.; TANK CONTENT MAX. – TANK CONTENT MIN. Spans for the "Height linearized" option: LEVEL MAX – LEVEL MIN; TANK CONTENT MAX. – TANK CONTENT MIN.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P) or Deltapilot S (BA00332P).
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 77, Table 10: BASIC SETUP
 - Page 89, Table 13: BASIC SETUP – "Height Linearized" level type
 - Page 104, Table 18: LINEARISATION – on-site operation
 - Page 107, Table 19: LINEARISATION – Digital communication.
- For a description of further parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

▲ WARNING

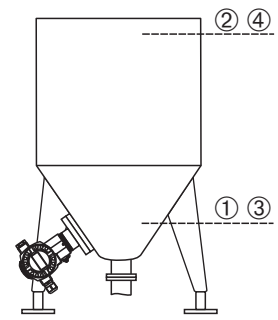
Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

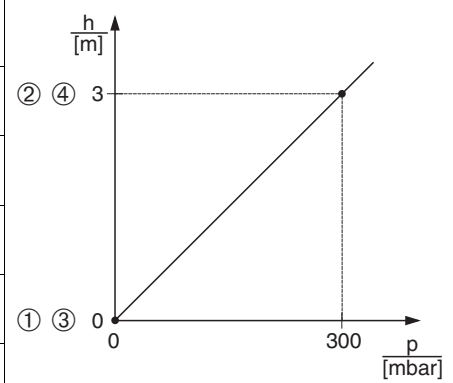
- ▶ Check calibration data when the measuring mode is changed.

Description	
1	Deltabar S: before configuring the device for your application, the pressure piping must be cleaned and filled with fluid. See Operating Instructions BA00270P.
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.
Perform calibration for the 1st measured variable:	
3	If necessary, select the "Level" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE See Page 62

Description	
4	<p>If necessary, select "Level Standard" level mode using the LEVEL SELECTION parameter.</p> <p>On-site display: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION</p> <p>Digital communication: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION</p>
5	<p>On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP</p>
6	<p>Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.</p>
7	<p>Select the "Height Linearized" option by means of the LEVEL MODE parameter.</p>
8	<p>Select the "Height + Volume" option by means of the COMB. MEASURAND parameter.</p>
9	<p>Select the unit for the 1st measured value via the HEIGHT UNIT parameter, here m for example.</p>
10	<p>Select the unit for the 2nd measured variable via the UNIT VOLUME parameter, here m³ for example.</p>
11	<p>Select LEVEL MIN parameter.</p> <p>Enter the minimum level to be expected, here 0 m for example.</p>
12	<p>Select LEVEL MAX parameter.</p> <p>Enter the maximum level to be expected, here 3 m (9.8 ft) for example.</p>
13	<p>Select the "Wet" option via the CALIBRATION MODE parameter (calibration mode for the 1st measured variable).</p>
14	<p>The pressure for the lower calibration point is present at the device, here 0 mbar for example.</p> <p>Select EMPTY CALIB. parameter.</p> <p>Enter the level value, here 0 m for example. Confirm the value to assign the pressure value present to the lower level value.</p>
15	<p>The pressure for the upper calibration point is present at the device, here 300 mbar (4.5 psi) for example.</p> <p>Select FULL CALIB. parameter.</p> <p>Enter the level value, here 3 m (9.8 ft) for example. Confirm the value to assign the pressure value present to the upper level value.</p>
16	<p>Result: The calibration for the 1st measured variable is carried out.</p>



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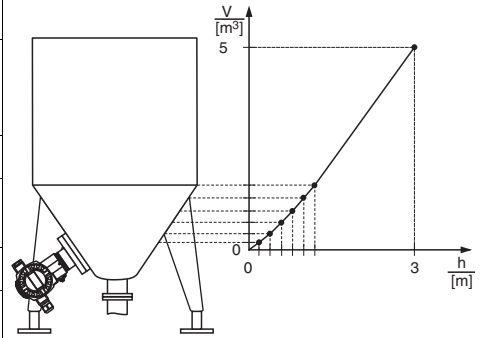


P01-xxxxxxx-05-xx-xx-xx-017

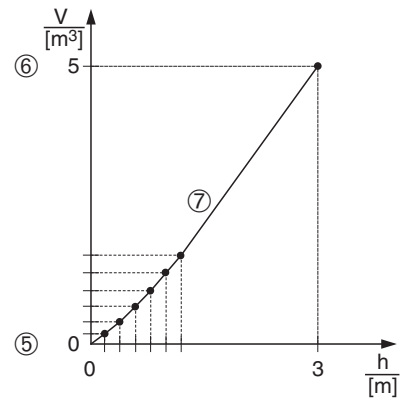
Fig. 17: Calibrating the 1st measured variable

- 1 See table, step 11.
- 2 See table, step 12.
- 3 See table, step 14.
- 4 See Table, step 15.

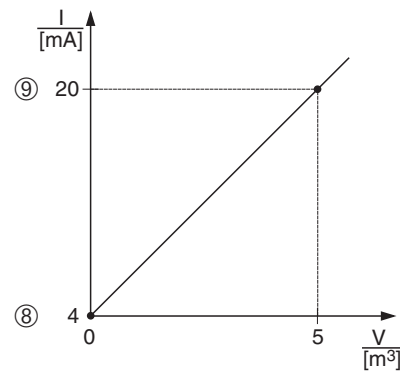
Description	
Perform linearisation (calibration for the 2nd measured variable)	
17	Change the function group. Menu path: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION
18	Select TANK CONTENT MIN parameter. Specify the minimum tank contents to be expected, here 0 m ³ for example.
19	Select TANK CONTENT MAX parameter. Specify the maximum tank contents to be expected, here 5 m ³ for example.
20	On-site display: Select the "Editor table" option by means of the TABLE SELECTION parameter.
21	Select the "Semiautomatic" option by means of the LIN. EDIT MODE parameter.
22	Select the "New table" option by means of the EDITOR TABLE parameter.
23	Enter linearisation table (min. 2 points, max. 32 points). Fill the tank to the height of the 1st point. LINE-NUMB: confirm value displayed. X-VAL.: the hydrostatic pressure present is measured and converted to the corresponding level and displayed. On-site display, Digital communication: The X-VAL. displayed is saved by confirming the Y-value. See following line, Y-VAL. HART handheld terminal: Confirm X-VAL. displayed. Y-VAL.: enter the volume value, here 0 m ³ for example, and confirm the value.
24	On-site display If you want to enter another point for the linearisation table, select the "Next point" option and enter the point as described in step 23. If you want to finish entering the values and activate the linearisation table, select the "Accept input table" option. Digital communication: You can enter further points for the linearisation table as explained in step 23. Once all the points have been entered, the table must be activated by means of the TAB. ACTIVATE parameter.
25	Result: - The linearisation table has been entered. - The measured value display and the TANK CONTENT parameter display the 2nd measured value (here the volume). - The LEVEL BEFORE LIN parameter displays the 1st measured value (here the height). See also the following note, point 5.



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P01-xxxxxxx-05-xx-xx-xx-018



P01-xxxxxxx-05-xx-xx-xx-019

Fig. 18: Calibrating the 2nd measured variable

- 5 See table, step 18.
- 6 See table, step 19.
- 7 See table, steps 20 – 24.
- 8 See the following note, point 4.
- 9 See the following note, point 4.

1. For this level type, the measured variables "Height + %", "Height + Volume", "Height + Mass", "%-Height + %", "%-Height + Volume" and "%-Height + Mass" are available. → See Page 87 ff.
2. You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 90), UNIT VOLUME (→ Page 91) and MASS UNIT (→ Page 92).
3. Once you have selected the "Pressure Linearized" level type, the warning message "W710 Set span too small. Not allowed." can appear. At this stage the linearisation table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-VAL. of the linearisation table, is smaller than the minimum span permitted (→ MINIMUM SPAN, Page 120). The message goes out as soon as the highest X-VAL. is larger than the minimum span.
4. A level value is assigned to both the lower and upper current value with the SET LRV (→ Page 102) and SET URV (→ Page 102) parameters.
You can use the ASSIGN CURRENT parameter (→ Page 114) to specify whether the current output should depict the 1st or 2nd measured variable. Depending on the setting of the ASSIGN CURRENT parameter, enter the following values for SET LRV and SET URV:
 - ASSIGN CURRENT = tank content (factory setting) ⇒ %-value, volume value or mass value
 - ASSIGNMENT = height ⇒ level value

The following applies for the setting ASSIGN CURRENT "Tank content":

If you enter values for TANK CONTENT MIN (→ Page 104 or 107) and TANK CONTENT MAX (→ Page 104 or 107), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for TANK CONTENT MIN and TANK CONTENT MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

The following applies for the setting ASSIGN CURRENT "Height":

If you enter values for LEVEL MIN (→ Page 93) and LEVEL MAX (→ Page 93), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for LEVEL MIN and LEVEL MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

5. You can use the MENU DESCRIPTOR parameter (→ Page 111) to specify which measured value should be displayed on the on-site display.

5.6.2 Dry calibration and manual entry of the linearisation table

Example:

In this example, the height and the volume should be measured at the same time.

Prerequisite:

- This is a theoretical calibration, i.e. the points for the linearisation table are known.
- A minimum gap of 0.5 % of the distance between two points must be maintained. Spans for the "Pressure linearized" option: HYDR. PRESS MAX. – HYDR. PRESS MIN.; TANK CONTENT MAX. – TANK CONTENT MIN. Spans for the "Height linearized" option: LEVEL MAX – LEVEL MIN; TANK CONTENT MAX. – TANK CONTENT MIN.
- See also Operating Instructions for Deltabar S (BA00270P) or Cerabar S (BA00271P), Section "Level measurement" or Deltapilot S (BA00332P), Section "Level measurement".
- Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero. → To perform a position adjustment see also Page 68, Table 6: Position adjustment.
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 77, Table 10: BASIC SETUP
 - Page 89, Table 12: BASIC SETUP – "Height Linearized" level type
 - Page 104, Table 18: LINEARISATION – on-site operation
 - Page 107, Table 19: LINEARISATION – Digital communication.
- For a description of further parameters, see
 - Page 100, Table 16: EXTENDED SETUP
 - Page 121, Table 28: PROCESS VALUES.

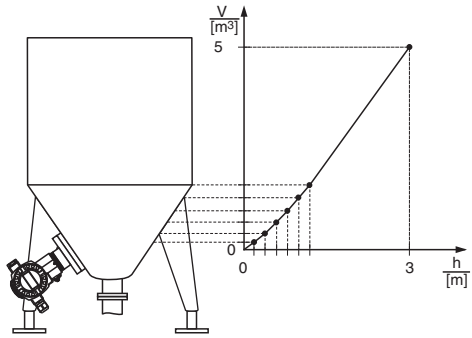
⚠ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

Description	
Perform calibration for the 1st measured variable:	
1	Perform calibration as per Section 5.4.2, steps 3 to 12.
2	Select the "Dry" option via the CALIBRATION MODE parameter (calibration mode for the 1st measured variable).
3	Enter the density of the fluid via the ADJUST DENSITY parameter, here 1 kg/dm ³ for example.
4	If necessary, enter a level offset via the ZERO POSITION parameter, here 0 m for example.
5	Result: The calibration for the 1st measured variable is carried out.



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Description	
Perform linearisation (calibration for the 2nd measured variable)	
6	Change the function group. Menu path: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION
7	Select TANK CONTENT MIN parameter. Specify the minimum tank contents to be expected, here 0 m ³ for example.
8	Select TANK CONTENT MAX parameter. Specify the maximum tank contents to be expected, here 5 m ³ for example.
9	On-site display: Select the "Editor table" option by means of the TABLE SELECTION parameter.
10	Select the "Manual" option by means of the LIN. EDIT MODE parameter.
11	Select the "New table" option by means of the EDITOR TABLE parameter.
12	Enter linearisation table (min. 2 points, max. 32 points). LINE-NUMB: confirm value displayed. X-VAL.: enter the height value and confirm. Y-VAL.: enter the volume value, here 0 m ³ for example, and confirm.
13	On-site display If you want to enter another point for the linearisation table, select the "Next point" option and enter the point as described in step 12. If you want to finish entering the values and activate the linearisation table, select the "Accept input table" option. Digital communication: You can enter further points for the linearisation table as explained in step 12. Once all the points have been entered, the table must be activated by means of the TAB. ACTIVATE parameter.
14	Result: - The linearisation table has been entered. - The measured value display and the TANK CONTENT parameter display the 2nd measured value (here the volume). - The LEVEL BEFORE LIN parameter displays the 1st measured value (here the height). See also the following note, point 5.

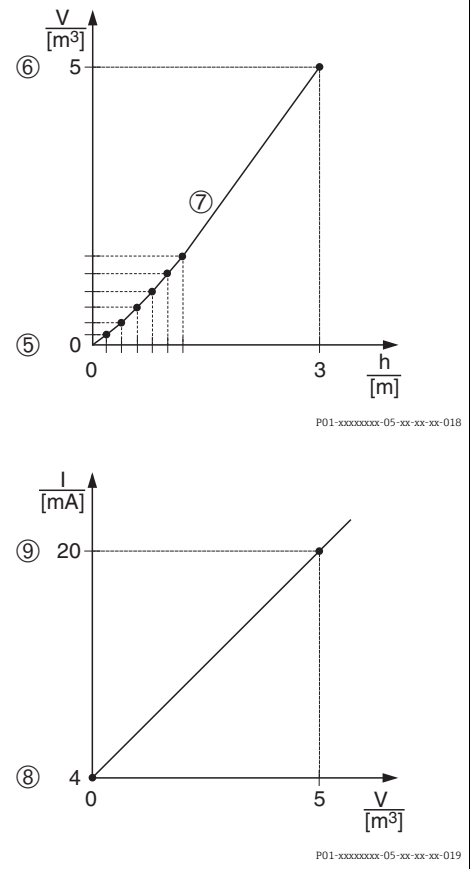


Fig. 19: Calibrating the 2nd measured variable

- 5 See table, step 7.
- 6 See table, step 8.
- 7 See table, steps 9 – 13.
- 8 See the following note, point 4.
- 9 See the following note, point 4.

1. For this level type, the measured variables "Height + %", "Height + Volume", "Height + Mass", "%-Height + %", "%-Height + Volume" and "%-Height + Mass" are available. → See Page 87 ff.
2. You can also specify customer-specific units. See parameter description for PRESS. ENG. UNIT (→ Page 77), HEIGHT UNIT (→ Page 90), UNIT VOLUME (→ Page 91) and MASS UNIT (→ Page 92).
3. Once you have selected the "Pressure Linearized" level type, the warning message "W710 Set span too small. Not allowed." can appear. At this stage the linearisation table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-VAL. of the linearisation table, is smaller than the minimum span permitted

(→ MINIMUM SPAN, Page 120). The message goes out as soon as the highest X-VAL. is larger than the minimum span.

4. A level value is assigned to both the lower and upper current value with the SET LRV (→ Page 102) and SET URV (→ Page 102) parameters. You can use the ASSIGN CURRENT parameter (→ Page 114) to specify whether the current output should depict the 1st or 2nd measured variable. Depending on the setting of the ASSIGN CURRENT parameter, enter the following values for SET LRV and SET URV:
 - ASSIGN CURRENT = tank content (factory setting) ⇒ %- value, volume value or mass value
 - ASSIGNMENT = height ⇒ level value

The following applies for the setting ASSIGN CURRENT "Tank content":

If you enter values for TANK CONTENT MIN (→ Page 104 or 107) and TANK CONTENT MAX (→ Page 104 or 107), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for TANK CONTENT MIN and TANK CONTENT MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

The following applies for the setting ASSIGN CURRENT "Height":

If you enter values for LEVEL MIN (→ Page 93) and LEVEL MAX (→ Page 93), the SET LRV and SET URV parameters are also changed. If you want to assign values other than those for LEVEL MIN and LEVEL MAX to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

5. You can use the MENU DESCRIPTOR parameter (→ Page 111) to specify which measured value should be displayed on the on-site display.

6 Flow measurement

6.1 Calibration

Example:

In this example, a volume flow should be measured in m³/h.

- The "Flow measurement" measuring mode is only available for the Deltabar S differential pressure transmitter.
- See also Operating Instructions BA00270P Deltabar S, Section "Flow measurement".
- For a description of the parameters mentioned, see
 - Page 62, Table 2: MEASURING MODE
 - Page 68, Table 6: POSITION ADJUSTMENT
 - Page 96 ff, Table 12: BASIC SETUP
 - Page 102 ff, Table 15: EXTENDED SETUP.
- For a description of further parameters, see
 - Page 102, Table 15: EXTENDED SETUP
 - Page 122, Table 29: PROCESS VALUES.

▲ WARNING

Changing the measuring mode can affect the adjustment data!

This situation can result in product overflow.

- ▶ Check calibration data when the measuring mode is changed.

	Description	
1	Before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA00270P.	<p style="text-align: right; font-size: small;">P01-xxxxxxx-19-xx-xx-xx-013</p>
2	Carry out position adjustment if necessary. See Page 68, Table 6: POSITION ADJUSTMENT.	
3	If necessary, select the "Flow" measuring mode via the MEASURING MODE parameter. On-site display: Menu path: GROUP SELECTION → MEASURING MODE Digital communication: See Page 62	
4	On-site display: Select BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP	
5	Select a pressure unit via the PRESS. ENG. UNIT parameter, here mbar for example.	
6	Select the "Volume p. cond." option by means of the FLOW-MEAS. TYPE parameter.	
7	Select a flow unit via the UNIT FLOW parameter, here m ³ /h for example.	
8	Select MAX. FLOW parameter. Enter the maximum flow value of the primary element, here 6000 m ³ /h for example. See also layout sheet of primary element.	
9	Select MAX PRESS. FLOW parameter. Enter the maximum pressure, here 400 mbar (6 psi) for example. See also layout sheet of primary element.	
10	Result: The device is configured for flow measurement.	

Fig. 20: Flow measurement calibration

- 1 See table, step 8.
- 2 See table, step 9.
- 3 See the following note, point 4.
- 4 See the following note, point 4.

1. You can also perform calibration by means of the QUICK SETUP menu. → See Page 66 ff, Table 5: QUICK SETUP menu.
2. Using the FLOW-MEAS. TYPE parameter, you can choose between the following flow types:
 - Volume p. cond. (volume under operating conditions)
 - Gas norm. cond. (norm volume under norm conditions in Europe: 1013.25 mbar and 273.15 K (0°C))
 - Gas std. cond. (standard volume under standard conditions in USA: 1013.25 mbar (14.7 psi) and 288. 15 K (15°C/59°F))
 - Mass
3. Depending on the flow type selected, you can choose between various units. You can also specify a customer-specific unit.
See parameter description for PRESS. ENG. UNIT (→ Page 97), UNIT FLOW (→ Page 98), NORM FLOW UNIT (→ Page 98), STD. FLOW UNIT (→ Page 98) and MASS FLOW UNIT (→ Page 99).
4. A flow value or a pressure value is assigned to both the lower and upper current value with the SET LRV (→ Page 103) and SET URV (→ Page 104) parameters.
You can use the LINEAR/SQROOT parameter (→ Page 114) to specify whether the current output should depict the linear pressure signal or the Flow (square root) flow signal. Depending on the setting of the LINEAR/SQROOT parameter, enter the following values for SET LRV and SET URV:
 - LINEAR/SQROOT = Flow (square root) (factory setting) ⇒ flow value
 - LINEAR/SQROOT = Differential pres. ⇒ pressure value

The following applies for the setting LINEAR/SQROOT "Flow (square root)":

As per the factory settings, the lower current value is set to equal zero and the upper current value is set to the MAX. FLOW value. If you enter a value for MAX. FLOW, the SET URV parameter is also changed. If you want to assign values other than zero and MAX. FLOW to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

The following applies for the setting LINEAR/SQROOT "Differential pres.":

As per the factory settings, the lower current value is set to equal zero and the upper current value is set to the MAX. PRESS. FLOW value. If you enter a value for MAX PRESS. FLOW, the SET URV parameter is also changed. If you want to assign values other than zero and MAX PRESS. FLOW to the lower and upper current values, the desired values must be entered for SET LRV and SET URV.

5. In the lower measuring range, small flow quantities (creepages) can lead to large measured value fluctuations. You can activate low flow cut-off via the LOW FLOW CUT-OFF parameter (→ Page 103).

6.2 Totalizers

Example:

In this example, the volume flow should be totalised and displayed in the unit m^3E^3 . Negative flows should be added to the flow rate.

- For a description of the parameters mentioned, see
 - Page 109 ff, Table 18: TOTALIZER SETUP
 - Page 122 ff, Table 29: PROCESS VALUES
- Totalizer 1 can be reset. Totalizer 2 cannot be reset.

	Description
1	Calibrate the device as per Section 6.1.
2	Change the function group: (GROUP SELECTION →) OPERATING MENU → SETTINGS → TOTALIZER SETUP
3	Select a flow unit via the TOTALIZER 1 UNIT parameter, here m^3E^3 for example.
4	Use the NEG. FLOW TOT. 1 parameter to specify the totalising mode for negative flows, here the "Positive" option for example.
5	Reset totalizer 1 to zero via the RESET TOTALIZER parameter.
6	Result: The TOTALIZER 1 and TOTAL. 1 OVERFLOW parameters display the totalised volume flow.

- You can also specify a customer-specific unit. → See parameter description for TOTALIZER 1 UNIT (→ Page 110) and TOTALIZER 2 UNIT (→ Page 111).
- The TOTALIZER 1 and TOTAL. 1 OVERFLOW parameters display the totalised flow value of the first totalizer. The TOTALIZER 2 and TOTAL. 2 OVERFLOW parameters display the totalised flow value of the second totalizer. → See Page 122 ff, PROCESS VALUES function group.
- You can use the MENU DESCRIPTOR parameter (→ Page 111) to specify which measured value should be displayed on the on-site display.

7 On-site display operating menu



The "Flow" measuring mode is only available for the Deltabar S differential pressure transmitter (not valid for (160 bar (2400 psi) and 250 bar (3750 psi) measuring cell). Depending on the parameter configuration, not all submenus and parameters are available. In the column "Measuring mode, Level mode or Level selection" all available operating modes are listed.

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
LANGUAGE	LANGUAGE			all	079	62
MEASURING MODE	MEASURING MODE			all	389	62
		Level	LEVEL SELECTION		020	63
		Flow				
		Pressure				
QUICK SETUP	POS.ZERO ADJUST			all	685	64
	POS. INPUT VALUE				563	64
	SET LRV			Pressure	245	64
	SET URV			Pressure	246	64
	EMPTY CALIB.			Level	314	66
	FULL CALIB.			Level	315	66
	MAX. FLOW			Flow	311	67
	MAX PRESS. FLOW			Flow	634	67
	DAMPING VALUE			all	247	65
OPERATING MENU	SETTINGS	POSITION ADJUST.	POS.ZERO ADJUST	all	685	64
			POS. INPUT VALUE		563	64
			CALIB. OFFSET		319	68
		BASIC SETUP	PRESS. ENG. UNIT	Pressure	060	69
			CUSTOMER UNIT P		075	69
			CUST.UNIT FACT.P		317	69
			SET LRV		245	69
			SET URV		246	70
			GET LRV		309	70
	GET URV		310		70	
	DAMPING VALUE		247		77	
	PRESS. ENG. UNIT		Level Easy Pressure		060	70
	CUSTOMER UNIT P				075	71
	CUST.UNIT FACT.P				317	71
	OUTPUT UNIT				023	71
	CALIBRATION MODE	008		72		
	EMPTY CALIB.	(Wet)		010	72	
	EMPTY CALIB.	(Dry)		010	72	
	FULL CALIB.	(Wet)		004	72	
	FULL CALIB.	(Dry)		004	73	

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			EMPTY PRESSURE	(Dry)	011	72
			FULL PRESSURE	(Dry)	005	73
			SET LRV		013	73
			SET URV		012	73
			DAMPING VALUE		247	73
			PRESS. ENG. UNIT	Level Easy Height	060	74
			CUSTOMER UNIT P		075	74
			CUST.UNIT FACT.P		317	74
			OUTPUT UNIT		023	75
			HEIGHT UNIT		003	75
			CALIBRATION MODE		008	75
			DENSITY UNIT		001	75
			ADJUST DENSITY		007	75
			EMPTY CALIB.	(Wet)	010	76
			EMPTY CALIB.	(Dry)	010	76
			FULL CALIB.	(Wet)	004	76
			FULL CALIB.	(Dry)	004	76
			EMPTY HEIGHT	(Dry)	009	76
			FULL HEIGHT	(Dry)	006	77
			SET LRV		013	77
			SET URV		012	77
			DAMPING VALUE		247	77
			PRESS. ENG. UNIT	Level Standard	060	77
			CUSTOMER UNIT P		075	78
			CUST.UNIT FACT.P		317	78
			LEVEL MODE		718	78
			LIN. MEASURAND	Linear	804	79
			HEIGHT UNIT		708	79
			CUSTOMER UNIT H		706	79
			CUST. UNIT FACT. H		705	80
			UNIT VOLUME		313	80
			CUSTOMER UNIT V		608	80
			CUST. UNIT FACT. V		607	81
			MASS UNIT		709	81
			CUSTOMER UNIT M		704	81
			CUST. UNIT FACT. M		703	82
			CALIBRATION MOD		392	82
			EMPTY CALIB.		314	82
			EMPTY PRESSURE		710	83
			FULL CALIB.		315	83
			FULL PRESSURE		711	83
			ADJUSTED DENSITY		810	83

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			DENSITY UNIT		812	83
			ADJUST DENSITY		316	83
			UNIT VOLUME		316	84
			CUSTOMER UNIT V		608	84
			CUST. UNIT FACT. V		607	84
			TANK VOLUME		858	84
			HEIGHT UNIT		708	85
			CUSTOMER UNIT H		706	85
			CUST. UNIT FACT. H		705	85
			TANK HEIGHT		859	85
			100% POINT		813	86
			ZERO POSITION		814	86
			SET LRV		719	86
			SET URV		720	86
			DAMPING VALUE		247	86
			LINd. MEASURAND	Pressure Linearized	805	87
			UNIT VOLUME		313	87
			CUSTOMER UNIT V		608	87
			CUST. UNIT FACT. V		607	88
			MASS UNIT		709	88
			CUSTOMER UNIT M		704	88
			CUST. UNIT FACT. M		703	89
			HYDR. PRESS MIN.		775	89
			HYDR. PRESS MAX.		761	89
			DAMPING VALUE		247	89
			COMB. MEASURAND	Height Linearized	806	90
			HEIGHT UNIT		708	90
			CUSTOMER UNIT H		706	90
			CUST. UNIT FACT. H		705	90
			UNIT VOLUME		313	91
			CUSTOMER UNIT V		608	91
			CUST. UNIT FACT. V		607	91
			MASS UNIT		709	92
			CUSTOMER UNIT M		704	92
			CUST. UNIT FACT. M		703	92
			LEVEL MIN		755	93
			LEVEL MAX		712	93
			CALIBRATION MODE		392	93
			EMPTY CALIB.		314	93
			EMPTY PRESSURE		710	94
			FULL CALIB.		315	94
			FULL PRESSURE		711	94

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			ADJUSTED DENSITY		810	94
			DENSITY UNIT		812	94
			ADJUST DENSITY		316	94
			HEIGHT UNIT		708	95
			CUSTOMER UNIT H		706	95
			CUST. UNIT FACT. H		705	95
			100% POINT		813	96
			ZERO POSITION		814	96
			DAMPING VALUE		247	96
			PRESS. ENG. UNIT	Flow	060	97
			CUSTOMER UNIT P		075	97
			CUST. UNIT FACT. P		317	97
			FLOW-MEAS. TYPE		640	98
			UNIT FLOW		391	98
			NORM FLOW UNIT		661	98
			STD. FLOW UNIT		660	98
			MASS FLOW UNIT		571	99
			CUSTOMER UNIT F		610	99
			CUST. UNIT FACT. F		609	99
			MAX. FLOW		311	100
			MAX PRESS. FLOW		634	100
			DAMPING VALUE		247	100
		EXTENDED SETUP	TEMP. ENG. UNIT	Pressure	318	100
			TEMP. ENG. UNIT	Level	318	101
			DENSITY UNIT		(001)/ (812)	101
			ADJUST DENSITY		(007)/ (316)	101
			PROCESS DENSITY		(025)/ (811)	101
			SET LRV		762	102
			SET URV		763	102
			TEMP. ENG. UNIT	Flow	318	103
			LOW FLOW CUT-OFF		442	103
			SET. L. FL. CUT-OFF		323	103
			SET LRV		637	103
			SET URV		638	104
		LINEARIZATION	TANK CONTENT MIN	Level	759	104
			TANK CONTENT MAX		713	104
			TABLE SELECTION		808	105
			LIN. EDIT MODE		397	105
			EDITOR TABLE		809	105
			LINE-NUMB:		549	105

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			Y-VAL:		551	105
			X-VAL:		550	106
			TABLE EDITOR		770	109
			MEASURING TABLE		549	106
			MEASURING TABLE		717	106
			TANK DESCRIPTION		815	106
		TOTALISER SETUP	TOTALIZER 1 UNIT	Flow	662, 398, 666, 664	110
			TOT. 1 USER UNIT		627	110
			FACT.U.U.TOTAL.1		329	110
			NEG. FLOW TOT. 1		400	110
			RESET TOTALISER1		331	111
			TOTALIZER 2 UNIT		663, 399, 667, 665	111
			TOT. 2 UNIT TEXT		628	111
			FACT.U.U.TOTAL.2		330	111
			NEG. FLOW TOT. 2		416	111
SAFETY CONFIRM.						
See Safety Manual for Deltabar S (SD00189), Cerabar S (SD00190) or Deltapilot S (SD00213P).						
DISPLAY		MAIN LINE CONT.		all	419	111
		MAIN DATA FORMAT			688	112
		ALTERNATE DATA			423	112
		DISPLAY CONTRAST			339	112
		DIGITS SET			840	112
OUTPUT		OUTPUT CURRENT		all	254	112
		CURRENT CHARACT.			694, 695 696, 764	113
		OUTPUT FAIL MODE			388	113
		ALT.CURR.OUTPUT			597	114
		SET MAX. ALARM			342	114
		SET MIN. CURRENT			343	114
		ASSIGN CURRENT		Height Linearized	760	114
		LINEAR/SQROOT		Flow	390	114
TRANSMITTER INFO	HART DATA	CURRENT MODE		all	052	115
		BUS ADDRESS			345	115
		DEVICE TYPE			002, 351, 802	115
		DEVICE REVISION			699	115
		PREAMBLE NUMBER			036	116
		MANUFACTOR ID			432	116
		HART MESSAGE			271	116
		HART DATE			481	116
	TRANSMITTER DATA	DEVICE SERIAL No		all	354	117
		ELECTR.SERIAL No			386	117

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			CUST. TAG NUMBER		055	117
			LONG TAG NUMBER		305	117
			ADDITIONAL INFO.		272	117
			DEVICE DESIGN.		350	117
			HARDWARE REV.		266	117
			SOFTWARE VERSION		264	117
			CONFIG RECORDER		352	117
			PCB TEMPERATURE		357	117
			Allowed Min.TEMP		358	117
			Allowed Max.TEMP		359	117
			DIP STATUS		363	118
		PROCESS CONNECTION	Pmax PROC. CONN.	all	570	118
			PROC.CONN.TYPE		482	118
			MAT.PROC.CONN. +		360	118
			MAT.PROC.CONN. -		361	118
			SEAL TYPE		362	119
		SENSOR DATA	SENSOR SER. No.	all	250	120
			PRESS.SENS LOLIM		484	120
			PRESS.SENS HILIM		485	120
			MINIMUM SPAN		591	120
			SENSOR MEAS.TYPE		581	120
			MAT. MEMBRANE		365	120
			FILLING FLUID		366	120
			Tmin SENSOR		368	120
			Tmax SENSOR		369	120
			SENS H/WARE REV		487	120
	PROCESS INFO	PROCESS VALUES	PRESSURE	all	301	121
			CORRECTED PRESS.		434	121
			SENSOR PRESSURE		584	121
			SENSOR TEMP.		367	121
			MEAS. VAL. TREND		378	121
			LEVEL BEFORE LIN	Linear Height Linearized	050	122
			TANK CONTENT	Pressure Linearized Height Linearized	370	122
			SUPPRESSED FLOW	Flow	375	123
			TOTALISER 1		652	123
			TOTAL.1 OVERFLOW		655	123
			TOTALISER 2		657	123
			TOTAL.2 OVERFLOW		658	123
		PEAK HOLD INDIC.	COUNTER:P > Pmax	all	380	123
			MAX. MEAS.PRESS.		383	123
			COUNTER:P < Pmin		467	123

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	Display ID	See page
			MIN. MEAS.PRESS.		469	123
			COUNTER:T > Tmax		404	124
			MAX. MEAS.TEMP.		471	124
			COUNTER:T < Tmin		472	124
			MIN. MEAS.TEMP.		474	124
			PCB COUNT:T>Tmax		488	124
			PCB MAX. TEMP.		490	124
			PCB COUNT:T<Tmin		492	124
			PCB MIN. TEMP.		494	124
			RESET PEAKHOLD		382	124
	OPERATION	ENTER RESET CODE		all	047	124
		OPERATING HOURS			409	124
		INSERT PIN No			48	125
		HistoROM AVAIL.			831	125
		DOWNLOAD SELECT.			014	125
		HistoROM CONTROL			832	125
	DIAGNOSTICS	SIMULATION	SIMULATION MODE	all	413	126
			SIM. PRESSURE		414	126
			SIM.FLOW VALUE	Flow	639	126
			SIM. LEVEL	Level	714	126
			SIM. TANK CONT.	Level	715	126
			SIM. CURRENT		270	126
			SIM. ERROR NO.		476	127
		MESSAGES	ALARM STATUS	all	046	127
			LAST DIAG. CODE		564	127
			ACK. ALARM MODE		401	127
			ACK. ALARM		500	127
			RESET ALL ALARMS		603	128
			ERROR No.		600	128
			SELECT ALARMTYPE		595	128
			ALARM DELAY		336	128
			ALARM DISPL.TIME		480	128
		USER LIMITS	PminALARM WINDOW	all	332	129
			PmaxALARM WINDOW		333	129
			TminALARM WINDOW		334	129
			TmaxALARM WINDOW		335	129
		SERVICE	SYSTEM 2	CURR. TRIM 4mA	all	045
	CURR. TRIM 20mA				042	130
	OFFSET 4mA TRIM				043	130
	OFFSET 20mA TRIM				044	130

8 FieldCare operating menu



The "Flow" measuring mode is only available for the Deltabar S differential pressure transmitter (not valid for (160 bar (2400 psi) and 250 bar (3750 psi) measuring cell). Depending on the parameter configuration, not all submenus and parameters are available.

In the column "Measuring mode, Level mode or Level selection" all available operating modes are listed.

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page		
MEASURING MODE	MEASURING MODE				62		
	LEVEL SELECTION			Level	63		
	LINEAR/SQROOT			Pressure and Flow	114		
	HART PRIMARY VALUE IS			all	116		
QUICK SETUP	DEVICE INFO	STATUS LOCKING (DIP STATUS)		all	118		
		CUST. TAG NUMBER			117		
		LONG TAG NUMBER			117		
		ADDITIONAL INFO.			117		
		HART MESSAGE			116		
		HART DATE			116		
	UNITS	PRESS. ENG. UNIT			Pressure	69	
		CUST.UNIT FACT.P				69	
		CUSTOMER UNIT P				69	
		TEMP. ENG. UNIT				100	
		PRESS. ENG. UNIT			Level Easy Pressure	70	
		CUST.UNIT FACT.P				71	
		CUSTOMER UNIT P				71	
		PRESS. ENG. UNIT			Level Easy Height	74	
		CUST.UNIT FACT.P				74	
		CUSTOMER UNIT P				74	
		PRESS. ENG. UNIT			Level Standard	77	
		CUST.UNIT FACT.P				78	
		CUSTOMER UNIT P				78	
		TEMP. ENG. UNIT				100	
		PRESS. ENG. UNIT			Flow	97	
		CUST.UNIT FACT.P				97	
		CUSTOMER UNIT P				97	
		TEMP. ENG. UNIT				103	
		RANGE VALUES	SET LRV			Pressure	64
			SET URV				64
	PRESS. SENS LOLIM					120	
	PRESS. SENS HILIM					120	
	LINEAR/SQROOT					114	
	CALIB. OFFSET					68	

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		POS. ZERO ADJUST			64
		SET MIN. CURRENT			114
		DAMPING VALUE			65
		EMPTY PRESSURE		Level Standard	72
		FULL PRESSURE			73
		PRESS. SENS LOLIM			120
		PRESS. SENS HILIM			120
		CALIB. OFFSET			68
		POS. ZERO ADJUST			65
		SET MIN. CURRENT			114
		DAMPING VALUE			66
		EMPTY PRESSURE		Level Easy Pressure	72
		FULL PRESSURE			73
		PRESS. SENS LOLIM			120
		PRESS. SENS HILIM			120
		CALIB. OFFSET			68
		POS. ZERO ADJUST			65
		SET MIN. CURRENT			114
		DAMPING VALUE			73
		EMPTY PRESSURE		Level Easy Height	72
		FULL PRESSURE			73
		PRESS. SENS LOLIM			120
		PRESS. SENS HILIM			120
		CALIB. OFFSET			68
		POS. ZERO ADJUST			65
		SET MIN. CURRENT			114
		DAMPING VALUE			77
		MIN.PRESS. FLOW		Flow	67
		MAX.PRESS. FLOW			67
		PRESS. SENS LOLIM			120
		PRESS. SENS HILIM			120
		LINEAR/SQROOT			114
		CALIB. OFFSET			68
		POS. ZERO ADJUST			67
		SET MIN. CURRENT			114
		DAMPING VALUE			67
	FLOW CUT-OFF	LOW FLOW CUT-OFF		Flow	103
		SET.L.FL.CUT-OFF			103
	DISP/PV SETTINGS	FLOW-MEAS. TYPE		Flow	98
		MASS FLOW UNIT			99
		MAX. FLOW			100
		UNIT FLOW			98
		NORM FLOW UNIT			98

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		STD. FLOW UNIT			98
	LEVEL ADJUST	EMPTY CALIB.		Level Standard	72
		EMPTY PRESSURE			72
		FULL CALIB.			72
		FULL PRESSURE			73
		LEVEL MODE			78
		LIN. MEASURAND			79
		CALIBRATION MODE			82
		OUTPUT UNIT		Level Easy Pressure	71
		CALIBRATION MODE			72
		EMPTY CALIB.			72
		EMPTY PRESSURE			72
		FULL CALIB.			72
		FULL PRESSURE		73	
		OUTPUT UNIT		Level Easy Height	75
		HEIGHT UNIT			75
		CALIBRATION MODE			75
		EMPTY CALIB.			76
		EMPTY HEIGHT			76
		EMPTY PRESSURE			72
		FULL CALIB.			76
	FULL HEIGHT		77		
	FULL PRESSURE		73		
	DENSITY UNIT		75		
	ADJUST DENSITY		75		
	ALARM SETTINGS	OUTPUT FAIL MODE		all	113
		ALT. CURR. OUTPUT			114
		VIEW ALARMS SET.			131
OPERATING MENU	SETTINGS	POSITION ADJUST.	PRESSURE	all	123
			POS.ZERO ADJUST		68
			POS. INPUT VALUE		68
			CALIB. OFFSET		68
		BASIC SETUP	PRESS. ENG. UNIT	Pressure	69
			CUSTOMER UNIT P		69
			CUST. UNIT FACT. P		69
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LINEAR/SQROOT		114
			SET LRV		69
			SET URV		70
			GET LRV		70
			GET URV		70
			DAMPING VALUE		70

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page	
		BASIC SETUP	PRESS. ENG. UNIT	Level Easy Pressure	70	
			CUSTOMER UNIT P		71	
			CUST. UNIT FACT. P		71	
			PRESS. SENS. LOLIM		120	
			PRESS. SENS. HILIM		120	
			OUTPUT UNIT		71	
			CALIBRATION MODE		72	
			EMPTY CALIB.		72	
			EMPTY PRESSURE		72	
			FULL CALIB.		73	
			FULL PRESSURE	73		
			SET LRV	73		
			SET URV	73		
			DAMPING VALUE	73		
			BASIC SETUP	PRESS. ENG. UNIT	Level Easy Height	74
				CUSTOMER UNIT P		74
				CUST. UNIT FACT. P		74
				PRESS. SENS. LOLIM		120
				PRESS. SENS. HILIM		120
		OUTPUT UNIT		75		
		HEIGHT UNIT		75		
		CALIBRATION MODE		75		
		DENSITY UNIT		75		
		ADJUST DENSITY		75		
		EMPTY CALIB.		76		
		EMPTY HEIGHT		76		
		EMPTY PRESSURE		72		
		FULL CALIB.		76		
		FULL HEIGHT		77		
		FULL PRESSURE		73		
		SET LRV		77		
		SET URV		77		
		DAMPING VALUE		77		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = % (Height) CALIBRATION MODE = Dry	77	
			CUSTOMER UNIT P		78	
			CUST. UNIT FACT. P		78	
			PRESS. SENS. LOLIM		120	
			PRESS. SENS. HILIM		120	
			LEVEL MODE		78	
			LIN. MEASURAND		79	
			HEIGHT UNIT		79	
			CUSTOMER UNIT H		79	
			CUSTOMER UNIT H		80	

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
			CALIBRATION MODE		82
			DENSITY UNIT		83
			ADJUST DENSITY		83
			100% POINT		86
			ZERO POSITION		86
			SET LRV		86
			SET URV		86
			DAMPING VALUE		86
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = % (Height) CALIBRATION MODE = Wet	77
			CUSTOMER UNIT P		78
			CUST. UNIT FACT. P		78
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LIN. MEASURAND		79
			CALIBRATION MODE		82
			EMPTY CALIB.		82
			EMPTY PRESSURE		83
			FULL CALIB.		83
			FULL PRESSURE		83
			SET LRV		86
			SET URV		86
			DAMPING VALUE	86	
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = Height CALIBRATION MODE = Dry	77
			CUSTOMER UNIT P		78
			CUST. UNIT FACT. P		78
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LIN. MEASURAND		79
			HEIGHT UNIT		79
			CUSTOMER UNIT H		79
			CUSTOMER UNIT H		80
			CALIBRATION MODE		82
			DENSITY UNIT		83
			ADJUST DENSITY		83
			ZERO POSITION		86
			SET LRV		86
			SET URV		86
			DAMPING VALUE	86	

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = Height CALIBRATION MODE = Wet	77
			CUSTOMER UNIT P		78
			CUST. UNIT FACT. P		78
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LIN. MEASURAND		79
			HEIGHT UNIT		85
			CUSTOMER UNIT H		79
			CUSTOMER UNIT H		80
			CALIBRATION MODE		82
			EMPTY CALIB.		82
			EMPTY PRESSURE		83
			FULL CALIB.		83
			FULL PRESSURE		83
			ADJUST DENSITY		83
			SET LRV		86
			SET URV		86
			DAMPING VALUE		86
			BASIC SETUP		PRESS. ENG. UNIT
		CUSTOMER UNIT P		78	
		CUST. UNIT FACT. P		78	
		PRESS. SENS. LOLIM		120	
		PRESS. SENS. HILIM		120	
		LEVEL MODE		78	
		LIN. MEASURAND		79	
		HEIGHT UNIT		79	
		UNIT VOLUME		80	
		CUSTOMER UNIT V		80	
		CUST. UNIT FACT. V		81	
		CALIBRATION MODE		82	
		DENSITY UNIT		83	
		ADJUST DENSITY		83	
		UNIT VOLUME		84	
		CUSTOMER UNIT V		84	
		CUST. UNIT FACT. V		84	
		TANK VOLUME		84	
		TANK HEIGHT		85	
		ZERO POSITION		86	
		SET LRV	86		
		SET URV	86		
		DAMPING VALUE	86		

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = Volume CALIBRATION MODE = Wet	77		
			CUSTOMER UNIT P		78		
			CUST. UNIT FACT. P		78		
			PRESS. SENS. LOLIM		120		
			PRESS. SENS. HILIM		120		
			LEVEL MODE		78		
			LIN. MEASURAND		79		
			UNIT VOLUME		84		
			CUSTOMER UNIT V		84		
			CUST. UNIT FACT. V		84		
			CALIBRATION MODE		82		
			EMPTY CALIB.		82		
			EMPTY PRESSURE		83		
			FULL CALIB.		83		
			FULL PRESSURE		83		
			SET LRV		86		
			SET URV		86		
			DAMPING VALUE		86		
			BASIC SETUP		PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = Mass CALIBRATION MODE = Dry	77
					CUSTOMER UNIT P		78
		CUST. UNIT FACT. P		78			
		PRESS. SENS. LOLIM		120			
		PRESS. SENS. HILIM		120			
		LEVEL MODE		78			
		LIN. MEASURAND		79			
		HEIGHT UNIT		85			
		MASS UNIT		81			
		CUSTOMER UNIT M		81			
		CUST. UNIT FACT. M		82			
		CALIBRATION MODE		82			
		DENSITY UNIT		83			
		ADJUST DENSITY		83			
		UNIT VOLUME		84			
		CUSTOMER UNIT V		84			
		CUST. UNIT FACT. V		84			
		TANK VOLUME		84			
		TANK HEIGHT		85			
		ZERO POSITION		86			
		SET LRV	86				
		SET URV	86				
		DAMPING VALUE	86				

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Linear, LIN. MEASURAND = Mass CALIBRATION MODE = Wet	77
			CUSTOMER UNIT P		78
			CUST. UNIT FACT. P		78
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LIN. MEASURAND		79
			MASS UNIT		81
			CUSTOMER UNIT M		81
			CUST. UNIT FACT. M		82
			CALIBRATION MODE		82
			EMPTY CALIB.		82
			EMPTY PRESSURE		83
			FULL CALIB.		83
			FULL PRESSURE		83
			SET LRV		86
			SET URV		86
			DAMPING VALUE		86
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Pressure Linearized LIN. MEASURAND = Pressure and %	70
			CUSTOMER UNIT P		71
			CUST. UNIT FACT. P		71
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LINd. MEASURAND		87
			HYDR. PRESS MIN.		89
			HYDR. PRESS MAX.		89
			DAMPING VALUE		89
			BASIC SETUP		PRESS. ENG. UNIT
		CUSTOMER UNIT P		71	
		CUST. UNIT FACT. P		71	
		PRESS. SENS. LOLIM		120	
		PRESS. SENS. HILIM		120	
		LEVEL MODE		78	
		LINd. MEASURAND		87	
		UNIT VOLUME		87	
		CUSTOMER UNIT V		87	
		CUST. UNIT FACT V		88	
		HYDR. PRESS MIN.		89	
		HYDR. PRESS MAX.		89	
		DAMPING VALUE		89	

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Pressure Linearized LIN. MEASURAND = Pressure and Mass	70
			CUSTOMER UNIT P		71
			CUST. UNIT FACT. P		71
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			LINd. MEASURAND		87
			MASS UNIT		88
			CUSTOMER UNIT M		88
			CUST. UNIT FACT. M		89
			HYDR. PRESS MIN.		89
			HYDR. PRESS MAX.		89
			DAMPING VALUE		89
			BASIC SETUP		PRESS. ENG. UNIT
		CUSTOMER UNIT P		74	
		CUST. UNIT FACT. P		74	
		PRESS. SENS. LOLIM		120	
		PRESS. SENS. HILIM		120	
		LEVEL MODE		78	
		COMB. MEASURAND		90	
		HEIGHT UNIT		95	
		CUSTOMER UNIT H		95	
		CUSTOMER UNIT H		95	
		LEVEL MIN.		93	
		LEVEL MAX.		93	
		CALIBRATION MODE		93	
		DENSITY UNIT		94	
		ADJUST DENSITY		94	
		100% POINT		96	
		ZERO POSITION	96		
		DAMPING VALUE	96		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = % Height and % CALIBRATION MODE = Wet	74
			CUSTOMER UNIT P		74
			CUST. UNIT FACT. P		74
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			EMPTY CALIB.		93
			EMPTY PRESSURE		94

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
			FULL CALIB.		94
			FULL PRESSURE		94
			DAMPING VALUE		96
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = % Height and Volume CALIBRATION MODE = Dry	74
			CUSTOMER UNIT P		74
			CUST. UNIT FACT. P		74
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			HEIGHT UNIT		95
			CUSTOMER UNIT H		95
			CUST. UNIT FACT. H		95
			UNIT VOLUME		91
			CUSTOMER UNIT V		91
			CUST. UNIT FACT. V		91
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			DENSITY UNIT		94
			ADJUST DENSITY		94
			100% POINT		96
			ZERO POSITION		96
			DAMPING VALUE	96	
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = % Height and Volume CALIBRATION MODE = Wet	74
			CUSTOMER UNIT P		74
			CUST. UNIT FACT. P		74
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			UNIT VOLUME		91
			CUSTOMER UNIT V		91
			CUST. UNIT FACT. V		91
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			EMPTY CALIB.		93
			EMPTY PRESSURE		94
			FULL CALIB.		94
			FULL PRESSURE		94
			DAMPING VALUE		96

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = % Height and Mass CALIBRATION MODE = Dry	74
			CUSTOMER UNIT P		74
			CUST. UNIT FACT. P		74
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			HEIGHT UNIT		95
			CUSTOMER UNIT H		95
			CUST. UNIT FACT. H		95
			MASS UNIT		92
			CUSTOMER UNIT M		92
			CUST. UNIT FACT. M		92
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			DENSITY UNIT		94
			ADJUST DENSITY		94
			100% POINT		96
			ZERO POSITION		96
		DAMPING VALUE	96		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = % Height and Mass CALIBRATION MODE = Wet	74
			CUSTOMER UNIT P		74
			CUST. UNIT FACT. P		74
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			MASS UNIT		92
			CUSTOMER UNIT M		92
			CUST. UNIT FACT. M		92
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			EMPTY CALIB.		93
			EMPTY PRESSURE		94
			FULL CALIB.		94
		FULL PRESSURE	94		
		DAMPING VALUE	96		

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and Volume CALIBRATION MODE = Dry	74
	CUSTOMER UNIT P		90		
	CUST. UNIT FACT. P		90		
	PRESS. SENS. LOLIM		120		
	PRESS. SENS. HILIM		120		
	LEVEL MODE		78		
	COMB. MEASURAND		90		
	HEIGHT UNIT		90		
	CUSTOMER UNIT H		90		
	CUST. UNIT FACT. H		90		
	UNIT VOLUME		91		
	CUSTOMER UNIT V		91		
	CUST. UNIT FACT. V		91		
	LEVEL MIN.		93		
	LEVEL MAX.		93		
	CALIBRATION MODE		93		
	DENSITY UNIT		94		
	ADJUST DENSITY		94		
	ZERO POSITION		96		
	DAMPING VALUE		96		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and Volume CALIBRATION MODE = Wet	74
	CUSTOMER UNIT P		90		
	CUST. UNIT FACT. P		90		
	PRESS. SENS. LOLIM		120		
	PRESS. SENS. HILIM		120		
	LEVEL MODE		78		
	COMB. MEASURAND		90		
	HEIGHT UNIT		90		
	CUSTOMER UNIT H		90		
	CUST. UNIT FACT. H		90		
	UNIT VOLUME		91		
	CUSTOMER UNIT V		91		
	CUST. UNIT FACT. V		91		
	LEVEL MIN.		93		
	LEVEL MAX.		93		
	CALIBRATION MODE		93		
	EMPTY CALIB.		93		
	EMPTY PRESSURE		94		
	FULL CALIB.		94		
	FULL PRESSURE		94		
	ADJUST DENSITY	94			
	DAMPING VALUE	96			

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and Mass CALIBRATION MODE = Dry	74
			CUSTOMER UNIT P		90
			CUST. UNIT FACT. P		90
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			HEIGHT UNIT		90
			CUSTOMER UNIT H		90
			CUSTOMER UNIT H		90
			MASS UNIT		92
			CUSTOMER UNIT M		92
			CUST. UNIT FACT. M		92
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			DENSITY UNIT		94
			ADJUST DENSITY		94
			ZERO POSITION		96
			DAMPING VALUE		96
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and Mass CALIBRATION MODE = Wet	74
			CUSTOMER UNIT P		90
			CUST. UNIT FACT. P		90
			PRESS. SENS. LOLIM		120
			PRESS. SENS. HILIM		120
			LEVEL MODE		78
			COMB. MEASURAND		90
			HEIGHT UNIT		90
			CUSTOMER UNIT H		90
			CUSTOMER UNIT H		90
			MASS UNIT		92
			CUSTOMER UNIT M		92
			CUST. UNIT FACT. M		92
			LEVEL MIN.		93
			LEVEL MAX.		93
			CALIBRATION MODE		93
			EMPTY CALIB.		93
			EMPTY PRESSURE		94
			FULL CALIB.		94
			FULL PRESSURE		94
		ADJUST DENSITY	94		
		DAMPING VALUE	96		

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page		
		BASIC SETUP	PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and % CALIBRATION MODE = Dry	74		
			CUSTOMER UNIT P		90		
			CUST. UNIT FACT. P		90		
			PRESS. SENS. LOLIM		120		
			PRESS. SENS. HILIM		120		
			LEVEL MODE		78		
			COMB. MEASURAND		90		
			HEIGHT UNIT		90		
			CUSTOMER UNIT H		90		
			CUSTOMER UNIT H		90		
			LEVEL MIN		93		
			LEVEL MAX		93		
			CALIBRATION MODE		93		
			DENSITY UNIT		94		
			ADJUST DENSITY		94		
			ZERO POSITION		96		
			DAMPING VALUE		96		
			BASIC SETUP		PRESS. ENG. UNIT	Level Standard LEVEL MODE = Height Linearized COMB. MEASURAND = Height and % CALIBRATION MODE = Wet	74
					CUSTOMER UNIT P		90
		CUST. UNIT FACT. P		90			
		PRESS. SENS. LOLIM		120			
		PRESS. SENS. HILIM		120			
		LEVEL MODE		78			
		COMB. MEASURAND		90			
		HEIGHT UNIT		90			
		CUSTOMER UNIT H		90			
		CUSTOMER UNIT H		90			
		LEVEL MIN.		93			
		LEVEL MAX.		93			
		CALIBRATION MODE		93			
		EMPTY CALIB.		93			
		EMPTY PRESSURE		94			
		FULL CALIB.		94			
		FULL PRESSURE		94			
		ADJUST DENSITY		94			
		DAMPING VALUE		96			
		BASIC SETUP	PRESS. ENG. UNIT	Flow	97		
			CUSTOMER UNIT P		97		
			CUST. UNIT FACT. P		97		
			PRESS. SENS. LOLIM		120		
			PRESS. SENS. HILIM		120		
			LINEAR/SQROOT		114		
			MIN PRESS. FLOW		67		

Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
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			FLOW-MEAS TYPE		98
			UNIT FLOW		98
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			MAX. DURCHFLOSS		100
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			SET. L. FL. CUT-OFF		103
			DAMPING VALUE		100
		EXTENDED SETUP	TEMP. ENG. UNIT	Flow	100
			TEMP. ENG. UNIT	Level	101
			DENSITY UNIT	Level Standard	101
			ADJUST DENSITY		101
			PROCESS DENSITY		101
			SET LRV	Pressure Linearized, Height Linearized	102
			SET URV	Pressure Linearized, Height Linearized	102
			DENSITY UNIT	Level Easy Pressure	101
			ADJUST DENSITY		101
			PROCESS DENSITY		101
			ADJUST DENSITY	Level Easy Height	101
			DENSITY UNIT		101
			PROCESS DENSITY		101
			TEMP. ENG. UNIT	Flow	103
			SET LRV		103
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Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
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			RESET TOTALISER1		111
			TOTAL.2 ENG.UNIT		111
			TOT. 2 UNIT TEXT		111
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			NEG. FLOW TOT. 2		111
SAFETY CONFIRM.					
See Safety Manual for Deltabar S (SD00189), Cerabar S (SD00190) or Deltapilot S (SD00213P).					
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Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
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			SEAL TYPE		119
			BOLTS MATERIAL		119
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			REMOTE SEAL +		119
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			PRESS.SENS LOLIM		120
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			MAT. MEMBRANE		120
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Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page	
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			MEASURED VALUE	Level	122	
			PRESSURE		122	
			CORRECTED PRESS.		122	
			SENSOR PRESSURE		122	
			SENSOR TEMP.		122	
			MEAS. VAL. TREND		122	
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			TANK CONTENT		Pressure Linearized, Height Linearized	122
			MEASURED VALUE	Flow	122	
			PRESSURE		123	
			CORRECTED PRESS.		123	
			SENSOR PRESSURE		123	
			SENSOR TEMP.		123	
			MEAS. VAL. TREND		123	
			SUPPRESSED FLOW		123	
			TOTALIZER 1		123	
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			COUNTER:T > Tmax	124		
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Level 1	Level 2	Level 3	Level 4	Measuring mode, Level mode or Level selection	See page
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		MESSAGES	ALARM STATUS	all	127
			LAST DIAG. CODE		127
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			RESET ALL ALARMS		128
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			SELECT ALARMTYPE (Overview alarms)		128 (131)
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			OFFSET 4mA TRIM		130
OFFSET 20mA TRIM				130	

9 Description of parameters

- The following tables list all the parameters as per the menu structure of the on-site display. Each table corresponds to a function group in the menu tree.
- The menu structure for on-site operation and the digital communication are different.
- In the operating program or HART handheld terminal, additional parameters are displayed. These parameters are marked accordingly.
- The menu path of the on-site display is indicated in the header of each table. You can use this path to get to the parameters in question.
- The menu has a different structure depending on the measuring mode selected. This means that some function groups are only displayed for one measuring mode, e.g. the "LINEARISATION" function group for the "Level" measuring mode. If certain requirements have to be met for a function group, these are listed in the first row of the table.
- Some parameters are only displayed if other parameters are appropriately configured. For example, the EMPTY CALIB. parameter is not displayed in the Quick Setup menu ("Level" measuring mode) unless the "Linear" option was selected for the LEVEL MODE parameter and the "Wet" option was selected for the CALIBRATION MODE parameter. There is a comment in the parameter description here stating: Note: prerequisite: LEVEL MODE = Linear and CALIBRATION MODE = Wet.
- Parameter names are written in upper case in the text.
- In the "Parameter name" column, the unique identification number (ID) of the parameter is indicated in brackets. This ID only appears on the on-site display.

Table 1: GROUP SELECTION → LANGUAGE – on-site operation	
Parameter name	Description
LANGUAGE (079) Selection	<p>Select the menu language for the on-site display.</p> <ul style="list-style-type: none"> ■ In the operating program and in the HART handheld terminal, the LANGUAGE parameter is arranged in the DISPLAY function group. ■ Select the menu language for FieldCare via the "Extras" menu → "Options" → "Display" tab → "Tool language" area. <p>Factory setting: English</p>

Table 2: GROUP SELECTION → MEASURING MODE – on-site operation	
Parameter name	Description
MEASURING MODE (389) Selection	<p>Select the measuring mode. The operating menu is structured according to the selected measuring mode.</p> <p>⚠ WARNING Changing the measuring mode can affect the adjustment data! This situation can result in product overflow.</p> <ul style="list-style-type: none"> ▶ Check calibration data when the measuring mode is changed. <p>Options:</p> <ul style="list-style-type: none"> ■ Pressure ■ Level ■ Deltabar S: Flow <p>Factory setting:</p> <ul style="list-style-type: none"> ■ Cerabar S and Deltabar S: Pressure ■ Deltapilot S: Level

Table 2: GROUP SELECTION → MEASURING MODE – on-site operation	
Parameter name	Description
LEVEL SELECTION (020) Options	<p>Select level mode.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level ■ In the "Level Easy Pressure" and "Level Easy Height" level modes, the values entered are not tested as extensively as in the "Level Standard" level mode. The values entered for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE, EMPTY HEIGHT/FULL HEIGHT and SET LRV/SET URV must have a minimum interval of 1% for the "Level Easy Pressure" and "Level Easy Height" level modes. The value will be rejected with a warning message if the values are too close together. Further limit values are not checked; i.e. the values entered must be appropriate for the sensor and the measuring task so that the measuring device can measure correctly. → For an overview of the different level modes and types, see Page 8, Section 5.1 "Overview of level measurement". ■ The "Level Easy Pressure" and "Level Easy Height" level modes encompass fewer parameters than the "Level Standard" mode and are used for quick and easy configuration of a level application. ■ Customer-specific units of fill level, volume and mass or a linearization table may only be entered in the "Level Standard" level mode. ■ Where the device is intended for use as a subsystem in a safety function (SIL), a "Device configuration with enhanced parameter security" (SAFETY CONFIRM.) is only possible for the "Level" operating mode in the "Level Easy Pressure" level mode. All parameters previously entered are checked after a password is entered. Once the "Level Easy Height" or "Level Standard" has been selected, the configuration will first have to be reset to the ex-works setting using the RESET parameter (menu path: (GROUP SELECTION →) OPERATING MENU → OPERATION) using the reset code "7864". → For additional information, see the Safety Manual for Deltabar S (SD00189), Cerabar S (SD00190) or Deltapilot S (SD00213P). <p>Options:</p> <ul style="list-style-type: none"> ■ Level Easy Pressure Specify two pressure-level value pairs for this level mode. The pressure measured value is converted directly to the unit which is selected via the OUTPUT UNIT parameter (→ Page 71). Two calibration modes, "Wet" and "Dry", are available. <ul style="list-style-type: none"> – Wet calibration takes place by filling and emptying the container. In the case of two different levels, the level, volume, mass or percentage value entered is assigned to the pressure measured at this point in time. – Dry calibration is a theoretical calibration. For this calibration, specify two pressure-level value pairs via the EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE parameters. → Parameter descriptions see Page 72 ff. ■ Level Easy Height For this level mode, specify a height unit, density and two height-level value pairs. The pressure measured value is converted to a height value using the density entered and the height unit. Two calibration modes, "Wet" and "Dry", are available. <ul style="list-style-type: none"> – Wet calibration takes place by filling and emptying the container. In the case of two different levels, the level, volume, mass or percentage value entered is assigned to the converted height value. – Dry calibration is a theoretical calibration. For this calibration, specify two height-level value pairs via the EMPTY CALIB., EMPTY HEIGHT, FULL CALIB. and FULL HEIGHT parameters. → Parameter descriptions see Page 76 ff. ■ Level standard Once you have selected this level mode, you can use the LEVEL MODE parameter (→ Page 78) to choose between "Linear", "Pressure Linearized" and "Height Linearized". <p>Factory setting: Level Easy Pressure</p>
<p>→ For LEVEL SELECTION = "Level Easy Pressure" see Page 70, Table 8. → For LEVEL SELECTION = "Level Easy Height" see Page 73, Table 9. → For LEVEL SELECTION = "Level standard" see Page 77, Table 10.</p>	

Table 3: (GROUP SELECTION →) QUICK SETUP "Pressure"	
Parameter name	Description
<p>This menu displays the most important parameters for the "Pressure" measuring mode.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> MEASURING MODE = Pressure 	
POS. ZERO ADJUST (685) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. Due to the orientation of the device, there may be a shift in the measured value, i.e. for example, when the container is empty, the MEASURED VALUE parameter does not display zero.</p> <p>Example:</p> <ul style="list-style-type: none"> MEASURED VALUE = 2.2 mbar (0.033 psi) Correct the MEASURED VALUE via the POS. ZERO ADJUST parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. MEASURED VALUE (after pos. zero adjust) = 0.0 mbar The current value is also corrected. <p>The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> This parameter is displayed for Deltabar S, Cerabar S with gauge pressure sensor and Deltapilot S. <p>Options:</p> <ul style="list-style-type: none"> Abort Confirm <p>Factory setting: Abort</p>
POS. INPUT VALUE (563) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. To correct the pressure difference, you need a reference measurement value (e. g. from a reference device). Due to the orientation of the device, there may be a shift in the measured value, i.e. for example, when the container is empty, the MEASURED VALUE parameter does not display zero or the desired value.</p> <p>Example:</p> <ul style="list-style-type: none"> MEASURED VALUE = 0.5 mbar (0.0075 psi) For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2 mbar. (MEASURED VALUE_{new} = POS. INPUT VALUE) MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar (0.03 psi) The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. CALIB. OFFSET = MEASURED VALUE_{old} – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar (0.0075 psi) – 2.0 mbar (0.03 psi) = – 1.5 mbar (0.0225 psi) The current value is also corrected. <p>Prerequisite:</p> <ul style="list-style-type: none"> This parameter is displayed for Cerabar S with absolute pressure sensors. <p>Factory setting: 0.0</p>
SET LRV (245) Entry	<p>Set lower range value – without reference pressure. Enter pressure value for the lower current value (4 mA).</p> <p>Factory setting: 0.0 or as per order specifications</p>
SET URV (246) Entry	<p>Set upper range value – without reference pressure. Enter pressure value for the upper current value (20 mA).</p> <p>Factory setting: High sensor limit (→ see PRESS. SENS HILIM, Page 120) or as per order specifications</p>

Table 3: (GROUP SELECTION →) QUICK SETUP "Pressure"	
Parameter name	Description
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 4: (GROUP SELECTION →) QUICK SETUP "Level"	
Parameter name	Description
<p>This menu displays the most important parameters for the "Level" measuring mode.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level 	
POS. ZERO ADJUST (685) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero.</p> <p>Example:</p> <ul style="list-style-type: none"> – MEASURED VALUE = 2.2 mbar (0.033 psi) – Correct the MEASURED VALUE via the POS. ZERO ADJUST parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. – MEASURED VALUE (after pos. zero adjust) = 0.0 mbar – The current value is also corrected. <p>The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ This parameter is displayed for Deltabar S, Cerabar S with gauge pressure sensor and Deltapilot S. <p>Options:</p> <ul style="list-style-type: none"> ■ Abort ■ Confirm <p>Factory setting: 0.0</p>
POS. INPUT VALUE (563) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. To correct the pressure difference, you need a reference measurement value (e. g. from a reference device). Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero or the desired value.</p> <p>Example:</p> <ul style="list-style-type: none"> – MEASURED VALUE = 0.5 mbar (0.0075 psi) – For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2.0 mbar (0.03 psi). (MEASURED VALUE_{new} = POS. INPUT VALUE) – MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar (0.03 psi) – The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. CALIB. OFFSET = MEASURED VALUE_{old} – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar (0.0075 psi) – 2.0 mbar (0.03 psi) = – 1.5 mbar (0.0225 psi) – The current value is also corrected. <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ This parameter is displayed for Cerabar S with absolute pressure sensors. <p>Factory setting: 0.0</p>

Table 4: (GROUP SELECTION →) QUICK SETUP "Level"	
Parameter name	Description
EMPTY CALIB. (314)/ (010) Entry	<p>Enter level value for the lower calibration point (container empty). The container is either empty or part full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LEVEL SELECTION = Level Easy Pressure (→ see also Page 63), CALIBRATION MODE = Wet (→ see also Page 72) ■ LEVEL SELECTION = Level Standard (→ see also Page), LEVEL MODE = Linear (→ see also Page 78), CALIBRATION MODE = Wet (→ see also Page 82) <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 0.0</p>
FULL CALIB. (315)/(004) Entry	<p>Enter level value for the upper calibration point (container full). The container is either completely or almost full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LEVEL SELECTION = Level Easy Pressure (→ see also Page 63), CALIBRATION MODE = Wet (→ see also Page 72) ■ LEVEL SELECTION = Level Standard, LEVEL MODE = Linear (→ see also Page 78), CALIBRATION MODE = Wet (→ see also Page 82) <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 100.0</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 5: (GROUP SELECTION →) QUICK SETUP "Flow"	
Parameter name	Description
	<p>This menu displays the most important parameters for the "Flow" measuring mode.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Deltabar S differential pressure transmitter ■ MEASURING MODE = Flow

Table 5: (GROUP SELECTION →) QUICK SETUP "Flow"	
Parameter name	Description
POS. ZERO ADJUST (685) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. (A reference pressure is present at the device.)</p> <p>Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the MEASURED VALUE parameter does not display zero.</p> <p>Example:</p> <ul style="list-style-type: none"> – MEASURED VALUE = 2.2 mbar (0,033 psi) – Correct the MEASURED VALUE via the POS. ZERO ADJUST parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. – MEASURED VALUE (after pos. zero adjust) = 0.0 mbar – The current value is also corrected. <p>The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected.</p> <p>Selection:</p> <ul style="list-style-type: none"> ▪ Abort ▪ Confirm <p>Factory setting: 0.0</p>
MAX. FLOW (311) Entry	<p>Enter maximum flow of primary element.</p> <p>See also layout sheet of primary element. The maximum flow is assigned to the maximum pressure which you enter via MAX PRESS. FLOW.</p> <p>Use the LINEAR/SQROOT parameter (→ Page 114) to specify the current signal for the "Flow" measuring mode. The following applies for the "Flow (square root)" setting:</p> <p>If you enter a new value for MAX. FLOW, the value for SET URV is also changed. Use SET URV to assign a flow to the upper current value. If you want to assign the upper current value a value other than that for MAX. FLOW, you must enter the desired value for SET URV. (→ SET URV, Page 104).</p> <p>Factory setting: 1.0</p>
MAX PRESS. FLOW (634) Entry	<p>Enter maximum pressure of primary element.</p> <p>→ See layout sheet of primary element. This value is assigned to the maximum flow value (→ see MAX. FLOW).</p> <p>Use the LINEAR/SQROOT parameter (→ Page 114) to specify the current signal for the "Flow" measuring mode. The following applies for the "Differential pres." setting:</p> <p>If you enter a new value for MAX PRESS. FLOW, the value for SET URV is also changed. Use SET URV to assign a pressure value to the upper current value. If you want to assign the upper current value a value other than that for MAX PRESS. FLOW, you must enter the desired value for SET URV. (→ SET URV, Page 104).</p> <p>Factory setting: High sensor limit (→ See PRESS. SENS HILIM, Page 120)</p>
MIN. PRESS. FLOW Display	<p>Display of the pressure value at minimum flow rate (= 0).</p> <p>Factory setting: 0</p> <p>Prerequisite: Digital communication</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ).</p> <p>The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 6: (GROUP SELECTION →) OPERATING MENU → SETTINGS → POSITION ADJUSTMENT	
Parameter name	Description
<p>Due to the orientation of the device, there may be a shift in the measured value, i.e. when the container is empty, the measured value does not display zero. Deltabar S and Cerabar S offer three different ways of performing a position adjustment.</p> <p>Recommendation:</p> <ul style="list-style-type: none"> ■ The pressure difference between zero (set point) and the measured pressure need not be known. <ul style="list-style-type: none"> - POS. ZERO ADJUST: Deltabar S or Cerabar S with gauge pressure sensor or Deltapilot S. - POS. INPUT VALUE: Cerabar S with absolute pressure sensor. ■ The pressure difference between zero (set point) and the measured pressure is known. <ul style="list-style-type: none"> - CALIB. OFFSET: Deltabar S, Cerabar S with gauge pressure sensor, Cerabar S with absolute pressure sensor or Deltapilot S. 	
POS. ZERO ADJUST (685) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.</p> <p>Example:</p> <ul style="list-style-type: none"> - MEASURED VALUE = 2.2 mbar (0.033 psi) - Correct the MEASURED VALUE via the POS. ZERO ADJUST parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. - MEASURED VALUE (after pos. zero adjust) = 0.0 mbar - The current value is also corrected. <p>The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected.</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Abort ■ Confirm <p>Factory setting: 0.0</p>
POS. INPUT VALUE (563) Entry	<p>Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. To correct the pressure difference, you need a reference measurement value (e. g. from a reference device).</p> <p>Example:</p> <ul style="list-style-type: none"> - MEASURED VALUE = 0.5 mbar (0.0075 psi) - For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2.0 mbar (0.03 psi). (MEASURED VALUE_{new} = POS. INPUT VALUE) - MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar (0.03 psi) - The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. CALIB. OFFSET = MEASURED VALUE_{old} – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar (0.0075 psi) – 2.0 mbar (0.03 psi) = – 1.5 mbar (0.0225 psi) - The current value is also corrected. <p>Factory setting: 0.0</p>
CALIB. OFFSET (319) Entry	<p>Position adjustment - the pressure difference between zero (set point) and the measured pressure is known.</p> <p>Example:</p> <ul style="list-style-type: none"> - MEASURED VALUE = 2.2 mbar (0.033 psi) - Via the CALIB. OFFSET parameter, enter the value by which the MEASURED VALUE should be corrected. To correct the MEASURED VALUE to 0.0 mbar, you must enter the value 2.2 here. (MEASURED VALUE_{new} = MEASURED VALUE_{old} – CALIB. OFFSET) - MEASURED VALUE (after entry for calib. offset) = 0.0 mbar - The current value is also corrected. <p>Factory setting: 0.0</p>

Table 7: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Pressure"	
Parameter name	Description
Prerequisite: <ul style="list-style-type: none"> ■ MEASURING MODE = Pressure 	
PRESS. ENG. UNIT (060) Selection	<p>Select pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ mbar, bar ■ mmH2O, mH2O, inH2O, ftH2O 1) ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg 2) ■ Torr ■ g/cm², kg/cm² ■ lb/ft² ■ atm ■ gf/cm², kgf/cm² ■ User unit, → See also the following parameter description for CUSTOMER UNIT P and CUST. UNIT FACT. P. <p>1) The conversion factor of the pressure units refers to a reference temperature of 4 °C (39.2 °F). 2) The conversion factor of the pressure units refers to a reference temperature of 0 °C (32 °F).</p> <p>Factory setting: Depends on the sensor nominal measuring range mbar or bar or as per order specifications</p>
CUSTOMER UNIT P (075) Entry	<p>Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT P parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: - - - - -</p>
CUST. UNIT FACT. P (317) Entry	<p>Enter conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also CUSTOMER UNIT P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 10000 Pa ≈ 1 PU - Entry CUSTOMER UNIT P: PU - Entry CUST. UNIT FACT. P: 0.0001 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>
SET LRV (245) Entry	<p>Set lower range value – without reference pressure. Enter pressure value for the lower current value (4 mA).</p> <p>Factory setting: 0.0 or as per order specifications</p>

Table 7: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Pressure"	
Parameter name	Description
SET URV (246) Entry	Set upper range value – without reference pressure. Enter pressure value for the upper current value (20 mA). Factory setting: High sensor limit (→ See PRESS. SENS HILIM, Page 120)
GET LRV (309) Entry	Set lower range value – reference pressure is present at device. The pressure for the lower current value (4 mA) is present at device. With the "Confirm" option, you assign the lower current value to the pressure value present. On-site display: the pressure value present is displayed in the bottom line. Options: <ul style="list-style-type: none"> ■ Abort ■ Confirm
GET URV (310) Entry	Set upper range value – reference pressure is present at device. The pressure for the upper current value (20 mA) is present at device. With the "Confirm" option, you assign the upper current value to the pressure value present. On-site display: the pressure value present is displayed in the bottom line. Options: <ul style="list-style-type: none"> ■ Abort ■ Confirm
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure. Input range: 0.0...999.0 s Factory setting: 2.0 s or as per order specifications

Table 8: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Pressure"	
<p>The following parameters are displayed if you have selected the "Level Easy Pressure" option for the LEVEL SELECTION parameter. Specify two pressure-level value pairs for this level mode. Two calibration modes, "Wet" and "Dry", are available.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level ■ LEVEL SELECTION = Level Easy Pressure 	
PRESS. ENG. UNIT (060) Selection	<p>Select pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ mbar, bar ■ mmH2O, mH2O, inH2O, ftH2O 1) ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg 2) ■ Torr ■ g/cm², kg/cm² ■ lb/ft² ■ atm ■ gf/cm², kgf/cm² ■ User unit, → See also the following parameter description for CUSTOMER UNIT P and CUST. UNIT FACT. P. <p>1) The conversion factor of the pressure units refers to a reference temperature of 4 °C (39.2 °F). 2) The conversion factor of the pressure units refers to a reference temperature of 0 °C (32 °F).</p> <p>Factory setting: Depends on the sensor nominal measuring range mbar or bar or as per order specifications</p>

Table 8: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Pressure"	
<p>CUSTOMER UNIT P (075) Entry</p>	<p>Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT P parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
<p>CUST. UNIT FACT. P (317) Entry</p>	<p>Enter conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also CUSTOMER UNIT P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE =10000 Pa ≈ 1 PU - Entry CUSTOMER UNIT P: PU - Entry CUST. UNIT FACT. P: 0.0001 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>
<p>OUTPUT UNIT (023) Selection</p>	<p>Select unit for measured value display and MEASURED VALUE parameter (→ Page 121).</p> <p>The selected unit is used only to describe the measured value. This means that when selecting a new output unit, the measured value is not converted.</p> <p>Example:</p> <ul style="list-style-type: none"> ■ current measured value: 0.3 ft ■ new output unit: m ■ new measured value: 0.3 m (0.98 ft) <p>Options</p> <ul style="list-style-type: none"> ■ % ■ mm, cm, dm, m ■ ft, inch ■ cm³, dm³, m³,m³ E³ ■ l, hl ■ ft³, ft³ E³ ■ gal, bbl, lgal ■ g, kg, t ■ lb, ton, oz <p>Factory setting: %</p>

Table 8: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Pressure"	
CALIBRATION MODE (008) Selection	<p>Select calibration mode.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Wet Wet calibration takes place by filling and emptying the container. In the case of two different levels, the level, volume, mass or percentage value entered is assigned to the pressure measured at this point in time. (→ See also this table, parameter descriptions for EMPTY CALIB. and FULL CALIB.) ■ Dry Dry calibration is a theoretical calibration. For this calibration, specify two pressure-level value pairs via the following parameters: EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE. <p>Factory setting: Wet</p>
EMPTY CALIB. (010) Entry	<p>Enter level, volume, mass or percentage value for the lower calibration point (container empty). The container is either empty or part full. By entering a value for this parameter, you assign a level, volume, mass or percentage value to the pressure present at the device. The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the <input type="checkbox"/> or <input type="checkbox"/> key before confirming with the <input type="checkbox"/> key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 0.0</p>
FULL CALIB. (004) Entry	<p>Enter height, volume or mass value for the upper calibration point (container full). The container is either completely or almost full. By entering a value for this parameter, you assign a height, volume or mass value to the pressure present at the device. The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the <input type="checkbox"/> or <input type="checkbox"/> key before confirming with the <input type="checkbox"/> key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 100.0</p>
EMPTY CALIB. (010) Entry	<p>Enter level, volume, mass or percentage value for the lower calibration point (container empty). The values entered for the EMPTY CALIB. and EMPTY PRESSURE parameters form the pressure-level value pair for the lower calibration point. The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 0.0</p>
EMPTY PRESSURE (011) Entry	<p>Enter pressure value for the lower calibration point (container empty). → See also EMPTY CALIB.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 0.0</p>

Table 8: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Pressure"	
FULL CALIB. (004) Entry	<p>Enter height, volume, mass or percentage value for the upper calibration point (container full). The values entered for the FULL CALIB. and FULL PRESSURE parameters form the pressure-level value pair for the upper calibration point. The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 100.0</p>
FULL PRESSURE (005) Entry	<p>Enter pressure value for the upper calibration point (container full). → See also FULL CALIB.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 100.0</p>
SET LRV (013) Entry	<p>Enter value for the lower current value (4 mA). The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Factory setting: 0.0</p>
SET URV (012) Entry	<p>Enter value for the upper current value (20 mA). The unit is selected via the OUTPUT UNIT parameter (→ Page 71).</p> <p>Factory setting: 100.0</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0 to 999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 9: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Height"	
<p>The following parameters are displayed if you have selected the "Level Easy Height" option for the LEVEL SELECTION parameter. For this level mode, specify a height unit, density and two height-level value pairs. The pressure measured value is converted to a height value using the density entered and the height. Two calibration modes, "Wet" and "Dry", are available.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level ■ LEVEL SELECTION = Level Easy Height 	

Table 9: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Height"	
PRESS. ENG. UNIT (060) Options	<p>Select pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ mbar, bar ■ mmH₂O, mH₂O, inH₂O, ftH₂O 1) ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg 2) ■ Torr ■ g/cm², kg/cm² ■ lb/ft² ■ atm ■ gf/cm², kgf/cm² ■ User unit, → See also the following parameter description for CUSTOMER UNIT P and CUST. UNIT FACT. P. <p>1) The conversion factor of the pressure units refers to a reference temperature of 4 °C (39.2 °F). 2) The conversion factor of the pressure units refers to a reference temperature of 0 °C (32 °F).</p> <p>Factory setting: Depends on the sensor nominal measuring range mbar or bar or as per order specifications</p>
CUSTOMER UNIT P (075) Entry	<p>Enter text (unit) for customised pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m²" is specified as the customer-specific unit, "crate/m²" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customised unit is displayed only in the CUSTOMER UNIT P parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. P (317) Entry	<p>Enter conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also CUSTOMER UNIT P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 10000 Pa ≈ 1 PU - Entry CUSTOMER UNIT P: PU - Entry CUST. UNIT FACT. P: 0.0001 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>

Table 9: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Height"	
<p>OUTPUT UNIT (023) Options</p>	<p>Select unit for measured value display and MEASURED VALUE parameter (→ Page 121).</p> <p>The selected unit is used only to describe the measured value. This means that when selecting a new output unit, the measured value is not converted.</p> <p>Example:</p> <ul style="list-style-type: none"> ■ current measured value: 0.3 ft ■ new output unit: m ■ new measured value: 0.3 m (0.98 ft) <p>Options:</p> <ul style="list-style-type: none"> ■ % ■ mm, cm, dm, m ■ ft, inch ■ cm³, dm³, m³,m³ E³ ■ l, hl ■ ft³, ft³ E³ ■ gal, bbl, lgal ■ g, kg, t ■ lb, ton, oz <p>Factory setting: %</p>
<p>HEIGHT UNIT (003) Options</p>	<p>Select height unit. The measured pressure is converted to the chosen height unit using the DENSITY UNIT and ADJUST DENSITY parameters.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ mm ■ cm ■ dm ■ m ■ inch ■ ft <p>Factory setting: m</p>
<p>CALIBRATION MODE (008) Options</p>	<p>Select calibration mode.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Wet Wet calibration takes place by filling and emptying the container. The measured pressure is converted to the chosen height unit using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters. In the case of two different levels, the level, volume, mass or percentage value entered is assigned to the converted height value. ■ Dry Dry calibration is a theoretical calibration. For this calibration, specify two height-level value pairs via the EMPTY CALIB., EMPTY HEIGHT, FULL CALIB. and FULL HEIGHT parameters. <p>Factory setting: Dry</p>
<p>DENSITY UNIT (001) Options</p>	<p>Select density unit. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ g/cm³ ■ kg/dm³ ■ kg/m³ ■ US lb/in³ ■ US lb/ft³ <p>Factory setting: kg/dm³</p>
<p>ADJUST DENSITY (007) Entry</p>	<p>Enter density of fluid. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters.</p> <p>Factory setting: 1.0</p>

Table 9: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Height"	
EMPTY CALIB. (010) Entry	<p>Enter level, volume, mass or percentage value for the lower calibration point (container empty).</p> <p>The container is either empty or part full. The measured pressure is converted to a height value using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters and displayed. Using the parameter EMPTY CALIB., you assign a level, volume, mass or percentage value to the height value. The unit is selected via the OUTPUT UNIT parameter (→ Page 75).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 0.0</p>
FULL CALIB. (004) Entry	<p>Enter level, volume, mass or percentage value for the upper calibration point (container full).</p> <p>The container is either completely or almost full. Using the parameters HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY, the measured pressure is converted to a height value and displayed. Using the parameter FULL CALIB., you assign a level, volume, mass or percentage value to the height value. The unit is selected via the OUTPUT UNIT parameter (→ Page 75).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 100.0</p>
EMPTY CALIB. (010) Entry	<p>Enter level, volume, mass or percentage value for the lower calibration point (container empty).</p> <p>The values entered for the EMPTY CALIB. and EMPTY HEIGHT parameters form the height-level value pair for the lower calibration point. The unit is selected via the OUTPUT UNIT parameter (→ Page 75).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 0.0</p>
EMPTY HEIGHT (009) Entry	<p>Height value for the lower calibration point (container empty). The unit is selected via the HEIGHT UNIT parameter (→ Page 75).</p> <p>→ See also EMPTY CALIB.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: Upper range limit (URL) converted to an height unit</p>
FULL CALIB. (004) Entry	<p>Enter level, volume, mass or percentage value for the upper calibration point (container full).</p> <p>The values entered for the FULL CALIB. and FULL HEIGHT parameters form the height-level value pair for the upper calibration point. The unit is selected via the OUTPUT UNIT parameter (→ Page 75).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 100.0</p>

Table 9: (GROUP SELECTION→) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level Easy Height"	
FULL HEIGHT (006) Entry	Enter height value for the upper calibration point (container full). The unit is selected via the HEIGHT UNIT parameter (→ Page 75). → See also FULL CALIB. Prerequisite: ▪ CALIBRATION MODE = Dry Factory setting: 0.0
SET LRV (013) Entry	Enter level, volume, mass or percentage value for the lower current value (4 mA). The unit is selected via the OUTPUT UNIT parameter (→ Page 75). Factory setting: 0.0
SET URV (012) Entry	Enter level, volume, mass or percentage value for the upper current value (20 mA). The unit is selected via the OUTPUT UNIT parameter (→ Page 75). Factory setting: 100.0
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure. Input range: 0.0 to 999.0 s Factory setting: 2.0 s or as per order specifications

Table 10: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level" LEVEL SELECTION "Level Standard"	
Parameter name	Description
Prerequisite: ▪ MEASURING MODE = level ▪ LEVEL SELECTION = Level Standard	
PRESS. ENG. UNIT (060) Selection	Select pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit. Options: ▪ mbar, bar ▪ mmH2O, mH2O, inH2O, ftH2O 1) ▪ Pa, hPa, kPa, MPa ▪ psi ▪ mmHg, inHg 2) ▪ Torr ▪ g/cm ² , kg/cm ² ▪ lb/ft ² ▪ atm ▪ gf/cm ² , kgf/cm ² ▪ User unit, → See also the following parameter description for CUSTOMER UNIT P and CUST. UNIT FACT. P. 1) The conversion factor of the pressure units refers to a reference temperature of 4 °C (39.2 °F). 2) The conversion factor of the pressure units refers to a reference temperature of 0 °C (32 °F). Factory setting: Depends on the sensor nominal measuring range mbar or bar or as per order specifications

Table 10: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level" LEVEL SELECTION "Level Standard"	
Parameter name	Description
CUSTOMER UNIT P (075) Entry	<p>Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT P parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. P (317) Entry	<p>Enter conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also CUSTOMER UNIT P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ PRESS. ENG. UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 10000 Pa \approx 1 PU - Entry CUSTOMER UNIT P: PU - Entry CUST. UNIT FACT. P: 0.0001 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>
LEVEL MODE (718) Selection	<p>Select level type.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Linear: the measured variable (level, volume, mass or %) is in direct proportion to the measured pressure. → See also Page 79 ff, Table 9. ■ Pressure Linearized: the measured variable (volume, mass or %) is not in direct proportion to the measured pressure such as in the case of containers with a conical outlet. For the calibration, enter a linearisation table with at least 2 and not more than 32 points. → See also Page 87 ff, Table 10. ■ Height Linearized: select this level type if you require two measured variables or if the container shape is given with value pairs, e.g. height and volume. The following combinations are possible: <ul style="list-style-type: none"> - Height + Volume - Height + Mass - Height + % - %-Height + Volume - %-Height + Mass - %-Height + % <p>Perform two calibrations for this level type. First for the measured variable height or %-height like for the "Linear" option and then for the measured variable volume, mass or % like for the "Pressure Linearized" option. → See also Page 89 ff, Table 11.</p> <p>Factory setting: Linear</p>
<p>→ For LEVEL MODE = Linear, see Page 79, Table 9. → For LEVEL MODE = Pressure Linearized, see Page 87, Table 10. → For LEVEL MODE = Height Linearized, see Page 89, Table 11.</p>	

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
<p>The following parameters are displayed if you selected the "Linear" option for the LEVEL MODE parameter. For this level type, the measured variable (level, volume, mass or %) is in direct proportion to the measured pressure.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level . ■ LEVEL SELECTION = Level Standard ■ LEVEL MODE = Linear 	
LIN. MEASURAND (804) Selection	<p>Select measured variable.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Level ■ Volume ■ Mass ■ % (Level) <p>Factory setting: % (Level)</p>
HEIGHT UNIT (708) Selection	<p>Select level unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = Level <p>Options:</p> <ul style="list-style-type: none"> ■ mm ■ cm ■ dm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter description for CUSTOMER UNIT H and CUST. UNIT FACT. H. <p>Factory setting: m</p>
CUSTOMER UNIT H (706) Entry	<p>Enter text (unit) for customer-specific level unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = Level, HEIGHT UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
CUST. UNIT FACT. H (705) Entry	<p>Enter conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also CUSTOMER UNIT H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Level, HEIGHT UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 0.5 m (1.6 ft) $\hat{=}$ 1 PU - Entry CUSTOMER UNIT H: PU - Entry CUST. UNIT FACT. H: 2 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>
UNIT VOLUME (313) Selection	<p>Select volume unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume <p>Options:</p> <ul style="list-style-type: none"> ▪ l ▪ hl ▪ cm³ ▪ dm³ ▪ m³ ▪ m³ E³ ▪ ft ▪ ft³ E³ ▪ gal ▪ lgal ▪ bbl ▪ User unit, → see also the following parameter description for CUSTOMER UNIT V and CUST. UNIT FACT. V. <p>Factory setting: m³</p>
CUSTOMER UNIT V (608) Entry	<p>Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. V</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume, UNIT VOLUME = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
CUST. UNIT FACT. V (607) Entry	<p>Enter conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m³". → See also CUSTOMER UNIT V.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume, UNIT VOLUME = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "buckets". - MEASURED VALUE = 0.01 m³ ≈ 1 bucket - Entry CUSTOMER UNIT V: bucket - Entry CUST. UNIT FACT. V: 100 - Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>
MASS UNIT (709) Selection	<p>Select mass unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Mass <p>Options:</p> <ul style="list-style-type: none"> ▪ g ▪ kg ▪ t ▪ oz ▪ lb ▪ ton ▪ User unit, → see also the following parameter description for CUSTOMER UNIT M and CUST. UNIT FACT. M. <p>Factory setting: kg</p>
CUSTOMER UNIT M (704) Entry	<p>Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Mass, MASS UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT M parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
CUST. UNIT FACT. M (703) Entry	<p>Enter conversion factor for a customer-specific mass unit. The conversion factor must be entered in relation to the SI unit "kg". → See also CUSTOMER UNIT M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = Mass, MASS UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> – You want the measured value to be displayed in "buckets". – MEASURED VALUE = 10 kg $\hat{=}$ 1 bucket – Entry CUSTOMER UNIT M: bucket – Entry CUST. UNIT FACT. M: 0.1 – Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>
CALIBRATION MODE (392) Selection	<p>Select calibration mode.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Wet Wet calibration takes place by filling and emptying the container. This calibration mode requires two pressure-level value pairs to be entered. In the case of two different levels, the level value is entered and the pressure measured at this moment is assigned to the level value. → See also the following parameter description for EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE. ■ Dry Dry calibration is a theoretical calibration which you can carry out even if the device is not mounted or the container is empty. <ul style="list-style-type: none"> – For the "Level" measured variable, the density of the fluid (→ see Page 83, ADJUST DENSITY) must be entered. – For the "Volume" measured variable, the density of the fluid and the tank volume and tank height must be entered (→ see Page 83, ADJUST DENSITY, TANK VOLUME and TANK HEIGHT). – For the "Mass" measured variable, the tank volume and the tank height must be entered (→ see Page 84, TANK VOLUME and TANK HEIGHT). The density must also be entered in the case of a zero point shift (level offset) (→ see Page 83, ADJUST DENSITY). – For the "%" measured variable, the density of the fluid must be entered and a level assigned to the 100 % point (→ see Page 83 and 86, ADJUST DENSITY and 100% POINT). <p>If the measurement should not start at the mounting location of the device, a level offset must be entered (→ see Page 86, ZERO POSITION).</p> <p>LIN. MEASURAND: "% (Level)", "Mass" and "Volume": If the change to dry calibration is made after a wet calibration, the density must be entered correctly using the ADJUST DENSITY and DENSITY PROCESS parameter before changing the calibration mode. → See also Page 101.</p> <p>Factory setting: Wet</p>
EMPTY CALIB. (314) Entry	<p>Enter level value for the lower calibration point (container empty). The container is either empty or part full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device. → See also EMPTY PRESSURE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet <p>For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged.</p> <p>Factory setting: 0.0</p>

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
EMPTY PRESSURE (710) Display	Displays the pressure value for the lower calibration point (container empty). → See also EMPTY CALIB. Prerequisite: ■ CALIBRATION MODE = Wet Factory setting: 0.0
FULL CALIB. (315) Entry	Enter level value for the upper calibration point (container full). The container is either completely or almost full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device. → See also FULL PRESSURE. Prerequisite: ■ CALIBRATION MODE = Wet For this parameter, the on-site display shows the level value to be entered and the pressure present at the device. In order for the level value to be saved together with the pressure present at the device, the entry field for the level value must first be activated using the \boxplus or \boxminus key before confirming with the \boxtimes key. This applies also if the level value is to remain unchanged. Factory setting: 100.0
FULL PRESSURE (711) Display	Displays the pressure value for the upper calibration point (container full). → See also FULL CALIB. Prerequisite: ■ CALIBRATION MODE = Wet Factory setting: High sensor limit (→ see PRESS. SENS HILIM, Page 120)
ADJUSTED DENSITY (810) Display	Displays the density calculated from the upper and lower level point. Prerequisite: ■ CALIBRATION MODE = Wet, LIN. MEASURAND = Level
DENSITY UNIT (812) Selection	Select density unit. Prerequisite: ■ LIN. MEASURAND = Level, CALIBRATION MODE = Dry ■ LIN. MEASURAND = % (Level), CALIBRATION MODE = Dry ■ LIN. MEASURAND = Volume, CALIBRATION MODE = Dry ■ LIN. MEASURAND = Mass, CALIBRATION MODE = Dry Options: ■ g/cm^3 ■ kg/dm^3 ■ kg/m^3 ■ US lb/in ³ ■ US lb/ft ³ Factory setting: kg/dm^3
ADJUST DENSITY (316) Entry	Enter density of fluid. Prerequisite: ■ CALIBRATION MODE = Dry Factory setting: 1.0 (kg/dm^3)

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
UNIT VOLUME (313) Selection	<p>Select volume unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume <p>Options:</p> <ul style="list-style-type: none"> ▪ l ▪ hl ▪ cm³ ▪ dm³ ▪ m³ ▪ m³ E³ ▪ ft ▪ ft³ E³ ▪ gal ▪ lgal ▪ bbl ▪ User unit, → see also the following parameter description for CUSTOMER UNIT V and CUST. UNIT FACT. V. <p>Factory setting: m³</p>
CUSTOMER UNIT V (608) Entry	<p>Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. V</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume, UNIT VOLUME = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. V (607) Entry	<p>Enter conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m³". → See also CUSTOMER UNIT V.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume, UNIT VOLUME = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "buckets". - MEASURED VALUE = 0.01 m³ ≈ 1 bucket - Entry CUSTOMER UNIT V: bucket - Entry CUST. UNIT FACT. V: 100 - Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>
TANK VOLUME (858) Entry	<p>Enter tank volume.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LIN. MEASURAND = Volume, CALIBRATION MODE = Dry ▪ LIN. MEASURAND = Mass, CALIBRATION MODE = Dry <p>Factory setting: 1.0 m³</p>

Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
HEIGHT UNIT (708) Selection	<p>Select level unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = % (Level), CALIBRATION MODE = Dry <p>Options:</p> <ul style="list-style-type: none"> ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter description for CUSTOMER UNIT H and CUST. UNIT FACT. H. <p>Factory setting: m</p>
CUSTOMER UNIT H (706) Entry	<p>Enter text (unit) for customer-specific level unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = % (Level), CALIBRATION MODE = Dry, HEIGHT UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. H (705) Entry	<p>Enter conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also CUSTOMER UNIT H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = % (Level), CALIBRATION MODE = Dry, HEIGHT UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 0.5 m (1.6 ft) ≈ 1 PU - Entry CUSTOMER UNIT H: PU - Entry CUST. UNIT FACT. H: 2 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>
TANK HEIGHT (859) Entry	<p>Enter tank height.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = Volume, CALIBRATION MODE = Dry ■ LIN. MEASURAND = Mass, CALIBRATION MODE = Dry <p>Factory setting: 1.0 m</p>

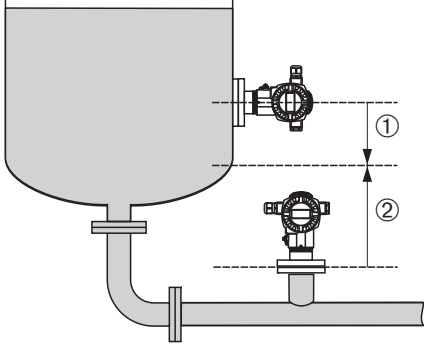
Table 11: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	Description
100% POINT (813) Entry	<p>Enter level value for 100% point.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LIN. MEASURAND = % (Level), CALIBRATION MODE = Dry <p>Example:</p> <ul style="list-style-type: none"> – The 100 %-point should correspond to 4 m (13 ft). – Select the "m" unit via the HEIGHT UNIT parameter. – Enter the value "4" for this parameter (100% POINT). <p>Factory setting: 1.0</p>
ZERO POSITION (814) Entry	<p>Enter value for level offset.</p> <p>If the measurement should not start at the mounting location of the device, e.g. for containers with a sump, carry out zero point shift (level offset).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <p>Factory setting: 0.0</p> <div style="text-align: center;">  </div> <p style="text-align: right; font-size: small;">P01-PMP75xxx-19-xx-xx-xx-001</p> <p><i>Fig. 21: Zero point shift</i></p> <ol style="list-style-type: none"> 1 Device is mounted above the level lower range value: a positive value has to be entered for ZERO POSITION. 2 Device is mounted below the level lower range value: a negative value has to be entered for ZERO POSITION.
SET LRV (719) Entry	<p>Enter level value for the lower current value (4 mA).</p> <p>Factory setting: 0.0</p>
SET URV (720) Entry	<p>Enter level value for the upper current value (20 mA).</p> <p>Factory setting: 100.0</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ).</p> <p>The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 12: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure Linearized"	
Parameter name	Description
<p>The following parameters are displayed if you selected the "Pressure Linearized" option for the LEVEL MODE parameter. For this level type, the measured variable (volume, mass or %) is not in direct proportion to the measured pressure. For the calibration, enter a linearisation table with at least 2 and not more than 32 points.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level ■ LEVEL SELECTION = Level Standard ■ LEVEL MODE = Pressure Linearized 	
LINd. MEASURAND (805) Selection	<p>Select measured variable.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Pressure and Volume ■ Pressure and Mass ■ Pressure and % <p>Factory setting: Pressure and %</p>
UNIT VOLUME (313) Selection	<p>Select volume unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LINd. MEASURAND = Pressure and Volume <p>Options:</p> <ul style="list-style-type: none"> ■ l ■ hl ■ cm³ ■ dm³ ■ m³ ■ m³ E³ ■ ft ■ ft³ E³ ■ gal ■ lgal ■ bbl ■ User unit, → see also the following parameter description for CUSTOMER UNIT V and CUST. UNIT FACT. V. <p>Factory setting: m³</p>
CUSTOMER UNIT V (608) Entry	<p>Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. V</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LINd. MEASURAND = Pressure and Volume, UNIT VOLUME = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT V parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>

Table 12: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure Linearized"	
Parameter name	Description
CUST. UNIT FACT. V (607) Entry	<p>Enter conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m³". → See also CUSTOMER UNIT V.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LInD. MEASURAND = Pressure and Volume, UNIT VOLUME = User unit <p>Example:</p> <ul style="list-style-type: none"> – You want the measured value to be displayed in "buckets". – MEASURED VALUE = 0.01 m³ ≈ 1 bucket – Entry CUSTOMER UNIT V: bucket – Entry CUST. UNIT FACT. V: 100 – Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>
MASS UNIT (709) Selection	<p>Select mass unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LInD. MEASURAND = Pressure and Mass <p>Options:</p> <ul style="list-style-type: none"> ▪ g ▪ kg ▪ t ▪ oz ▪ lb ▪ ton ▪ User unit, → see also the following parameter description for CUSTOMER UNIT M and CUST. UNIT FACT. M. <p>Factory setting: kg</p>
CUSTOMER UNIT M (704) Entry	<p>Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LInD. MEASURAND = Pressure and Mass, MASS UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT M parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>

Table 12: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure Linearized"	
Parameter name	Description
CUST. UNIT FACT. M (703) Entry	<p>Enter conversion factor for a customer-specific mass unit. The conversion factor must be entered in relation to the SI unit "kg". → See also CUSTOMER UNIT M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ LINd. MEASURAND = Pressure and Mass, MASS UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "buckets". - MEASURED VALUE = 10 kg ≈ 1 bucket - Entry CUSTOMER UNIT M: bucket - Entry CUST. UNIT FACT. M: 0.1 - Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>
HYDR. PRESS MIN. (775) Entry	<p>Enter the minimum hydrostatic pressure to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the minimum hydrostatic pressure to be expected, the more accurate the measurement result.</p> <p>Factory setting: 0.0</p>
HYDR. PRESS MAX. (761) Entry	<p>Enter the maximum hydrostatic pressure to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the maximum hydrostatic pressure to be expected, the more accurate the measurement result.</p> <p>Factory setting: High sensor limit (→ See PRESS. SENS HILIM, Page 120)</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
	<p>The following parameters are displayed if you selected the "Height Linearized" option for the LEVEL MODE parameter.</p> <p>Select this level type if you require two measured variables or if the container shape is given with value pairs, e.g. height and volume. The following combinations are possible:</p> <ul style="list-style-type: none"> ▪ Height + Volume ▪ Height + Mass ▪ Height + % ▪ %-Height + Volume ▪ %-Height + Mass ▪ %-Height + % <p>The 1st measured variable (%-Height or Height) must be in direct proportion to the measured pressure. The 2nd measured variable (Volume, Mass or %) must not be in direct proportion. A linearisation table must be entered for the 2nd measured variable. The 2nd measured variable is assigned to the 1st measured variable by means of this table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Level ▪ LEVEL SELECTION = Level Standard ▪ LEVEL MODE = Height Linearized

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
COMB. MEASURAND (806) Selection	Select measured variable. Options: <ul style="list-style-type: none"> ■ Height and Volume ■ Height and Mass ■ Height and % ■ %-Height and Volume ■ %-Height and Mass ■ %-Height and % Factory setting: %-Height and %
HEIGHT UNIT (708) Selection	Select level unit for the 1st measured variable. Prerequisite: <ul style="list-style-type: none"> ■ COMB. MEASURAND = Height and Volume, Height and Mass or Height and % Options: <ul style="list-style-type: none"> ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter description for CUSTOMER UNIT H and CUST. UNIT FACT. H. Factory setting: m
CUSTOMER UNIT H (706) Entry	Enter text (unit) for customer-specific level unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. H. Prerequisite: <ul style="list-style-type: none"> ■ COMB. MEASURAND = Height and Volume, HEIGHT UNIT = User unit ■ COMB. MEASURAND = Height and Mass, HEIGHT UNIT = User unit ■ COMB. MEASURAND = Height and %, HEIGHT UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> Factory setting: - - - - -
CUST. UNIT FACT. H (705) Entry	Enter conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also CUSTOMER UNIT H. Prerequisite: <ul style="list-style-type: none"> ■ COMB. MEASURAND = Height and Volume, HEIGHT UNIT = User unit ■ COMB. MEASURAND = Height and Mass, HEIGHT UNIT = User unit ■ COMB. MEASURAND = Height and %, HEIGHT UNIT = User unit Example: <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 0.5 m (1,6 ft) $\hat{=}$ 1 PU - Entry CUSTOMER UNIT H: PU - Entry CUST. UNIT FACT. H: 2 - Result: MEASURED VALUE = 1 PU Factory setting: 1.0

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
UNIT VOLUME (313) Selection	<p>Select the volume unit for the 2nd measured value.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Volume or %-Height and Volume <p>Options:</p> <ul style="list-style-type: none"> ▪ l ▪ hl ▪ cm³ ▪ dm³ ▪ m³ ▪ m³ E³ ▪ ft ▪ ft³ E³ ▪ gal ▪ lgal ▪ bbl ▪ User unit, → see also the following parameter description for CUSTOMER UNIT V and CUST. UNIT FACT. V. <p>Factory setting: m³</p>
CUSTOMER UNIT V (608) Entry	<p>Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. V</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Volume, HEIGHT UNIT = User unit ▪ COMB. MEASURAND = %-Height and Volume, HEIGHT UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT V parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. V (607) Entry	<p>Enter conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m³". → See also CUSTOMER UNIT V.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Volume, HEIGHT UNIT = User unit ▪ COMB. MEASURAND = %-Height and Volume, HEIGHT UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "buckets". - MEASURED VALUE = 0.01 m³ ≈ 1 bucket - Entry CUSTOMER UNIT V: bucket - Entry CUST. UNIT FACT. V: 100 - Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
MASS UNIT (709) Selection	<p>Select the mass unit for the 2nd measured value.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Mass or %-Height and Mass <p>Options:</p> <ul style="list-style-type: none"> ▪ g ▪ kg ▪ t ▪ oz ▪ lb ▪ ton ▪ User unit, → see also the following parameter description for CUSTOMER UNIT M and CUST. UNIT FACT. M. <p>Factory setting: kg</p>
CUSTOMER UNIT M (704) Entry	<p>Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Mass, MASS UNIT = User unit ▪ COMB. MEASURAND = %-Height and Mass, MASS UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT M parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. M (703) Entry	<p>Enter conversion factor for a customer-specific mass unit. The conversion factor must be entered in relation to the SI unit "kg". → See also CUSTOMER UNIT M.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ COMB. MEASURAND = Height and Mass, MASS UNIT = User unit ▪ COMB. MEASURAND = %-Height and Mass, MASS UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "buckets". - MEASURED VALUE = 10 kg ≈ 1 bucket - Entry CUSTOMER UNIT M: bucket - Entry CUST. UNIT FACT. M: 0.1 - Result: MEASURED VALUE = 1 bucket <p>Factory setting: 1.0</p>

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
LEVEL MIN (755) Entry	<p>Enter the minimum level to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the minimum level to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> The following applies for the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear": If you enter a new value for LEVEL MIN, the value for SET LRV is also changed. Use SET LRV to assign a height to the lower current value. If you want to assign the lower current value a value other than that for LEVEL MIN, you must enter the desired value for SET LRV. (→ SET LRV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 0.0</p>
LEVEL MAX (712) Entry	<p>Enter the maximum level to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the maximum level to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> The following applies for the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear": If you enter a new value for LEVEL MAX, the value for SET URV is also changed. Use SET URV to assign a height to the upper current value. If you want to assign the upper current value a value other than that for LEVEL MAX, you must enter the desired value for SET URV. (→ SET URV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 100.0</p>
CALIBRATION MODE (392) Selection	<p>Select the calibration mode for the calibration of the 1st measured variable.</p> <p>Options:</p> <ul style="list-style-type: none"> Wet Wet calibration takes place by filling the container. This calibration mode requires two pressure-level value pairs to be entered. In the case of two different levels, the level value is entered and the pressure measured at this moment is assigned to the level value. → See also the following parameter description for EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE. Dry Dry calibration is a theoretical calibration which you can carry out even if the device is not mounted or the container is empty. <ul style="list-style-type: none"> For the "Level" measured variable, the density of the fluid (→ see Page 94, ADJUST DENSITY) must be entered. For the "%" measured variable, the density of the fluid must be entered and a level assigned to the 100 % point (→ see Page 94, ADJUST DENSITY and 100% POINT). <p>If the measurement should not start at the mounting location of the device, a level offset must be entered (→ see Page 96, ZERO POSITION).</p> <p>If the change to dry calibration is made after a wet calibration, the density must be entered correctly using the ADJUST DENSITY and DENSITY PROCESS parameter before changing the calibration mode. → See also Page 101.</p> <p>Factory setting: Wet</p>
EMPTY CALIB. (314) Entry	<p>Enter level value for the lower calibration point (container empty). The container is either empty or part full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device. → See also EMPTY PRESSURE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> CALIBRATION MODE = Wet <p>Factory setting: 0.0</p>

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
EMPTY PRESSURE (710) Display	Displays the pressure value for the lower calibration point (container empty). → See also EMPTY CALIB. Prerequisite: <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet
FULL CALIB. (315) Entry	Enter level value for the upper calibration point (container full). The container is either completely or almost full. By entering a value for this parameter, you are assigning a level value to the pressure present at the device. → See also FULL PRESSURE. Prerequisite: <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet Factory setting: 100.0
FULL PRESSURE (711) Display	Displays the pressure value for the upper calibration point (container full). → See also FULL CALIB. Prerequisite: <ul style="list-style-type: none"> ■ CALIBRATION MODE = Wet Factory setting: High sensor limit (→ see PRESS. SENS HILIM, Page 120)
ADJUSTED DENSITY (810) Display	Displays the density calculated from the upper and lower level point. Prerequisite: <ul style="list-style-type: none"> ■ COMB. MEASURAND = Height and Volume, CALIBRATION MODE = Wet ■ COMB. MEASURAND = Height and Mass, CALIBRATION MODE = Wet ■ COMB. MEASURAND = Height and %, CALIBRATION MODE = Wet
DENSITY UNIT (812) Selection	Select density unit. Prerequisite: <ul style="list-style-type: none"> ■ COMB. MEASURAND = %-Height and %, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height and Volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height and Mass, CALIBRATION MODE = Dry ■ COMB. MEASURAND = Height and %, CALIBRATION MODE = Dry ■ COMB. MEASURAND = Height and Volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = Height and Mass, CALIBRATION MODE = Dry Options: <ul style="list-style-type: none"> ■ g/cm³ ■ kg/dm³ ■ kg/m³ ■ US lb/in³ ■ US lb/ft³ Factory setting: kg/dm ³
ADJUST DENSITY (316) Entry	Enter density of fluid. Prerequisite: <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry Factory setting: 1.0 (kg/dm ³)

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
HEIGHT UNIT (708) Selection	<p>Select level unit.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ COMB. MEASURAND = %-Height and Volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height and Mass, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height + %, CALIBRATION MODE = Dry <p>Options:</p> <ul style="list-style-type: none"> ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter description for CUSTOMER UNIT H and CUST. UNIT FACT. H. <p>Factory setting: m</p>
CUSTOMER UNIT H (706) Entry	<p>Enter text (unit) for customer-specific level unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ COMB. MEASURAND = %-Height and Volume, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-Height and Mass, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-Height and %, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT H parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. H (705) Entry	<p>Enter conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also CUSTOMER UNIT H.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ COMB. MEASURAND = %-Height and Volume, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-Height and Mass, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-Height and %, CALIBRATION MODE = Dry, HEIGHT UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE = 0.5 m (1.6 ft) ≈ 1 PU - Entry CUSTOMER UNIT H: PU - Entry CUST. UNIT FACT. H: 2 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>

Table 13: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height Linearized"	
Parameter name	Description
100% POINT (813) Entry	<p>Enter level value for 100% point.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ COMB. MEASURAND = %-Height and Volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height and Mass, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-Height + %, CALIBRATION MODE = Dry <p>Example:</p> <ul style="list-style-type: none"> - The 100 %-point should correspond to 4 m (13 ft). - Select the "m" unit via the HEIGHT UNIT parameter. - Enter the value "4" for this parameter (100% POINT). <p>Factory setting: 1.0</p>
ZERO POSITION (814) Entry	<p>Enter value for level offset.</p> <p>If the measurement should not start at the mounting location of the device, e.g. for containers with a sump, carry out zero point shift (level offset).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ CALIBRATION MODE = Dry <div data-bbox="845 862 1276 1209" data-label="Diagram"> </div> <p>Fig. 22: Zero point shift</p> <ol style="list-style-type: none"> 1 Device is mounted above the level lower range value: a positive value has to be entered for ZERO POSITION. 2 Device is mounted below the level lower range value: a negative value has to be entered for ZERO POSITION. <p>Factory setting: 0.0</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ).</p> <p>The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 14: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Flow 	

Table 14: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	Description
PRESS. ENG. UNIT (060) Selection	<p>Select pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ mbar, bar ▪ mmH2O, mH2O, inH2O, ftH2O 1) ▪ Pa, hPa, kPa, MPa ▪ psi ▪ mmHg, inHg 2) ▪ Torr ▪ g/cm², kg/cm² ▪ lb/ft² ▪ atm ▪ gf/cm², kgf/cm² ▪ User unit, → See also the following parameter description for CUSTOMER UNIT P and CUST. UNIT FACT. P. <p>1) The conversion factor of the pressure units refers to a reference temperature of 4 °C (39.2 °F). 2) The conversion factor of the pressure units refers to a reference temperature of 0 °C (32 °F).</p> <p>Factory setting: Depends on the sensor nominal measuring range mbar or bar or as per order specifications</p>
CUSTOMER UNIT P (075) Entry	<p>Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ PRESS. ENG. UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT P parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. P (317) Entry	<p>Enter conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also CUSTOMER UNIT P.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ PRESS. ENG. UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "PU" (PU: packing unit). - MEASURED VALUE =10000 Pa ≈ 1 PU - Entry CUSTOMER UNIT P: PU - Entry CUST. UNIT FACT. P: 0.0001 - Result: MEASURED VALUE = 1 PU <p>Factory setting: 1.0</p>

Table 14: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	Description
FLOW-MEAS. TYPE (640) Selection	<p>Select the flow type.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Volume p. cond. (volume under operating conditions) ▪ Vol. norm. cond. (norm volume under norm conditions in Europe: 1013.25 mbar and 273.15 K (0°C)) ▪ Vol. std. cond. (standard volume under standard conditions in USA: 1013.25 mbar (14.7 psi) and 288.15 K (15°C/59°F)) ▪ Mass (mass under operating conditions) <p>Factory setting: Volume p. cond.</p>
UNIT FLOW (391) Selection	<p>Select volume flow unit.</p> <p>When a new flow unit is selected, all flow-specific parameters are converted and displayed with the new unit within a flow mode (FLOW-MEAS. TYPE). When the flow mode is changed, conversion is not possible.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ FLOW-MEAS. TYPE = Volume p. cond. <p>Options:</p> <ul style="list-style-type: none"> ▪ m³/s, m³/min, m³/h, m³/day ▪ l/s, l/min, l/h ▪ hl/s, hl/min, hl/day ▪ ft³/s, ft³/min, ft³/h, ft³/day ▪ ACFS, ACFM, ACFH, ACFD ▪ ozf/s, ozf/min ▪ US Gal/s, US Gal/min, US Gal/h, US Gal/day ▪ Imp. Gal/s, Imp. Gal/min, Imp. Gal/h ▪ bbl/s, bbl/min, bbl/h, bbl/day ▪ User unit, → see also this table, parameter description for CUSTOMER UNIT F and CUST. UNIT FACT. F <p>Factory setting: m³/s</p>
NORM FLOW UNIT (661) Selection	<p>Select norm volume flow unit.</p> <p>When a new flow unit is selected, all flow-specific parameters are converted and displayed with the new unit within a flow mode (FLOW-MEAS. TYPE). When the flow mode is changed, conversion is not possible.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ FLOW-MEAS. TYPE = Vol. norm conditions <p>Options:</p> <ul style="list-style-type: none"> ▪ Nm³/s, Nm³/min, Nm³/h, Nm³/day ▪ User unit, → see also this table, parameter description for CUSTOMER UNIT F and CUST. UNIT FACT. F <p>Factory setting: Nm³/s</p>
STD. FLOW UNIT (660) Selection	<p>Select standard volume flow unit.</p> <p>When a new flow unit is selected, all flow-specific parameters are converted and displayed with the new unit within a flow mode (FLOW-MEAS. TYPE). When the flow mode is changed, conversion is not possible.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ FLOW-MEAS. TYPE = Vol. std. conditions <p>Options:</p> <ul style="list-style-type: none"> ▪ Sm³/s, Sm³/min, Sm³/h, Sm³/day ▪ SCFS, SCFM, SCFH, SCFD ▪ User unit, → see also this table, parameter description for CUSTOMER UNIT F and CUST. UNIT FACT. F <p>Factory setting: Sm³/s</p>

Table 14: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	Description
MASS FLOW UNIT (571) Selection	<p>Select mass flow unit. When a new flow unit is selected, all flow-specific parameters are converted and displayed with the new unit within a flow mode (FLOW-MEAS. TYPE). When the flow mode is changed, conversion is not possible.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ FLOW-MEAS. TYPE = Mass <p>Options:</p> <ul style="list-style-type: none"> ■ g/s, kg/s, kg/min, kg/min, kg/h ■ t/s, t/min, t/h, t/day ■ oz/s, oz/min ■ lb/s, lb/min, lb/h ■ ton/s, ton/min, ton/h, ton/day ■ User unit, → see also the following parameter description for CUSTOMER UNIT F and CUST. UNIT FACT. F <p>Factory setting: kg/s</p>
CUSTOMER UNIT F (610) Entry	<p>Enter text (unit) for customer-specific flow unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT FACT. F.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ UNIT FLOW = User unit ■ NORM FLOW UNIT = User unit ■ STD. FLOW UNIT = User unit ■ MASS FLOW UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the CUSTOMER UNIT F parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>
CUST. UNIT FACT. F (609) Entry	<p>Enter conversion factor for a customer-specific flow unit. The conversion factor must be entered in relation to an appropriate SI unit, e.g. m³/s for the "Volume p. cond." flow mode. → See also CUSTOMER UNIT F.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ UNIT FLOW = User unit ■ NORM FLOW UNIT = User unit ■ STD. FLOW UNIT = User unit ■ MASS FLOW UNIT = User unit <p>Example:</p> <ul style="list-style-type: none"> - You want the measured value to be displayed in "bucket/h". - MEASURED VALUE = 0.01 m³/s ≈ 3600 bucket/h - Entry CUSTOMER UNIT F: bucket/h - Entry CUST. UNIT FACT. F: 360000 - Result: MEASURED VALUE = 3600 bucket/h <p>Factory setting: 1.0</p>

Table 14: (GROUP SELECTION →) OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	Description
MAX. FLOW (311) Entry	<p>Enter maximum flow of primary element. → See also layout sheet of primary element. The maximum flow is assigned to the maximum pressure which you enter via MAX PRESS. FLOW.</p> <p>Use the LINEAR/SQROOT parameter (→ Page 114) to specify the current signal for the "Flow" measuring mode. The following applies for the "Flow (square root)" setting: If you enter a new value for MAX. FLOW, the value for SET URV is also changed. Use SET URV to assign a flow to the upper current value. If you want to assign the upper current value a value other than that for MAX. FLOW, you must enter the desired value for SET URV. (→ SET URV, Page 104).</p> <p>Factory setting: 1.0</p>
MAX PRESS. FLOW (634) Entry	<p>Enter maximum pressure of primary element. → See layout sheet of primary element. This value is assigned to the maximum flow value (→ see MAX. FLOW).</p> <p>Use the LINEAR/SQROOT parameter (→ Page 114) to specify the current signal for the "Flow" measuring mode. The following applies for the "Differential pres." setting: If you enter a new value for MAX PRESS. FLOW, the value for SET URV is also changed. Use SET URV to assign a pressure value to the upper current value. If you want to assign the upper current value a value other than that for MAX PRESS. FLOW, you must enter the desired value for SET URV. (→ SET URV, Page 104).</p> <p>Factory setting: High sensor limit (→ see PRESS. SENS HILIM, Page 120)</p>
DAMPING VALUE (247) Entry	<p>Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the on-site display, measured value and current output react to a change in the pressure.</p> <p>Input range: 0.0...999.0 s</p> <p>Factory setting: 2.0 s or as per order specifications</p>

Table 15: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure"	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Pressure 	
TEMP. ENG. UNIT (318) Selection	<p>Select the unit for the temperature measured values. → See also PCB TEMPERATURE (Page 117) and SENSOR TEMP. (Page 121).</p> <p>Options:</p> <ul style="list-style-type: none"> ■ °C ■ °F ■ K ■ R <p>Factory setting: °C</p>

Table 16: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Level 	

Table 16: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"	
Parameter name	Description
TEMP. ENG. UNIT (318) Selection	Select the unit for the temperature measured values. → See also PCB TEMPERATURE (Page 117) and SENSOR TEMP. (Page 122). Options: <ul style="list-style-type: none"> ▪ °C ▪ °F ▪ K ▪ R Factory setting: °C
DENSITY UNIT (001)/ (812) Options	Select density unit. Options: <ul style="list-style-type: none"> ▪ g/cm³ ▪ kg/dm³ ▪ kg/m³ ▪ US lb/in³ ▪ US lb/ft³ Factory setting: kg/dm ³
ADJUST DENSITY (007)/(316) Entry	Enter density of fluid. ⚠ CAUTION Note Dependencies when setting parameters! <ul style="list-style-type: none"> ▶ LIN. MEASURAND: "% (Level)", "Mass" and "Volume" and MEASUAND KOMB.: If a change to dry calibration is made after a wet calibration using the CALIBRATION MODE parameter (→ Page 82 or 93), the density for this parameter must be entered correctly before changing the calibration mode. ▶ In the event that the pressure falls with increasing levels (LIN. MEASURED: Volume), such as in the case of a residual volume measurement, a negative value shall be entered for this parameter. Factory setting: 1.0 (kg/dm ³)
PROCESS DENSITY (025)/(811) Entry	Enter a new density value for density correction. The calibration was carried out with the medium water, for example. Now the container is to be used for another fluid with another density. The calibration is corrected appropriately by entering the new density value in the PROCESS DENSITY parameter. LIN. MEASURAND: "% (Level)", "Mass" and "Volume" and MEASUAND KOMB.: If a change to dry calibration is made after a wet calibration using the CALIBRATION MODE parameter (→ Page 82 or 93), the density for this parameter must be entered correctly before changing the calibration mode. In the event that the pressure falls with increasing levels (LIN. MEASURED: Volume), such as in the case of a residual volume measurement, a negative value shall be entered for this parameter. Factory setting: 1.0

Table 16: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"	
Parameter name	Description
SET LRV (762) Entry	<p>Enter value for the lower current value (4 mA).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LEVEL MODE = Pressure Linearized or Height Linearized <ul style="list-style-type: none"> ■ For the LEVEL MODE "Height Linearized", you can use the ASSIGN CURRENT parameter (→ Page 114) to specify whether the current output should depict the 1st or 2nd measured variable (height or tank content). Depending on the setting of the ASSIGN CURRENT parameter, enter the following value for SET LRV: <ul style="list-style-type: none"> - ASSIGN CURRENT = tank content (factory setting) ⇒ %- value, volume value or mass value - ASSIGN CURRENT = height ⇒ level value <p>The following applies for the LEVEL MODE "Pressure Linearized" or LEVEL MODE "Height Linearized" + ASSIGN CURRENT "Tank content":</p> <ul style="list-style-type: none"> ■ If you enter a new value for TANK CONTENT MIN, the value for SET LRV is also changed. If you want to assign the lower current value a value other than that for TANK CONTENT MIN, you must enter the desired value for SET LRV. (→ TANK CONTENT MIN, Page 104 or 107.) <p>The following applies for the LEVEL MODE "Height Linearized" + ASSIGN CURRENT "Height":</p> <ul style="list-style-type: none"> ■ If you enter a new value for LEVEL MIN, the value for SET LRV is also changed. If you want to assign the lower current value a value other than that for LEVEL MIN, you must enter the desired value for SET LRV. (→ LEVEL MIN, Page 93.) <p>Factory setting: 0.0</p>
SET URV (763) Entry	<p>Enter value for the upper current value (20 mA).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LEVEL MODE = Pressure Linearized or Height Linearized <ul style="list-style-type: none"> ■ For the LEVEL MODE "Height Linearized", you can use the ASSIGN CURRENT parameter (→ Page 114) to specify whether the current output should depict the 1st or 2nd measured variable (height or tank content). Depending on the setting of the ASSIGN CURRENT parameter, enter the following value for SET URV: <ul style="list-style-type: none"> - ASSIGN CURRENT = tank content (factory setting) ⇒ %- value, volume value or mass value - ASSIGN CURRENT = height ⇒ level value <p>The following applies for the LEVEL MODE "Pressure Linearized" or LEVEL MODE "Height Linearized" + ASSIGN CURRENT "Tank content":</p> <ul style="list-style-type: none"> ■ If you enter a new value for TANK CONTENT MAX, the value for SET URV is also changed. If you want to assign the upper current value a value other than that for TANK CONTENT MAX, you must enter the desired value for SET URV. (→ TANK CONTENT MAX, Page 104 or 107.) <p>The following applies for the LEVEL MODE "Height Linearized" + ASSIGN CURRENT "Height":</p> <ul style="list-style-type: none"> ■ If you enter a new value for LEVEL MAX, the value for SET URV is also changed. If you want to assign the lower current value a value other than that for LEVEL MAX, you must enter the desired value for SET URV. (→ LEVEL MAX, Page 93.) <p>Factory setting: 100.0</p>

Table 17: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"	
Parameter name	Description
	<p>Prerequisite:</p> <ul style="list-style-type: none"> ■ MEASURING MODE = Flow

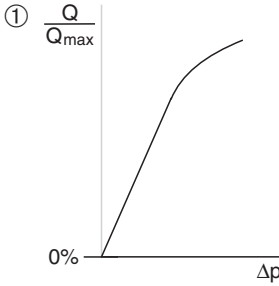
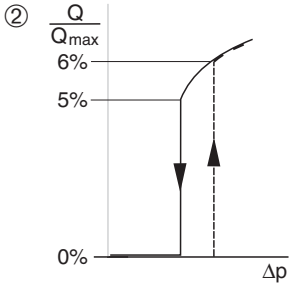
Table 17: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"	
Parameter name	Description
TEMP. ENG. UNIT (318) Selection	<p>Select the unit for the temperature measured value. → See also PCB TEMPERATURE (Page 117) and SENSOR TEMP. (Page 123).</p> <p>Options:</p> <ul style="list-style-type: none"> ■ °C ■ °F ■ K ■ R <p>Factory setting: °C</p>
LOW FLOW CUT-OFF (442) Selection	<p>Switches "low flow cut-off" function on and off. In the lower measuring range, small flow quantities (creepages) can lead to large measured value fluctuations. Switching on this function stops these flow quantities from being recorded. → See also SET. L. FL. CUT-OFF.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Off ■ On <p>Factory setting: Off</p>
SET. L. FL. CUT-OFF (323) Entry	<p>Enter switch-off point of low flow cut-off. The hysteresis between the switch-on point and the switch-off point is always 1 % of the end flow value. → See also LOW FLOW CUT-OFF.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ LOW FLOW CUT-OFF = on <p>Input range: Switch-off point: 0...50 % of end flow value (→ MAX. FLOW).</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>①</p>  </div> <div style="text-align: center;"> <p>②</p>  </div> </div> <p style="text-align: right; font-size: small;">P01-PMD7xxxx-05-xx-xx-xx-000</p> <p>Factory setting: 5 % (of end flow value)</p>
SET LRV (637) Entry	<p>Depending on the setting in the LINEAR/SQROOT parameter (→ Page 114), enter a flow value or a pressure value for the lower current value (4 mA) here.</p> <ul style="list-style-type: none"> ■ LINEAR/SQROOT = Flow (square root) (factory setting) ⇒ flow value ■ LINEAR/SQROOT = Differential pres. ⇒ pressure value <p>Factory setting: 0</p>

Table 17: (GROUP SELECTION →) OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"	
Parameter name	Description
SET URV (638) Entry	<p>Depending on the setting in the LINEAR/SQROOT parameter (→ Page 114), enter a flow value or a pressure value for the upper current value (20 mA) here.</p> <ul style="list-style-type: none"> ▪ LINEAR/SQROOT = Flow (square root) (factory setting) ⇒ flow value ▪ LINEAR/SQROOT = Differential pres. ⇒ pressure value <p>The following applies for the setting LINEAR/SQROOT "Flow (square root)":</p> <ul style="list-style-type: none"> ▪ If you enter a new value for MAX. FLOW, the value for SET URV is also changed. If you want to assign the upper current value a value other than that for MAX. FLOW, you must enter the desired value for SET URV. (→ MAX. FLOW, Page 100). <p>The following applies for the setting LINEAR/SQROOT "Differential pres.":</p> <ul style="list-style-type: none"> ▪ If you enter a new value for MAX PRESS. FLOW, the SET URV value is also changed. If you want to assign the upper current value a value other than that for MAX PRESS. FLOW, you must enter the desired value for SET URV. (→ MAX PRESS. FLOW, Page 100). <p>Factory setting: MAX. FLOW</p>

Table 18: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – on-site operation	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Level ▪ LEVEL MODE = Pressure Linearized or Height Linearized 	
TANK CONTENT MIN (759) Entry	<p>Enter the minimum tank contents to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the minimum tank content to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> ▪ If you enter a new value for TANK CONTENT MIN, the value for SET LRV is also changed. Use SET LRV to assign a %-value, volume value or mass value to the lower current value. If you want to assign the lower current value a value other than that for TANK CONTENT MIN, you must enter the desired value for SET LRV. (→ SET LRV, Page 102). ▪ For the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear", the TANK CONTENT MIN parameter does not affect the SET LRV parameter. (→ SET LRV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 0.0</p>
TANK CONTENT MAX (713) Entry	<p>Enter the maximum tank contents to be expected. The input limits for the subsequent calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the maximum tank content to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> ▪ If you enter a new value for TANK CONTENT MAX, the value for SET URV is also changed. Use SET URV to assign a %-value, volume value or mass value to the upper current value. If you want to assign the upper current value a value other than that for TANK CONTENT MAX, you must enter the desired value for SET URV. (→ SET URV, Page 102.) ▪ For the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear", the TANK CONTENT MAX parameter does not affect the SET URV parameter. (→ SET URV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 100.0</p>

Table 18: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – on-site operation	
Parameter name	Description
TABLE SELECTION (808) Selection	<p>Select table. The device works with a measuring and an editor table. The measuring table is used to calculate the measured value. To make sure measuring also runs properly when entering a new table, there is another table, the editor table, for entering new values.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ View meas. table ▪ Editor table <p>Factory setting: View meas. table</p>
LIN. EDIT MODE (397) Selection	<p>Select the entry mode for the linearisation table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ TABLE SELECTION = Editor table <p>Options:</p> <ul style="list-style-type: none"> ▪ Manual: the container neither has to be filled nor emptied for this entry mode. Enter the value pairs for the linearisation table. ▪ Semiautomatic: the container is filled or emptied in stages in this entry mode. The device automatically records the hydrostatic pressure. The associated volume, mass or %-value is entered. <p>Factory setting: Manual</p>
EDITOR TABLE (809) Selection	<p>Select table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ TABLE SELECTION = editor table <p>Options:</p> <ul style="list-style-type: none"> ▪ New table: enter new linearisation table. ▪ Edit measure table: The measuring table is loaded as an editor table so that changes can be made. → See also TAB. SELECTION ▪ Continue edit: Edit an editor table that already exists. → See also TABLE EDITOR (770) <p>Factory setting: New table</p>
EDITOR TABLE Entry ("Semiautomatic" edit mode) – LINE-NUMB (549) – Y-VAL. (551)	<p>Enter table in the "Semiautomatic" editing mode. A linearisation table must have at least 2 points and may not have more than 32 points. A point consists of LINE-NUMB, X-VAL. and Y-VAL. For this editing mode, the container is filled or emptied in stages.</p> <p>Example: Enter point for LEVEL MODE = Pressure Linearized</p> <ul style="list-style-type: none"> – LINE-NUMB: confirm value displayed. – Y-VAL.: depending on the setting in the LIND. MEASURAND parameter, enter the volume, mass or % value. – X-VAL.: the hydrostatic pressure present is displayed and saved by confirming the Y-value. <p>Example: Enter point for LEVEL MODE = Height Linearized</p> <ul style="list-style-type: none"> – LINE-NUMB: confirm value displayed. – Y-VAL.: depending on the setting in the COMB. MEASURAND parameter, enter the volume, mass or % value. – X-VAL.: the hydrostatic pressure present is measured. Depending on the setting in the COMB. MEASURAND parameter, the measured pressure is converted to a level unit or a % and displayed. The value is saved by confirming the Y-value. <p>Factory setting: LINE-NUMB = 1, X-VAL. = 0.0, Y-VAL. = 0.0</p>

Table 18: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – on-site operation	
Parameter name	Description
EDITOR TABLE Entry ("manual" edit mode) – LINE-NUMB (549) – Y-VAL. (551) – X-VAL. (550)	<p>Enter table in the "manual" editing mode. A linearisation table must have at least 2 points and may not have more than 32 points. A point consists of a line number, X-value and Y-value. The container neither has to be filled nor emptied for this editing mode.</p> <p>Example: Enter point for LEVEL MODE = Pressure Linearized – LINE-NUMB: confirm value displayed. – X-VAL.: enter pressure value. – Y-VAL.: depending on the setting in the LINd. MEASURAND parameter, enter the related volume, mass or % value.</p> <p>Example: Enter point for LEVEL MODE = Height Linearized – LINE-NUMB: confirm value displayed. – X-VAL.: the hydrostatic pressure present is measured. Depending on the setting in the COMB. MEASURAND parameter, enter a level value or % value. – Y-VAL.: depending on the setting in the COMB. MEASURAND parameter, enter the related volume, mass or % value.</p> <p>Factory setting: LINE-NUMB = 1, X-VAL. = 0.0, Y-VAL. = 0.0</p>
EDITOR TABLE (770) Options	<p>Select the function for the editor table.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Next point: enter next point. ▪ Last input point: jump back to previous point to correct a mistake for example. ▪ Accept input table: save editor table as measuring table. This overwrites the old measuring table. ▪ Abort: save values entered up to this point for the editor table and display next parameter. The editor table is not activated as a measuring table. ▪ Insert point: see example below. ▪ Delete point: the current point is deleted. See example below. <p>Example: Add point, in this case between the 4th and 5th point for example – Select point 5 via the EDITOR TABLE/LINE NUMB parameter. – Confirm current X and Y values with Enter. – Using the TABLE EDITOR (770) parameter, select the option "Insert point". – Point 5 is displayed for the TABLE EDITOR/LINE NUMB parameter. New values for the X-VAL and Y-VAL parameters.</p> <p>Example: delete point, in this case the 5th point for example – Select point 5 via the EDITOR TABLE/LINE NUMB parameter. – Using the TABLE EDITOR (770) parameter, select the option "Delete point". – The 5th point is deleted. All of the following points are pushed up one number i.e. following deletion, the 6th point becomes Point 5.</p> <p>Factory setting: Next point</p>
MEASURING TABLE (549) Display	<p>A point of the linearisation table saved (measuring table) appears on the display The parameter first displays the first point of the linearisation table. By entering a line number, you can directly display the corresponding point in the linearisation table.</p>
MEASURING TABLE (717) Selection	<p>Select the function for the measuring table.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Next point: view next point of the measuring table. ▪ Last input point: view previous point of the measuring table. ▪ Abort: cancel measuring table display. Display next parameter. <p>Factory setting: Next point</p>
TANK DESCRIPTION (815) Entry	<p>Enter tank description. (max. 32 alphanumeric characters)</p> <p>Factory setting: -----</p>

Table 19: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – Digital communication	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Level ▪ LEVEL MODE = Pressure Linearized or Height Linearized 	
TANK CONTENT MIN Entry	<p>Enter the minimum tank contents to be expected. The input limits for the calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the minimum tank content to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> ▪ If you enter a new value for TANK CONTENT MIN, the value for SET LRV is also changed. Use SET LRV to assign a %-value, volume value or mass value to the lower current value. If you want to assign the lower current value a value other than that for TANK CONTENT MIN, you must enter the desired value for SET LRV. (→ SET LRV, Page 102). ▪ For the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear", the TANK CONTENT MIN parameter does not affect the SET LRV parameter. (→ SET LRV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 0.0</p>
TANK CONTENT MAX Entry	<p>Enter the maximum tank contents to be expected. The input limits for the subsequent calibration (editing limits) are derived from the value entered. The closer the value entered corresponds to the maximum tank content to be expected, the more accurate the measurement result.</p> <ul style="list-style-type: none"> ▪ If you enter a new value for TANK CONTENT MAX, the value for SET URV is also changed. Use SET URV to assign a %-value, volume value or mass value to the upper current value. If you want to assign the upper current value a value other than that for TANK CONTENT MAX, you must enter the desired value for SET URV. (→ SET URV, Page 102.) ▪ For the setting LEVEL MODE "Height Linearized" and ASSIGN CURRENT "Linear", the TANK CONTENT MAX parameter does not affect the SET URV parameter. (→ SET URV, Page 102 and ASSIGN CURRENT, Page 114) <p>Factory setting: 100.0</p>
TABLE SELECTION Selection	<p>Select table. The device works with a measuring and an editor table. The measuring table is used to calculate the measured value. To make sure measuring also runs properly when entering a new table, there is another table, the editor table, for entering new values.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ View meas. table ▪ Editor table <p>Factory setting: View meas. table</p>
LIN. EDIT MODE Selection	<p>Select the entry mode for the linearisation table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ TABLE SELECTION = Editor table <p>Options:</p> <ul style="list-style-type: none"> ▪ Manual: The container neither has to be filled nor emptied for this entry mode. Enter the value pairs for the linearisation table. ▪ Semiautomatic: the container is filled or emptied in stages in this entry mode. The device automatically records the hydrostatic pressure. The associated volume, mass or %-value is entered. <p>Factory setting: Manual</p>

Table 19: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – Digital communication	
Parameter name	Description
EDITOR TABLE Selection	<p>Select table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = Editor table <p>Options:</p> <ul style="list-style-type: none"> New table: Enter new linearisation table. View meas. table: View saved linearisation table and change points if necessary. Continue edit: Edit a linearisation table that already exists. <p>Operating program:</p> <ul style="list-style-type: none"> If you select the "View meas. table" option, the saved measuring table is loaded in the operating program. Use the "Lin.-Tab." window to view the entire table, change values if necessary and write the modified table to the device. If you change a value via the X-VAL. or Y-VAL. parameters, the table in the "Lin.-Tab." window is not updated. To view the table saved in the device, this table must first be read out of the device. <p>Factory setting: New table</p>
LINE-NUMB Entry	<p>Enter the line number for the linearisation table. A linearisation table must have at least 2 points and may not have more than 32 points.</p> <ul style="list-style-type: none"> TABLE SELECTION = View meas. table Via this parameter you can select the point of the linearisation table which should be displayed. TABLE SELECTION = Editor table Enter a point via the LINE-NUMB, X-VAL. and Y-VAL. parameters. → See also this table, parameter description for LIN. EDIT MODE, X-VAL. ("Manual" entry mode), X-VAL. ("Semiautomatic" entry mode) and Y-VAL. <p>In the operating program, you can enter a complete linearisation table (Menu "Device Operation" → "Device Functions" → "Additional Functions" → "Linearization Table").</p>
X-VAL. ("Manual" entry mode) Entry	<p>Enter the pressure value for the linearisation table. → See also LIN. EDIT MODE, LINE-NUMB and Y-VAL.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = Editor table
X-VAL. ("Semiautomatic" entry mode) Display	<p>In the "Semiautomatic" entry mode, the container is filled or emptied in stages. The X-VAL. displays the measured hydrostatic pressure.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = Editor table <p>Operating program The X-VAL. is saved by confirming the Y-value.</p> <p>HART Handheld Confirm X-VAL. displayed.</p> <p>→ See also LIN. EDIT MODE, LINE-NUMB and Y-VAL.</p>
Y-VAL. Entry	<p>Enter the volume, mass or %-value belonging to the X-VAL. for the linearisation table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = Editor table <p>Depending on the setting in the LINd. MEASURAND or COMB. MEASURAND parameters, enter a volume, mass or %-value here. → See also this table, parameter description for LIN. EDIT MODE, LINE-NUMB, X-VAL. ("Manual" entry mode), X-VAL. ("Semiautomatic" entry mode).</p>

Table 19: (GROUP SELECTION →) OPERATING MENU → SETTINGS → LINEARISATION – Digital communication	
Parameter name	Description
EDITOR TABLE Options	<p>Select the function for the editor table.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = Editor table <p>Options:</p> <ul style="list-style-type: none"> Next point: without function Last input point: without function Accept input table: save editor table as measuring table. This overwrites the old measuring table. Abort: save values entered up to this point for the editor table and display next parameter. The editor table is not activated as a measuring table. Insert point: see example below. Delete point: the current point is deleted. See example below. <p>Example: Add point, in this case between the 4th and 5th point for example</p> <ul style="list-style-type: none"> Select point 5 via the LINE NUMB parameter. Using the TABLE EDITOR parameter, select the option "Insert point". Point 5 is displayed for the LINE NUMB parameter. New values for the X-VAL and Y-VAL parameters. <p>Example: delete point, in this case the 5th point for example</p> <ul style="list-style-type: none"> Select point 5 via the LINE NUMB parameter. Using the TABLE EDITOR parameter, select the option "Delete point". The 5th point is deleted. All of the following points are pushed up one number i.e. following deletion, the 6th point becomes Point 5. <p>Factory setting: Next point</p>
ACTIV LIN. TAB. X Display	<p>An X-value of the linearisation table already saved appears on the display You can select a point of the linearisation table via the LINE-NUMB parameter.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = View meas. table <p>In the operating program, you can view the entire saved table (Menu "Device Operation" → "Device Functions" → "Additional Functions" → "Linearization Table").</p>
ACTIV LIN. TAB. Y Display	<p>A Y-value of the linearisation table already saved appears on the display You can select a point of the linearisation table via the LINE-NUMB parameter.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> TABLE SELECTION = View meas. table <p>In the operating program, you can view the entire saved table (Menu "Device Operation" → "Device Functions" → "Additional Functions" → "Linearization Table").</p>
TANK DESCRIPTION Entry	<p>Enter tank description. (max. 32 alphanumeric characters)</p> <p>Factory setting: -----</p>
TABLE ACTIVATE	Save editor table as measuring table. This overwrites the old measuring table.

Table 20: (GROUP SELECTION →) OPERATING MENU → SETTINGS → TOTALIZER SETUP	
Parameter name	Description
	<p>Prerequisite:</p> <ul style="list-style-type: none"> MEASURING MODE = Flow

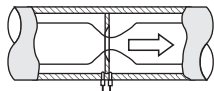
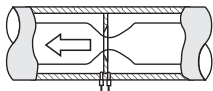
Table 20: (GROUP SELECTION →) OPERATING MENU → SETTINGS → TOTALIZER SETUP														
Parameter name	Description													
TOTALIZER 1 UNIT (398), (666), (664), (662) Selection	<p>Select unit for totalizer 1. Depending on the setting in the FLOW-MEAS. TYPE parameter (→ Page 98) this parameter offers a list of volume, norm volume, standard volume and mass units. When a new volume or mass unit is selected, totalizer-specific parameters are converted and displayed with the new unit within a unit group. When the flow mode is changed, the totalizer value is not converted.</p> <p>The 3-digit ID number on the on-site display depends on the FLOW-MEAS. TYPE selected:</p> <ul style="list-style-type: none"> - (398): FLOW-MEAS. TYPE "Volume p. cond." - (662): FLOW-MEAS. TYPE "Mass" - (664): FLOW-MEAS. TYPE "Gas. std. cond." - (666): FLOW-MEAS. TYPE "Gas. norm conditions" <p>Factory setting: m³</p>													
TOT. 1 USER UNIT (627) Entry	<p>Enter text (unit) for customer-specific unit for totalizer 1. You can enter a maximum of eight alphanumeric characters here. → See also FACT. U. U. TOTAL. 1.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ TOTALIZER 1 UNIT = User unit <p>Only the first five characters are shown on the on-site display. For example, if "crates" is specified as the customer-specific unit, "crate" is displayed. If the unit contains a slash, up to eight characters can be shown on the on-site display. The maximum number of characters in the counter is again limited to five. For example, if "crates/m2" is specified as the customer-specific unit, "crate/m2" is displayed. In the FieldCare, all eight characters are displayed. In the HART handheld terminal, the customer-specific unit is only displayed in the TOT. 1 USER UNIT parameter. The measured value is displayed with the additional text "User Unit".</p> <p>Factory setting: -----</p>													
FACT. U. U. TOTAL. 1 (329) Entry	<p>Enter conversion factor for a customer-specific unit for totalizer 1. The conversion factor must be entered in relation to an appropriate SI unit, e.g. m³ for the "Volume p. cond." FLOW-MEAS. TYPE. → See also TOT. 1 USER UNIT.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ TOTALIZER 1 UNIT = User unit <p>Example: You want the measured value to be displayed in "buckets".</p> <ul style="list-style-type: none"> - MEASURED VALUE = 1 m³ ≈ 100 buckets - Entry TOT. 1 USER UNIT: bucket - Entry FACT. U. U. TOTAL. 1: 100 - Result: MEASURED VALUE = 100 buckets <p>Factory setting: 1.0</p>													
NEG. FLOW TOT. 1 (400) Selection	<p>Specify way of counting negative flows for totalizer 1.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>positive flow</p>  </div> <div style="text-align: center;"> <p>negative flow</p>  </div> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 20%;">Options</th> <th style="width: 40%;">positive flow</th> <th style="width: 40%;">negative flow</th> </tr> </thead> <tbody> <tr> <td>Inc. on neg. flow</td> <td>Total increases</td> <td>Total increases</td> </tr> <tr> <td>Dec. on neg. flow</td> <td>Total increases</td> <td>Total decreases</td> </tr> <tr> <td>Stop on neg. flow</td> <td>Total increases</td> <td>Total remains constant</td> </tr> </tbody> </table> <p style="text-align: right; font-size: small; margin-top: 5px;">P01-xMD7xxxx-16-xx-xx-xx-003</p> <p>Factory setting: Inc. on neg. flow</p>		Options	positive flow	negative flow	Inc. on neg. flow	Total increases	Total increases	Dec. on neg. flow	Total increases	Total decreases	Stop on neg. flow	Total increases	Total remains constant
Options	positive flow	negative flow												
Inc. on neg. flow	Total increases	Total increases												
Dec. on neg. flow	Total increases	Total decreases												
Stop on neg. flow	Total increases	Total remains constant												

Table 20: (GROUP SELECTION →) OPERATING MENU → SETTINGS → TOTALIZER SETUP	
Parameter name	Description
RESET TOTALIZER1 (331) Selection	You reset totalizer 1 to zero with this parameter. Options: <ul style="list-style-type: none"> ■ Abort (do not reset) ■ Reset Factory setting: Abort
TOTALIZER 2 UNIT (399), (663), (665), (667) Selection	Select unit for totalizer 2. → See also TOTAL 1. ENG. UNIT. The 3-digit ID number on the on-site display depends on the FLOW-MEAS. TYPE selected: – (399): FLOW-MEAS. TYPE "Volume p. cond." – (663): FLOW-MEAS. TYPE "Mass" – (665): FLOW-MEAS. TYPE "Vol. std. cond." – (667): FLOW-MEAS. TYPE "Vol. norm conditions" Factory setting: m ³
TOT. 2 USER UNIT (628) Entry	Enter text (unit) for customer-specific unit for totalizer 2. → See also TOT. 1 USER UNIT. Prerequisite: <ul style="list-style-type: none"> ■ TOTALIZER 2 UNIT = User unit Factory setting: -----
FACT. U. U. TOTAL. 2 (330) Selection	Enter conversion factor for a customer-specific unit for totalizer 2. → See also FACT. U. U. TOTAL. 1. Prerequisite: <ul style="list-style-type: none"> ■ TOTALIZER 2 UNIT = User unit Factory setting: 1.0
NEG. FLOW TOT. 2 (416) Selection	Specify way of counting negative flows for totalizer 2. → See NEG. FLOW TOT. 1. Factory setting: Positive

Table 21: (GROUP SELECTION →) OPERATING MENU → DISPLAY	
Parameter name	Description
MENU DESCRIPTOR (419) Selection	Specify contents for the main line of the on-site display in the measuring mode. → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "On-site display". Options: <ul style="list-style-type: none"> ■ Main measured value (PV) ■ Main measured value (%) ■ Pressure ■ Flow ■ Level ■ Tank content ■ Current ■ Temperature ■ Error number ■ Totalizer 1 ■ Totalizer 2 The selection depends on the measuring mode chosen. Factory setting: Main measured value (PV)

Table 21: (GROUP SELECTION →) OPERATING MENU → DISPLAY	
Parameter name	Description
MAIN DATA FORMAT (688) Selection	<p>Specifies the number of places after the decimal point for the value displayed in the main line. → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or (BA00332P) Deltapilot S, Section "On-site display".</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Auto ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx ■ x.xxxxx <p>Factory setting: Auto</p>
ALTERNATE DATA (423) Selection	<p>Switch on "Alternating display" mode.</p> <p>In this display mode, the on-site display alternates between the following measured values depending on the measuring mode selected.</p> <ul style="list-style-type: none"> - Pressure: Main measured value (PV), Pressure, Temperature and Current - Level Standard: Main measured value (PV), Pressure, Level, Tank content, Temperature and Current - Level Easy: Main measured value (PV), Pressure, Temperature and Current - Flow: Main measured value (PV), Pressure, Flow, Temperature, Current, Totalizer 1 and Totalizer 2 <p>Options:</p> <ul style="list-style-type: none"> ■ Off ■ On <p>Factory setting: Off</p>
DISPLAY CONTRAST (339) Entry	<p>Adjust contrast of on-site display. You specify the contrast of the display with a number. Changes are only accepted as single steps, i.e. to change the value from "8" to "4", you need to save four times. You can also adjust the contrast of the display by means of the keys on the electronic insert or at the device. → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Function of operating keys".</p> <p>Input range: 4...13, 4: contrast weaker (brighter), 13: contrast stronger (darker).</p> <p>Factory setting: 8</p>
DIGITS SETS (840) Display	<p>This parameter is used to check the correct display of characters and digits on the user interface. If the characters and digits are displayed correctly, this parameter displays the string "0123456789.-".</p>

Table 22: (GROUP SELECTION →) OPERATING MENU → OUTPUT	
Parameter name	Description
OUTPUT CURRENT (254) Display	Displays the current current value.

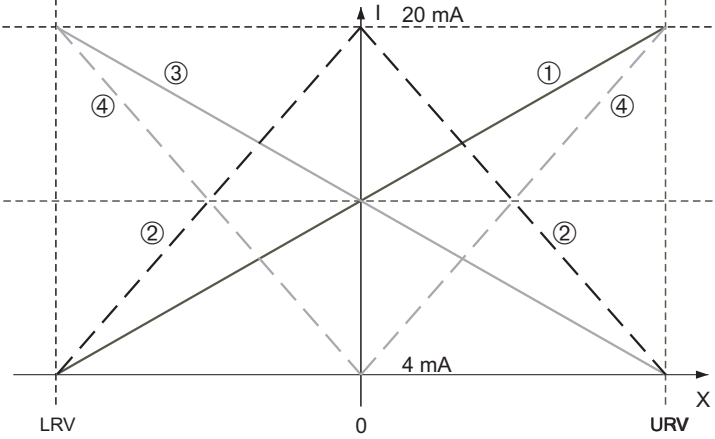
Table 22: (GROUP SELECTION →) OPERATING MENU → OUTPUT	
Parameter name	Description
CURR. CHARACT. (694), (695), (696), (764) Selection	<p>Select curve of current output.</p> <p>Options:</p>  <p><i>Fig. 23: Illustration of current output curves</i></p> <p>1 Linear: lower range value = 4 mA, upper range value = 20 mA 2 Bi-linear: lower range value = 4 mA, centre or zero = 20 mA, upper range value = 4 mA 3 Linear inverse: lower range value = 20 mA, upper range value = 4 mA 4 Bi-linear inverse: lower range value = 20 mA, centre or zero = 4 mA, upper range value = 20 mA</p> <p>LRV Lower range value URV Upper range value I Current X Measured value (Pressure/Level/Flow) The "CURR. CHARACT." function refers to the operating mode previously selected.</p> <p>The 3-digit ID number on the on-site display depends on the MEASURING MODE selected:</p> <ul style="list-style-type: none"> – (694): MEASURING MODE "Pressure" or MEASURING MODE "Flow" with the setting for LINEAR/SQROOT "Differential pres. – (695): MEASURING MODE "Flow" with the setting LINEAR/SQROOT "Flow (square root)" – (696): MEASURING MODE "Level", LEVEL MODE "Linear" or "Pressure Linearized" and LEVEL MODE "Height Linearized" with the setting for ASSIGN CURRENT "Level" – (764): MEASURING MODE "Level", LEVEL MODE "Height Linearized" with the setting for ASSIGN CURRENT "Tank content" <p>Factory setting: Linear</p>
OUTPUT FAIL MODE (388) Entry	<p>Select the current value in the event of an alarm.</p> <p>In the event of an alarm, the current and the bargraph assume the current value specified with this parameter.</p> <p>Options:</p> <ul style="list-style-type: none"> ■ Max. alarm (110%): can be set between 21...23 mA ■ Hold meas. value: last measured value is kept. ■ Min. alarm (-10%): 3.6 mA <p>→ See also this table SET MAX. ALARM and Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Setting current output for alarm".</p> <p>Factory setting: Max. alarm 110% (22 mA)</p>

Table 22: (GROUP SELECTION →) OPERATING MENU → OUTPUT	
Parameter name	Description
ALT. CURR. OUTPUT (597) Selection	<p>Set current output if sensor limits undershot or overshoot.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Normal/NE43: the current output assumes the value set via the OUTPUT FAIL MODE and SET MAX. ALARM parameters. ▪ Special: <ul style="list-style-type: none"> - Lower sensor limit undershot (E120): Current output = 3.6 mA - Upper sensor limit overshoot (E115): current output assumes the value set via the SET MAX. ALARM parameter. <p>Attention : when using the case "special", the behavior is limited to an over/underpressure in a range LRL -10%, URL +10%.</p> <p>Factory setting: Normal/NE43</p>
SET MAX. ALARM (342) Entry	<p>Enter current value for maximum alarm current. → See also OUTPUT FAIL MODE.</p> <p>Input range: 21...23 mA</p> <p>Factory setting: 22 mA</p>
SET MIN. CURRENT (343) Entry	<p>Enter lower current limit. Some switching units sometimes do not accept currents less than 4.0 mA.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ 3.8 mA ▪ 4.0 mA <p>Factory setting: 3.8 mA</p>
ASSIGN CURRENT (760) Selection	<p>Specify current signal for the "Level" measuring mode. See also SET LRV (→ Page 102) and SET URV (→ Page 102).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Level, LEVEL MODE = Height Linearized <p>Options:</p> <ul style="list-style-type: none"> ▪ Height ▪ Tank content <p>Factory setting: Tank content</p>
LINEAR/SQROOT (390) Selection	<p>Specify current signal for the "Flow" measuring mode. See also SET LRV (→ Page 103) and SET URV (→ Page 104).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Flow or Pressure <p>Options:</p> <ul style="list-style-type: none"> ▪ Differential pres.: the linear pressure signal is used for the current output. ▪ Flow (square root): the root flow signal is used for the current output. The "Flow (square root)" current signal is indicated on the on-site display with a root symbol. <p>Factory setting: Pressure</p>

Table 23: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → HART DATA	
Parameter name	Description
HART VERSION Display	Displays the HART Version.

Table 23: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → HART DATA	
Parameter name	Description
CURRENT MODE (052) Selection	<p>Set the current mode for HART communication.</p> <p>Selection via on-site display and FieldCare:</p> <ul style="list-style-type: none"> ■ Signaling Measured value transmission by the current value ■ Fixed Fixed current 4.0 mA (multidrop mode) (Measured value transmission only via HART digital communication) <p>Factory setting: Signaling</p> <p>Selection via HART Handheld Terminal:</p> <ul style="list-style-type: none"> ■ enabled Measured value transmission by the current value ■ disabled Fixed current 4.0 mA (multidrop mode) (Measured value transmission only via HART digital communication) <p>Factory setting: enabled</p>
BUS ADDRESS (345) Entry	<p>Enter the address for the exchange of data with the HART protocol. (HART 5.0: range 0 to 15, wherein if the address = 0 this produces the "Signaling" setting; HART 6.0/7.0: range 0 to 63)</p> <p>Factory setting: 0</p>
DEVICE TYPE (351) Display	<p>Displays the device type in decimal numerical format, here Deltabar S: 23 The extended device type is a composition of the manufacturer number (17) and the device type (23).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Deltabar S differential pressure transmitter
DEVICE TYPE (802) Display	<p>Displays the device type in decimal numerical format, here Cerabar S: 24 The extended device type is a composition of the manufacturer number (17) and the device type (24).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Pressure transmitter Cerabar S
DEVICE TYPE (002) Display	<p>Displays the device type in decimal numerical format, here Deltapilot S: 26 The extended device type is a composition of the manufacturer number (17) and the device type (26).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Pressure transmitter Deltapilot S
DEVICE NAME STR. Display	<p>Displays the device name (16 alphanumeric characters).</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Digital communication
DEVICE REVISION (699) Display	<p>Displays the device revision</p>
BURST MODE Selection	<p>Switches "Burst Mode" function on and off.</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ On ■ Off <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Digital communication
BURST OPTION Entry	<p>Use this parameter to specify which command is sent to the master.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ■ Digital communication <p>Factory setting: 3 (HART commando 3)</p>

Table 23: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → HART DATA	
Parameter name	Description
PREAMBLE NUMBER (036) Entry	Enter the number of preambles in the HART protocol. (Synchronisation of the modem modules along a transmission path, each modem module could "swallow" a byte - at least 2 bytes must arrive.) Input range: 2...20 Factory setting: 5
MANUFACTOR ID (432) Display	Displays the manufacturer number in a decimal numerical format. Here: 17 Endress+Hauser
HART MESSAGE (271) Entry	Enter message (max. 32 alphanumeric characters). On command from the master, this message is sent via the HART protocol. Factory setting: ----- or as per order specifications
HART DATE (481) Entry	Enter the date of the last configuration change. Factory setting: DD.MM.YY (date of final test)
HART PRIMARY VALUE IS Display	This parameter displays the following measured value depending on the measuring mode selected: - Measuring mode "Pressure": PRESSURE - "Level" measuring mode, "Linear" or "Pressure Linearized" level type: LEVEL BEFORE LIN - Measuring mode "Level", level type "Height Linearized": TANK CONTENT - Measuring mode "Flow": SUPPRESSED FLOW → See also PRIMARY VALUE. Prerequisite: ■ Digital communication
PRIMARY VALUE Display	Displays the primary value. → See also HART PRIMARY VALUE IS. Prerequisite: ■ Digital communication
SECONDARY VAL. IS	Select second process value. You can choose between the following process values depending on the measuring mode selected: - PRESSURE - CORRECTED PRESS. - SENSOR PRESSURE - SENSOR TEMP. - PCB TEMPERATURE - SUPPRESSED FLOW - TOTALIZER 1 - TOTALIZER 2 - LEVEL BEFORE LIN - TANK CONTENT Prerequisite: ■ Digital communication
SECONDARY VALUE	Display second process value. → See also SECONDARY VAL. IS. Prerequisite: ■ Digital communication
THIRD VALUE IS	Select third process value. → See also SECONDARY VAL. IS. Prerequisite: ■ Digital communication
THIRD VALUE	Display third process value. → See also SECONDARY VAL. IS. Prerequisite: ■ Digital communication

Table 23: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → HART DATA

Parameter name	Description
4TH VALUE IS	Select fourth process value. → See also SECONDARY VAL. IS. Prerequisite: ▪ Digital communication
4TH VALUE	Display fourth process value. → See also SECONDARY VAL. IS. Prerequisite: ▪ Digital communication

Table 24: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → TRANSMITTER DATA

Parameter name	Description
DEVICE SERIAL No (354) Display	Displays the serial number of the device (11 alphanumeric characters).
ELECTR. SERIAL No (386) Display	Displays the serial number of the main electronics (11 alphanumeric characters).
CUST. TAG NUMBER (055) Entry	Enter TAG number (max. 8 alphanumeric characters). Factory setting: _____ or as per order specifications
LONG TAG NUMBER (305) Entry	Enter TAG number (max. 32 alphanumeric characters). Factory setting: ----- or as per order specifications
ADDITIONAL INFO. (272) Entry	Enter tag description (max. 16 alphanumeric characters). Factory setting: _____ or as per order specifications
DEVICE DESIGN. (350) Display	Displays the device designation and order code.
HARDWARE REV. (266) Display	Displays the revision number of the main electronics e.g.: V02.00.00
SOFTWARE VERSION (264) Display	Displays the software version e.g.: V02.10.00
CONFIG RECORDER (352) Display	Displays the configuration counter. This counter is increased by one with each change to a parameter or group. The counter counts to 65535 and then starts again at zero. Changes in the parameters of the DISPLAY function group do not increase the counter.
PCB TEMPERATURE (357) Display	Displays the measured temperature of the main electronics.
ALLOWED MIN. TEMP (358) Display	Displays the lower temperature limit of the main electronics.
ALLOWED MAX. TEMP (359) Display	Displays the upper temperature limit of the main electronics.

Table 24: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → TRANSMITTER DATA	
Parameter name	Description
DIP STATUS (363) Display	<p>Displays the status of DIP switch 1 on the electronic insert. You can lock or unlock parameters relevant to the measured value with DIP switch 1. If operation is locked by means of the INSERT PIN No. parameter, you can only unlock operation again by means of this parameter. (→ INSERT PIN NO, see Page 125.) → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Locking/unlocking operation".</p> <p>Display:</p> <ul style="list-style-type: none"> ▪ On (locking switched on) ▪ Off (locking switched off) <p>Factory setting: Off (locking switched off)</p>

Table 25: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION	
Parameter name	Description
Pmax PROC. CONN. (570) Entry	<p>For entering and displaying the maximum permitted pressure of the process connection.</p> <p>Factory setting: In accordance with nameplate data (→ see also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section nameplate)</p>
PROC. CONN. TYPE (482) Selection	<p>For selecting and displaying the process connection type.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Not used ▪ Unknown ▪ Special ▪ Oval flange ▪ Thread female ▪ Thread male ▪ Flange ▪ Remote seal
MAT. PROC. CONN. + (360) Selection	<p>For selecting and displaying the material of the process connection (P+). → See also parameter description for MAT. PROC. CONN. -</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Not used ▪ Unknown ▪ Special ▪ Steel ▪ 304 st. steel ▪ 316 st. steel ▪ Alloy C ▪ Monel ▪ Tantalum ▪ Titanium ▪ PTFE (Teflon) ▪ 316L st. steel ▪ PVC ▪ Inconel ▪ PVDF ▪ ECTFE <p>Factory setting: As per order specifications</p>
MAT. PROC. CONN. - (361) Selection	<p>For selecting and displaying the material of the process connection (P-). → See also parameter description for MAT. PROC. CONN. +</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ Deltabar S differential pressure transmitter

Table 25: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION	
Parameter name	Description
SEAL TYPE (362) Selection	For selecting and displaying the material of the process seal. Options: <ul style="list-style-type: none"> ■ Not used ■ Unknown ■ Special ■ FKM Viton ■ NBR ■ EPDM ■ Urethane ■ IIR ■ Kalrez ■ FKM Viton oxyg ■ CR ■ MVQ ■ PTFE glass ■ PTFE graphite ■ PTFE oxygen ■ Copper ■ Copper f. oxygen Factory setting: As per order specifications
BOLTS MATERIAL	For selecting and displaying the material of the bolts. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
NUTS MATERIAL	For selecting and displaying the material of the nuts. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
DRAIN VENT MAT.	For selecting and displaying the material of the vent valves. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
DRAIN VENT POS.	For selecting and displaying the position of the vent valves. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
THREAD	For selecting and displaying the process connection thread. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
MOUNTING THREAD	For selecting and displaying the ways of securing the device. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
REMOTE SEAL +	For selecting and displaying the diaphragm seal type on the positive side. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
REMOTE SEAL -	For selecting and displaying the diaphragm seal type on the negative side. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
DIAPHRAG. MAT. +	For selecting and displaying the material of the process isolating diaphragm on the positive side. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication
DIAPHRAG. MAT. -	For selecting and displaying the material of the process isolating diaphragm on the negative side. Prerequisite: <ul style="list-style-type: none"> ■ Digital communication

Table 25: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION	
Parameter name	Description
NR OF REMOTE SEAL	For selecting and displaying the number of diaphragm seals. Prerequisite: ▪ Digital communication
FILL FLUID	For selecting and displaying the diaphragm seal fill fluid. Prerequisite: ▪ Digital communication

Table 26: (GROUP SELECTION →) OPERATING MENU → TRANSMITTER INFO → SENSOR DATA (all measuring modes)	
Parameter name	Description
SENSOR SER. No. (250) Display	Displays the serial number of the sensor (11 alphanumeric characters).
PRESS. SENS LOLIM (484) Display	Displays the lower measuring limit of the sensor.
PRESS. SENS HILIM (485) Display	Displays the upper measuring limit of the sensor.
MINIMUM SPAN (591) Display	Displays the smallest possible span.
SENSOR MEAS. TYPE (581) Display	Displays the sensor type. ▪ Deltabar S = differential ▪ Cerabar S with gauge pressure sensor = relative ▪ Cerabar S with absolute pressure sensor = absolute ▪ Deltapilot S = relative
Pmin SENS. DAMAGE (251) Display	Displays the minimum permissible absolute pressure of the sensor (vacuum-proofing).
Pmax SENS. DAMAGE (252) Display	Displays the maximum permissible absolute pressure of the sensor (overpressure-proofing).
MAT. MEMBRANE (365) Display	Displays the material of the process isolating diaphragm. Factory setting: As per version in the order code → For Deltabar S, see Technical Information TI00382P, for Cerabar S, see Technical Information TI00383P or for Deltapilot S, see Technical Information TI00416P, "Ordering information" section.
FILLING FLUID (366) Display	Displays the filling fluid.
Tmin SENSOR (368) Display	Displays the lower nominal temperature limit of the sensor.
Tmax SENSOR (369) Display	Displays the upper nominal temperature limit of the sensor.
SENS H/WARE REV (487) Display	Displays the revision number of the sensor hardware. e.g.: 1

Table 27: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure"	
Parameter name	Description
Prerequisite: ▪ MEASURING MODE = pressure	

Table 27: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure"

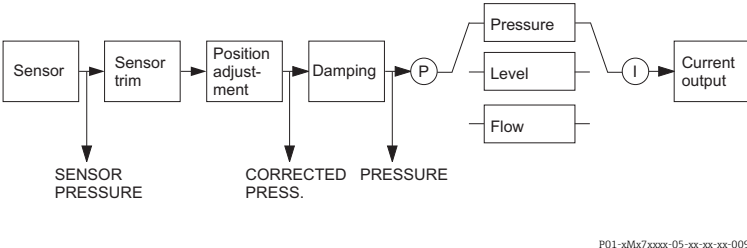
Parameter name	Description
MEASURED VALUE (679)	<p>Displays the measured value</p> <p>In the "Pressure" measuring mode, this value corresponds to the PRESSURE parameter.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ Digital communication <p>On-site operation:</p> <ul style="list-style-type: none"> ▪ For on-site operation, the MEASURED VALUE parameter is displayed on the 1st level.
PRESSURE (301) Display	<p>Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the MEASURED VALUE parameter in the "Pressure" measuring mode.</p>  <p style="text-align: right; font-size: small;">P01-xMa7xxxx-05-xx-xx-xx-009</p>
CORRECTED PRESS. (434) Display	<p>Displays the measured pressure after sensor trim and position adjustment and before damping. → See also PRESSURE diagram.</p>
SENSOR PRESSURE (584) Display	<p>Displays the measured pressure before sensor trim, position adjustment and damping. → See also PRESSURE diagram.</p>
SENSOR TEMP. (367) Display	<p>Displays the temperature currently measured in the sensor. This temperature can deviate from the process temperature.</p>
MEAS. VAL. TREND (378) Display	<p>Displays the trend of the pressure measured value.</p> <p>Possibilities: increasing, decreasing, constant</p>

Table 28: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level"

Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ MEASURING MODE = Level 	
MEASURED VALUE (679)	<p>Displays the measured value</p> <p>In the "Level" measuring mode with "Linear" level type, this value corresponds to the LEVEL BEFORE LIN parameter</p> <p>In the "Level" measuring mode with "Height Linearized" or "Pressure Linearized" level type, this value corresponds to the TANK CONTENT parameter.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ Digital communication <p>On-site operation:</p> <ul style="list-style-type: none"> ▪ For on-site operation, the MEASURED VALUE parameter is displayed on the 1st level.

Table 28: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level"	
Parameter name	Description
PRESSURE (301) Display	<p>Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the MEASURED VALUE parameter in the "Pressure" measuring mode.</p> <p style="text-align: right; font-size: small;">P01-xMx7xxxx-05-xx-xx-xx-010</p>
CORRECTED PRESS. (434) Display	Displays the measured pressure after sensor trim and position adjustment and before damping. → See also PRESSURE diagram.
SENSOR PRESSURE (584) Display	Displays the measured pressure before sensor trim, position adjustment and damping. → See also PRESSURE diagram.
SENSOR TEMP. (367) Display	Displays the temperature currently measured in the sensor. This temperature can deviate from the process temperature.
MEAS. VAL. TREND (378) Display	Displays the trend of the pressure measured value. Possibilities: increasing, decreasing, constant
LEVEL BEFORE LIN (050) Display	<p>Displays the level value prior to linearisation.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> LEVEL MODE = Linear or Height Linearized <p>Depending on the setting for the LIN. MEASURAND or COMB. MEASURAND parameter, this parameter displays the current level in % or in a unit of level.</p>
TANK CONTENT (370) Display	<p>Displays the level value after linearisation.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> LEVEL MODE = Pressure Linearized or Height Linearized <p>Depending on the settings for the LIND. MEASURAND or COMB. MEASURAND parameter, the current tank content is displayed in % or in a unit of volume or mass. This value corresponds to the MEASURED VALUE.</p>

Table 29: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"	
Parameter name	Description
<p>Prerequisite:</p> <ul style="list-style-type: none"> MEASURING MODE = Flow 	
MEASURED VALUE (679)	<p>Displays the measured value</p> <p>In the "Flow" measuring mode, this value corresponds to the SUPPRESSED FLOW parameter.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> Digital communication <p>On-site operation:</p> <ul style="list-style-type: none"> For on-site operation, the MEASURED VALUE parameter is displayed on the 1st level.

Table 29: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"

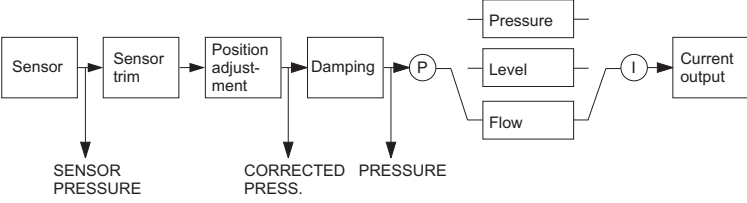
Parameter name	Description
PRESSURE (301) Display	Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the MEASURED VALUE parameter in the "Pressure" measuring mode. 
CORRECTED PRESS. (434) Display	Displays the measured pressure after sensor trim and position adjustment and before damping. → See also PRESSURE diagram.
SENSOR PRESSURE (584) Display	Displays the measured pressure before sensor trim, position adjustment and damping. → See also PRESSURE diagram.
SENSOR TEMP. (367) Display	Displays the temperature currently measured in the sensor. This temperature can deviate from the process temperature.
MEAS. VAL. TREND (378) Display	Displays the trend of the pressure measured value. Possibilities: increasing, decreasing, constant
SUPPRESSED FLOW (375) Display	Displays the current flow. Depending on the flow mode selected (→ FLOW-MEAS. TYPE), a volume flow, mass flow, standard volume flow or corrected volume flow is displayed.
TOTALIZER 1 (652) Display	Displays the total flow value of totalizer 1. You can reset the value with the RESET TOTALIZER 1 parameter. The TOTAL. 1 OVERFLOW parameter displays the overflow. Example: The value 123456789 m ³ is displayed as follows: - TOTALIZER 1: 3456789 m ³ - TOTAL. 1 OVERFLOW: 12 E7
TOTAL. 1 OVERFLOW (655) Display	Displays the overflow value of totalizer 1. → See also TOTALIZER 1.
TOTALIZER 2 (657) Display	Displays the total flow value of totalizer 2. You cannot reset totalizer 2. The TOTAL. 2 OVERFLOW parameter displays the overflow. → See also example for TOTALIZER 1.
TOTAL. 2 OVERFLOW (658) Display	Displays the overflow value of totalizer 2. → See also TOTALIZER 2 and example for TOTALIZER 1.

Table 30: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PEAK HOLD INDICATOR

Parameter name	Description
COUNTER:P > Pmax (380) Display	Displays the overpressure counter of the sensor The limit value is: upper nominal pressure limit of sensor + 10 % of upper nominal pressure limit of sensor. You can reset this counter by means of the RESET PEAKHOLD parameter.
MAX. MEAS. PRESS. (383) Display	Displays the largest measured pressure value (peak hold indicator). You can reset this indicator by means of the RESET PEAKHOLD parameter.
COUNTER P < Pmin (467) Display	Displays the vacuum pressure counter of the sensor The limit value is: lower nominal pressure limit of sensor - 10 % of upper nominal pressure limit of sensor. You can reset this counter by means of the RESET PEAKHOLD parameter.
MIN. MEAS. PRESS. (469) Display	Displays the smallest measured pressure value (peak hold indicator). You can reset this indicator by means of the RESET PEAKHOLD parameter.

Table 30: (GROUP SELECTION →) OPERATING MENU → PROCESSINFO → PEAK HOLD INDICATOR	
Parameter name	Description
COUNTER:T > Tmax (404) Display	Displays the number of times the specified temperature range of the sensor has been overshoot. You can reset this counter by means of the RESET PEAKHOLD parameter.
MAX. MEAS. TEMP. (471) Display	Displays the largest measured temperature in the sensor (peak hold indicator). You can reset this indicator by means of the RESET PEAKHOLD parameter.
COUNTER:T < Tmin (472) Display	Displays the number of times the specified temperature range of the sensor has been undershot. You can reset this counter by means of the RESET PEAKHOLD parameter.
MIN. MEAS. TEMP. (474) Display	Displays the smallest measured temperature in the sensor (peak hold indicator). You can reset this indicator by means of the RESET PEAKHOLD parameter.
PCB COUNT:T > Tmax (488) Display	Displays the number of times the specified temperature range of the electronics has been overshoot.
PCB MAX. TEMP. (490) Display	Displays the largest electronics temperature measured.
PCB COUNT:T < Tmin (492) Display	Displays the number of times the specified temperature range of the electronics has been undershot.
PCB MIN. TEMP. (494) Display	Displays the smallest electronics temperature measured.
RESET PEAKHOLD (382) Selection	<p>This parameter lists all the peak hold indicator parameters that can be reset. You can select the peak hold indicators you want to reset.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ None ▪ Max. pressure ▪ Min. pressure ▪ Pmax history ▪ Pmin history ▪ Max. temp. ▪ Min. temp. ▪ Tmax history ▪ Tmin history ▪ Reset all <p>Factory setting: None</p>

Table 31: (GROUP SELECTION →) OPERATING MENU → OPERATING	
Parameter name	Description
ENTER RESET CODE (047) Entry	<p>Reset parameters completely or partially to factory values or delivery status. → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Factory setting" (reset).</p> <p>Factory setting: 0</p>
OPERATING HOURS (409) Display	Displays the hours of operation. This parameter cannot be reset.


Table 31: (GROUP SELECTION →) OPERATING MENU → OPERATING	
Parameter name	Description
INSERT PIN NO (048) Entry	<p>For entering a code to lock or unlock operation.</p> <ul style="list-style-type: none"> ▪ The  -symbol on the on-site display indicates that operation is locked. Parameters which refer to how the display appears, e.g. LANGUAGE and DISPLAY CONTRAST can still be altered. ▪ If operation is locked by means of the DIP-switch, you can only unlock operation again by means of the DIP-switch. If operation is locked by means of the on-site display or remote operation e.g. FieldCare, you can unlock operation again by means of the on-site display or using remote operation. <p>→ See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Locking/unlocking operation".</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Lock: enter a number between 0...9999 which is ≠100. ▪ Unlock: enter the number 100. <p>Factory setting: 100</p>
HistoROM AVAIL. (831) Display	<p>Indicates whether the optional HistoROM®/M-DAT memory module is connected to the electronic insert.</p> <p>→ See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "HistoROM®/M-DAT (optional)".</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ Yes (HistoROM®/M-DAT is attached to the electronic insert) ▪ No (HistoROM®/M-DAT is not attached to the electronic insert)
DOWNLOAD SELECT (014) Options	<p>Select download function from HistoROM to device. The selection has no effect on an upload from the device to the HistoROM.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ A HistoROM®/M-DAT is attached to the electronic insert (HistoROM AVAIL. = yes) <p>Options:</p> <ul style="list-style-type: none"> ▪ Configuration copy: For this option, all parameters apart from the DEVICE SERIAL No, DEVICE DESIGN., CUST. TAG NUMBER, LONG TAG NUMBER, ADDITIONAL INFO., BUS ADDRESS, CURRENT MODE and the parameters of the POSITION ADJUSTMENT and PROCESS CONNECTION group are overwritten. ▪ Device replacement: With this option, all parameters except for DEVICE SERIAL No, DEVICE DESIGN. and the parameters of the POSITION ADJUSTMENT and PROCESS CONNECTION group are overwritten. ▪ Electronics replace: With this option, all parameters except for the parameters of the POSITION ADJUSTMENT group are overwritten. <p>Factory setting: Copy config. (if HistoROM®/M-DAT is attached to the electronic insert)</p>
HistoROM CONTROL (832) Selection	<p>For selecting the direction for copying the data.</p> <p>→ See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "HistoROM®/M-DAT (optional)".</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ A HistoROM®/M-DAT is attached to the electronic insert (HistoROM AVAIL. = yes) <p>Options:</p> <ul style="list-style-type: none"> ▪ Abort ▪ HistoROM → Device ▪ Device → HistoROM <p>Factory setting: Abort (if HistoROM®/M-DAT is connected to the electronic insert)</p>

Table 32: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → SIMULATION	
Parameter name	Description
SIMULATION MODE (413) Selection	<p>Switch on simulation and select simulation type. Any simulation running is switched off if the measuring mode or level type is changed.</p> <p>Options:</p> <ul style="list-style-type: none"> None Pressure, → see also this table parameter description for SIM. PRESSURE Flow (only differential pressure transmitter), → see also this table parameter description for SIM. FLOW VALUE Level, → see also this table parameter description for SIM. LEVEL Tank content, → see also this table parameter description for SIM. TANK CONT. Current, → see also this table parameter description for SIM. CURRENT <p>Note: "Square root" has to be selected in the LINEAR/SQROOT parameter to ensure the current output corresponds to the simulated flow value.</p> <ul style="list-style-type: none"> Alarm/warning, , → see also this table parameter description for SIM. ERROR NO. <div style="text-align: center;"> <p style="text-align: right; font-size: small;">P01-xMx7xxxx-05-xx-xx-xx-012</p> </div> <p>Factory setting: None</p>
SIM. PRESSURE (414) Entry	<p>Enter simulation value. → See also SIMULATION MODE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> SIMULATION MODE = Pressure <p>Factory setting: Current pressure measured value</p>
SIM. FLOW VALUE (639) Entry	<p>Enter simulation value. → See also SIMULATION MODE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> MEASURING MODE = Flow and SIMULATION MODE = Flow
SIM. LEVEL (714) Entry	<p>Enter simulation value. → See also SIMULATION MODE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> MEASURING MODE = Level and SIMULATION MODE = Level
SIM. TANK CONT. (715) Entry	<p>Enter simulation value. → See also SIMULATION MODE.</p> <p>Prerequisites:</p> <ul style="list-style-type: none"> MEASURING MODE = Level, LEVEL MODE = Pressure Linearized and SIMULATION MODE = Tank content MEASURING MODE = Level, LEVEL MODE = Height Linearized and SIMULATION MODE = Tank content
SIM. CURRENT (270) Entry	<p>Enter simulation value. → See also SIMULATION MODE.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> SIMULATION MODE = Current value <p>Factory setting: Current current value</p>

Table 32: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → SIMULATION

Parameter name	Description
SIM. ERROR NO. (476) Entry	<p>⚠ CAUTION</p> <p>Note Dependencies when setting parameters!</p> <ul style="list-style-type: none"> ▶ The SIMULATION parameter overwrites fault states (alarm/warning) that are actually present. When the simulation is ended, the fault states (alarm/warning) still persist but are no longer displayed! When the device is restarted it returns to its fault state. <p>Enter message number. → See also SIMULATION MODE. → See also these Operating Instructions, Section 10.1 "Messages", "Code" table column.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ SIMULATION MODE = Alarm/Warning <p>Factory setting: 613 (simulation active)</p>

Table 33: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → MESSAGES

Parameter name	Description
ALARM STATUS (046) Display	<p>Displays the current messages present. → See also these Operating Instructions, Section 10.1. "Messages" and Section 10.3 "Confirming messages".</p> <p>On-site display</p> <ul style="list-style-type: none"> ▪ The measured value display shows the message with the highest priority. ▪ The ALARM STATUS parameter shows all the messages in descending order of priority. You can scroll through all the messages present with the \boxplus or \boxminus key. <p>Operating program</p> <ul style="list-style-type: none"> ▪ The "Status" field and the ALARM STATUS parameter show the message with the highest priority.
LAST DIAG. CODE (564) Display	<p>Displays the last messages that occurred and were eliminated.</p> <ul style="list-style-type: none"> ▪ On-site display: you can scroll through the last 15 messages with the \boxplus or \boxminus key. ▪ Digital communication: the last message appears on the display. ▪ Use the RESET ALL ALARMS parameter to delete the messages listed in the LAST DIAG. CODE parameter.
ACK. ALARM MODE (401) Selection	<p>Switch on acknowledge alarm mode. → See also ACK. ALARM.</p> <p>Options:</p> <ul style="list-style-type: none"> ▪ On ▪ Off <p>Factory setting: Off</p>
ACK. ALARM (500) Selection	<p>Acknowledge alarm.</p> <p>Prerequisite:</p> <ul style="list-style-type: none"> ▪ ACK. ALARM MODE = on <p>Options:</p> <ul style="list-style-type: none"> ▪ Abort ▪ Confirm <p>The cause of the alarm must be eliminated, the message must be acknowledged via the ACK. ALARM parameter and, where applicable, the ALARM DISPL. TIME (→ Page 128) has to have elapsed before the device starts measuring again following an alarm. → See also these Operating Instructions, Section 10.3 "Confirming messages".</p> <p>Factory setting: Abort</p>

Table 33: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → MESSAGES	
Parameter name	Description
RESET ALL ALARMS (603) Selection	Use this parameter to reset all the messages of the LAST DIAG. CODE parameter. Options: <ul style="list-style-type: none"> ▪ Abort ▪ Confirm Factory setting: Abort
ERROR No. Entry	For "Error"-type messages, you can decide whether the device should behave as in the event of an alarm (A) or as in the event of a warning (W). Enter the corresponding message number for this parameter. → See also SELECT ALARMTYPE. → See also these Operating Instructions, Section 10.1 "Messages" and Section 10.2 "Response of outputs to errors". Prerequisite: <ul style="list-style-type: none"> ▪ Digital communication
SELECT ALARMTYPE (595) – Entry (600) – Selection	For "Error"-type messages, you can decide whether the device should behave as in the event of an alarm (A) or as in the event of a warning (W). → See also ERROR No. → See also these Operating Instructions, Section 10.2 "Response of outputs to errors". Options: <ul style="list-style-type: none"> ▪ Alarm (A): output current assumes a defined value. ▪ Warning (W): device continues measuring On-site operation: <ol style="list-style-type: none"> 1. Enter the corresponding message number for ERROR No. field. 2. Select "Alarm" or "Warning" option. Digital communication: <ol style="list-style-type: none"> 1. Enter the corresponding message number via the ERROR No. parameter. 2. Use the SELECT ALARMTYPE parameter to select the "Alarm" or "Warning" option.
ALARM DELAY (336) Entry	Enter alarm response time for all "Error" messages. There is no alarm if the cause of the error is eliminated within the alarm delay time. Input range: 0...100 s Factory setting: 0.0 s
ALARM DISPL. TIME (480) Entry	Enter alarm display time for all "Error" messages. Once the cause of the error is rectified, the alarm display time starts running. The following applies if the setting for ACK. ALARM MODE = on: If an alarm appears and the alarm display time elapses before the alarm has been acknowledged, the message will be cleared once it has been acknowledged. → See also these Operating Instructions, Section 10.3 "Confirming messages". Input range: 0...999.9 s Factory setting: 0.0 s

Table 34: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → USER LIMITS	
Parameter name	Description
Pmin ALARM WINDOW (332) Entry	Customer-specific process monitoring – enter lower pressure limit. You can use the SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure undershoots the specified value. → See also these Operating Instructions, Section 10.1 "Messages", table, Code E730 and Section 10.2 "Response of outputs to errors". Factory setting: Low sensor limit ■ 1.1 (→ For the low sensor limit, see PRESS. SENS LOLIM.)
Pmax ALARM WINDOW (333) Entry	Customer-specific process monitoring – enter upper pressure limit. You can use the SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure exceeds the specified value. → See also these Operating Instructions, Section 10.1 "Messages", table, Code E731 and Section 10.2 "Response of outputs to errors". Factory setting: High sensor limit ■ 1.1 (→ For the high sensor limit, see PRESS. SENS HILIM.)
Tmin ALARM WINDOW (334) Entry	Customer-specific process monitoring – enter lower temperature limit. You can use the SELECT ALARMTYPE parameter to enter how the device responds if the sensor temperature undershoots the specified value. → See also these Operating Instructions, Section 10.1 "Messages", table, Code E732 and Section 10.2 "Response of outputs to errors". Factory setting: Lower sensor temperature application limit – 10 K (→ For the lower temperature application limit, see Tmin SENSOR)
Tmax ALARM WINDOW (335) Entry	Customer-specific process monitoring – enter upper temperature limit. You can use the SELECT ALARMTYPE parameter to enter how the device responds if the sensor temperature exceeds the specified value. → See also these Operating Instructions, Section 10.1 "Messages", table, Code E733 and Section 10.2 "Response of outputs to errors". Factory setting: Upper sensor temperature application limit +10 K (→ For the upper temperature application limit, see Tmax SENSOR)

Table 35: (GROUP SELECTION →) OPERATING MENU → SERVICE → SYSTEM 2	
Parametername	Beschreibung
CURR. TRIM 4mA (045) Entry	Enter current value for the lower point (4 mA) of the current output trim line. You can adapt the current output to the transmission conditions with this parameter and CURR. TRIM 20mA. Perform current trim for the lower point as follows: <ol style="list-style-type: none">1. Select SIMULATION group. (Menu path: (GROUP SELECTION) → OPERATING MENU → DIAGNOSTICS → SIMULATION)2. Select option "Current" via SIMULATION parameter.3. Enter "4 mA" for SIM. CURRENT parameter.4. Select SYSTEM 2 group. (Menu path: (GROUP SELECTION) → OPERATING MENU → SERVICE)5. Enter the current value measured with the switching unit for the CURR. TRIM 4mA parameter. Input range: Measured current (3.8 mA to 4.2 mA) Factory setting: 4 mA

Table 35: (GROUP SELECTION →) OPERATING MENU → SERVICE → SYSTEM 2	
Parametername	Beschreibung
CURR. TRIM 20mA (042) Entry	<p>Enter current value for the upper point (20 mA) of the current output trim line. You can adapt the current output to the transmission conditions with this parameter and CURR. TRIM 4mA.</p> <p>Perform current trim for the upper point as follows:</p> <ol style="list-style-type: none"> 1. Select SIMULATION group. (Menu path: (GROUP SELECTION) → OPERATING MENU → DIAGNOSTICS → SIMULATION) 2. Select option "Current" via SIMULATION parameter. 3. Enter "20 mA" for SIM. CURRENT parameter. 4. Select SYSTEM 2 group. (Menu path: (GROUP SELECTION) → OPERATING MENU → SERVICE) 5. Enter the current value measured with the switching unit for the CURR. TRIM 20mA parameter. <p>Input range: Measured current (19 mA to 21 mA)</p> <p>Factory setting: 20 mA</p>
OFFSET 4mA TRIM (043) Display	<p>Displays the difference between 4 mA and the value entered for the CURRENT TRIM 4mA parameter.</p> <p>Factory setting: 0</p>
OFFSET 20mA TRIM (044) Display	<p>Displays the difference between 20 mA and the value entered for the CURRENT TRIM 20mA parameter.</p> <p>Factory setting: 0</p>

10 Troubleshooting

10.1 Messages

The following table lists all the possible messages that can occur.

The device differentiates between the error types "Alarm", "Warning" and "Error". You may specify whether the instrument should react as if for an "Alarm" or "Warning" for "Error" messages.

→ See "Error type/NA 64" column and parameter descriptions for ERROR No. and SELECT ALARMTYPE (→ Page 128).

In addition, the "Error type/NA 64" column classifies the messages in accordance with NAMUR Recommendation NA 64:

- Break down: indicated with "B"
- Maintenance need: indicated with "C" (check request)
- Function check: indicated with "T" (in service)

Error message display on the on-site display:

- The measured value display shows the message with the highest priority. → See "Priority" column.
- The ALARM STATUS (→ Page 127) parameter shows all the messages present in descending order of priority. You can scroll through all the messages present with the key or key.

Message display via the digital communication:

- The ALARM STATUS (→ Page 127) parameter shows the message with the highest priority. → See "Priority" column.
- If the device detects a defect in the on-site display during initialization, special error messages are generated. → For the error messages, see Page 140, Section 10.1.1 "On-site display error messages".
- For support and further information, please contact Endress+Hauser Service.

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
101 (A101)	Alarm B	Failure (F)	B>Sensor electronic EEPROM error	<ul style="list-style-type: none"> – Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). This message normally only appears briefly. – Sensor defect. 	<ul style="list-style-type: none"> – Wait a few minutes. – Restart the device. Perform reset (Code 62). – Block off electromagnetic effects or eliminate source of disturbance. – Replace sensor. 	17
102 (W102)	Warning C	Maintenance request (M)	C>Checksum error in EEPROM: peakhold segment	<ul style="list-style-type: none"> – Main electronics defect. Correct measurement can continue as long as you do not need the peak hold indicator function. 	<ul style="list-style-type: none"> – Replace main electronics. 	53
106 (W106)	Warning C	Function check (C)	C>Downloading - please wait	<ul style="list-style-type: none"> – Downloading. 	<ul style="list-style-type: none"> – Wait for download to complete. 	52

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
110 (A110)	Alarm B	Failure (F)	B>Checksum error in EEPROM: configuration segment	<ul style="list-style-type: none"> - The supply voltage is disconnected when writing. - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Main electronics defect. 	<ul style="list-style-type: none"> - Reestablish supply voltage. Perform reset (Code 7864) if necessary. Carry out calibration again. - Block off electromagnetic effects or eliminate sources of disturbance. - Replace main electronics. 	6
113 (A113)	Alarm B	Failure (F)	B>ROM failure in transmitter electronic	<ul style="list-style-type: none"> - Main electronics defect. 	<ul style="list-style-type: none"> - Replace main electronics. 	1
115 (E115)	Error B factory setting: Warning C	Out of specification (S)	B>Sensor overpressure	<ul style="list-style-type: none"> - Overpressure present. - Sensor defect. 	<ul style="list-style-type: none"> - Reduce pressure until message disappears. - Replace sensor. 	29
116 (W116)	Warning C	Maintenance request (M)	C>Download error, repeat download	<ul style="list-style-type: none"> - The file is defect. - During the download, the data are not correctly transmitted to the processor, e.g. because of open cable connections, spikes (ripple) on the supply voltage or electromagnetic effects. 	<ul style="list-style-type: none"> - Use another file. - Check cable connection PC – transmitter. - Block off electromagnetic effects or eliminate sources of disturbance. - Perform reset (Code 7864) and carry out calibration again. - Repeat download. 	36
120 (E120)	Error B factory setting: Warning C	Out of specification (S)	B>Sensor low pressure	<ul style="list-style-type: none"> - Pressure too low. - Sensor defect. 	<ul style="list-style-type: none"> - Increase pressure until message disappears. - Replace sensor. 	30
121 (A121)	Alarm B	Failure (F)	B>Checksum error in factory segment of EEPROM	<ul style="list-style-type: none"> - Main electronics defect. 	<ul style="list-style-type: none"> - Replace main electronics. 	5
122 (A122)	Alarm B	Failure (F)	B>Sensor not connected	<ul style="list-style-type: none"> - Cable connection sensor –main electronics disconnected. - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Main electronics defect. - Sensor defect. 	<ul style="list-style-type: none"> - Check cable connection and repair if necessary. - Block off electromagnetic effects or eliminate source of disturbance. - Replace main electronics. - Replace sensor. 	13
130 (A130)	Alarm B	Failure (F)	B>EEPROM is defect.	<ul style="list-style-type: none"> - Main electronics defect. 	<ul style="list-style-type: none"> - Replace main electronics. 	10
131 (A131)	Alarm B	Failure (F)	B>Checksum error in EEPROM: min/max segment	<ul style="list-style-type: none"> - Main electronics defect. 	<ul style="list-style-type: none"> - Replace main electronics. 	9
132 (A132)	Alarm B	Failure (F)	B>Checksum error in totalizer EEPROM	<ul style="list-style-type: none"> - Main electronics defect. 	<ul style="list-style-type: none"> - Replace main electronics. 	7

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
133 (A133)	Alarm B	Failure (F)	B>Checksum error in History EEPROM	<ul style="list-style-type: none"> - An error occurred when writing. - Main electronics defect. 	<ul style="list-style-type: none"> - Perform reset (Code 7864) and carry out calibration again. - Replace electronics. 	8
602 (W602)	Warning C	Funktion check (C)	C>Linearisation curve not monotone	<ul style="list-style-type: none"> - The linearisation table is not monotonic increasing or decreasing. 	<ul style="list-style-type: none"> - Add to linearisation table or perform linearisation again. 	57
604 (W604)	Warning C	Funktion check (C)	C>Linearisation table not valid. Less than 2 points or points too close	From software version "02.10.xx" onwards, there is no min. span for the Y-points.		
				<ul style="list-style-type: none"> - The linearisation table consists of less than 2 points. - At least 2 points in the linearisation table are too close together. A minimum gap of 0.5 % of the distance between two points must be maintained. Spans for the "Pressure linearized" option: HYDR. PRESS MAX. - HYDR. PRESS MIN.; TANK CONTENT MAX. - TANK CONTENT MIN. Spans for the "Height linearized" option: LEVEL MAX - LEVEL MIN; TANK CONTENT MAX. - TANK CONTENT MIN. 	<ul style="list-style-type: none"> - Add to linearisation table. If necessary, perform linearisation again. - Correct linearisation table and accept again. 	58
613 (W613)	Warning I	Funktion check (C)	I>Simulation is active	<ul style="list-style-type: none"> - Simulation is switched on, i.e. the device is not measuring at present. 	<ul style="list-style-type: none"> - Switch off simulation. 	60
620 (E620)	Error C Factory setting: Warning C	Out of specification (S)	C>Current output out of range	<p>The current is outside the permitted range 3.8 to 20.5 mA.</p> <ul style="list-style-type: none"> - The pressure applied is outside the set measuring range (but within the sensor range). - Loose connection at sensor cable 	<ul style="list-style-type: none"> - Check pressure applied, reconfigure measuring range if necessary (→ See also these Operating Instructions, chapter 4 to 6.) - Perform reset (Code 7864) and carry out calibration again. - Wait a short period of time and tighten the connection, or avoid loose connection. 	49
700 (W700)	Warning C	Maintenance request (M)	C>Last configuration not stored	<ul style="list-style-type: none"> - An error occurred when writing or reading configuration data or the power supply was disconnected. - Main electronics defect. 	<ul style="list-style-type: none"> - Perform reset (Code 7864) and carry out calibration again. - Replace main electronics. 	54
701 (W701)	Warning C	Funktion check (C)	C>Measuring chain config. exceeds sensor range	<ul style="list-style-type: none"> - The calibration carried out would result in the sensor nominal operating range being undershot or overshot. 	<ul style="list-style-type: none"> - Carry out calibration again. 	50

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
702 (W702)	Warning C	Maintenance request (M)	C>HistoROM data not consistent.	<ul style="list-style-type: none"> - Data were not written correctly to the HistoROM, e.g. if the HistoROM was detached during the writing process. - HistoROM does not have any data. 	<ul style="list-style-type: none"> - Repeat upload. - Perform reset (Code 7864) and carry out calibration again. - Copy suitable data to the HistoROM. (→ See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S) or BA00332P (Deltapilot S), Section "Copying configuration data".) 	55
703 (A703)	Alarm B	Failure (F)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	22
704 (A704)	Alarm B	Funktion check (C)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	12
705 (A705)	Alarm B	Failure (F)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	21
706 (W706)	Warning C	Maintenance request (M)	C>Configuration in HistoROM and device not identical	<ul style="list-style-type: none"> - Configuration (parameters) in the HistoROM and in the device is not identical. 	<ul style="list-style-type: none"> - Copy data from the device to the HistoROM. - Copy data from the HistoROM to the device. The message remains if the HistoROM and the device have different software versions. The message goes out if you copy the data from the device to the HistoROM. - Device reset codes such as 7864 do not have any effect on the HistoROM. That means that if you do a reset, the configurations in the HistoROM and in the device may not be the same. - → See also Operating Instructions BA00270P (Deltabar S), BA00271P (Cerabar S), BA00332P (Deltapilot S) Section "Copying configuration data". 	59
707 (A707)	Alarm B	Funktion check (C)	B>X-VAL. of lin. table out of edit limits.	<ul style="list-style-type: none"> - At least one X-VALUE in the linearisation table is either below the value for HYDR. PRESS. MIN. or MIN. LEVEL or above the value for HYDR. PRESS. MAX. or LEVEL MAX. 	<ul style="list-style-type: none"> - Carry out calibration again. (→ See also these Operating Instructions, chapter 5.) 	38
710 (W710)	Warning C	Funktion check (C)	B>Set span too small. Not allowed.	<ul style="list-style-type: none"> - Values for calibration (e.g. lower range value and upper range value) are too close together. - The sensor was replaced and the customer-specific configuration does not suit the sensor. - Unsuitable download carried out. 	<ul style="list-style-type: none"> - Adjust calibration to suit sensor. (→ See also Page 120, parameter description MINIMUM SPAN.) - Adjust calibration to suit sensor. - Replace sensor with a suitable sensor. - Check configuration and perform download again. 	51

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
711 (A711)	Alarm B	Funktion check (C)	B>LRV or URV out of edit limits	<ul style="list-style-type: none"> - Lower range value and/or upper range value undershoot or overshoot the sensor range limits. - The sensor was replaced and the customer-specific configuration does not suit the sensor. - Unsuitable download carried out. 	<ul style="list-style-type: none"> - Reconfigure lower range value and/or upper range value to suit the sensor. Pay attention to position factor. - Reconfigure lower range value and/or upper range value to suit the sensor. Pay attention to position factor. - Replace sensor with a suitable sensor. - Check configuration and perform download again. 	37
713 (A713)	Alarm B	Funktion check (C)	B>100% POINT level out of edit limits	<ul style="list-style-type: none"> - The sensor was replaced. 	<ul style="list-style-type: none"> - Carry out calibration again. 	39
715 (E715)	Error C Factory setting: Warning C	Out of specification (S)	C>Sensor over temperature	<ul style="list-style-type: none"> - The temperature measured in the sensor is greater than the upper nominal temperature of the sensor. (→ See also Page 120, parameter description Tmax SENSOR.) - Unsuitable download carried out. 	<ul style="list-style-type: none"> - Reduce process temperature/ ambient temperature. - Check configuration and perform download again. 	32
716 (E716)	Error B Factory setting: Alarm B	Failure (F)	B>Process isolating diaphragm broken	<ul style="list-style-type: none"> - Sensor defect. 	<ul style="list-style-type: none"> - Replace sensor. - Reduce pressure. 	24
717 (E717)	Error C Factory setting: Warning C	Out of specification (S)	C>Transmitter over temperature	<ul style="list-style-type: none"> - The temperature measured in the electronics is greater than the upper nominal temperature of the electronics (+88 °C). - Unsuitable download carried out. 	<ul style="list-style-type: none"> - Reduce ambient temperature. - Check configuration and perform download again. 	34
718 (E718)	Error C Factory setting: Warning C	Out of specification (S)	C>Transmitter under temperature	<ul style="list-style-type: none"> - The temperature measured in the electronics is smaller than the lower nominal temperature of the electronics (-43 °C). - Unsuitable download carried out. 	<ul style="list-style-type: none"> - Increase ambient temperature. Insulate device if necessary. - Check configuration and perform download again. 	35
719 (A719)	Alarm B	Funktion check (C)	B>Y-VAL of lin. table out of edit limits	<ul style="list-style-type: none"> - At least on Y-VALUE in the linearisation table is below the MIN. TANK CONTENT or above the MAX. TANK CONTENT. 	<ul style="list-style-type: none"> - Carry out calibration again. 	40

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
720 (E720)	Error C Factory setting: Warning C	Out of specification (S)	C>Sensor under temperature	<ul style="list-style-type: none"> - The temperature measured in the sensor is smaller than the lower nominal temperature of the sensor. (→ See also Page 120, parameter description Tmin SENSOR.) - Unsuitable download carried out. - Loose connection at sensor cable 	<ul style="list-style-type: none"> - Increase process temperature/ ambient temperature. - Check configuration and perform download again. - Wait a short period of time and tighten the connection, or avoid loose connection. 	33
721 (A721)	Alarm B	Funktion check (C)	B>ZERO POSITION level out of edit limits	<ul style="list-style-type: none"> - LEVEL MIN or LEVEL MAX has been changed. 	<ul style="list-style-type: none"> - Perform reset (Code 2710) and carry out calibration again. 	41
722 (A722)	Alarm B	Funktion check (C)	B>EMPTY CALIB. or FULL CALIB. out of edit limits	<ul style="list-style-type: none"> - LEVEL MIN or LEVEL MAX has been changed. 	<ul style="list-style-type: none"> - Perform reset (Code 2710) and carry out calibration again. 	42
723 (A723)	Alarm B	Funktion check (C)	B>MAX. FLOW out of edit limits	<ul style="list-style-type: none"> - FLOW-MEAS. TYPE has been changed. 	<ul style="list-style-type: none"> - Carry out calibration again. 	43
725 (A725)	Alarm B	Failure (F)	B>Sensor connection error, cycle disturbance	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Setscrew loose. - Sensor or main electronics defect. 	<ul style="list-style-type: none"> - Block off electromagnetic effects or eliminate source of disturbance. - Retighten setscrew with 1 Nm (0,74 lbf ft) (see chapter "Rotating the housing" in BA00270P (Deltabar S), BA00271P (Cerabar S), BA00332P (Deltapilot S). - Replace sensor or main electronics. 	25
726 (E726)	Error C Factory setting: <ul style="list-style-type: none"> ■ Deltapilot: Warning C ■ Deltabar/ Cerabar: Alarm C 	Out of specification (S)	C>Sensor temperature error - overrange	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Process temperature is outside permitted range. - Sensor defect. 	<ul style="list-style-type: none"> - Block off electromagnetic effects or eliminate source of disturbance. - Check temperature present, reduce or increase if necessary. - If the process temperature is within the permitted range, replace sensor. 	31

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
727 (E727)	Error C Factory setting: Warning C	Out of specification (S)	C>Sensor pressure error - overrange	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Pressure is outside permitted range. - Sensor defect. 	<ul style="list-style-type: none"> - Block off electromagnetic effects or eliminate source of disturbance. - Check pressure present, reduce or increase if necessary. - If the pressure is within the permitted range, replace sensor. 	28
728 (A728)	Alarm B	Failure (F)	B>RAM error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	2
729 (A729)	Alarm B	Failure (F)	B>RAM error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	3
730 (E730)	Error C Factory setting: Warning C	Out of specification (S)	C>LRV user limits exceeded	<ul style="list-style-type: none"> - Pressure measured value has undershot the value specified for the Pmin ALARM WINDOW parameter. - Loose connection at sensor cable 	<ul style="list-style-type: none"> - Check system/pressure measured value. - Change value for Pmin ALARM WINDOW if necessary. (→ See also Page 129, parameter description Pmin ALARM WINDOW.) - Wait a short period of time and tighten the connection, or avoid loose connection. 	46
731 (E731)	Error C Factory setting: Warning C	Out of specification (S)	C>URV user limits exceeded	<ul style="list-style-type: none"> - Pressure measured value has overshoot the value specified for the Pmax ALARM WINDOW parameter. - Loose connection at sensor cable 	<ul style="list-style-type: none"> - Check system/pressure measured value. - Change value for Pmax ALARM WINDOW if necessary. (→ See also Page 129, parameter description Pmax ALARM WINDOW.) - Wait a short period of time and tighten the connection, or avoid loose connection. 	45
732 (E732)	Error C Factory setting: Warning C	Out of specification (S)	C>LRV Temp. User limits exceeded	<ul style="list-style-type: none"> - Temperature measured value has undershot the value specified for the Tmin ALARM WINDOW parameter. 	<ul style="list-style-type: none"> - Check system/temperature measured value. - Change value for Tmin ALARM WINDOW if necessary. (→ See also Page 129, parameter description Tmin ALARM WINDOW.) 	48
733 (E733)	Error C Factory setting: Warning C	Out of specification (S)	C>URV Temp. User limits exceeded	<ul style="list-style-type: none"> - Temperature measured value has overshoot the value specified for the Tmax ALARM WINDOW parameter. 	<ul style="list-style-type: none"> - Check system/temperature measured value. - Change value for Tmax ALARM WINDOW if necessary. (→ See also Page 129, parameter description Tmax ALARM WINDOW.) 	47
736 (A736)	Alarm B	Failure (F)	B>RAM error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	4
737 (A737)	Alarm B	Failure (F)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	20

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
738 (A738)	Alarm B	Failure (F)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	19
739 (A739)	Alarm B	Failure (F)	B>Measurement error	<ul style="list-style-type: none"> - Fault in the main electronics. - Main electronics defect. 	<ul style="list-style-type: none"> - Briefly disconnect device from the power supply. - Replace main electronics. 	23
740 (E740)	Error C Factory setting: Warning C	Maintenance request (M)	C>Calculation overflow, bad configuration	<ul style="list-style-type: none"> - Level measuring mode: the measured pressure has undershot the value for HYDR. PRESS. MIN. or overshoot the value for HYDR. PRESS MAX. - Level measuring mode: The measured level did not reach the LEVEL MIN value or exceeded the LEVEL MAX value. - Flow measuring mode: the measured pressure has undershot the value for MAX. PRESS FLOW. 	<ul style="list-style-type: none"> - Check configuration and carry out calibration again if necessary. - Select a device with a suitable measuring range. - Check configuration and carry out calibration again if necessary. (→ See also parameter description LEVEL MIN., Page 93.) - Check configuration and carry out calibration again if necessary. - Select a device with a suitable measuring range. 	27
741 (A741)	Alarm B	Funktion check (C)	B>TANK HEIGHT out of edit limits	<ul style="list-style-type: none"> - LEVEL MIN or LEVEL MAX has been changed. 	<ul style="list-style-type: none"> - Perform reset (Code 2710) and carry out calibration again. 	44
742 (A742)	Alarm B	Failure (F)	B>Sensor connection error (upload)	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). This message normally only appears briefly. - Cable connection sensor – main electronics disconnected. - Sensor defect. 	<ul style="list-style-type: none"> - Wait a few minutes. - Perform reset (Code 7864) and carry out calibration again. - Check cable connection and repair if necessary. - Replace sensor. 	18
743 (E743)	Alarm B	Failure (F)	B>Electronic PCB error during initialisation	<ul style="list-style-type: none"> - This message normally only appears briefly. - Main electronics defect. 	<ul style="list-style-type: none"> - Wait a few minutes. - Restart the device. Perform reset (Code 62). - Replace main electronics. 	14
744 (A744)	Alarm B	Failure (F)	B>Main electronic PCB error	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Main electronics defect. 	<ul style="list-style-type: none"> - Restart the device. Perform reset (Code 62). - Block off electromagnetic effects or eliminate source of disturbance. - Replace main electronics. 	11
745 (W745)	Warning C	Maintenance request (M)	C>Sensor data unknown	<ul style="list-style-type: none"> - Sensor does not suit the device (electronic sensor nameplate). Device continues measuring. 	<ul style="list-style-type: none"> - Replace sensor with a suitable sensor. 	56

Code	Error type/ NA 64	Corresponds NE 107	Message/description	Cause	Measure	Priority
746 (W746)	Warning C	Funktion check (C)	C>Sensor connection error - initialising	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Overpressure or low pressure present. 	<ul style="list-style-type: none"> - Wait a few minutes. - Restart the device. Perform reset (Code 7864). - Block off electromagnetic effects or eliminate source of disturbance. - Reduce or increase pressure. 	26
747 (A747)	Alarm B	Failure (F)	B>Sensor software not compatible to electronics	<ul style="list-style-type: none"> - Sensor does not suit the device (electronic sensor nameplate). 	<ul style="list-style-type: none"> - Replace sensor with a suitable sensor. 	16
748 (A748)	Alarm B	Failure (F)	B>Memory failure in signal processor	<ul style="list-style-type: none"> - Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI00382P (Deltabar S), TI00383P (Cerabar S) or TI00416P (Deltapilot S). - Main electronics defect. 	<ul style="list-style-type: none"> - Block off electromagnetic effects or eliminate source of disturbance. - Replace main electronics. 	15

10.1.1 On-site display error messages



If the device detects a defect in the on-site display during initialization, the following error messages can be displayed:

Message	Measure
Initialization, VU Electr. Defect A110	Exchange on-site display.
Initialization, VU Electr. Defect A114	
Initialization, VU Electr. Defect A281	
Initialization, VU Checksum Err. A110	
Initialization, VU Checksum Err. A112	
Initialization, VU Checksum Err. A171	

10.2 Response of outputs to errors

The device differentiates between the error types Alarm, Warning and Error.

→ See also Section 10.1 "Messages" und Page 112 ff, Table 22: OUTPUT and Page 127 ff, Table 31: MESSAGES.

Output	A (Alarm)	W (Warning)	E (Error: Alarm/Warning)
Current output	Assumes the value specified via the OUTPUT FAIL MODE ¹ , ALT. CURR. OUTPUT ¹ and SET MAX. ALARM ¹ parameter. → See also the following section "Configuring current output for an alarm".	Device continues measuring.	For this error, you can enter whether the device should react as in the event of an alarm or as in the event of a warning. See corresponding "Alarm" or "Warning" column. (→ See also these Operating Instructions, parameter description SELECT ALARM TYPE.)
Bargraph (on-site display)	The bargraph adopts the value defined by the OUTPUT FAIL MODE ¹ parameter.	The bargraph adopts the value which corresponds to the current value.	→ See this table, column "Alarm" or "Warning".
On-site display	<ul style="list-style-type: none"> The measured value and message are displayed alternately Measured value display:  -symbol is permanently displayed. <p>Message display</p> <ul style="list-style-type: none"> 3-digit number such as A122 and description 	<ul style="list-style-type: none"> The measured value and message are displayed alternately Measured value display:  -symbol flashes. <p>Message display:</p> <ul style="list-style-type: none"> 3-digit number such as W613 and description 	<ul style="list-style-type: none"> The measured value and message are displayed alternately Measured value display: see corresponding "Alarm" or "Warning" column <p>Message display:</p> <ul style="list-style-type: none"> 3-digit number such as E731 and description
Remote operation (Digital communication)	In the case of an alarm, the ALARM STATUS ² parameter displays a 3-digit number such as 122 for "Sensor not connected".	In the case of a warning, the ALARM STATUS ² parameter displays a 3-digit number such as 613 for "Simulation is active".	In the case of an error, the ALARM STATUS ² parameter displays a 3-digit number such as 731 for "URV user limits exceeded".

1) Menu path: (GROUP SELECTION →) OPERATING MENU → OUTPUT

2) Menu path: (GROUP SELECTION →) OPERATING MENU → MESSAGES



10.3 Confirming messages

Depending on the settings for the ALARM DISPL. TIME (→ Page 128) and ACK. ALARM MODE (→ Page 127) parameters, the following measures should be taken to clear a message:

Settings ¹⁾	Measures
<ul style="list-style-type: none"> - ALARM DISPL. TIME = 0 s - ACK. ALARM MODE = off 	<ul style="list-style-type: none"> - Rectify cause of the message (see also Section 10.1).
<ul style="list-style-type: none"> - ALARM DISPL. TIME > 0 s - ACK. ALARM MODE = off 	<ul style="list-style-type: none"> - Rectify cause of the message (see also Section 10.1). - Wait for the alarm display time to elapse.
<ul style="list-style-type: none"> - ALARM DISPL. TIME = 0 s - ACK. ALARM MODE = on 	<ul style="list-style-type: none"> - Rectify cause of the message (see also Section 10.1). - Confirm message using ACK. ALARM parameter.
<ul style="list-style-type: none"> - ALARM DISPL. TIME > 0 s - ACK. ALARM MODE = on 	<ul style="list-style-type: none"> - Rectify cause of the message (see also Section 10.1). - Confirm message using ACK. ALARM parameter. - Wait for the alarm display time to elapse. If a message appears and the alarm display time elapses before the message has been acknowledged, the message will be cleared once it has been acknowledged.

- 1) Menu path for ALARM DISPL. TIME and ACK. ALARM MODE: (GROUP SELECTION →) OPERATING MENU → DIAGNOSTICS → MESSAGES

If the on-site display displays a message, you can delete it with the  key.

If there are several messages, the on-site display shows the message which has the highest priority (see also Section 10.1). Once you have deleted this message using the  key, the message with the next highest priority is displayed. You can use the  key to delete each message, one after the other.

The ALARM STATUS parameter continues to display all the messages present.

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