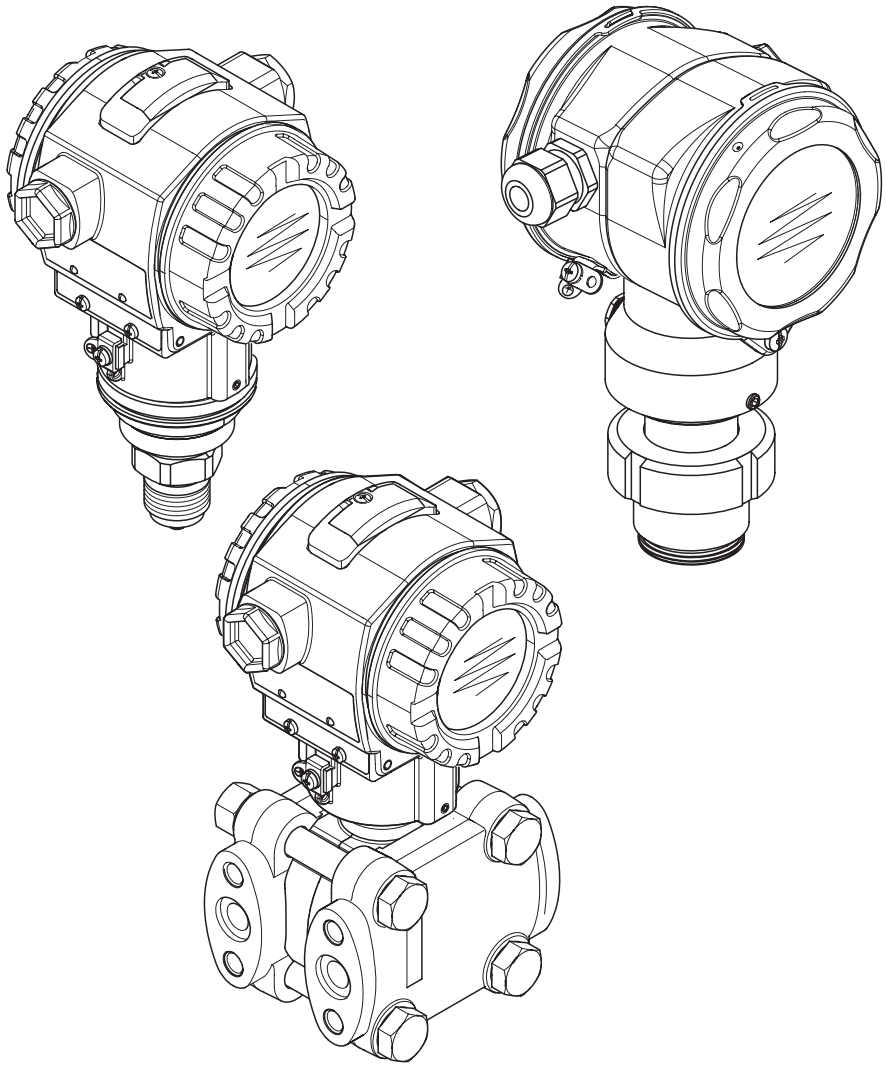
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions – Description of Device Functions

Cerabar S/Deltabar S/Deltapilot S

Process pressure measurement/differential pressure measurement/hydrostatic level measurement

Fieldbus™ Foundation



BA303P/00/en/08.08
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valid from Software version:
03.00.zz

Endress+Hauser

People for Process Automation

Overview of documentation

Device	Documentation	Content	Remarks
Cerabar S FOUNDATION Fieldbus	Technical Information TI383P	Technical data	– The documentation can be found on the documentation CD supplied. – The documentation is also available on the Internet. → See: www.endress.com → Download
	Operating Instructions BA302P	– Identification – Installation – Wiring – Operation – Commissioning, description of Quick Setup menus – Maintenance – Troubleshooting and spare parts – Appendix: illustration of menus	
	Operating Instructions BA303P	– Examples of configuration for pressure and level measurement – Description of parameters – Troubleshooting – Appendix: illustration of menus	
	Brief Operating Instructions KA1025P	– Installation – Wiring – Local operation – Commissioning – Description of Quick Setup menus	
	Fold-out brochure KA252P	– Wiring – Operation without display – Description of Quick Setup menus – HistoROM®/M-DAT operation	

Device	Documentation	Content	Remarks
Deltabar S FOUNDATION Fieldbus	Technical Information TI383P	Technical data	– The documentation can be found on the documentation CD supplied. – The documentation is also available on the Internet. → See: www.endress.com → Download
	Operating Instructions BA301P	– Identification – Installation – Wiring – Operation – Commissioning, description of Quick Setup menus – Maintenance – Troubleshooting and spare parts – Appendix: illustration of menus	
	Operating Instructions BA303P	– Examples of configuration for pressure and level measurement – Description of parameters – Troubleshooting – Appendix: illustration of menus	
	Brief Operating Instructions KA1024P	– Installation – Wiring – Local operation – Commissioning – Description of Quick Setup menus	
	Fold-out brochure KA252P	– Wiring – Operation without display – Description of Quick Setup menus – HistoROM®/M-DAT operation	

Device	Documentation	Content	Remarks
Deltapilot S FOUNDATION Fieldbus	Technical Information TI416P	Technical data	– The documentation can be found on the documentation CD supplied. – The documentation is also available on the Internet. → See: www.endress.com → Download
	Operating Instructions BA372P	– Identification – Installation – Wiring – Operation – Commissioning, description of Quick Setup menus – Maintenance – Troubleshooting and spare parts – Appendix: illustration of menus	
	Operating Instructions BA303P	– Examples of configuration for pressure and level measurement – Description of parameters – Troubleshooting – Appendix: illustration of menus	
	Brief Operating Instructions KA1026P	– Installation – Wiring – Local operation – Commissioning – Description of Quick Setup menus	
	Fold-out brochure KA252P	– Wiring – Operation without display – Description of Quick Setup menus – HistoROM®/M-DAT operation	

Table of contents

1 Notes on use

Sections 4 to 6 describe how to operate the unit using an FF configuration program.
With FOUNDATION Fieldbus, all the device parameters are categorized according to their functional properties and task and are assigned to the Resource Block, the Transducer Blocks and the function blocks. The parameters of the Resource Block, the Transducer Blocks and the Analog Input Block are described in Section 7. For a description of the parameters of the other function blocks, such as the PID or Discret Ouput Block, see Operating Instructions BA013S "FOUNDATION Fieldbus Overview" or the FOUNDATION Fieldbus Specification.
Sections 8 to 10 describe how to operate the unit via the local operation and the Endress+Hauser operating program FieldCare.
Section 11 describes all the parameters in the order of how they appear in the menu.

Sections 1.1 and 1.2 describe ways of finding a certain parameter description more easily.

1.1 Finding parameter descriptions using ID numbers

Each parameter is indicated on the local operation with a unique identification number (ID). All the parameters are listed in numerical order in Section 2. The page reference/link takes you to the parameter in question.
In FieldCare, additional parameters and, to an extent, other parameters are displayed. These parameters are not listed in Section 2. You can find these parameters by means of the index.
→ See also Section 1.3.

1.2 Finding function groups using graphic representation

All the function groups are shown in table form in Section 3. The page reference/link takes you to the function group in question. In Section 7, all the parameters of a function group are compiled in a table.

1.3 Finding parameter descriptions using parameter names (index)

The index lists all the parameters in alphabetical order. The page reference/link takes you to the parameter in question.

2 Parameter description of local operation and FieldCare

You can find the parameter description as follows:
- Via the ID number for the local operation
- Via the parameter name for FieldCare

ID number	Parameter name	Description, see page
001	DENSITY UNIT	147 or 179
003	HEIGHT UNIT	147
004	FULL CALIB. – QUICK SETUP	135
004	FULL CALIB. – "Level easy pressure" level selection	144
004	FULL CALIB. – "Level easy height" level selection	148
005	FULL PRESSURE	144
006	FULL HEIGHT	149
007	ADJUST DENSITY	147 or 179
008	CALIBRATION MODE – "Level easy pressure" level selection	143
008	CALIBRATION MODE – "Level easy height" level selection	147
009	EMPTY HEIGHT	148
010	EMPTY CALIB. – QUICK SETUP	134
010	EMPTY CALIB. – "Level easy pressure" level selection	143 or 144
010	EMPTY CALIB. – "Level easy height" level selection	148
011	EMPTY PRESSURE	144
014	DOWNLOAD SELECT	200
020	LEVEL SELECTION	130
023	OUTPUT UNIT – "Level easy pressure" level selection	143
023	OUTPUT UNIT – "Level easy height" level selection	147
025	PROCESS DENSITY	179
046	ALARM STATUS	202
047	ENTER RESET CODE	200
048	INSERT PIN NO	200
050	LEVEL BEFORE LIN	197
060	PRESS. ENG. UNIT	139, 142, 146, 150 or 174
075	CUSTOMER UNIT P	139, 142, 146, 151 or 174
079	LANGUAGE	128
247	DAMPING VALUE	132, 135, 136, 140, 144, 149, 160, 163, 172 or 177
250	SENSOR SER. No.	193
264	SOFTWARE VERSION	191
266	HARDWARE REV.	191
301	PRESSURE – "Pressure" measuring mode	196
	PRESSURE – "Level" measuring mode	196
	PRESSURE – "Flow" measuring mode	197
311	MAX. FLOW	136 or 177
313	UNIT VOLUME – "Linear" level mode	154 or 157
	UNIT VOLUME – "Pressure linearized" level mode	161
	UNIT VOLUME – "Height linearized" level mode	166
314	EMPTY CALIB. – QUICK SETUP	134
	EMPTY CALIB. – "Linear" level mode	156
	EMPTY CALIB. – "Height linearized" level mode	169
315	FULL CALIB. – QUICK SETUP	135
	FULL CALIB. – "Pressure linearized" level mode	156
	FULL CALIB. – "Height linearized" level mode	169
316	ADJUST DENSITY – "Linear" level mode	157
	ADJUST DENSITY – "Height linearized" level mode	170
	ADJUST DENSITY– "Level" extended setup	179
317	CUST. UNIT. FACT. P	140, 142, 146, 151 or 175
318	TEMP. ENG. UNIT – "Pressure" measuring mode	178
	TEMP. ENG. UNIT – "Level" measuring mode	179
	TEMP. ENG. UNIT – "Flow" measuring mode	179
319	CALIB. OFFSET	138
323	SET. L. FL. CUT-OFF	180
329	FACT. U.U. TOTAL.1	188
330	FACT. U.U. TOTAL.2	189
331	RESET TOTALIZER 1	188
332	Pmin ALARM WINDOW	203
333	Pmax ALARM WINDOW	203

ID number	Parameter name	Description, see page
334	Tmin ALARM WINDOW	204
335	Tmax ALARM WINDOW	204
336	ALARM DELAY	203
339	DISPLAY CONTRAST	190
350	DEVICE DESIGN.	191
352	CONFIG RECORDER	192
354	DEVICE SERIAL No.	191
357	PCB TEMPERATURE	192
358	Allowed Min. TEMP	192
359	Allowed Max. TEMP	192
360	MAT. PROC. CONN. +	193
361	MAT. PROC. CONN. -	193
362	SEAL TYPE	193
363	DIP STATUS	192
365	MAT. MEMBRANE	194
366	FILLING FLUID	194
367	SENSOR TEMP.	196 or 197
368	Tmin SENSOR	194
369	Tmax SENSOR	194
370	TANK CONTENT	197
375	SUPPRESSED FLOW	197
378	MEAS. VAL. TREND	196 or 197
380	COUNTER: P > Pmax	198
382	RESET PEAKHOLD	199
383	MAX. MEAS. PRESS.	198
386	ELECTR. SERIAL NO.	191
389	MEASURING MODE	129
392	CALIBRATION MODE – "Linear" level mode	156
	CALIBRATION MODE – "Height linearized" level mode	169
397	LIN. EDIT MODE	182
398	TOTALIZER 1 UNIT – "Volume operat. cond." flow type	187
399	TOTALIZER 2 UNIT – "Volume operat. cond." flow type	188
400	NEG. FLOW TOT. 1	188
401	ACK. ALARM MODE	202
404	COUNTER: T > Tmax	198
409	OPERATING HOURS	200
413	SIMULATION MODE	201
414	SIM. PRESSURE	201
416	NEG. FLOW TOT. 2	189
419	MAIN LINE CONT.	189
423	ALTERNATE DATA	190
434	CORRECTED PRESS. – "Pressure" measuring mode	196
	CORRECTED PRESS. – "Level" measuring mode	196
	CORRECTED PRESS. – "Flow" measuring mode	197
442	LOW FLOW CUT-OFF	180
467	COUNTER: P < Pmin	198
469	MIN. MEAS. PRESS.	198
471	MAX. MEAS. TEMP.	198
472	COUNTER: T < Tmin	198
474	MIN. MEAS. TEMP.	198
476	SIM. ERROR NO.	201
480	ALARM DISPL. TIME	203
482	PROC. CONN. TYPE	192
484	PRESS.SENS LOLIM	193
485	PRESS.SENS HILIM	193
487	SENSOR H/WARE REV.	194
488	PCB COUNT: T>Tmax	198
490	PCB MAX. TEMP.	198
492	PCB COUNT: T < Tmin	198
494	PCB MIN. TEMP.	199
500	ACK. ALARM	202
549	MEASURING TABLE (display)	183
549	EDITOR TABLE, LINE-NUMB (enter values)	182
550	EDITOR TABLE, X-VAL. (enter values)	183
551	EDITOR TABLE, Y-VAL. (enter values)	182, 183
563	POS. INPUT VALUE	132, 134 or 137
564	LAST DIAG. CODE	202
570	Pmax PROC. CONN.	192

3 Graphic representation of function groups

3.1 Representation via device display

Note!
The "Flow" measuring mode is only available for the Deltabar S differential pressure transmitter. The groups marked with "*" are only displayed for Deltabar S.

1. Group selection	2. Selection level	3. Function group	Description, see page
LANGUAGE	LANGUAGE (079)		→ 128
MEASURING MODE	MEASURING MODE (389)		→ 129
Depending on the MEASURING MODE selected (pressure, level or flow), the QUICK SETUP is set to pressure, level or flow.			
QUICK SETUP (pressure)			→ 131
QUICK SETUP (level)			→ 133
QUICK SETUP (flow *)			→ 128
OPERATING MENU	→ SETTINGS (557)	→ POSITION ADJUSTMENT	→ 137
		→ BASIC SETUP (pressure)	→ 138
		→ BASIC SETUP (level), "Level easy pressure"	→ 141
		→ BASIC SETUP (level), "Level easy height"	→ 145
		→ BASIC SETUP (level), "Level standard"	→ 150
		→ BASIC SETUP (flow) *	→ 173
		→ EXTENDED SETUP (pressure)	→ 178
		→ EXTENDED SETUP (level)	→ 178
		→ EXTENDED SETUP (flow) *	→ 179
		→ LINEARIZATION – local operation	→ 181
		→ LINEARIZATION – FieldCare	→ 184
		→ TOTALIZER SETUP *	→ 187
	→ DISPLAY (555)		→ 189
	→ TRANSMITTER INFO (560)	→ FF-DATA	→ 194
		→ TRANSMITTER DATA	→ 191
		→ PROCESS CONNECTION	→ 192
		→ SENSOR DATA	→ 193
	→ PROCESSINFO (561)	→ PROCESS VALUES (pressure)	→ 195
		→ PROCESS VALUES (level)	→ 196
		→ PROCESS VALUES (flow) *	→ 197
		→ FUNCTION BLOCKS	→ 198
		→ PEAK HOLD INDICATOR	→ 198
	→ OPERATION		→ 200
	→ DIAGNOSTICS	→ SIMULATION MODE	→ 201
		→ MESSAGES	→ 202
		→ USER LIMITS	→ 203

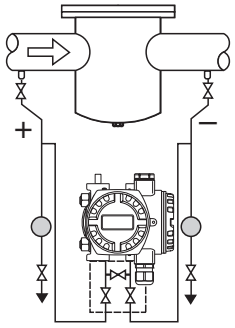
3.2 Representation in FieldCare

Note!
The "Flow" measuring mode is only available for the Deltabar S differential pressure transmitter. The groups marked with "*" are only displayed for Deltabar S.

1. Identifier	2. Selection level	3. Function group	Description, see page
Depending on the MEASURING MODE selected (pressure, level or flow), the QUICK SETUP is set to pressure, level or flow.			
QUICK SETUP (pressure)			→ 131
QUICK SETUP (level)			→ 133
QUICK SETUP (flow *)			→ 128
	MEASURING MODE		→ 129
OPERATING MENU	→ SETTINGS	→ POSITION ADJUSTMENT	→ 137
		→ BASIC SETUP (pressure)	→ 138
		→ BASIC SETUP (level), "Level easy pressure"	→ 141
		→ BASIC SETUP (level), "Level easy height"	→ 145
		→ BASIC SETUP (level), "Level standard"	→ 150
		→ BASIC SETUP (flow) *	→ 173
		→ EXTENDED SETUP (pressure)	→ 178
		→ EXTENDED SETUP (level)	→ 178
		→ EXTENDED SETUP (flow) *	→ 179
		→ LINEARIZATION – local operation	→ 181
		→ LINEARIZATION – FieldCare	→ 184
		→ TOTALIZER SETUP *	→ 187
	→ DISPLAY		→ 189
	→ TRANSMITTERINFO	→ FF-DATA	→ 194
		→ TRANSMITTER DATA	→ 191
		→ PROCESS CONNECTION	→ 192
		→ SENSOR DATA	→ 193
	→ PROCESSINFO	→ PROCESS VALUES (pressure)	→ 195
		→ PROCESS VALUES (level)	→ 196
		→ PROCESS VALUES (flow) *	→ 197
		→ FUNCTION BLOCKS	→ 198
		→ PEAK HOLD INDICATOR	→ 198
	→ OPERATION		→ 200
	→ DIAGNOSTICS	→ SIMULATION MODE	→ 201
		→ MESSAGES	→ 202
		→ USER LIMITS	→ 203

4 Pressure measurement (FF configuration program)

Note!
- The Cerabar S and the Deltabar S are configured for the pressure measuring mode as standard. The Deltapilot S is configured for the level measuring mode as standard. The measuring range and the unit in which the measured value is transmitted, as well as the digital output value of the Analog Input Block OUT, correspond to the data on the nameplate.
- See also Operating Instructions BA301P Deltabar S, "Pressure measurement" section or Operating Instructions BA302P Cerabar S, "Pressure measurement" section or BA372P Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 📄 51, Pressure Transducer Block
  – → 📄 89, Analog Input Block.

	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 BA301P.	 P01-PMD75xxx-19-xx-xx-xx-000
2	Open the Pressure Transducer Block and set the block mode to OOS.	
3	Carry out position adjustment if necessary. The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).	
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ Select the "Differential pressure", Gauge pressure" or "Absolute pressure" option by means of the PRIMARY_VALUE_TYPE parameter.	
5	Set the Pressure Transducer Block to the "Auto" block mode.	
6	Where necessary, configure the CHANNEL (→ 📄 92), L_TYPE (→ 📄 93), XD_SCALE (→ 📄 91) and OUT_SCALE (→ 📄 92) parameters by means of the Analog Input Block.	
7	Result: The device is ready for pressure measurement.	

Note!
- You can select another pressure unit by means of the CAL_UNIT parameter (→ 📄 52). You can also specify a customer-specific unit by means of this parameter.

5 Level measurement (FF configuration program)

5.1 Overview of level measurement

Measuring task	LEVEL SELECTION/ LEVEL MODE	Measured variable options	LEVEL_TYP/ LEVEL MODE	Description	Measured value display
The measured variable is in direct proportion to the measured pressure.	LEVEL SELECTION: Level easy pressure	– % (level) – Level – Volume – Mass	Linear	Calibration without reference pressure – dry calibration, see → 📄 25, → Chap. 5.4.2	The measured value display and the PRIMARY_VALUE and MEASURED_LEVEL_AFTER_ SIMULATION/LEVEL BEFORE LIN. parameters display the measured value.
The measured variable is not in direct proportion to the measured pressure as is the case with tanks with a conical outlet, for example. A linearization table has to be entered for the calibration.	LEVEL SELECTION: Level standard/ LEVEL MODE: Pressure linearized	– Pressure and % – Pressure and volume – Pressure and mass	Pressure linearized	– Calibration with reference pressure: semiautomatic entry of linearization table, see → 📄 27, → Chap. 5.5.1. – Calibration without reference pressure: manual entry of linearization table, see → 📄 29, → Chap. 5.5.2.	The measured value display and the PRIMARY_VALUE parameter show the measured value.
– Two measured variables are required or – The container shape is given by value pairs, such as height and volume. 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 linearization table has to be entered for the 2nd measured variable. The 2nd measured variable is assigned to the 1st measured variable by means of this table.	LEVEL SELECTION: Level standard/ LEVEL MODE: Height linearized	– Height and volume – Height and mass – Height and % – %-height and volume – %-height and mass – %-height and %	Height linearized	– Calibration without reference pressure: dry calibration and manual entry of linearization table, see → 📄 31, → Chap. 5.6.1.	The measured value display and the PRIMARY_VALUE parameter show the 2nd measured value (volume, mass or %). The MEASURED_ LEVEL_AFTER_SIMULATION/ LEVEL BEFORE LIN parameter displays the 1st measured value (%-height or height).

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. The pressure range is set to 0–300 mbar.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for "Empty Calib. Level Easy" and "Full Calib. Level Easy" must be at least 1% apart 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. → For information on how to perform position adjustment, see also → 📄 56, "PRESSURE_1_ACCEPT_ZERO_INSTALL_OFFSET/POS.ZERO ADJUST"

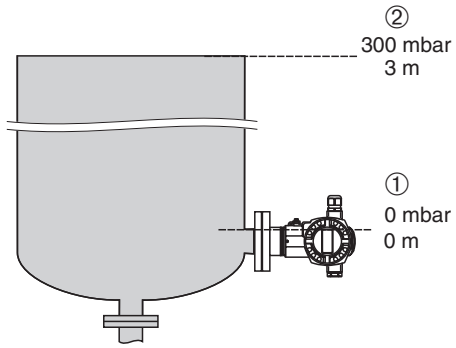
	Description	
1	Deltabar S: Before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA301P.	
2	Open the Pressure Transducer Block and set the block mode to OOS.	

Fig. 1: Calibration with reference pressure – wet calibration

1 See Table, Step 8.
2 See Table, Step 10.

	Description
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 🖹 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 🖹 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 🖹 56).
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter select the "Volume" option.
5	By means of the SCALE OUT "Units Index" parameter, select the "m" option. Or select a level unit, such as "l" in this example, by means of the OUT UNIT EASY/Output unit level easy parameter.
6	By means of the LEVEL_ADJUST_MODE_EASY/ CALIBRATION MODE level easy parameter, select the "Wet" option.
7	Fill the container up to the lower level point. The related pressure value can be viewed via the "Meas. pressure" parameter.
8	By means of the SCALE OUT "EU at 0%" parameter, enter a level value, here 0 l for example. Or by means of the Empty calib. level easy parameter, enter a level value, here 0 l for example.
9	Fill the container up to the upper level point. The related pressure value can be viewed via the "Meas. pressure" parameter.
10	By means of the SCALE OUT "EU at 100%" parameter, enter a level value, here 1000 l for example. Or by means of the Full calib. level easy parameter, enter a level value, here 1000 l for example.
11	Set the Pressure Transducer Block to the "Auto" block mode.
12	Where necessary, configure the CHANNEL (→ 🖹 92), L_TYPE (→ 🖹 93), XD_SCALE (→ 🖹 91) and OUT_SCALE (→ 🖹 92) parameters by means of the Analog Input Block.

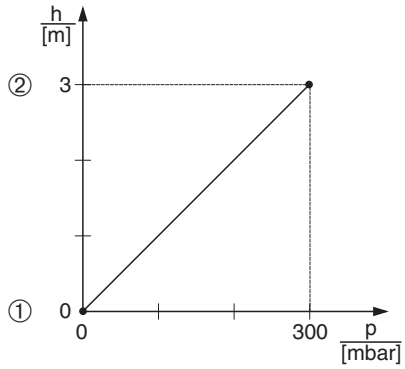


Fig. 2: Calibration with reference pressure – wet calibration

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

5.2.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in liters. The maximum volume of 1000 liters corresponds to a pressure of 450 mbar. The minimum volume of 0 liters corresponds to a pressure of 50 mbar since 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.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for "Empty Calib. Level Easy" and "Full Calib. Level Easy" must be at least 1 % apart 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. → For information on how to perform position adjustment, see also → 📄 56, "PRESSURE_1_ACCEPT_ZERO_INSTALL_OFFSET/POS.ZERO ADJUST".

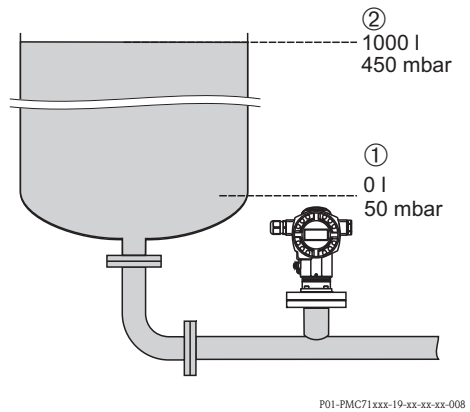
	Description	
1	Deltabar S: Before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA301P.	
2	Open the Pressure Transducer Block and set the block mode to OOS.	
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).	

Fig. 3: Calibration without reference pressure – dry calibration

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

	Description
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option.
5	By means of the SCALE OUT "Units Index" parameter, select the "l" (liter) option. Or select a volume unit, such as "l" in this example, by means of the OUT UNIT EASY/Output unit level easy parameter.
6	By means of the LEVEL_ADJUST_MODE_EASY/ CALIBRATION MODE level easy parameter, select the "Dry" option.
7	By means of the Full calib. level easy parameter, enter a pressure, here 450mbar for example.
8	By means of the Empty calib. level easy parameter, enter a pressure, here 50mbar for example.
9	By means of the SCALE OUT "EU at 100%" parameter, enter the tank volume, here 1000 l for example. Or by means of the Full calib. level easy parameter, enter a volume, here 1000 l for example.
10	By means of the SCALE OUT "EU at 0%" parameter, enter the tank volume, here 0 l for example. Or by means of the Empty calib. level easy parameter, enter a volume, here 0 l for example.
11	Set the Pressure Transducer Block to the "Auto" block mode.
12	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.

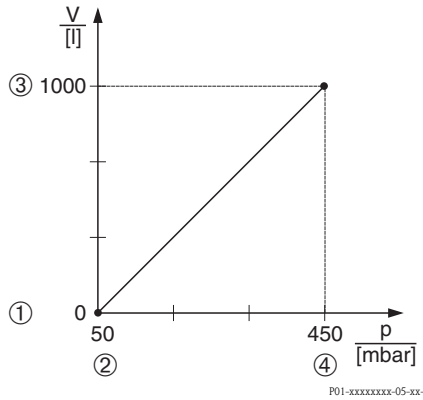


Fig. 4: Calibration with reference pressure – wet calibration

1 See Table, Step 7.
2 See Table, Step 8.
3 See Table, Step 9.
4 See Table, Step 10.

5.3 "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 liters. The maximum volume of 1000 liters corresponds to a level of 4.5 m. The minimum volume of 0 liters corresponds to a level of 0.5 m since the device is mounted below the level lower-range value. The density of the fluid is 1 kg/dm^3.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For the "Level easy pressure" level mode, the values entered for "Empty Calib. Level Easy" and "Full Calib. Level Easy" must be at least 1 % apart. 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. → For information on how to perform position adjustment, see also → 📄 56, "PRESSURE_1_ACCEPT_ZERO_INSTALL_OFFSET/POS.ZERO ADJUST".

	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 BA301P.
2	Open the Pressure Transducer Block and set the block mode to OOS.

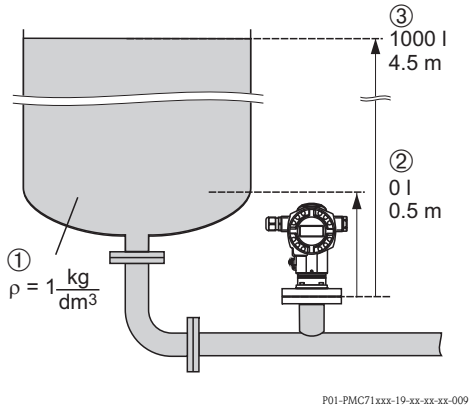
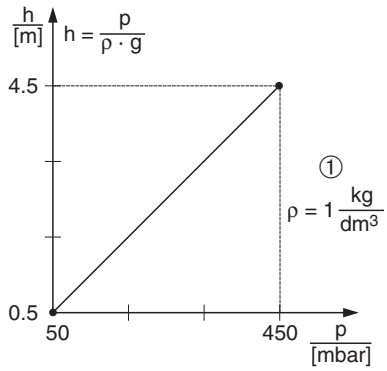


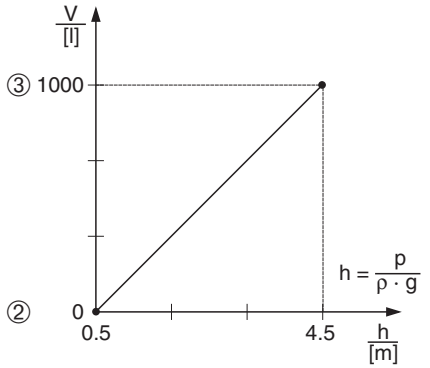
Fig. 5: Calibration with reference pressure – wet calibration

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

	Description
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 🖹 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 🖹 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 🖹 56).
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option.
5	By means of the parameter "Level Selection" select the "Level Easy Height".
6	By means of the parameter OUT UNIT EASY/Output Unit Level Easy select a volume unit, e.g. "1".
7	By means of the parameter "Height Unit Level Easy" select a height unit, e.g. "m".
8	By means of the LEVEL_ADJUST_MODE_EASY/ CALIBRATION MODE level easy parameter, select the "Wet" option.
9	By means of the parameter "Density Unit Level Easy" select a density unit, e.g. "kg/dm³"
10	By means of the parameter "Adjust Density Level Easy" enter a density , e.g. "1" kg/dm³.
11	Fill the container up to the upper level point. The related level value can be viewed via the "Meas. level easy" parameter.
12	By means of the Full height level easy parameter, enter a percentage value, here 100% for example.
13	Fill the container up to the upper level point. The related level value can be viewed via the "Meas. level easy" parameter.
14	By means of the Full height level easy parameter, enter a percentage value, e.g. 1000 "1".
15	Set the Pressure Transducer Block to the "Auto" block mode.
16	Where necessary, configure the CHANNEL (→ 🖹 92), L_TYPE (→ 🖹 93), XD_SCALE (→ 🖹 91) and OUT_SCALE (→ 🖹 92) parameters by means of the Analog Input Block.



P01-xxxxxxxx-05-xx-xx-xx-029



P01-xxxxxxxx-05-xx-xx-xx-030

Fig. 6: Calibration with reference pressure – wet calibration

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

5.3.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in liters. The maximum volume of 1000 liters corresponds to a level of 4.5 m. The minimum volume of 0 liters corresponds to a level of 0.5 m since the device is mounted below the level lower-range value. The density of the fluid is 1 kg/dm^3.

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.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For the "Level easy pressure" level mode, the values entered for "Empty Calib. Level Easy" and "Full Calib. Level Easy" must be at least 1 % apart. 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. → For information on how to perform position adjustment, see also → 📄 56, "PRESSURE_1_ACCEPT_ZERO_INSTALL_OFFSET/POS.ZERO ADJUST".

	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 BA301P.
2	Open the Pressure Transducer Block and set the block mode to OOS.
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).

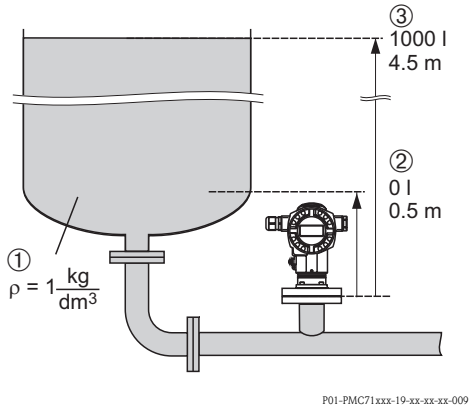


Fig. 7: Calibration without reference pressure – dry calibration

1 See Table, Step 10.
2 See Table, Steps 12 and 13.
3 See Table, Steps 14 and 15.

	Description
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option.
5	Select the "Level easy height" option by means of the "Level selection" parameter.
6	Select a volume unit, such as "l" in this example, by means of the OUT UNIT EASY/Output unit level easy parameter.
7	Select a height unit by means of the Height unit level easy parameter, here "m" for example.
8	By means of the LEVEL_ADJUST_MODE_EASY/ CALIBRATION MODE level easy parameter, select the "Dry" option.
9	Select a density unit via the Density unit level easy parameter, here "kg/dm³" for example.
10	By means of the Adjust density level easy parameter, enter a density, here "1" "kg/dm³" for example.
11	By means of the Empty calib. level easy parameter, enter a volume, here 0 l for example.
12	By means of the Empty height level easy parameter, enter a volume, here 0.5m for example.
13	By means of the Full calib. level easy parameter, enter a volume, here 1000 l for example.
14	By means of the Full height level easy parameter, enter a volume, here 4.5m for example.
15	Set the Pressure Transducer Block to the "Auto" block mode.

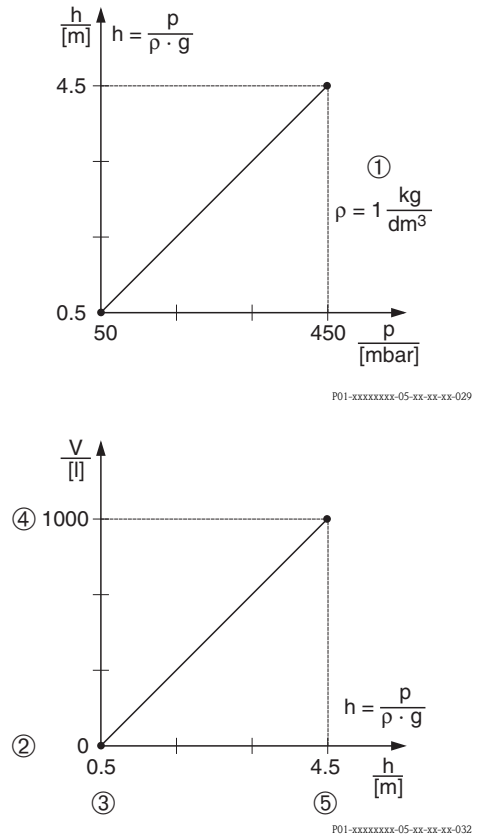


Fig. 8: Calibration with reference pressure – wet calibration

1 See Table, Step 10.
2 See Table, Step 12.
3 See Table, Step 13.
4 See Table, Step 14
5 See Table, Step 15.

5.4 "Level standard" level selection, "Linear" level mode

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. The pressure range is set to 0-300 mbar.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions BA301P for Deltabar S or Operating Instructions BA302P for Cerabar S or Operating Instructions BA372P for Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 📄 51, Pressure Transducer Block
  – → 📄 89, Analog Input Block.

	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 BA301P.
2	Open the Pressure Transducer Block and set the block mode to OOS.
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Level" option.
5	Select the "LEVEL standard" option by means of the "LEVEL SELECTION" parameter.
6	Select the "Linear" option by means of the "Level mode" parameter.
7	Select the "Level" option by means of the "Lin. measurand" parameter.
8	By means of the SCALE OUT "Units Index" parameter, select the "m" option. Or by means of the "Unit Height" parameter, select a height unit, here "m" for example.
9	By means of the LEVEL_ADJUST_MODE/ CALIBRATION MODE parameter, select the "Wet" option. See also Point 3 in the following note.
10	Fill the container up to the lower level point. The related pressure value can be viewed via the "Meas. pressure" parameter.

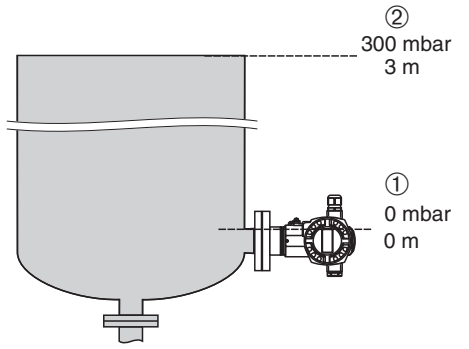
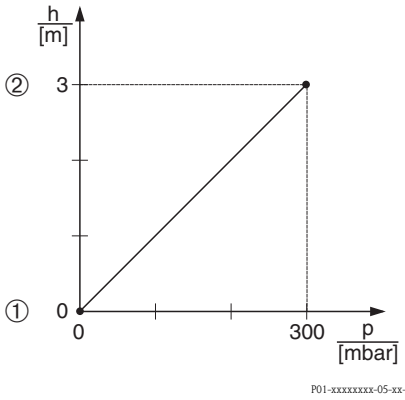


Fig. 9: Calibration without reference pressure – dry calibration

1 See Table, Step 11.
2 See Table, Step 13.

	Description	
11	By means of the SCALE OUT "EU at 0%" parameter, enter a level value, here 0m for example.	 1 See Table, Step 11. 2 See Table, Step 13.
12	Fill the container up to the upper level point. The related pressure value can be viewed via the "Meas. pressure" parameter.	
13	By means of the SCALE OUT "EU at 100%" parameter, enter a level value, here 3m for example.	
14	Set the Pressure Transducer Block to the "Auto" block mode.	
15	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.	

5.4.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in m^3. The maximum volume is 5 m^3 and the maximum height is 4 m. The density of the fluid is 1 kg/dm^3. 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.

Note!
- See also Operating Instructions BA301P for Deltabar S or Operating Instructions BA302P for Cerabar S or Operating Instructions BA372P for Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 📄 51, Pressure Transducer Block
  – → 📄 89, Analog Input Block.

	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 BA301P.
2	Open the Pressure Transducer Block and set the block mode to OOS.
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).
4	Select the measuring mode if necessary: ■ Select the "No linearization" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option.
5	Select the "LEVEL standard" option by means of the "LEVEL SELECTION" parameter.
6	Select a pressure unit via the CAL_UNIT parameter, here mbar for example.
7	By means of the LEVEL_TYPE/LEVEL MODE parameter, select the "Linear" option.
8	By means of the MEASURAND_LINEAR/LIN. MEASURAND parameter, select the "Volume" option.
9	Select a volume unit via the VOLUME_UNIT/UNIT VOLUME parameter, here m^3 for example.
10	By means of the LEVEL_ADJUST_MODE/ CALIBRATION MODE parameter, select the "Dry" option. See also Point 3 in the following note.

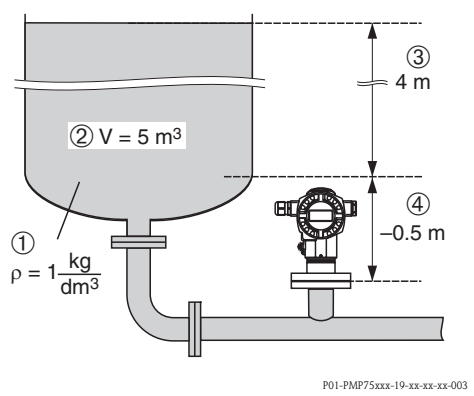


Fig. 10: Calibration without reference pressure – dry calibration

1 See Table, Step 11.
2 See Table, Step 12.
3 See Table, Step 13.
4 See Table, Step 14

	Description	
11	By means of the LEVEL_ADJUST_DENSITY/ADJUST DENSITY and DENSITY_UNIT/DENSITY UNIT parameters, enter a value for the density, here 1 kg/dm^3 for example.	
12	Enter the tank volume via the LEVEL_TANK_VOLUME/TANK VOLUME parameter, here 5 m^3 for example.	
13	Enter the tank height via the LEVEL_TANK_HEIGHT/ TANK HEIGHT parameter, here 4 m for example.	
14	By means of the LEVEL_OFFSET/ZERO POINT parameter, enter the level offset, here –0.5 m for example.	
15	Set the Pressure Transducer Block to the "Auto" block mode.	
16	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.	
17	Result: The device is ready for level measurement.	

Note!

1. For this level mode, the measured variables %, level, volume and mass are available. → 58 ff.
2. You can also specify customer-specific units. See parameter description for CAL_UNIT (→ 52), HEIGHT_UNIT (→ 59), VOLUME_UNIT (→ 60) and MASS_UNIT (→ 61).

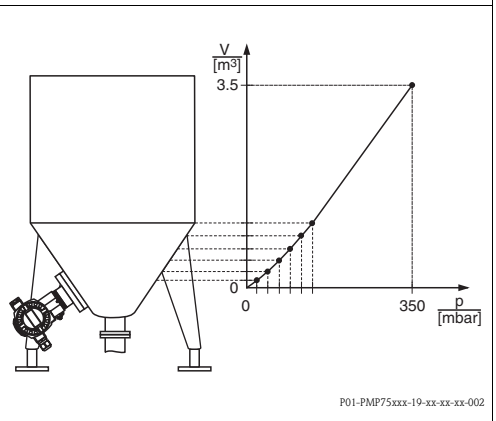
5.5 "Level standard" level selection, "Pressure linearized" level mode

5.5.1 Semiautomatic entry of the linearization table

Example:
In this example, the volume in a tank with a conical outlet should be measured in m^3.

Prerequisite:
- The tank can be filled. The linearization characteristic must rise continuously.

Note!
- See also Operating Instructions BA301P for Deltabar S or Operating Instructions BA302P for Cerabar S or Operating Instructions BA372P for Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 51, Pressure Transducer Block.
  – → 89, Analog Input Block

	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 BA301P.	 P01-PMP75xxx-19-xx-xx-xx-002
2	Open the Pressure Transducer Block and set the block mode to OOS.	
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 56).	
	Carry out basic setup:	
4	Select the measuring mode if necessary: ■ Select the "Level linearized" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option. See also Point 3 in the following note.	
5	Select the "LEVEL standard" option by means of the "LEVEL SELECTION" parameter.	
6	Select a pressure unit via the CAL_UNIT parameter, here mbar for example.	
7	By means of the LEVEL_TYPE/LEVEL MODE parameter, select the "Pressure linearized" option.	
8	By means of the MEASURAND_LINEARIZED/LINd. MEASURAND parameter, select the "Pressure and volume" option.	
9	Select a volume unit via the VOLUME_UNIT/UNIT VOLUME parameter, here m^3 for example.	
10	Select the SCALE_IN parameter, EU_0 element.	
	Enter the minimum hydrostatic pressure to be expected, here 0 mbar for example.	

	Description
11	Select the SCALE_IN parameter, EU_100 element .
	Enter the maximum hydrostatic pressure to be expected, here 350 mbar for example.
	Carry out linearization:
12	Select the SCALE_OUT parameter, EU_0 element.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
13	Select the SCALE_OUT parameter, EU_100 element.
	Specify the maximum tank contents to be expected, here 3.5 m^3 for example. See also Point 4 in the following note.
14	By means of the LINEARIZATION_TABLE_MODE/LIN. EDIT MODE parameter, select the "Semiautomatic" option.
15	By means of the LINEARIZATION_TABLE_SELECTION /TABLE SELECTION parameter, select the "Edit table" option.
16	Enter the linearization table (min. 2 points, max. 32 points).
	Fill the tank to the height of the 1st point.
	LINEARIZATION_TABLE_INDEX: enter the value of the corresponding point.
	The PRESSURE_1_AFTER_DAMPING/ SENSOR_PRESSURE parameter indicates the hydrostatic pressure present at the device. This hydrostatic pressure displayed is saved by confirming the Y-value. See the following line.
	LINEARIZATION_TABLE_Y_VALUE, 2nd element (Y-value): Enter the volume value, here 0 m^3 for example, and confirm the value.
17	You can enter further points for the linearization table as explained in Step 15. The previous point first has to be saved in the linearization table before the next point can be entered. This means that complete linearization tables cannot be saved in the device. Once all the points have been entered, the table must be activated by means of the LINEARIZATION_TABLE_POST_EDIT/TABLE ACTIVATE parameter.
18	Set the Pressure Transducer Block to the "Auto" block mode.
19	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.
20	Result: The linearization table has been entered and the device is ready for level measurement.

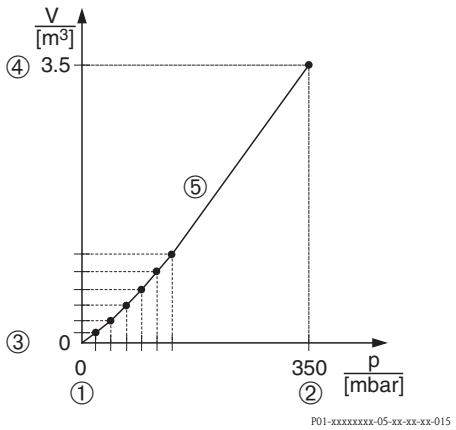


Fig. 11: Semiautomatic entry of the linearization table

1 See Table, Step 10.
2 See Table, Step 11.
3 See Table, Step 12.
4 See Table, Step 13.
5 See Table, Steps 14 to 17.

Note!

1. For this level mode, the measured variables %, volume and mass are available. → 58 ff.
2. You can also specify customer-specific units. See parameter description for CAL_UNIT (→ 52), HEIGHT_UNIT (→ 59), VOLUME_UNIT (→ 60) and MASS_UNIT (→ 61).

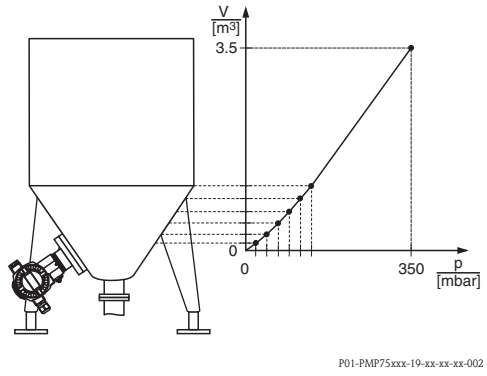
3. Once you have selected the "Pressure linearized" level mode (LEVEL_TYPE), the warning message "W710 Set span too small. Not allowed." can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-value of the linearization table, is smaller than the minimum span permitted (→ CAL_MIN_SPAN/MINIMUM SPAN, → 52). The message disappears as soon as the highest X-value is greater than the minimum span and the table entered is active.
4. Once you have entered the maximum tank contents to be expected for SCALE_OUT, EU_100 element, the alarm "A719 Y-Val of lin. table out of edit limits" can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest Y-value of the linearization table, is greater than the value entered for SCALE_OUT, EU_100 element. The message disappears as soon as no Y_value is greater than the value for SCALE_OUT, EU_100 element and the table entered is active.

5.5.2 Manual entry of the linearization table

Example:
In this example, the volume in a tank with a conical outlet should be measured in m^3.

Prerequisite:
- This is a theoretical calibration, i.e. the points for the linearization table are known.

Note!
- See also Operating Instructions BA301P for Deltabar S or Operating Instructions BA302P for Cerabar S or Operating Instructions BA372P for Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 51, Pressure Transducer Block.
  – → 89, Analog Input Block

	Description	
1	Perform calibration as per Section 5.5.1, Steps 1 to 10.	
	Carry out linearization:	
2	Select the SCALE_OUT parameter, EU_0 element.	
	Specify the minimum tank contents to be expected, here 0 m^3 for example.	
3	Select the SCALE_OUT parameter, EU_100 element.	
	Specify the maximum tank contents to be expected, here 3.5 m^3 for example. See also Point 3 in the following note.	
4	By means of the LINEARIZATION_TABLE_MODE/LIN. EDIT MODE parameter, select the "Manual" option.	
5	By means of the LINEARIZATION_TABLE_SELECTION /TABLE SELECTION parameter, select the "Edit table" option.	

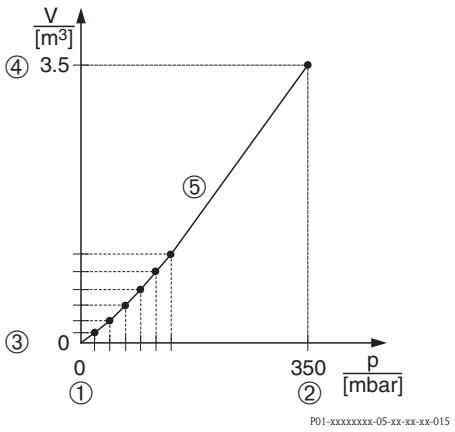
	Description	
6	Enter the linearization table (min. 2 points, max. 32 points).	
	LINEARIZATION_TABLE_INDEX: enter the value of the corresponding point.	
	LINEARIZATION_TABLE_Y_VALUE, 1st element (X-value): enter the pressure value.	
	LINEARIZATION_TABLE_Y_VALUE, 2nd element (Y-value): Enter the volume value, here 0 m^3 for example, and confirm.	
7	You can enter further points for the linearization table as explained in Step 6. The previous point first has to be saved in the linearization table before the next point can be entered. This means that complete linearization tables cannot be saved in the device. Once all the points have been entered, the table must be activated by means of the TAB_OBCODE/TABLE ACTIVATE parameter.	
8	Set the Pressure Transducer Block to the "Auto" block mode.	
9	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.	
10	Result: The linearization table has been entered and the device is ready for level measurement.	

Fig. 12: Manual entry of the linearization table

1 See Section 5.5.1, Table, Step 9.
2 See Section 5.5.1, Table, Step 10.
3 See this table, Step 2.
4 See this table, Step 3.
5 See this table, Steps 4 to 7.

Note!

1. For this level mode, the measured variables %, volume and mass are available. → 58 ff.
2. You can also specify customer-specific units. See parameter description for CAL_UNIT (→ 52), HEIGHT_UNIT (→ 59), VOLUME_UNIT (→ 60) and MASS_UNIT (→ 61).
3. Once you have entered the maximum tank contents to be expected for SCALE_OUT, EU_100 element, the alarm "A719 Y-Val of lin. table out of edit limits" can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest Y-value of the linearization table, is greater than the value entered for SCALE_OUT, EU_100 element. The message disappears as soon as no Y_value is greater than the value for SCALE_OUT, EU_100 element and the table entered is active.

5.6 "Height linearized" level mode

5.6.1 Dry calibration and manual entry of the linearization 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 linearization table are known.

Note!
- See also Operating Instructions BA301P for Deltabar S or Operating Instructions BA302P for Cerabar S or Operating Instructions BA372P for Deltapilot S, "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 📄 51, Pressure Transducer Block.
  – → 📄 89, Analog Input Block

	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 BA301P, Section 6.6.1
2	Open the Pressure Transducer Block and set the block mode to OOS.
3	The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).
	Perform calibration for the 1st measured variable:
4	Select the measuring mode if necessary: ■ Select the "Level combined" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Volume" option.
5	Select the "LEVEL standard" option by means of the "LEVEL SELECTION" parameter.
6	Select a pressure unit via the CAL_UNIT parameter, here mbar for example.
7	By means of the LEVEL_TYPE/LEVEL MODE parameter, select the "Height linearized" option.
8	By means of the MEASURAND_COMBINED/COMB. MEASURAND parameter, select the "Height + volume" option.
9	Select the unit for the 1st measured value via the HEIGHT_UNIT/HEIGHT UNIT parameter, here m for example.
10	Select the unit for the 2nd measured variable via the VOLUME_UNIT/UNIT VOLUME parameter, here m^3 for example.

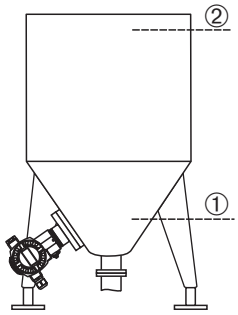


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Fig. 13: Calibrating the 1st measured variable

1 See Table, Step 11.
2 See Table, Step 12.

	Description
11	Select the LINEAR_LEVEL_MIN/LEVEL MIN parameter.
	Enter the minimum level to be expected, here 0 m for example.
12	Select the LINEAR_LEVEL_MAX/LEVEL MAX parameter.
	Enter the maximum level to be expected, here 3 m for example. See also Point 3 in the following note.
13	Select the "Dry" option via the LEVEL_ADJUST_MODE/ CALIBRATION MODE parameter (calibration mode for the 1st measured variable). See also Point 4 in the following note.
14	By means of the LEVEL_ADJUST_DENSITY/ADJUST DENSITY and DENSITY_UNIT/DENSITY UNIT parameters, enter a value for the density, here 1 kg/dm^3 for example.
15	Result: The calibration for the 1st measured variable is carried out.
	Perform linearization (calibration for the 2nd measured variable)
16	Select the SCALE_OUT parameter, EU_0 element.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
17	Select the SCALE_OUT parameter, EU_100 element.
	Specify the maximum tank contents to be expected, here 5 m^3 for example.
18	By means of the LINEARIZATION_TABLE_MODE/LIN. EDIT MODE parameter, select the "Manual" option.
19	By means of the LINEARIZATION_TABLE_SELECTION /TABLE SELECTION parameter, select the "Edit table" option.
20	Enter the linearization table (min. 2 points, max. 32 points).
	LINEARIZATION_TABLE_INDEX/LINE-NUMB: enter the value of the corresponding point.
	LINEARIZATION_TABLE_Y_VALUE, 1st element (X-value): enter the level, here 0 m for example.
	LINEARIZATION_TABLE_Y_VALUE, 2nd element (Y-value): Enter the volume value, here 0 m^3 for example.
21	You can enter further points for the linearization table as explained in Step 19. The previous point first has to be saved in the linearization table before the next point can be entered. This means that complete linearization tables cannot be saved in the device. Once all the points have been entered, the table must be activated by means of the LINEARIZATION_TABLE_POST_EDIT/TABLE ACTIVATE parameter.
22	Set the Pressure Transducer Block to the "Auto" block mode.
23	Where necessary, configure the CHANNEL (→ 92), L_TYPE (→ 93), XD_SCALE (→ 91) and OUT_SCALE (→ 92) parameters by means of the Analog Input Block.

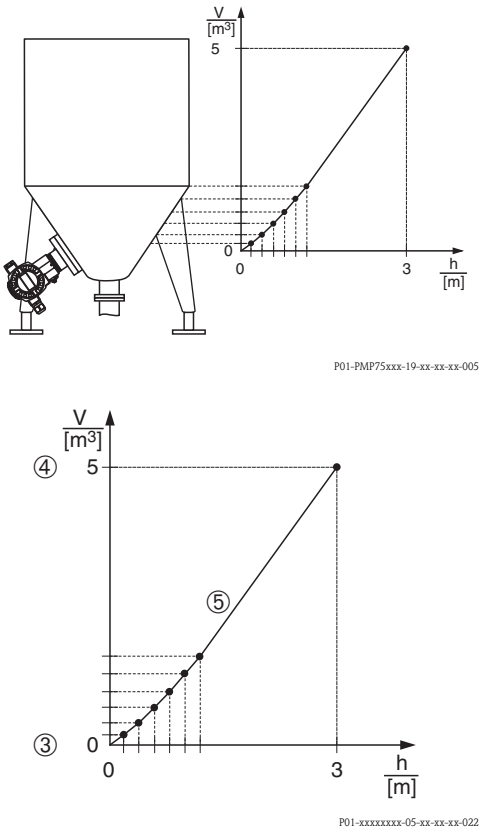


Fig. 14: Calibrating the 2nd measured variable

3 See Table, Step 16.
4 See Table, Step 17.
5 See Table, Steps 18 to 21.

	Description	
24	Result: – The linearization table has been entered. – The measured value display and the PRIMARY_VALUE parameter display the 2nd measured value (here the volume). – The MEASURED_LEVEL_AFTER_SIMULATION/ LEVEL BEFORE LIN parameter displays the 1st measured value (here the height). See also Point 5 in the following note.	

Note!

1. For this level mode, the measured variables "height + %", "height + volume", "height + mass", "%-height + %", "%-height + volume" and "%-height + mass" are available. → 59 ff.
2. You can also specify customer-specific units. See parameter description for CAL_UNIT (→ 52), HEIGHT_UNIT (→ 59), VOLUME_UNIT (→ 60) and MASS_UNIT (→ 61).
3. Once you have entered the maximum level to be expected for LINEAR_LEVEL_MAX/LEVEL MAX., the alarm "A707 X-Val of lin. table out of edit limits" can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-value of the linearization table, is greater than the maximum level entered. The message disappears as soon as the highest X-value is greater than the maximum level and the table entered is active.
4. The "Wet" calibration mode is not available by means of the FF operating programs.
5. You can use the DISPLAY_MAINLINE_CONTENT/MAIN LINE CONT. parameter (→ 84) to specify which measured value should be displayed on the local operation.

6 Flow measurement (FF configuration program)

6.1 Calibration

Example:
In this example, a volume flow should be measured in m^3/h.

Note!
- The "Flow measurement" measuring mode is only available for the Deltabar S differential pressure transmitter.
- See also Operating Instructions BA301P for Deltabar S, Section 6.5 "Flow measurement".
- For a description of the parameters mentioned, see
  – → 📄 51, Pressure Transducer Block.
  – → 📄 89, Analog Input Block.

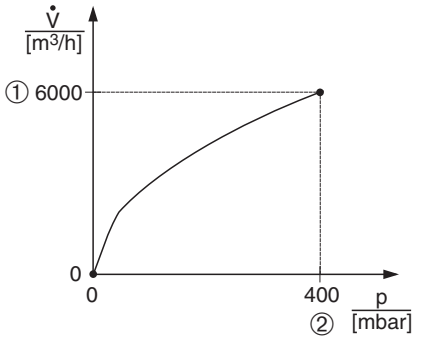
	Description	
1	Before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA301P.	
2	Open the Pressure Transducer Block and set the block mode to OOS.	
3	Carry out position adjustment if necessary. The following options are available for performing position adjustment: ■ By means of the parameters – PRESSURE_1_ACCEPT_ZERO_INSTALL_ OFFSET/POS.ZERO ADJUST (→ 📄 56) or – PRESSURE_1_ACCEPT_INSTALL_OFFSET/ POS. INPUT VALUE (→ 📄 56) or – PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET (→ 📄 56).	
4	Select the measuring mode if necessary: ■ Select the "Flow square root" option by means of the LINEARIZATION/LINEARIZATION parameter. ■ By means of the PRIMARY_VALUE_TYPE parameter, select the "Flow" option.	
5	Select a pressure unit via the CAL_UNIT parameter, here mbar for example.	
6	By means of the FLOW_TYPE/FLOW-MEAS. TYPE parameter, select the "Volume operat. cond." option.	
7	Select a flow unit via the FLOW_UNIT/UNIT FLOW parameter, here m^3/h for example.	
8	Select the SCALE_OUT parameter, EU_100 element.	
	Enter the maximum flow value of the primary device, here 6000 m^3/h for example. See also the layout sheet of the primary device.	
9	Select the SCALE_IN parameter, EU_100 element.	
	Enter the maximum pressure, here 400 mbar for example. See also the layout sheet of the primary device.	
10	Set the Pressure Transducer Block to the "Auto" block mode.	
11	Where necessary, configure the CHANNEL (→ 📄 92), L_TYPE (→ 📄 93), XD_SCALE (→ 📄 91) and OUT_SCALE (→ 📄 92) parameters by means of the Analog Input Block.	
12	Result: The device is configured for flow measurement.	

Fig. 15: Flow measurement calibration

1 See Table, Step 8.
2 See Table, Step 9.

Note!

1. By means of the FLOW_TYPE/FLOW-MEAS. TYPE parameter (→ 78), you can choose between the following flow types:
   – Volume operat. 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 p. cond. (mass under operating conditions)
2. The unit selected by means of the FLOW_UNIT/UNIT FLOW parameter (→ 79) has to suit the flow type selected (FLOW_TYP/FLOW-MEAS. TYPE, → 78).
3. In the lower measuring range, small flow quantities (creepages) can lead to large fluctuations in the measured value. You can activate low flow cut-off via the CREEP_FLOW_SUPPRESSION_ENABLE/LOW FLOW CUT-OFF parameter (→ 80).

6.2 Totalizer

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

Note!
- For a description of the parameters mentioned, see
  – → 78, DP Flow Transducer Block
  – → 89, Analog Input Block.
- Totalizer 1 can be reset. Totalizer 2 cannot be reset.

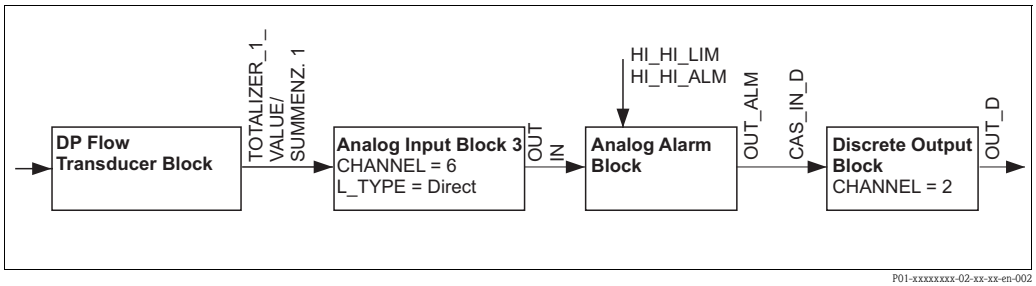
	Description
1	Calibrate the device in accordance with Section 6.1.
2	Open the DP Flow Transducer Block.
3	By means of the TOTALIZER_1_UNIT/TOTALIZER 1 UNIT parameter, select a flow unit, here m^3 E^3 for example.
4	Use the TOTALIZER_1_MODE/NEG. FLOW TOT. 1 parameter to specify the totalizing mode for negative flows, here the "Positive" option for example.
5	Reset totalizer 1 to zero via the TOTALIZER_1_RESET/ RESET TOTALIZER parameter.
6	Result: The TOTALIZER_1_VALUE parameter displays the totalized volume flow.

Note!
- You can also specify a customer-specific unit. → See parameter descriptions for TOTALIZER_1_UNIT (→ 82).
- You can use the DISPLAY_MAINLINE_CONTENT/MAIN LINE CONT. parameter (→ 84) to specify which measured value should be displayed on the local operation.
- The parameters for the 2nd totalizer, such as TOTALIZER_2_UNIT/TOTALIZER 2 UNIT, TOTALIZER_2_MODE/NEG. FLOW TOT. 2 and TOTALIZER_2_FLOAT/TOTALIZER 2 can be found in the Pressure Transducer Block.

6.2.1 Resetting totalizer 1 automatically

By means the Analog Alarm Block

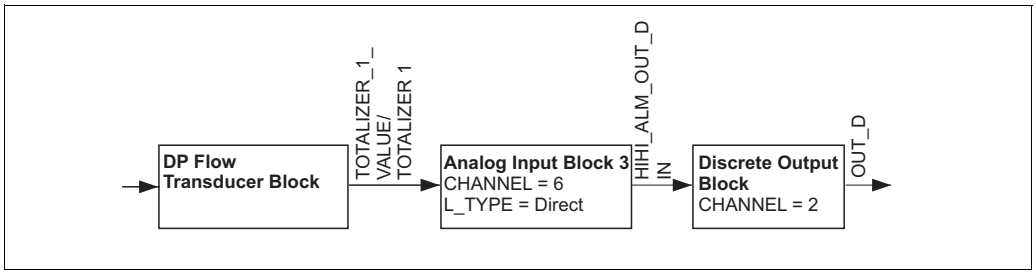
With the aid of the Analog Alarm and Discrete Output Block, totalizer 1 in the DP Flow Transducer Block can be reset automatically.



The DP Flow Transducer Block is connected to an Analog Input Block by means of the CHANNEL parameter (CHANNEL = 6). In the Analog Alarm Block, the HI_HI_LIM parameter is used to set a limit value at which the totalizer should be reset to zero. As soon as this limit value is overshot, the Analog Alarm Block transmits an alarm value to the downstream Discrete Output Block. The latter changes its output from 0 to 1 and thus resets the totalizer in the DP Flow Transducer Block to 0. The output of the Analog Alarm Block changes back to 0.

By means the Analog Input Block

With the aid of Analog Input and Discrete Output Block, totalizer 1 in the DP Flow Transducer Block can be reset automatically.



The DP Flow Transducer Block is connected to an Analog Input Block by means of the CHANNEL parameter (CHANNEL = 6). In the Analog Input Block, the HI_HI_LIM parameter is used to set a limit value at which the totalizer should be reset to zero. As soon as this limit valu is overshot, the Analog Input Block tranmits an alarm value to the downstream Discrete Output Block. The latter changes its output from 0 to 1 and thus resets the totalizer in the DP Flow Transducer Block to 0. The output of the Analog Input Block changes back to 0.

7 Parameter description (FF configuration program)

Note!

- With FOUNDATION Fieldbus, all the device parameters are categorized according to their functional properties and task and are assigned to the Resource Block, the Transducer Blocks and the function blocks. The parameters of the Resource Block, the Transducer Blocks and the Analog Input Block are described in this section. For a parameter description of the other function blocks, such as the PID or Discret Ouput Block, see Operating Instructions BA013S "FOUNDATION Fieldbus Overview" or the FOUNDATION Fieldbus Specification.
- Some parameters are only relevant if other parameters are appropriately configured. For example, the PRESSURE_1_UNIT_TEXT/CUSTOMER UNIT P parameter is only relevant if the "User unit" option was selected beforehand via the CAL_UNIT parameter. There is a comment in the parameter description here stating: Note: prerequisite: CAL_UNIT = User unit.
- Parameter names are written in upper case in the text.
- The menu path 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 "LINEARIZATION" 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.
- In the "Parameter name" column, the unique identification number (ID) of the parameter is indicated in brackets. This ID only appears on the local operation.

7.1 Cerabar S/Deltabar S/Deltapilot S block model

The Cerabar S/Deltabar S/Deltapilot S has the following blocks:

- Resource Block (device block)
- Transducer Blocks
  - Pressure Transducer Block
    This Block supplies the output variables PRIMARY_VALUE and SECONDARY_VALUE. It contains all the parameters to configure the measuring device for the measuring task such as measuring mode selection, linearization function and unit selection.
  - Service Transducer Block
    This Block supplies the output variables COUNTER P_PMAX, PRESSURE_1_ MAX_ RESETTABLE and PRESSURE_1_AFTER_DAMPING. It also includes all the counters for measuring range overshoot/undershoot for pressure and temperature, minimum and maximum measured values for pressure and temperature and the HistoROM function.
  - DP Flow Transducer Block (only Deltabar S)
    This Block supplies the output variable TOTALIZER_1_VALUE/TOTALIZER 1 and TOTALIZER_2_VALUE/TOTALIZER 2. It contains all the parameters that are needed to configure this totalizer.
  - Diagnostic Transducer Block
    This Block does not return any alarm messages. It contains the simulation function for the Pressure Transducer Block, parameters to configure the alarm response and the user limits for pressure and temperature.
  - Display Transducer Block
    This Block does not return any output variables. It contains all the parameters for configuring the local operation such as DISPLAY_LANGUAGE and DISPLAY_CONTRAST.
- Function blocks
  - Deltabar S: 3 Analog Input Blocks (AI), Cerabar S and Deltapilot S: 2 Analog Input Blocks (AI)
  - Discrete Output Block (DO)
  - PID Block (PID)
  - Arithmetic Block (ARB)
  - Signal Characterizer Block (SCB)
  - Input Selector Block (ISB)
  - Analog Alarm Block (AALB)
  - Integrator Block (IT)

– Discrete Input Block (DI)

Block configuration when device is delivered

The block model shown below illustrates the block configuration when the device is delivered.

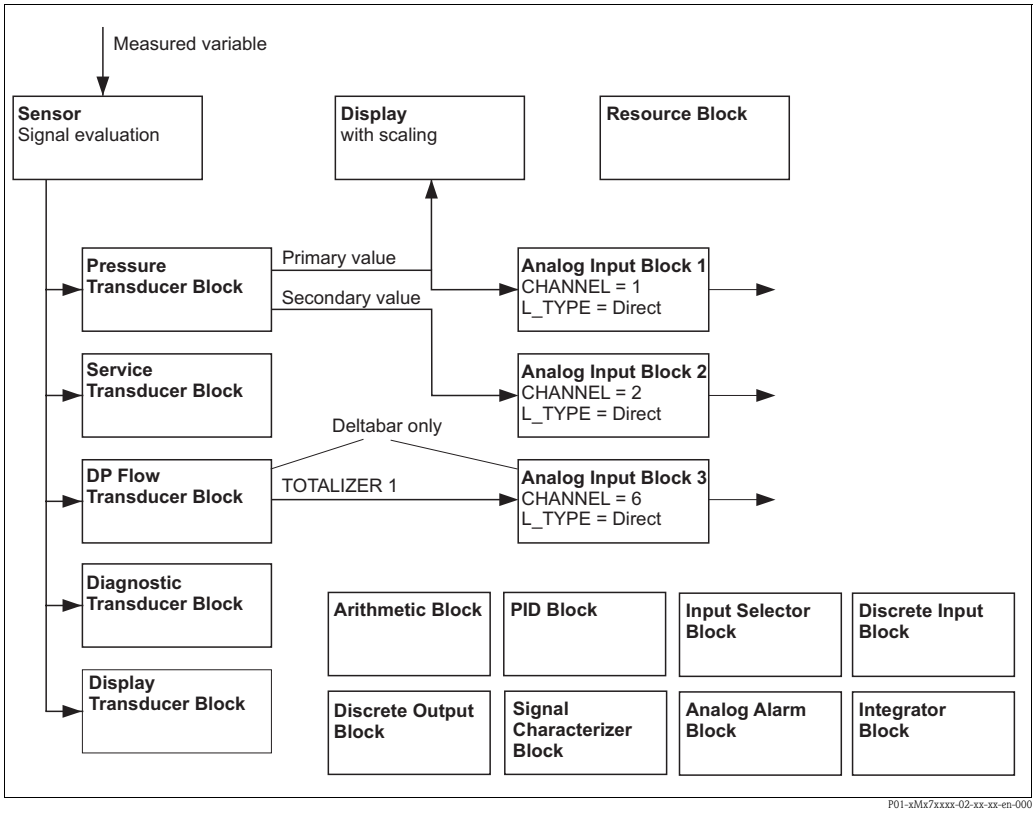


Fig. 16: Block configuration when delivered

Cerabar S/Deltapilot S

The Pressure Transducer Block returns the Primary Value (pressure measured value) and the Secondary Value (sensor temperature). The Primary Value and Secondary Value are each transmitted to an Analog Input Block via the CHANNEL parameter (→ 92, CHANNEL parameter description).
The Discrete Output, Discrete Input, PID, Arithmetic, Signal Characterizer, Input Selector, Integrator and Analog Alarm Block are not connected in the as-delivered configuration. (IT, DI)

Deltabar S

The Pressure Transducer Block returns the Primary Value (pressure measured value) and the Secondary Value (sensor temperature). In the DP Flow Transducer Block, the flow is totalized in the "Flow" measuring mode and output by means of the TOTALIZER_1_VALUE/TOTALIZER 1 parameter. The Primary Value, Secondary Value and TOTALIZER_1_VALUE are each transmitted to one Analog Input Block via the CHANNEL parameter (→ 92, CHANNEL parameter description).
The Discrete Output, PID, Arithmetic, Signal Characterizer, Input Selector and Analog Alarm Block are not connected in the as-delivered state. (IT, DI)

Note!
Please note that the links between the blocks are deleted and the FF parameters are reset to the default values following a reset by means of the RESTART parameter in the Resource Block, "Default" option.

7.2 Resource Block

Resource Block	
Parameter	**Description**
ST_REV Display Index: 1 Data type: unsigned16 Access: read only	Displays the counter for static parameters of the Resource Block. The counter is incremented by one with each change of a static parameter of the Resource Block. The counter counts up to 65535 and then starts again at zero.
TAG_DESC Entry Index: 2 Data type: octet string Access: auto, OOS	Enter a description for the related block or the measuring point e.g. TAG number (max. 32 alphanumeric characters).
STRATEGY Entry Index: 3 Data type: unsigned16 Access: auto, OOS	Enter user-specific value for grouping and thus faster evaluation of the blocks. Grouping takes place by entering the same numerical value for the STRATEGY parameter of the block in question. This value is neither checked nor processed by the Resource Block. **Input range:** 0 to 65535 **Factory setting:** 0
ALERT_KEY Entry Index: 4 Data type: unsigned8 Access: auto, OOS	Enter the identification number for the measuring device or for each individual block. The control level uses this identification number to sort alarm and event messages and initiate other processing steps. **Input range:** 1 to 255 **Factory setting:** 0
MODE_BLK Selection, display Index: 5 Data type: DS-69 Access: auto, OOS	The MODE_BLK parameter is a structured parameter consisting of four elements. The Resource Block supports the "Auto" (automatic) and OOS (out of service) modes. **TARGET** ■ Change the block mode. **ACTUAL** ■ Displays the current block mode. **PERMITTED** ■ Displays the modes supported by the block. **NORMAL** ■ Displays the block mode during standard operation.
BLOCK_ERR Display Index: 6 Data type: bit string Access: read only	Displays the active block error. **Possibilities**: ■ Out of service: the Resource Block is in the OOS block mode. ■ Simulation active: DIP switch 2 "Simulation" on the electronic insert is set to "on", i.e. simulation is possible.
RS_STATE Display Index: 7 Data type: unsigned8 Access: read only	Displays the current status of the Resource Block. **Possibilities**: ■ Standby: The Resource Block is in the OOS mode (out-of-service). The remaining blocks cannot be executed. ■ Online linking: The configured links between the function blocks have not yet been established. ■ Online: Standard block mode, the Resource Block operates in the auto mode. All the configured links between the function blocks have been established. If a link is missing, this parameter displays the "Online linking" status.

Resource Block	
Parameter	**Description**
TEST_RW/ TEST READ WRITE Display Index: 8 Data type: DS-85 Access: auto, OOS	This parameter is required only for the FF conformance test and has no meaning in normal operation.
DD_RESOURCE Index: 9 Data type: visible string Access: read only	String that indicates the tag of the resource that contains the device description for this resource.
MANUFAC_ID Display Index: 10 Data type: unsigned16 Access: read only	Displays the manufacturer's ID number. Endress+Hauser: 0 x 452B48 (decimal: 4533064)
DEV_TYPE Display Index: 11 Data type: unsigned16 Access: read only	Displays the device ID number. Deltabar S: hexadecimal: 1009, decimal: 4105. Cerabar S: hexadecimal: 1007, decimal: 4103. Deltapilot S: hexadecimal: 0x100B, decimal: 4107.
DEV_REV Display Index: 12 Data type: unsigned8 Access: read only	Displays the revision number of the device.
DD_REV Display Index: 13 Data type: unsigned8 Access: read only	Displays the revision number of the device description (DD).
GRANT_DENY Selection Index: 14 Data type: DS-70 Access: auto, OOS	Grant or restrict access authorization for a fieldbus host system to the device. This parameter is not evaluated by Deltabar S, Cerabar S and Deltapilot S.
HARD_TYPES Display Index: 15 Data type: bit string Access: read only	Displays the output signal type for the Output function blocks. Displays the input signal type for the Input function blocks.
RESTART Selection Index: 16 Data type: unsigned8 Access: r, w	Select the reset mode. **Options**: ■ ENP_RESTART: A restart is needed to accept the ENP configuration changes. ■ Run: Standard operating mode ■ Resource: This mode is not supported by Endress+Hauser. ■ Defaults: The device data and the links of the function blocks are reset to the factory settings. The manufacturer-specific parameters of the Transducer Block are not reset to the factory settings. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Factory setting" (reset) section. ■ Processor: Warm start of device, processor restart. ■ Factory: The links of the function blocks, all FF-specific and resettable manufacturer-specific parameters are reset to the factory setting.

Resource Block	
Parameter	**Description**
FEATURES Display Index: 17 Data type: bit string Access: read only	Displays the additional functions supported by the device. → See also this Table, FEATURE_SEL parameter description.
FEATURE_SEL/ FEATURE SELECTION Selection Index: 18 Data type: bit string Access: auto, OOS	Select the additional device functions. The additional functions that the device supports are displayed in the FEATURES parameter (→ 42).
CYCLE_TYPE Display Index: 19 Data type: bit string Access: read only	Displays the block execution methods supported by the device. → See also this Table, CYCLE_SEL parameter description.
CYCLE_SEL Display Index: 20 Data type: bit string Access: auto, OOS	Displays the block execution method used by the fieldbus host system. The block execution method is selected by the fieldbus host system. **Possibilities**: ■ Scheduled: cyclical block execution method ■ Block execution: sequential block execution method
MIN_CYCLE_T Display Index: 21 Data type: Unsigned32 Access: read only	Displays the shortest MACROCYCLE supported by the device. **Factory setting:** 3200 $^{1}/_{32}$ ms (≅ 100 ms)
MEMORY_SIZE Display Index: 22 Data type: DS-69 Access: read only	Displays the available configuration memory in kilobytes. This parameter is not supported by Deltabar S, Cerabar S and Deltapilot S.
NV_CYCLE_T/ NONVOLATILE CYCLE TIME Display Index: 23 Data type: Unsigned32 Access: read only	Displays the time interval for which the dynamic device parameters are stored in the nonvolatile memory. Since the Cerabar S, Deltabar S and Deltapilot S units do not store the dynamic device parameters in the nonvolatile memory, the parameter always displays the value 0 $^{1}/_{32}$ ms.
FREE_SPACE Display Index: 24 Data type: float Access: read only	Displays the system memory (in percent) available for the execution of further function blocks. **Input range:** 0 to 100 %
FREE_TIME Display Index: 25 Data type: float Access: read only	Displays the free system time (in percent) available for the execution of further function blocks. **Input range:** 0 to 100 %

Resource Block	
Parameter	**Description**
SHED_RCAS/ SHED REMOTE CASCADE Entry Index: 26 Data type: Unsigned32 Access: auto, OOS	Enter the monitoring time for checking the connection between the fieldbus host system and the PID function block in the RCAS block mode. On expiry of this monitoring time the PID function block switches from the RCAS block mode to the block mode selected via the SHED_OPT parameter. **Factory setting:** 640000 $^{1}/_{32}$ ms
SHED_ROUT/ SHED REMOTE OUT Entry Index: 27 Data type: Unsigned32 Access: auto, OOS	Enter the monitoring time for checking the connection between the fieldbus host system and the PID function block in the ROUT block mode. On expiry of this monitoring time the PID function block switches from the ROUT block mode to the block mode selected via the SHED_OPT parameter. **Factory setting:** 640000 $^{1}/_{32}$ ms
FAULT_STATE Display Index: 28 Data type: unsigned8 Access: read only	Current status display of the fault state of the Discrete Output function block. **Possibilities**: ■ Uninititalized ■ Clear (fault state not active) ■ Active (fault state active)
SET_FSTATE/ SET FAULT STATE Selection Index: 29 Data type: unsigned8 Access: auto, OOS	Activate the fault state of the Discrete Ouput function block manually. → See also this Table, CLR_FSTATE parameter description. **Possibilities**: ■ Uninititalized ■ Off ■ Set (the fault state is enabled)
CLR_FSTATE/ CLEAR FAULT STATE Selection Index: 30 Data type: unsigned8 Access: auto, OOS	Deactivate the fault state of the Discrete Ouput function block manually. →See also this Table, SET_FSTATE parameter description. **Possibilities**: ■ Uninititalized ■ Off ■ Clear (fault state is disabled)
MAX_NOTIFY Display Index: 31 Data type: unsigned8 Access: read only	Displays the number of event reports supported by the device that can exist unconfirmed at the same time. → See also this Table, LIM_NOTIFY parameter description.
LIM_NOTIFY Entry Index: 32 Data type: unsigned8 Access: auto, OOS	Enter the maximum possible number of event reports that can exist unconfirmed at the same time. This parameter is not evaluated by Deltabar S, Cerabar S and Deltapilot S.
CONFIRM_TIME Entry Index: 33 Data type: Unsigned32 Access: auto, OOS	Enter the confirmation time for the event report. If the device does not receive confirmation within this time, the event report is sent to the fieldbus host system again. **Factory setting:** 640000 $^{1}/_{32}$ ms

Resource Block	
Parameter	**Description**
WRITE_LOCK Display Index: 34 Data type: unsigned8 Access: read only	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 SW_LOCK/INSERT PIN No parameter (→ 46), you can only unlock operation again by means of this parameter. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Locking/unlocking operation" section. **Possibilities**: ■ Locked: Security locking switched on, i.e. the parameters cannot be written to. ■ Not locked: Security locking switched off. Depending on the block mode in question, it is possible to write to the parameters (→ see Tables, "Parameter" column, access). **Factory setting:** Locked (locking switched on)
UPDATE_EVT Display Index: 35 Data type: DS-73 Access: read only	The UPDATE_EVT parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ This element is set to "Unacknowledged" as soon as a static parameter changes. **UPDATE_STATE** ■ Indicates whether the change was reported. **TIME_STAMP** ■ Displays the date and time when a static parameter was changed. **STATIC_REVISION** ■ The revision counter is increased each time a static parameter is changed. **RELATIVE_INDEX** ■ Displays the altered parameter in the form of the relative index. See also this Table, "Parameter, Index" column.
BLOCK_ALM Display, selection Index: 36 Data type: DS-72 Access: auto, OOS	The BLOCK_ALM parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ If the "Deactivated" option was selected for the alarm that occurred by means of the ACK_OPTION parameter, this alarm can only be acknowledged by means of this element. **ALARM_STATE** ■ Use this function to display the current block condition with information on pending configuration, hardware or system errors. The following block alarm messages are possible with the Resource Block: – Simulate active – Out of service **TIME_STAMP** ■ Displays the time when the alarm occurred. **SUB_CODE** ■ Displays the reason why the alarm was reported. **VALUE** ■ Displays the value of the corresponding parameter at the time the alarm was reported.
ACK_OPTION Selection Index: 38 Data type: bit string Access: auto, OOS	Use this parameter to specify the process alarm to be acknowledged automatically as soon as it is detected by the fieldbus host system. If the option is activated for a process alarm, this process alarm is acknowledged automatically by the fieldbus host system. **Options**: ■ DiscAlm: write protection alarm ■ BlockAlm: block alarm ✎ Note! The message has to be acknowledged via the BLOCK_ALM parameter, UNACKNOWLEDGE element for process alarms for which automatic confirmation is not active. **Factory setting:** The option is not active for any process alarm, i.e. every process alarm message must be acknowledged manually.
WRITE_PRI Entry Index: 39 Data type: unsigned8 Access: read only	If write protection is disabled, an alarm is issued. Use this parameter to specify the priority which should be assigned to this alarm. **Input range:** ■ 0 to 15 ■ 0: The alarm is suppressed. ■ 15: Critical alarm with the highest priority.

Resource Block	
Parameter	**Description**
WRITE_ALM Display Index: 40 Data type: DS-72 Access: read only	The WRITE_ALM parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ If the "Deactivated" option was selected for the alarm that occurred by means of the ACK_OPTION parameter, this alarm can only be acknowledged by means of this element. **ALARM_STATE** ■ Displays the status of the write protection alarm. **TIME_STATE** ■ Displays the time when the alarm occurred. **SUB_CODE** ■ Displays the reason why the alarm was reported. **VALUE** ■ Displays the value of the corresponding parameter at the time the alarm was reported.
ITK_VER Display Index: 41 Data type: unsigned16 Access: read only	Displays the revision version of the interoperability test kit (ITK).
ALARM_SUM Display, selection Index: 45 Data type: DS-74 Access: auto, OOS	The ALARM_SUM parameter is a structured parameter consisting of four elements. **CURRENT** ■ Displays the current status of the process alarms in the Resource Block. The following alarms are possible: DiscAlm and BlockAlm. **UNACKNOWLEDGED** ■ Displays the process alarms not confirmed. **UNREPORTED** ■ Displays the process alarms not reported. **DISABLED** ■ Possibility of deactivating process alarms.
CAPABILITY_LEVEL Index: 55 Data type: UNSIGNED8 Access:	This parameter is integrated into a device to indicate what capability level is supported by the device: 1. Mnemonic parameter name: CAPABILITY_LEV 2. Object type/structure: UNSIGNED8 3. Use/model: C/Contained 4. Store: S 5. Size: 1 6. Valid range: 0-255 7. Initial value: 0 8. Direction: 9. Units: not specified 10. Rights: 11. Mode: 12. Other: read only 13. Range check: 14. Block access: not part of View 1, 2, 3, 4 15. Description: capability level supported by the device. A value of zero (0) indicates that the device does not support multiple capability levels.

Resource Block	
Parameter	**Description**
Endress+Hauser Resource Block parameters	
DEVICE_DIALOG/ DEVICE DIALOG Display Index: 42 Data type: unsigned8 Access: read only	If configuration is unsuitable, this parameter displays a message indicating that a configuration error is present. The message can also refer to the parameter that was configured incorrectly.
SW_LOCK/ INSERT PIN No Entry Index: 43 Data type: unsigned16 Access: auto, OOS	For entering a code to lock or unlock operation. Note! ■ The -symbol on the local operation 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 remote operation, you can only unlock operation again using remote operation. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Locking/unlocking operation" section. **Options:** ■ Lock: Enter a number between 0 and 9999 and ≠100. ■ Unlock: Enter the number 100. **Factory setting:** 100
STATUS_LOCKING Index: 44 Data type: UNSIGNED8 Access:	Displays the current locking status of the device or conditions that can lock the device (hardware locking, software locking).
HARDWARE_REVISION Display Index: 45 Data type: visible string Access: read only	Displays the revision number of the main electronics e.g. V01.00
ELECTRONIC _SERIAL _NUMBER/ ELECTR. SERIAL No. Display Index: 46 Data type: float Access: read only	Displays the serial number of the main electronics (11 alphanumeric characters).
PROCESS_CONNEC- TION_MODEL/ PROC.CONN.TYPE Selection Index: 47 Data type: unsigned16 Access: auto, OOS	For selecting and displaying the process connection type. **Options:** ■ Not used ■ Unknown ■ Special ■ Oval flange ■ Thread female ■ Thread male ■ Flange ■ Remote seal

Resource Block	
Parameter	**Description**
PROCESS_CONNEC-TION_MATERIAL_ POSITIVE/ MAT. PROC. CONN. + Selection Index: 48 Data type: float Access: auto, OOS	For selecting and displaying the material of the process connection (P+). → See also parameter description for MAT. PROC. CONN. - **Options:** ■ 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 **Factory setting:** As per order specifications
PROCESS_CONNEC-TION_MATERIAL_ NEGATIVE/MAT. PROC. CONN. – Selection Index: 49 Data type: float Access: auto, OOS	For selecting and displaying the material of the process connection (P–). → See also parameter description for MAT. PROC. CONN. +
PROCESS_FLANGE_ GASKET_MATERIAL/ SEAL TYPE Selection Index: 50 Data type: visible string Access: auto, OOS	For selecting and displaying the material of the process seal. **Options:** ■ 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
UP_DOWN_FEATURE_ SUPPORTED Index: 51 Data type:UNSIGNED8 Access:	No function. Reserved for future use.

Resource Block	
Parameter	**Description**
UP_DOWN_CTRL Index: 52 Data type: UNSIGNED8 Access:	No function. Reserved for future use.
UP_DOWN_ PARAMETER Index: 53 Data type: octet Access:	No function. Reserved for future use.
SCI_OCTET_STR Display Index: 54 Data type: visible string Access: read only	Internal service parameter.
ENP_VER Index: 56 Data type: visible string Access:	This parameter indicates the version of the standard for electronic nameplates supported by the device.
ENP_DEVICE_TAG Index: 57 Data type: visible string Access:	The DEVICE_TAG currently configured via the device.
ENP_SER_NUM/ DEVICE SERIAL No. Display Index: 58 Data type: float Access: read only	Displays the serial number of the device (11 alphanumeric characters).
ENP_ORDER_CODE/ DEVICE DESIGN. Display Index: 59 Data type: visible string Access: read only	Displays the device designation and the order code.
ENP_FW_VER Display Index: 60 Data type: float Access: read only	Displays the software version e.g.: V03.00.
RESOURCE_DIR Index: 61 Data type: visible string Access:	This parameter is a field of the UINT16 parameter which describes the arrangement of the extended parameters in groups. – Group ID (UINT16) – Number of the parameter in the group (UINT16) – Relative group revision index in the Resource Block of the first parameter in the group (UINT16)

7.3 Transducer Blocks

7.3.1 FOUNDATION Fieldbus Transducer Blocks standard parameters

Transducer Block, FOUNDATION Fieldbus standard parameters (all Transducer Blocks)	
Parameter	**Description**
ST_REV Display Index: 1 Data type: usigned16 Access: read only	Displays the counter for static parameters of the Transducer Block. The counter is incremented by one with each change of a static parameter of the corresponding Transducer Block. The counter counts up to 65535 and then starts again at zero.
TAG_DESC Entry Index: 2 Data type: octet string Access: auto, OOS	Enter a description for the related block or the measuring point e.g. TAG number (max. 32 alphanumeric characters). **Factory setting:** Empty field
STRATEGY Entry Index: 3 Data type: unsigned16 Access: auto, OOS	Enter user-specific value for grouping and thus faster evaluation of the blocks. Grouping takes place by entering the same numerical value for the STRATEGY parameter of the block in question. These data are neither checked nor processed by the Transducer Blocks. **Input range:** 0 to 65535 **Factory setting:** 0
ALERT_KEY Entry Index: 4 Data type: unsigned8 Access: auto, OOS	Enter the identification number for the measuring device or for each individual block. The control level uses this identification number to sort alarm and event messages and initiate other processing steps. **Input range:** 1 to 255 **Factory setting:** 0
MODE_BLK Selection, display Index: 5 Data type: DS-69 Access: auto, OOS	The MODE_BLK parameter is a structured parameter consisting of four elements. The Transducer Blocks support the "Auto" (automatic) and OOS (out of service) modes. **TARGET** ■ Change the block mode. **ACTUAL** ■ Displays the current block mode. **PERMITTED** ■ Displays the modes supported by the block. **NORMAL** ■ Displays the block mode during standard operation. ✎ Note! Measured values or information can be forwarded to an Analog Input Block via the Pressure, Service and DP Flow Transducer Block. If the Pressure Transducer Block is set to the OOS block mode, the Primary Value and Secondary Value continue to be updated but the status of the downstream Analog Input Block changes to BAD.
BLOCK_ERR Display Index: 6 Data type: bit string Access: read only	Displays the warning messages and error messages of the software and hardware of the Transducer Block in question. In addition, this parameter triggers an alarm. If two or more messages occur simultaneously, the message with the highest priority is shown on the display. For the Pressure, Service and Totalizer Block, see possible messages, these Operating Instructions, Section 12.1 "Messages". The Display and Diagnostic Block do not display any warnings or error messages.

Transducer Block, FOUNDATION Fieldbus standard parameters (all Transducer Blocks)	
Parameter	**Description**
UPDATE_EVT Display Index: 7 Data type: DS-73 Access: read only	The UPDATE_EVT parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ This element is set to "Unacknowledged" as soon as a static parameter changes. **UPDATE_STATE** ■ Indicates whether the change was reported. **TIME_STAMP** ■ Displays the date and time when a static parameter was changed. **STATIC_REVISION** ■ The revision counter is increased each time a static parameter is changed. **RELATIVE_INDEX** ■ Displays the altered parameter in the form of the relative index. See also this Table, "Parameter, Index" column.
BLOCK_ALM Display, selection Index: 8 Data type: DS-72 Access: auto, OOS	The BLOCK_ALM parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ If the "Deactivated" option was selected for the alarm that occurred by means of the ACK_OPTION parameter, this alarm can only be acknowledged by means of this element. **ALARM_STATE** ■ Use this function to display the current block condition with information on pending configuration, hardware or system errors. **TIME_STAMP** ■ Displays the date and time when the alarm occurred. **SUB_CODE** ■ Displays the reason why the alarm was reported. **VALUE** ■ Displays the value of the corresponding parameter at the time the alarm was reported.
TRANSDUCER_ DIRECTORY Display Index: 9 Data type: unsigned16 Access: read only	A directory that specifies the number of transducers, and their indexes, mapped in the Pressure Transducer Block. This parameter is only displayed in the Pressure Transducer Block. **Display:** 0: Only one transducer is mapped in the Pressure Transducer Block.
TRANSDUCER_ TYPE Display Index: 10 Data type: unsigned16 Access: read only	Displays the Transducer Block type.
XD_ERROR Display Index: 11 Data type: usigned8 Access: read only	Displays the active device state. → See also these Operating Instructions, Section 12.1 "Messages". **Prerequisite:** ■ Pressure Transducer Block ■ Service Transducer Block ■ DP Flow Transducer Block (only Deltabar S)
COLLECTION_ DIRECTORY Display Index: 12 Data type: Unsigned32 Access: read only	A directory that specifies the number of parameter groups (data collection), and their indexes and DD item IDS, mapped in the Pressure Transducer Block. This parameter is only displayed in the Pressure Transducer Block. **Display:** 0: This parameter is not used.

7.3.2 Pressure Transducer Block

Pressure Transducer Block	
Parameter	**Description**
PRIMARY_VALUE_TYPE Selection Index: 13 Data type: unsigned16 Access: OOS	Select the measuring mode and the measured variable by means of this parameter and the LINEARIZATION/LINEARIZATION parameter (→ 54). → See also Operating Instructions for Deltabar S (BA301P) and Cerabar S (BA302P) or BA372P (Deltapilot S), "Selecting the language and measuring mode" section. **Options:** ■ Differential pressure with Deltabar S ■ Deltapilot S with gauge pressure sensors ■ Gauge pressure with Cerabar S with gauge pressure sensors ■ Absolute pressure with Cerabar S with absolute pressure sensors ■ Level ■ Volume ■ Mass ■ Flow (only Deltabar S) ■ Tank content (PV) in % ✎ Note! Make sure that the unit selected by means of the SCALE_OUT parameter, "Units Index" element suits the measured variable.
PRIMARY_VALUE Display Index: 14 Data type: DS-65 Access: read only	The PRIMARY_VALUE parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the primary value - a pressure, level or flow value depending on the measuring mode. **STATUS** ■ Displays the status of the primary value. ✎ Note! You can transmit the value and status of the PRIMARY_VALUE parameter via the CHANNEL parameter (→ 92) in the Analog Input Block. The CHANNEL must be set to "1" for this purpose.
PRIMARY_VALUE_ RANGE Display Index: 15 Data type: DS-68 Access: read only	The PRIMARY_VALUE_RANGE parameter is a structured parameter consisting of four elements. **EU_100** ■ Displays the upper limit for the primary value. **EU_0** ■ Displays the lower limit for the primary value. **UNITS_INDEX** ■ Displays the unit. **DECIMAL** ■ Displays the number of decimal places. ✎ Note! The PRIMARY_VALUE_RANGE parameter corresponds to the SCALE_OUT parameter (→ 55).
CAL_POINT_HI/ HIGH SENSOR TRIM Entry Index: 16 Data type: float Access: OOS	Enter the upper point of the sensor characteristic curve in the event of sensor recalibration. By means of this parameter, you can assign a new target pressure value to a reference pressure present at the device. The pressure value present and the target pressure value specified for this parameter correspond to the upper point in the sensor characteristic curve. Position adjustment has to be performed again for the device following sensor recalibration. ✎ Note! ■ The sensor recalibration can be reset via the RESET_INPUT_VALUE/ENTER RESET CODE parameter (→ 89) with the "2509" code. ■ The PRESSURE_1_UPPER_CAL_MEASURED/HI TRIM MEASURED parameter (→ 57) displays the pressure value that was present at the device during calibration and was used for calibrating the upper point of the sensor characteristic curve. ■ For calibrating the lower point of the sensor characteristic curve, see the parameter description for CAL_POINT_LO/LOW SENSOR TRIM. Factory setting: High sensor limit (→ SENSOR_RANGE, EU_100 element)

Pressure Transducer Block	
Parameter	**Description**
CAL_POINT_LO/ LOW SENSOR TRIM Entry Index: 17 Data type: float Access: OOS	Enter the lower point of the sensor characteristic curve in the event of sensor recalibration. By means of this parameter, you can assign a new target pressure value to a reference pressure present at the device. The pressure value present and the target pressure value specified for this parameter correspond to the lower point in the sensor characteristic curve. Position adjustment has to be performed again for the device following sensor recalibration. Note! ■ The sensor recalibration can be reset via the RESET_INPUT_VALUE/ENTER RESET CODE parameter (→ 89) with the "2509" code. ■ The PRESSURE_1_LOWER_CAL_MEASURED/LO TRIM MEASURED parameter (→ 57) displays the pressure value that was present at the device during calibration and was used for calibrating the lower point of the sensor characteristic curve. ■ For calibrating the upper point of the sensor characteristic curve, see the parameter description for CAL_POINT_HI/HIGH SENSOR TRIM. Factory setting: Low sensor limit (→ SENSOR_RANGE, EU_0 element)
CAL_MIN_SPAN/ MINIMUM SPAN Display Index: 18 Data type: float Access: OOS	Displays the smallest possible span.
CAL_UNIT Entry Index: 19 Data type: unsigned16 Access: OOS	Select the pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit. **Options:** ■ mbar, bar ■ mmH_2O, mH_2O, inH_2O, ftH_2O ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also parameter descriptions for PRESSURE_1_UNIT_TEXT/CUSTOMER UNIT P (→ 57) and PRESSURE_1_UNIT_SCALE/CUST. UNIT FACT. P (→ 57). **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications
SENSOR_TYPE Selection Index: 20 Data type: unsigned16 Access: OOS	Displays the sensor type.
SENSOR_RANGE Display Index: 21 Data type: DS-68 Access: read only	The SENSOR_RANGE parameter is a structured parameter consisting of four elements. **EU_100** ■ Displays the upper measuring limit of the sensor. **EU_0** ■ Displays the lower measuring limit of the sensor. **UNITS_INDEX** ■ Displays the unit selected. **DECIMAL** ■ Displays the number of decimal places.

Pressure Transducer Block	
Parameter	**Description**
SENSOR_SN/ SENSOR SER. NO. Display Index: 22 Data type: visible string Access: read only	Displays the serial number of the sensor (11 alphanumeric characters).
SENSOR_CAL_METHOD Selection Index: 23 Data type: unsigned8 Access: OOS	For displaying and selecting the last sensor calibration mode used.
SENSOR_CAL_LOC Entry Index: 24 Data type: visible string Access: OOS	Enter the place the sensor was calibrated (32 alphanumeric characters).
SENSOR_CAL_DATE Entry Index: 25 Data type: date Access: OOS	Enter the date and time the sensor was calibrated.
SENSOR_CAL_WHO Entry Index: 26 Data type: visible string Access: OOS	Enter the name of the person who calibrated the sensor (32 alphanumeric characters).
SENSOR_ISOLATOR_ MTL Display Index: 27 Data type: unsigned16 Access: read only	Displays the membrane material.
SENSOR_FILL_FLUID Display Index: 28 Data type: unsigned16 Access: read only	Displays the filling fluid.
SECONDARY_VALUE Display Index: 29 Data type: DS-65 Access: read only	The SECONDARY_VALUE parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the second process value, here the sensor temperature. **STATUS** ■ Displays the status of the second process value. ✎ Note! You can transmit the value and status of the SECONDARY_VALUE parameter via the CHANNEL parameter (→ 🖹 92) in the Analog Input Block. The CHANNEL must be set to "2" for this purpose.
SECONDARY_VALUE_ UNIT Selection Index: 30 Data type: unsigned16 Access: auto, OOS	Select the unit for the second process value. → See also parameter description for SECONDARY_VALUE.

Pressure Transducer Block	
Parameter	**Description**
DEVICE_DIALOG/ DEVICE DIALOG Display Index: 31 Data type: unsigned8 Access: read only	If configuration is unsuitable, this parameter displays a message indicating that a configuration error is present. The message can also refer to the parameter that was configured incorrectly.
LINEARIZATION/ LINEARIZATION Selection Index: 34 Data type: unsigned8 Access: OOS	Select the measuring mode and the measured variable by means of this parameter and the PRIMARY_VALUE_TYPE parameter (→ 🖹 51). → See also Operating Instructions for Deltabar S (BA301P) and Cerabar S (BA302P) or BA372P (Deltapilot S), "Selecting the language and measuring mode" section. **Options:** ■ No linearization ("Pressure" or "Level" measuring mode) ■ Level linearized ("Level" measuring mode) ■ Level combined ("Level" measuring mode) ■ % level combined ("Level" measuring mode) ■ Flow square root ("Flow" measuring mode) The option selected for this parameter can also affect the setting of the LEVEL_TYPE/LEVEL MODE parameter (→ 🖹 58), e.g. if "Level linearized" is selected, the LEVEL_TYP/LEVEL MODE parameter is set to the "Pressure linearized" option. ✎ Note! Make sure that the unit selected by means of the SCALE_OUT parameter, "Units Index" element suits the measured variable.
SCALE_IN Entry Index: 35 Data type: DS-65 Access: auto, OOS	The SCALE_IN parameter is a structured parameter consisting of four elements. **EU_100** ■ "Pressure" measuring mode; "Level easy pressure" measuring mode; "Level easy height" measuring mode; "Level standard" measuring mode, "Linear" or "Height linearized" level mode: enter the upper limit for the pressure value of the Transducer Block. ■ "Level standard" measuring mode, "Pressure linearized" level mode: 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. ■ "Flow" measuring mode: Enter the maximum pressure of the primary device. → See the layout sheet of primary device. This value is assigned to the maximum flow value (→ See the following SCALE_OUT parameter, EU_100 element). ■ Factory setting: Upper range limit of the sensor **EU_0** ■ "Pressure" measuring mode; "Level easy pressure" measuring mode; "Level easy height" measuring mode; "Level standard" measuring mode, "Linear" or "Height linearized" level mode, "Flow" measuring mode: enter the lower limit for the pressure value of the Transducer Block. ■ "Level standard" measuring mode, "Pressure linearized" level mode: 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. ■ Factory setting: 0 **UNITS_INDEX** ■ Select the unit for input scaling. **DECIMAL** ■ Displays the number of decimal places.

Pressure Transducer Block	
Parameter	**Description**
SCALE_OUT Entry Index: 36 Data type: DS-68 Access: OOS	The SCALE_OUT parameter is a structured parameter consisting of four elements. **EU_100** ■ "Pressure" measuring mode; "Level easy pressure" measuring mode; "Level easy height" measuring mode; "Level standard" measuring mode, "Linear" level mode: enter the upper limit for the output value of the Transducer Block. Factory setting: 100 ■ "Level standard" measuring mode, "Pressure linearized" or "Height linearized" level mode: 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. Factory setting: 100 ■ "Flow" measuring mode: Enter the maximum flow of the primary device. See also the layout sheet of the primary device. The maximum flow is assigned to the maximum pressure you enter via the SCALE_IN parameter, EU_100 element. Factory setting: 1.0 **EU_0** ■ "Pressure" measuring mode; "Level easy pressure" measuring mode; "Level easy height" measuring mode; "Level standard" measuring mode, "Linear" level mode; "Flow" measuring mode: enter the lower limit for the output value of the Transducer Block. ■ "Level standard" measuring mode, "Pressure linearized" or "Height linearized" level mode: 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. ■ Factory setting: 0 **UNITS_INDEX** ■ Select the unit for output scaling. **DECIMAL** ■ Enter the number of decimal places. ✎ Note! Make sure that the unit selected by means of the SCALE_OUT parameter, "Units Index" element suits the measured variable. → See also the parameter descriptions for PRIMARY_ VALUE_TYPE (→ 🖹 51) and LINEARIZATION (→ 🖹 54).
ACTIVE_ PRESSURE _1_DAMPING/ DAMPING VALUE Entry Index: 37 Data type: float Access: auto, OOS	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value (Primary Value) and output value of the Analog Input Block react to a change in the pressure. **Input range:** 0.0 to 999.0 s **Factory setting:** 2.0 s or as per order specification

Pressure Transducer Block	
Parameter	**Description**
PRESSURE_1_ACCEPT_ ZERO_INSTALL_OFFSET /POS.ZERO ADJUST Selection Index: 38 Data type: unsigned8 Access: auto, OOS	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 or partly filled, the PRIMARY_VALUE parameter does not display zero. This parameter provides the possibility of performing position adjustment where the pressure difference between zero (set point) and the measured pressure need not be known. (A reference pressure is present at the device.) **Example:** – PRIMARY VALUE = 2.2 mbar – Correct the PRIMARY VALUE via the PRESSURE_1_ACCEPT_ZERO_ INSTALL_OFFSET parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. – PRIMARY VALUE (after pos. zero adjust) = 0.0 mbar The PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET parameter (→ 56) displays the resulting pressure difference (offset) by which the PRIMARY_VALUE was corrected. **Options**: ■ Abort ■ Confirm **Factory setting:** 0.0
PRESSURE_1_ACCEPT_ INSTALL_OFFSET/POS. INPUT VALUE Entry Index: 39 Data type: float Access: auto, OOS	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 or partly filled, the PRIMARY_VALUE parameter does not display zero or the desired value. This parameter provides the possibility of performing position adjustment where the pressure difference between zero (set point) and the measured pressure need not be known. (A reference pressure is present at the device.) **Example:** – PRIMARY VALUE = 0.5 mbar – For the PRESSURE_1_ACCEPT_INSTALL_OFFSET parameter, specify the desired set point for the PRIMARY_VALUE, for example 2 mbar. (The following applies: $PRIMARY\_VALUE_{new}$ = PRESSURE_1_ACCEPT_INSTALL _OFFSET) – PRIMARY VALUE (after entry for PRESSURE_1_ACCEPT_INSTALL_OFFSET) = 2.0 mbar – The PRESSURE_1_INSTALL_OFFSET/CALIB. OFFSET parameter (→ 56) displays the resulting pressure difference (offset) by which the PRIMARY_VALUE was corrected. (The following applies: PRESSURE_1_INSTALL_OFFSET = $PRIMARY\_VALUE_{old}$ – PRESSURE_1_ACCEPT_INSTALL_OFFSET, here: PRESSURE_1_INSTALL_OFFSET = 0.5 mbar – 2.0 mbar = – 1.5 mbar) **Factory setting:** 0.0
PRESSURE_1_INSTALL_ OFFSET/ CALIB. OFFSET Entry Index: 40 Data type: float Access: auto, OOS	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 or partly filled, the PRIMARY_VALUE parameter does not display zero or the desired value. This parameter provides the possibility of performing position adjustment where the pressure difference between zero (set point) and the measured pressure is known. (A reference pressure is not present at the device.) **Example:** – PRIMARY VALUE = 2.2 mbar – Via the PRESSURE_1_INSTALL_OFFSET parameter, enter the value by which the PRIMARY_VALUE should be corrected. To correct the PRIMARY VALUE to 0.0 mbar, you must enter the value 2.2 here. (The following applies: $PRIMARY\_VALUE_{new}$ = $PRIMARY\_VALUE_{old}$ – PRESSURE_1_INSTALL_OFFSET) – PRIMARY VALUE (after entry for calib. offset) = 0.0 mbar **Factory setting:** 0.0

Pressure Transducer Block	
Parameter	**Description**
PRESSURE_1_UNIT_ TEXT/ CUSTOMER UNIT P Entry Index: 41 Data type: visible string Access: auto, OOS	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also PRESSURE_1_UNIT_SCALE/CUST. UNIT. FACT. P **Prerequisite:** ■ CAL_UNIT (→ 52) = User unit Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. In the FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** – – – – – – – –
PRESSURE_1_UNIT_ SCALE/ CUST. UNIT. FACT. P Entry Index: 42 Data type: float Access: auto, OOS	Enter the conversion factor for a customer-specific pressure unit. The conversion factor must be entered in relation to the SI unit "Pa". → See also PRESSURE_1_UNIT_TEXT/CUSTOMER UNIT P. **Prerequisite:** ■ CAL_UNIT (→ 52) = User unit **Example:** – You want the measured value to be displayed in "PU" (PU: packing unit). – PRIMARY_VALUE =10000 Pa ≙ 1 PU – Enter PRESSURE_1_UNIT_TEXT/CUSTOMER UNIT P: PU – Enter PRESSURE_1_UNIT_SCALE/CUST. UNIT FACT. P: 0.0001 – Result: PRIMARY_VALUE = 1 PU **Factory setting:** 1.0
PRESSURE_1_LOWER_ CAL_MEASURED/ LO TRIM MEASURED Display Index: 43 Data type: float Access: read only	Displays the pressure that was present at the device during calibration and was used for the calibration of the lower point of the sensor characteristic curve. → See also the parameter description for CAL_POINT_LO/LOW SENSOR TRIM (→ 52).
PRESSURE_1_UPPER_ CAL_MEASURED/ HI TRIM MEASURED Display Index: 44 Data type: float Access: read only	Displays the pressure that was present at the device during calibration and was used for the calibration of the upper point of the sensor characteristic curve. → See also the parameter description for CAL_POINT_HI/HIGH SENSOR TRIM (→ 51).

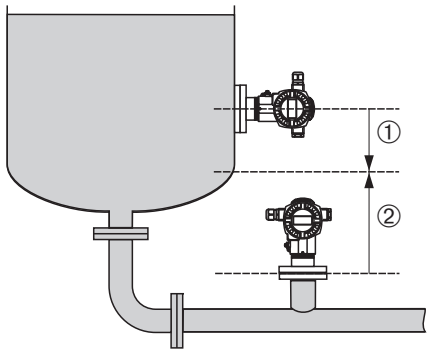
Pressure Transducer Block	
Parameter	**Description**
LEVEL_TYPE/ LEVEL MODE Selection Index: 45 Data type: unsigned8 Access: OOS	Select the level mode **Options:** ■ Linear: The measured variable (level, volume, mass or %) is in direct proportion to the measured pressure. → 📄 23 ff, Section 5.4. ■ Pressure 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 linearization table with at least 2 and not more than 32 points. → 📄 27 ff, Section 5.5. ■ Height linearized: Select this level mode 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: – Height + volume – Height + mass – Height + % – %-height + volume – %-height + mass – %-height + % Perform two calibrations for this level mode. 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. → 📄 31 ff, Section 5.6. ✎ Note! This parameter can only be changed if the settings for the LINEARIZATION (→ 📄 54) and PRIMARY_VALUE_TYPE (→ 📄 51) parameters suit it, e.g. if the "Flow square root" option was selected for the LINEARIZATION parameter, this parameter cannot be changed. **Factory setting:** Linear
MEASURAND_LINEAR/ LIN. MEASURAND Selection Index: 46 Data type: unsigned8 Access: OOS	Select the measured variable. **Options:** ■ Level ■ Volume ■ Mass ■ % (level) ✎ Note! This parameter can only be changed if the setting for the LINEARIZATION parameter (→ 📄 54) suits it, e.g. if the "Flow square root" option was selected for the LINEARIZATION parameter, this parameter cannot be changed. **Factory setting:** % (level)
MEASURAND_ LINEARIZED/ LINd. MEASURAND Selection Index: 47 Data type: unsigned8 Access: OOS	Select the measured variable. **Options:** ■ Pressure and volume ■ Pressure and mass ■ Pressure and % ✎ Note! This parameter can only be changed if the setting for the LINEARIZATION parameter (→ 📄 54) suits it, e.g. if the "Flow square root" option was selected for the LINEARIZATION parameter, this parameter cannot be changed. **Factory setting:** Pressure and %

Pressure Transducer Block	
Parameter	**Description**
MEASURAND_ COMBINED/ COMB. MEASURAND Selection Index: 48 Data type: Unsigned Access: OOS	Select the measured variable. **Options:** ■ Height and volume ■ Height and mass ■ Height and % ■ %-height and volume ■ %-height and mass ■ %-height and % ✎ Note! This parameter can only be changed if the setting for the LINEARIZATION parameter (→ 🖹 54) suits it, e.g. if the "Flow square root" option was selected for the LINEARIZATION parameter, this parameter cannot be changed. **Factory setting:** %-height and %
DENSITY_UNIT/ DENSITY UNIT Selection Index: 49 Data type: unsigned16 Access: auto, OOS	Select the density unit. **Prerequisite:** ■ MEASURAND_COMBINED = %-height and %, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height and volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height and mass, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and %, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and mass, LEVEL_ADJUST_MODE = Dry – MEASURAND_COMBINED = COMB. MEASURAND – LEVEL_ADJUST_MODE = CALIBRATION MODE **Options:** ■ g/cm^3 ■ kg/dm^3 ■ kg/m^3 ■ US lb/in^3 ■ US lb/ft^3 **Factory setting:** kg/dm^3
HEIGHT_UNIT/ HEIGHT UNIT Selection Index: 50 Data type: unsigned16 Access: auto, OOS	Select the level unit. **Prerequisite:** ■ MEASURAND_COMBINED/COMB. MEASURAND. = Height and volume, height and mass or height and % **Options:** ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also HEIGHT_UNIT_TEXT/CUSTOMER UNIT H (→ 🖹 60) and HEIGHT_UNIT_SCALE/CUST. UNIT FACT. H (→ 🖹 60) **Factory setting:** m

Pressure Transducer Block	
Parameter	**Description**
HEIGHT_UNIT_TEXT/ CUSTOMER UNIT H Selection Index: 51 Data type: visible string Access: auto, OOS	Enter text (unit) for customer-specific level unit. You can enter a maximum of eight alphanumeric characters here. → See also HEIGHT_UNIT_SCALE/CUST. UNIT. FACT. H. **Prerequisite:** ■ MEASURAND_COMBINED = Height and volume, HEIGHT_UNIT = User unit ■ MEASURAND_COMBINED = Height and mass, HEIGHT_UNIT = User unit ■ MEASURAND_COMBINED = Height and %, HEIGHT_UNIT = User unit – MEASURAND_COMBINED = COMB. MEASURAND – HEIGHT_UNIT= HEIGHT UNIT ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. In the FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** – – – – – – – –
HEIGHT_UNIT_SCALE/ CUST. UNIT. FACT. H Entry Index: 52 Data type: float Access: auto, OOS	Enter the conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also HEIGHT_UNIT_TEXT/CUSTOMER UNIT H. **Prerequisite:** ■ MEASURAND_COMBINED = Height and volume, HEIGHT_UNIT = User unit ■ MEASURAND_COMBINED = Height and mass, HEIGHT_UNIT = User unit ■ MEASURAND_COMBINED = Height and %, HEIGHT_UNIT = User unit – MEASURAND_COMBINED = COMB. MEASURAND – HEIGHT_UNIT= HEIGHT UNIT **Example:** – You want the measured value to be displayed in "PU" (PU: packing unit). – PRIMARY_VALUE = 0.5 m ≙ 1 PU – Enter HEIGHT_UNIT_TEXT/CUSTOMER UNIT H: PU – Enter HEIGHT_UNIT_SCALE/CUST. UNIT FACT. H: 2 – Result: PRIMARY_VALUE = 1 PU **Factory setting:** 1.0
VOLUME_UNIT/ UNIT VOLUME Selection Index: 53 Data type: unsigned16 Access: auto, OOS	Select the volume unit. **Prerequisite:** ■ MEASURAND_COMBINED/COMB. MEASURAND = Height and volume or %-height and volume **Options:** ■ l ■ hl ■ cm^3 ■ dm^3 ■ m^3 ■ m^3 E^3 ■ ft ■ ft^3 E^3 ■ gal ■ Igal ■ bbl ■ User unit, → see also VOLUME_UNIT_TEXT/CUSTOMER UNIT V (→ 🖹 61) and VOLUME_UNIT_SCALE/CUST. UNIT FACT. V (→ 🖹 61) **Factory setting:** m^3

Pressure Transducer Block	
Parameter	**Description**
VOLUME_UNIT_TEXT/ CUSTOMER UNIT V Entry Index: 54 Data type: visible string Access: auto, OOS	Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also VOLUME_UNIT_SCALE/CUST. UNIT. FACT. V. **Prerequisite:** ■ MEASURAND_COMBINED = Height and volume, VOLUME_UNIT = User unit ■ MEASURAND_COMBINED = %-height and volume, VOLUME_UNIT = User unit – MEASURAND_COMBINED = COMB. MEASURAND – VOLUME_UNIT= UNIT VOLUME ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. In the FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** _ _ _ _ _ _ _ _
VOLUME_UNIT_SCALE /CUST. UNIT. FACT. V Entry Index: 55 Data type: float Access: auto, OOS	Enter the conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m^3". → See also VOLUME_UNIT_TEXT/CUSTOMER UNIT V. **Prerequisite:** ■ MEASURAND_COMBINED = Height and volume, HEIGHT_UNIT = User unit ■ MEASURAND_COMBINED = %-height and volume, HEIGHT_UNIT = User unit – MEASURAND_COMBINED = COMB. MEASURAND – VOLUME_UNIT= UNIT VOLUME **Example:** – You want the measured value to be displayed in "buckets". – PRIMARY_VALUE = 0.01 m3 ≙ 1 bucket – Enter VOLUME_UNIT_TEXT/CUSTOMER UNIT V: bucket – Enter VOLUME_UNIT_SCALE/CUST. UNIT FACT. V: 100 – Result: PRIMARY_VALUE = 1 bucket **Factory setting:** 1.0
MASS_UNIT/ MASS UNIT Selection Index: 56 Data type: unsigned16 Access: auto, OOS	Select the mass unit. **Prerequisite:** ■ MEASURAND_LINEARIZED/LINd. MEASURAND. = Pressure and mass **Options:** ■ g ■ kg ■ t ■ oz ■ lb ■ ton ■ User unit, → see also the following parameter descriptions for MASS_UNIT_TEXT/ CUSTOMER UNIT M (→ 🖹 62) and MASS_UNIT_SCALE/CUST. UNIT FACT. M (→ 🖹 62) **Factory setting:** kg

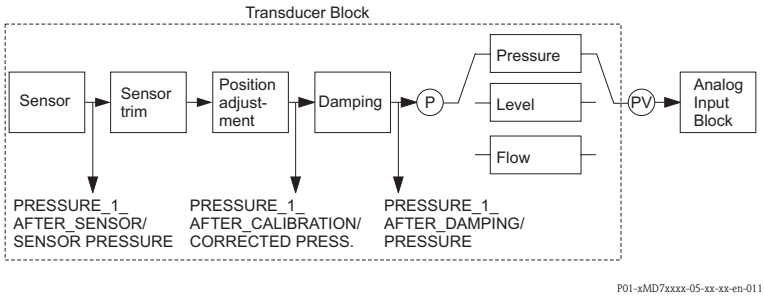
Pressure Transducer Block	
Parameter	**Description**
MASS_UNIT_TEXT/ CUSTOMER UNIT M Entry Index: 57 Data type: visible string Access: auto, OOS	Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also MASS_UNIT_SCALE/CUST. UNIT. FACT. M. **Prerequisite:** ■ MEASURAND_LINEARIZED/LINd. MEASURAND. = Pressure and mass, MASS_UNIT/MASS UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. In the FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** _ _ _ _ _ _ _ _
MASS_UNIT_SCALE/ CUST. UNIT. FACT. M Entry Index: 58 Data type: float Access: auto, OOS	Enter the conversion factor for a customer-specific mass unit. The conversion factor must be entered in relation to the SI unit "kg". → See also MASS_UNIT_TEXT/CUSTOMER UNIT M. **Prerequisite:** ■ MEASURAND_LINEARIZED/LINd. MEASURAND. = Pressure and mass, MASS_UNIT/MASS UNIT = User unit **Example:** – You want the measured value to be displayed in "buckets". – PRIMARY_VALUE = 10 kg ≙ 1 bucket – Enter MASS_UNIT_TEXT/CUSTOMER UNIT M: bucket – Enter MASS_UNIT_SCALE/CUST. UNIT FACT. M: 0.1 – Result: PRIMARY_VALUE = 1 bucket **Factory setting:** 1.0
LEVEL_ADJUST_MODE /CALIBRATION MODE Selection Index: 59 Data type: unsigned8 Access: auto, OOS	Select the calibration mode. **Options:** ■ Wet: option without a function ■ Dry Dry calibration is a theoretical calibration which you can carry out even if the device is not mounted or the container is empty. – For the "Level" measured variable, the density of the fluid (→ 🖹 63: LEVEL_ADJUST_DENSITY/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 (→ 🖹 63: LEVEL_ADJUST_DENSITY/ADJUST DENSITY, → 🖹 64: LEVEL_TANK_VOLUME/TANK VOLUME and → 🖹 64: LEVEL_TANK_HEIGHT /TANK HEIGHT). – For the "Mass" measured variable, the tank volume and tank height must be entered (→ 🖹 64, LEVEL_TANK_VOLUME/TANK VOLUME and → 🖹 64: LEVEL_TANK_HEIGHT/TANK HEIGHT). In the event of a zero point shift (level offset), the density also has to be entered (→ 🖹 63, LEVEL_ADJUST_ DENSITY /ADJUST DENSITY). – For the "%" measured variable, the density of the fluid has to be entered and a level also has to be assigned to the 100 % point (→ 🖹 63: LEVEL_ADJUST_ DENSITY/ADJUST DENSITY and → 🖹 64: LEVEL_100_PERCENT_VALUE/100% POINT). If the measurement should not start at the mounting location of the device, a level offset must be entered (→ 🖹 63: LEVEL_OFFSET/ZERO POINT). **Factory setting:** Wet

Pressure Transducer Block	
Parameter	**Description**
LEVEL_ADJUST_ DENSITY/ ADJUST DENSITY Entry Index: 60 Data type: float Access: auto, OOS	Enter the density of the fluid. **Prerequisite:** ■ MEASURAND_COMBINED = %-height and %, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height and volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height and mass, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and %, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = Height and mass, LEVEL_ADJUST_MODE = Dry – MEASURAND_COMBINED = COMB. MEASURAND – LEVEL_ADJUST_MODE = CALIBRATION MODE **Factory setting:** 1.0
LEVEL_OFFSET/ ZERO POINT Entry Index: 61 Data type: float Access: auto, OOS	Enter the value for level offset. 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). **Prerequisite:** ■ LEVEL_ADJUST_MODE/CALIBRATION MODE = Dry **Factory setting:** 0.0  P01-PMP75xxx-19-xx-xx-xx-001 *Fig. 17: Zero point shift* *1 Device is mounted above the level lower-range value: a positive value has to be entered for the LEVEL_ADJUST_MODE/ZERO POINT parameter.* *2 Device is mounted below the level lower-range value: a negative value has to be entered for the LEVEL_ADJUST_MODE/ZERO POINT parameter.*
LOW_LEVEL Entry Index: 62 Data type: float Access: auto, OOS	Enter the 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. **Prerequisite:** ■ CALIBRATION MODE = Wet ✎ Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 0.0

Pressure Transducer Block	
Parameter	**Description**
HIGH_LEVEL Entry Index: 63 Data type: float Access: auto, OOS	Enter the 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 ✎ Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 100.0
LEVEL_TANK_VOLUME /TANK VOLUME Entry Index: 64 Data type: float Access: auto, OOS	Enter the tank volume. **Prerequisite:** ■ MEASURAND_LINEAR = Volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_LINEAR = Mass, LEVEL_ADJUST_MODE = Dry – MEASURAND_LINEAR = LIN. MEASURAND – LEVEL_ADJUST_MODE = CALIBRATION MODE **Factory setting:** 1.0 m^3
LEVEL_TANK_HEIGHT/ TANK HEIGHT Entry Index: 65 Data type: float Access: auto, OOS	Enter the tank height. **Prerequisite:** ■ MEASURAND_LINEAR = Volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_LINEAR = Mass, LEVEL_ADJUST_MODE = Dry – MEASURAND_LINEAR = LIN. MEASURAND – LEVEL_ADJUST_MODE = CALIBRATION MODE **Factory setting:** 1.0 m
LEVEL_100_PERCENT_ VALUE/ 100% POINT Entry Index: 66 Data type: float Access: auto, OOS	Enter the level value for the 100% point. **Prerequisite:** ■ MEASURAND_COMBINED = %-height and volume, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height and mass, LEVEL_ADJUST_MODE = Dry ■ MEASURAND_COMBINED = %-height + %, LEVEL_ADJUST_MODE = Dry – MEASURAND_COMBINED = COMB. MEASURAND – LEVEL_ADJUST_MODE = CALIBRATION MODE **Example:** – The 100 %-point should correspond to 4 m. – Select the "m" unit via the HEIGHT_UNIT/HEIGHT UNIT parameter. – Enter the value "4" for this LEVEL_100_PERCENT_VALUE/100% POINT parameter. **Factory setting:** 1.0
LINEAR_LEVEL_MIN/ LEVEL MIN Entry Index: 67 Data type: float Access: auto, OOS	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. **Factory setting:** 0.0
LINEAR_LEVEL_MAX/ LEVEL MAX Entry Index: 68 Data type: float Access: auto, OOS	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. **Factory setting:** 100.0

Pressure Transducer Block	
Parameter	**Description**
LEVEL_MEASUREMENT _DENSITY/ PROCESS DENSITY Entry Index: 69 Data type: float Access: auto, OOS	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 LEVEL_MEASUREMENT_DENSITY/PROCESS DENSITY parameter. **Factory setting:** 1.0
LINEARIZATION_TABLE _SELECTION / TABLE SELECTION Index: 70 Data type: UNSIGNED8 Access: AUTO, OOS	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. **Options:** ■ View meas. table ■ Editor table **Factory setting:** View meas. table
LINEARIZATION_ TABLE_PRE_EDIT / EDITOR TABLE Index: 72 Data type: UNSIGNED8 Access	Select table. **Prerequisite:** ■ TABLE SELECTION = Editor table **Options:** ■ New table: Enter a new linearization 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 EDITOR TABLE (770). **Factory setting:** New table
LINEARIZATION_TABLE _INDEX / LINE-NUMB Index: 73 Data type: UNSIGNED8 Access:	Enter the line number for the linearization table. A linearization table must have at least 2 points and may not have more than 32 points. ■ TABLE SELECTION = View meas. table Via this parameter you can select the point of the linearization 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 descriptions for LIN. EDIT MODE, X-VAL. ("Manual" entry mode), X-VAL. ("Semiautomatic" entry mode) and Y-VAL.. ✎ Note! In the operating program, you can enter a complete linearization table in one go, and view it, via the "Lin.-Tab." window.
LINEARIZATION_TABLE _X_VALUE / X-VALUE (manual) Index: 74 Data type: float Access:	Enter the pressure value for the linearization table. → See also LIN. EDIT MODE, LINE-NUMB and Y-VAL.. **Prerequisite:** ■ TABLE SELECTION = Editor table
LINEARIZATION_TABLE _X_VALUE / X-VALUE (semiautomatic) Index: 74 Data type: float Access:	In the "Semiautomatic" entry mode, the container is filled or emptied in stages. The X-VAL. displays the measured hydrostatic pressure. **Prerequisite:** ■ TABLE SELECTION = Editor table **Operating program** The X-VAL. is saved by confirming the Y-value. **HARD handheld** Confirm X-VALUE displayed. → See also LIN. EDIT MODE, LINE-NUMB and Y-VAL..

Pressure Transducer Block	
Parameter	**Description**
LINEARIZATION_TABLE _Y_VALUE / Y-VALUE Index: 75 Data type: float Access:	Enter the volume, mass or %-value belonging to the X-VAL. for the linearization table. **Prerequisite:** ■ TABLE SELECTION = Editor table Depending on the setting in the LINd. MEASURAND or COMB. MEASURAND parameters, enter a volume, mass or %-value here. → See also table, parameter description for LIN. EDIT MODE, LINE-NUMB, X-VAL. ("Manual" entry mode), X-VAL. ("Semiautomatic" entry mode)
LINEARIZATION_ TABLE_POST_EDIT / EDITOR TABLE Index: 76 Data type: UNSIGNED8 Access: OOS	Select the function for the editor table. **Options**: ■ Next point: no function ■ Last input point: no 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. **Example:** Add point, in this case between the 4th and 5th point for example – Select Point 5 via the LINE-NUMB parameter. – Using the EDITOR TABLE parameter, select the "Insert point" option. – Point 5 is displayed for the LINE-NUMB parameter. Enter new values for the X-VAL and Y-VAL. parameters. **Example:** Delete point, in this case the 5th point for example ■ Select Point 5 via the LINE-NUMB parameter. ■ Using the EDITOR TABLE parameter, select the "Delete point" option. ■ 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. **Factory setting:** Next point
LINEARIZATION_ TABLE_POST_EDIT / MEASURING TABLE Index: 77 Data type: UNSIGNED8 Access:	Select the function for the measuring table. **Options:** ■ 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. **Factory setting:** Next point
LINEARIZATION_TABLE _MODE/LIN. EDIT MODE Entry Index: 71 Data type: unsigned8 Access: auto, OOS	Select the entry mode for the linearization table. **Options:** ■ Manual: The container neither has to be filled nor emptied for this entry mode. Enter the value pairs for the linearization 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. **Factory setting:** Manual
LEVEL_TANK_ DESCRIPTION/ TANK DESCRIPTION Entry Index: 78 Data type: visible string Access: auto, OOS	Enter tank description. (max. 32 alphanumeric characters) **Factory setting:** _

Pressure Transducer Block	
Parameter	**Description**
PRESSURE_1_AFTER_ SENSOR/ SENSOR PRESSURE Display Index: 79 Data type: float Access: auto, OOS	Displays the measured pressure before sensor trim, position adjustment and damping. → See also the following graphic, parameter description for PRESSURE_1_AFTER_DAMPING/ PRESSURE
PRESSURE_1_AFTER_ DAMPING/ PRESSURE Display Index: 80 Data type: float Access: auto, OOS	Displays the measured pressure after sensor trim, position adjustment and damping. This value corresponds to the PRIMARY_VALUE parameter in the "Pressure" measuring mode. 
MEASURAND_LEVEL/ LEVEL BEFORE LIN Display Index: 81 Data type: float Access: auto, OOS	Displays the level value prior to linearization. **Prerequisite:** ■ LEVEL_TYPE/LEVEL MODE = Linear or height linearized Depending on the setting for the MEASURAND_LINEAR/LIN. MEASURAND or MEASURAND_COMBINED/COMB. MEASURAND parameter, this parameter displays the current level in % or in a unit of level.
SENSOR_ MEASUREMENT_TYPE/ SENSOR MEAS.TYPE Display Index: 82 Data type: unsigned16 Access: read only	Displays the sensor type. ■ Deltabar S = Differential ■ Cerabar S with gauge pressure sensors = Relative ■ Cerabar S with absolute pressure sensors = Absolute ■ Deltapilot S with gauge pressure sensors = Relative

Pressure Transducer Block	
Parameter	**Description**
CONFIGURATION_ TYPE / LEVEL SELECTION Index: 83 Data type: UNSIGNED8 Access: OOS	Select the level mode. **Prerequisite:** ■ MEASURING MODE = Level ✎ Note! ■ With regard to 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. In the "Level easy pressure" and "Level easy height" level modes, the values entered for EMPTY CALIBRATION/FULL CALIBRATION, EMPTY PRESSURE/FULL PRESSURE, EMPTY HEIGHT/FULL HEIGHT must be at least 1% apart. The value will be rejected with a 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 → 📄 14 Section 5.1 and → 📄 100 Section 9.1 "Overview of level measurement". ■ The "Level easy pressure" and "Level easy height" level modes comprise fewer parameters than the "Level standard" mode and are used to quickly and easily configure a level application. ■ Customer-specific units of level, volume and mass, or a linearization table, can only be entered in the "Level standard" level mode. **Prerequisite:** ■ Level easy pressure You 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 (→ 📄 69. The two calibration modes, "Wet" and "Dry", are available. – 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, you specify two pressure-level value pairs via the EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE parameters. Parameter description, see → 📄 70 ■ Level easy height For this level mode, you specify a height unit, the 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. The two calibration modes, "Wet" and "Dry", are available. – 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, you specify two height-level value pairs via the EMPTY CALIB., EMPTY HEIGHT, FULL CALIB. and FULL HEIGHT parameters. → Parameter description, see → 📄 70 ■ Level standard Once you have selected this level mode, you can use the LEVEL MODE parameter (→ → 📄 58) to choose between "Linear", "Pressure linearized" and "Height linearized". **Factory setting:** Level easy pressure
HEIGHT_UNIT_EASY / HEIGHT UNIT Index: 84 Data type: UNSIGNED16 Access: OOS	Select the height unit. The measured pressure is converted to the chosen height unit using the DENSITY UNIT and ADJUST DENSITY parameters. **Options:** ■ mm ■ cm ■ dm ■ m ■ inch ■ ft **Factory setting:** m

Pressure Transducer Block	
Parameter	**Description**
OUT_UNIT_EASY / OUTPUT UNIT Index: 85 Data type: UNSIGNED16	Select the unit for the measured value display and the MEASURED VALUE parameter (→ 195). Note! 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. Example: ■ Current measured value: 0.3 ft ■ New output unit: m ■ New measured value: 0.3 m **Options:** ■ % ■ mm, cm, dm, m ■ ft, inch ■ cm^3, dm^3, m^3, m^3E^3 ■ l, hl ■ ft^3, ft^3E^3 ■ gal, bbl, lgal ■ g, kg, t ■ lb, ton, oz **Factory setting:** %
LEVEL_ADJUST_MODE _EASY / CALIBRATION MODE Index: 86 Data type: UNSIGNED8 Access: OOS	Select the calibration mode. **Options:** ■ 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, you specify two pressure-level value pairs via the following parameters: EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE. **Factory setting:** Wet
DENSITY_UNIT_EASY / DENSITY UNIT Index: 87 Data type: UNSIGNED16 Access: OOS	Select the density unit. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters. **Options:** ■ g/cm^3 ■ kg/dm^3 ■ kg/m^3 ■ US lb/in^3 ■ US lb/ft^3 **Factory setting:** kg/dm^3
LEVEL_ADJUST_ DENSITY_EASY / ADJUST DENSITY Index: 88 Data type: FLOAT Access: OOS	Enter the density of the fluid. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters. **Factory setting:** 1.0
LEVEL_OFFSET_EASY / EMPTY CALIB. Index: 89 Data type: FLOAT Access: OOS	Enter the level, volume, mass or percentage value for the lower calibration point (empty container). 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 (→ 69). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0

Pressure Transducer Block	
Parameter	**Description**
LEVEL_100_PERCENT_ VALUE_EASY / FULL CALIB. Index: 90 Data type: FLOAT Access: OOS	Enter the 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 (→ 69). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 100.0
LEVEL_MEASUREMENT _DENSITY_EASY / PROCESS DENSITY Index: 91 Data type: FLOAT Access: OOS	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. Note! LIN. MEASURAND: "% (Level)", "Mass" and "Volume" and COMB. MEASURAND: If you change to dry calibration after a wet calibration using the CALIBRATION MODE parameter (→ 156), the density for the ADJUST DENSITY and PROCESS DENSITY parameters must be entered correctly before changing the calibration mode. If the pressure falls with increasing levels (LIN. MEASURED: volume), such as in the case of a residual volume measurement, a negative value must be entered for this parameter. **Factory setting:** 1.0
HIGH_LEVEL_EASY / FULL HEIGHT Index: 93 Data type: FLOAT Access: OOS	Enter the height value for the upper calibration point (container full). The unit is selected via the HEIGHT UNIT parameter (→ 68). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** Upper range limit (URL) is converted to a unit of height.
LOW_LEVEL_EASY / EMPTY HEIGHT Index: 94 Data type: FLOAT Access: OOS	Enter the height value for the lower calibration point (container empty). The unit is selected via the HEIGHT UNIT parameter (→ 68). See also EMPTY CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0
HIGH_LEVEL_PRESSUR E_EASY / FULL PRESSURE Index: 95 Data type: FLOAT Access: OOS	Enter the pressure value for the upper calibration point (container full). → See also FULL CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 100.0
LOW_LEVEL_PRESSURE _EASY / EMPTY PRESSURE Index: 96 Data type: FLOAT Access: OOS	Enter the pressure value for the lower calibration point (container empty). → See also EMPTY CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0

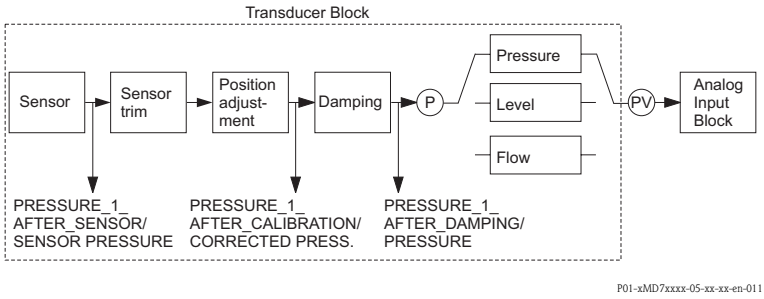
7.3.3 Service Transducer Block

Service Transducer Block	
Parameter	**Description**
SW_LOCK/ Display Index: 12 Data type: UNSIGNED16	For entering a code to lock or unlock operation. Note! ■ The -symbol on the local operation 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 remote operation, you can only unlock operation again using remote operation. → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), Section 5.6 "Locking/unlocking operation". **Options:** ■ Lock: Enter a number between 0 and 9999 and ≠100. ■ Unlock: Enter the number 100. **Factory setting:** 100
TATUS_LOCKING Display Index: 13 Data type:UNSIGNED 8	Displays the current locking status of the device or conditions that can lock the device (hardware locking, software locking).
CONFIGURATION COUNTER/ CONFIG. RECORDER Display Index: 14 Data type: unsigned16 Access: read only	Displays the configuration counter. This counter is incremented by one with each change of a manufacturer-specific parameter. The counter counts up to 65535 and then starts again at zero. Changes to parameters that configure the local operation, such as the DISPLAY_LANGUAGE/LANGUAGE parameter, do not cause an increase in the counter value.
MEASURED_ TEMPERATURE_3/ SENSOR TEMP. Display Index: 15 Data type: float Access: read only	Displays the measured temperature of the main electronics.
TEMPERATURE_3_LOW _LIMIT/ Allowed Min.TEMP Display Index: 16 Data type: float Access: read only	Displays the lower temperature limit of the main electronics.
TEMPERATURE_3_ HIGH_LIMIT/ Allowed Max.TEMP Index: 17 Data type: float Access: read only	Displays the upper temperature limit of the main electronics.

Service Transducer Block	
Parameter	**Description**
PROCESS_CONNEC-TION_PRESSURE_HIGH _ LIMIT/ Pmax PROC. CONN. Entry Index: 18 Data type: float Access: auto, OOS	For entering and displaying the maximum permitted pressure of the process connection. **Factory setting:** In accordance with nameplate data (→ see also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Nameplates" section)
SENSOR_ MEASUREMENT_TYPE/ SENSOR MEAS.TYPE Display Index: 19 Data type: unsigned16 Access: read only	Displays the sensor type. ■ Deltabar S = Differential ■ Cerabar S with gauge pressure sensors = Relative ■ Cerabar S with absolute pressure sensors = Absolute ■ Deltapilot S with gauge pressure sensors = Relative
SENSOR_MIN_ ABSOLUTE_LIMIT/ Pmin SENS.DAMAGE Display Index: 20 Data type: float Access: read only	Displays the minimum permitted absolute pressure of the sensor (resistance to vacuum).
SENSOR_MAX_ ABSOLUTE_LIMIT/ Pmax SENS.DAMAGE Display Index: 21 Data type: float Access: read only	Displays the maximum permitted absolute pressure of the sensor (resistance to overpressure).
TEMPERATURE_1_ SENSOR_LIMIT_LOW/ Tmin SENSOR Display Index: 22 Data type: float Access: read only	Displays the lower nominal temperature limit of the sensor.
TEMPERATURE_1_ SENSOR_LIMIT_HIGH/ Tmax SENSOR Display Index: 23 Data type: float Access: read only	Displays the upper nominal temperature limit of the sensor.
SENSOR_HARDWARE REVISION/ SENS H/WARE REV Display Index: 24 Data type: unsigned8 Access: read only	Displays the revision number of the sensor hardware. e.g.: 01.00.00

Service Transducer Block	
Parameter	**Description**
COUNTER_PMAX/ COUNTER:P > Pmax Display Index: 25 Data type: DS-65 Access: read only	The COUNTER P_PMAX parameter is a structured parameter consisting of two elements. **VALUE** ■ 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 via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter. **STATUS** ■ Displays the status. Note! ■ You can transmit the value and status of the COUNTER_PMAX parameter via the CHANNEL parameter (→ 92) in the Analog Input Block. The CHANNEL must be set to "5" for this purpose. ■ You can transmit the value and status of the COUNTER_PMAX parameter via the CHANNEL parameter in the Discrete Output Block. The CHANNEL must be set to "1" for this purpose.
PRESSURE_1_MAX_ RESETABLE/ MAX. PRESSURE Display Index: 26 Data type: DS-65 Access: read only	The PRESSURE_1_MAX_RESETABLE parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the highest measured pressure value (peak hold indicator). You can reset this maximum indicator via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter. **STATUS** ■ Displays the status. Note! You can transmit the value and status of the PRESSURE_1_MAX_RESETABLE parameter via the CHANNEL parameter (→ 92) in the Analog Input Block. The CHANNEL must be set to "4" for this purpose.
COUNTER_PMIN/ COUNTER:P < Pmin Display Index: 27 Data type: unsigned16 Access: read only	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 via the RESET_TRANSMITTER_OBSERVATION/ RESET PEAKHOLD parameter.
PRESSURE_1_MIN_ RESETABLE/ MIN. PRESSURE Display Index: 28 Data type: float Access: read only	Displays the lowest measured pressure value (peak hold indicator). You can reset this maximum indicator via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter.
COUNTER_TMAX/ COUNTER:T > Tmax Display Index: 29 Data type: unsigned16 Access: read only	Displays the number of times the specified temperature range of the sensor has been overshot. You can reset this counter via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter.
TEMPERATURE_1_MAX _RESETABLE/ MAX. MEAS.TEMP. Display Index: 30 Data type: float Access: read only	Displays the highest measured temperature in the sensor (peak hold indicator). You can reset this maximum indicator via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter.

Service Transducer Block	
Parameter	**Description**
COUNTER_TMIN/ COUNTER:T < Tmin Display Index: 31 Data type: unsigned16 Access: read only	Displays the number of times the specified temperature range of the sensor has been undershot. You can reset this counter via the RESET_TRANSMITTER_OBSERVATION/ RESET PEAKHOLD parameter.
TEMPERATURE_1_MAX _RESETABLE/ MIN. MEAS.TEMP. Display Index: 32 Data type: float Access: read only	Displays the lowest measured temperature in the sensor (peak hold indicator). You can reset this maximum indicator via the RESET_TRANSMITTER_OBSERVATION/RESET PEAKHOLD parameter.
ELECTRONIC_OVER_ TEMPERATURE_ COUNTER/ PCB COUNT T > Tmax Display Index: 33 Data type: unsigned16 Access: read only	Displays the number of times the specified temperature range of the electronics has been overshot.
ELECTRONIC_OVER_ TEMPERATURE/ PCB MAX. TEMP. Display Index: 34 Data type: float Access: read only	Displays the highest electronics temperature measured.
ELECTRONIC_UNDER_ TEMPERATURE_ COUNTER/ PCB COUNT:T<Tmin Display Index: 35 Data type: unsigned16 Access: read only	Displays the number of times the specified temperature range of the electronics has been undershot.
ELECTRONIC_UNDER_ TEMPERATURE/ PCB MIN. TEMP. Display Index: 36 Data type: float Access: read only	Displays the lowest electronics temperature measured.

Service Transducer Block	
Parameter	**Description**
RESET_TRANSMITTER_ OBSERVATION/ RESET PEAKHOLD Selection Index: 37 Data type: unsigned8 Access: auto, OOS	This parameter lists all the peak hold indicator parameters that can be reset. You can select the peak hold indicators you want to reset. **Options:** ■ None ■ Max. pressure ■ Min. pressure ■ Pmax history ■ Pmin history ■ Max. temp. ■ Min. temp. ■ Tmax history ■ Tmin history ■ Reset all **Factory setting:** None
PRESSURE_1_AFTER_ DAMPING/ PRESSURE Display Index: 38 Data type: DS-65 Access: read only	The PRESSURE_1_AFTER_DAMPING parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the PRIMARY_VALUE parameter in the "Pressure" measuring mode. **STATUS** ■ Displays the status.  P01-xMD7xxxx-05-xx-xx-en-011 ✎ Note! You can transmit the value and status of this parameter via the CHANNEL parameter (→ 🖹 92) in the Analog Input Block. The CHANNEL must be set to "3" for this purpose.
PRESSURE_1_AFTER_ CALIBRATION/ CORRECTED PRESS. Display Index: 39 Data type: float Access: read only	Displays the measured pressure after sensor trim and position adjustment and before damping. → See also the graphic for PRESSURE_1_AFTER_DAMPING/PRESSURE
TENDENCY/ MEAS. VAL. TREND Display Index: 40 Data type: unsigned8 Access: read only	Displays the trend of the pressure measured value. Possibilities: increasing, decreasing, constant
MAX_TURNDOWN Display Index: 41 Data type: float Access: read only	Displays the maximum possible turndown of the transmitter.

Service Transducer Block	
Parameter	**Description**
NUMBER_OF_SENSOR_CHANGES/ SENSOR CHANGES Display Index: 42 Data type: float Access: read only	Displays the number of sensor changes that have been performed to date.
PEAK_HOLD_INCREMENT_FACTOR/ P PEAKHOLD STEP Display Index: 43 Data type: float Access: read only	Displays the step size at which the pressure peakhold values are saved. The value is displayed as a factor of the sensor end value. The pressure peakhold values are saved every 15 minutes regardless of this value.
TEMPERATURE_1_PEAK_HOLD_INCREMENT_OFFSET/ T. PEAKHOLD STEP Display Index: 44 Data type: float Access: read only	Displays the step size at which the temperature peakhold values are saved. The value is displayed in the Kelvin unit. The temperature peakhold values are saved every 15 minutes regardless of this value.
ACCELERATION_OF_GRAVITY/ ACC. OF GRAVITY Display Index: 45 Data type: float Access: read only	Displays the gravitational acceleration used by the device to calculate the measured variables in the "Level" measuring mode.
CREEP_FLOW_SUPPRESSION_HYSTERESIS/ CREEP FLOW HYST Display Index: 46 Data type: float Access: read only	Displays the hysteresis of the low flow cut off. → 76, Pressure Transducer Block, parameter description for LOW_FLOW_CUT_OFF/SET. L. FL. CUT-OFF. **Factory setting:** 1 % (of end flow value)
HISTOROM_SAVING_CYCLE_TIME/ HIST. SAVING CYCLE Display Index: 47 Data type: unsigned8 Access: read only	Displays the time interval for saving the measured value.
HISTOROM_AVAILABLE/ HistoROM AVAIL. Display Index: 48 Data type: unsigned8 Access: read only	Indicates whether the optional HistoROM®/M-DAT memory module is connected to the electronic insert. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "HistoROM®/M-DAT (optional)" section. **Options:** ■ Yes (HistoROM®/M-DAT is attached to the electronic insert) ■ No (HistoROM®/M-DAT is not attached to the electronic insert)

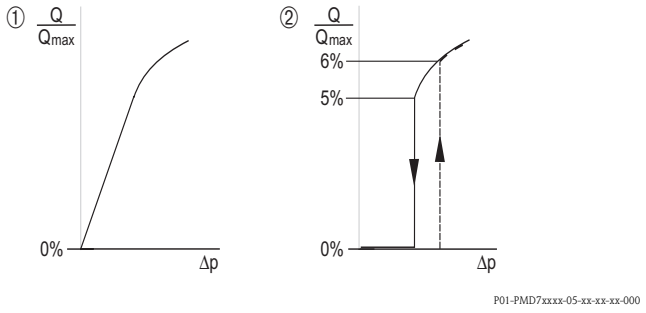
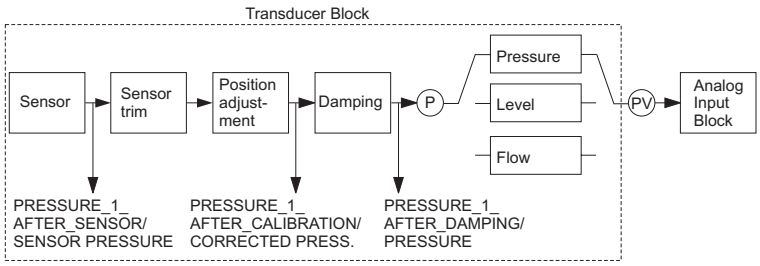
Service Transducer Block	
Parameter	**Description**
DOWNLOAD_ OVERWRITE_ SELECTION/ DOWNLOAD SELECT. Display Index: 49 Data type: Access:	Select download function from HistoROM to device. The option selected has no effect on an upload from the device to the HistoROM. **Prerequisite:** ■ A HistoROM®/M-DAT is attached to the electronic insert (HistoROM AVAIL. = Yes) **Options:** ■ Configuration copy: With this option, all parameters apart from the TRANSMITTER SERIAL No, DEVICE DESIGNATION, CUST. TAG NUMBER, LONG TAG NUMBER, ADDITIONAL INFO., BUS ADDRESS and the parameters of the POSITION ADJUSTMENT and PROCESS CONNECTION group are overwritten. ■ Device replacement: With this option, all parameters except for TRANSMITTER SERIAL No, DEVICE DESIGNATION 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. **Factory setting:** Configuration copy (if HistoROM®/M-DAT is attached to the electronic insert)
DAT_HANDLING/ HistoROM CONTROL Selection Index: 50 Data type: unsigned8 Access: auto, OOS	For selecting the direction for copying the data. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "HistoROM®/M-DAT (optional)" section. **Prerequisite:** ■ A HistoROM®/M-DAT is attached to the electronic insert (HISTO_ROM_AVAILABLE/HistoROM AVAIL. = Yes) **Options:** ■ Abort ■ HistoROM → Device ■ Device → HistoROM **Factory setting:** Abort (if HistoROM®/M-DAT is attached to the electronic insert)
PRESSURE_1_UNIT/ PRESS. ENG. UNIT Display Index: 51 Data type: unsigned16 Access: read only	Displays the pressure unit selected. The pressure unit is selected via the CAL_UNIT parameter (→ 52) in the Pressure Transducer Block.
TEMPERATURE_UNIT/ TEMP. ENG. UNIT Display Index: 52 Data type: unsigned16 Access: read only	Displays the temperature unit selected. You can select the temperature unit by means of the SECONDARY_VALUE_UNIT parameter (→ 53) in the Pressure Transducer Block.
PRESSURE_1_INPUT_IN _VERSION / PRESSURE INVERT. Index: 53 Data type: unsigned8 Access:	Internal service parameter

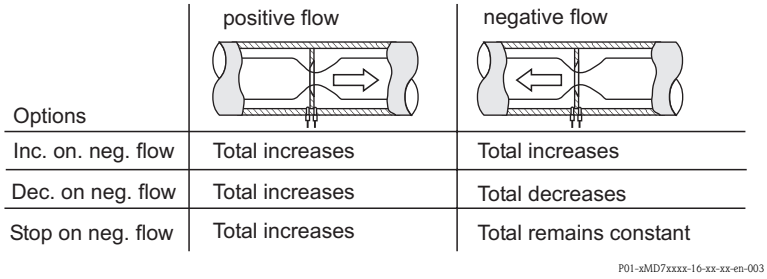
7.3.4 DP Flow Transducer Block (only Deltabar S)

DP Flow Transducer Block	
Parameter	**Description**
DEVICE_DIALOG Display Index: 11 Data type: unsigned8 Access: read only	If the configuration is not suitable, this parameter displays a message saying that a configuration error is present. The message can indicate which parameter was incorrectly configured.
TOT_SW_LOCK/ INSERT PIN No. Entry Index: 12 Data type: unsigned16 Access: read, write	For entering a code to lock or unlock operation. Hinweis! ■ 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, cou can only unlock operation again by means of the DIP-switch. If operation is locked by means of remote operation, you can only unlock operation again by means of remote operation. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) oder BA372P (Deltapilot S) Chapter "Locking/unlocking operation". **Options:** ■ Lock: enter a number between 0...9999 which is ≠100. ■ Unlock: enter number 100. **Factory setting:** 100
TOT_STATUS_LOCKIN G/STATUS LOCKING Index: 13 Data type: unsigned8 Access: read only	Shows the actual locking status of the device or conditions that can cause the locking. (Hardware locking, Software locking)
FLOW_TYPE/ FLOW-MEAS. TYPE Selection Index: 14 Data type: unsigned8 Access: read, write, OOS	Select the flow type. **Prerequisite:** ■ Deltabar S differential pressure transmitter **Options:** ■ Volume operat. cond. (volume under operating conditions) ■ Volume norm. cond. (norm volume under norm conditions in Europe: 1013.25 mbar and 273.15 K (0 °C)) ■ Volume std. cond. (standard volume under standard conditions in USA: 1013.25 mbar (14.7 psi) and 288.15 K (15 °C/59 °F)) ■ Mass p. cond. (mass under operating conditions) **Factory setting:** Volume operat. cond.
SUPPRESSED_FLOW/ FLOW Display Index: 15 Data type: Float Access: read only	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.

DP Flow Transducer Block	
Parameter	**Description**
FLOW_UNIT / UNIT FLOW Entry Index: 16 Data type: UNSIGNED16 Access: read, write, OOS	Select flow unit. **Prerequisite:** ■ Deltabar S differential pressure transmitter ✎ Note! Make sure that the unit suits the flow mode selected. → 🖹 78, parameter description for FLOW_TYPE / FLOW-MEAS. TYPE. When a new flow unit is selected, all flow-specific parameters are converted and displayed with the new unit within a flow mode (FLOW_TYPE/FLOW-MEAS. TYPE). When the flow mode is changed, conversion is not possible. **Possible units for FLOW_TYPE / FLOW-MEAS. TYPE = Volume operat. cond.:** ■ 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 parameter description for FLOW_UNIT_TEXT / CUSTOMER UNIT F (→ 🖹 80) and FLOW_UNIT_SCALE/CUST. UNIT FACT. F (→ 🖹 80) **Factory setting:** m^3/s **Possible units for FLOW_TYPE/FLOW-MEAS. TYPE = Volume norm. cond.:** ■ NM3/s, Nm3/min, Nm3/h, Nm3/day ■ User unit, → see also parameter description for FLOW_UNIT_TEXT/CUSTOMER UNIT F (→ 🖹 80) and FLOW_UNIT_SCALE/CUST. UNIT FACT. F (→ 🖹 80) **Factory setting:** Nm^3/s **Possible units for FLOW_TYPE/FLOW-MEAS. TYPE = Volume std. cond.:** ■ Sm3/s, Sm3/min, Sm3/h, Sm3/day ■ SCFS, SCFM, SCFH, SCFD ■ User unit, → see also parameter description for FLOW_UNIT_TEXT/CUSTOMER UNIT F (→ 🖹 80) and FLOW_UNIT_SCALE/CUST. UNIT FACT. F (→ 🖹 80) **Factory setting:** Sm3/s **Possible units for FLOW_TYPE / FLOW-MEAS. TYPE = Mass p. cond.:** ■ g/s, kg/s, 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 parameter description for FLOW_UNIT_TEXT/CUSTOMER UNIT F (→ 🖹 80) and FLOW_UNIT_SCALE/CUST. UNIT FACT. F (→ 🖹 80) **Factory setting:** kg/s

DP Flow Transducer Block	
Parameter	**Description**
FLOW_UNIT_TEXT/ CUSTOMER UNIT F Entry Index: 17 Data type: visible string Access: read, write	Enter text (unit) for customer-specific flow unit. You can enter a maximum of eight alphanumeric characters here. → See also FLOW_UNIT_SCALE/CUST. UNIT. FACT. F. **Prerequisites:** ■ Deltabar S differential pressure transmitter ■ FLOW_UNIT/UNIT FLOW = User unit ✎ Note! Only the first five characters are shown on the local operation. 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 local operation. 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 FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** - - - - - - - - - -
FLOW_UNIT_SCALE / CUST. UNIT. FACT. F Entry Index: 18 Data type: float Access: read, write	Enter the conversion factor for a customer-specific flow unit. The conversion factor must be entered in relation to an appropriate SI unit, e.g. "m^3/s" for the "Volume operat. cond." flow mode. → See also FLOW_UNIT_TEXT/CUSTOMER UNIT F. **Prerequisite:** ■ Deltabar S differential pressure transmitter ■ FLOW_UNIT/UNIT FLOW = User unit **Example:** – You want the measured value to be displayed in "bucket/h". – PRIMARY_VALUE = 0.01 m3/s ≙ 3600 bucket/h – Enter FLOW_UNIT_TEXT/CUSTOMER UNIT F: bucket/h – Enter FLOW_UNIT_SCALE/CUST. UNIT FACT. F: 360000 – Result: PRIMARY_VALUE = 3600 bucket/h **Factory setting:** Off
CREEP_FLOW_SUPPRESSION_ENABLE / LOW FLOW CUT-OFF Selection Index: 19 Data type: UNSIGNED8 Access: read, write, OOS	Switch the "low flow cut-off" function on and off. In the lower measuring range, small flow quantities (creepages) can lead to large fluctuations in the measured value. Switching on this function stops these flow quantities from being recorded. → 81, LOW_FLOW_CUT_OFF/SET. L. FL. CUT-OFF. **Prerequisite:** ■ Deltabar S differential pressure transmitter **Options:** ■ Off ■ On **Factory setting:** Off

DP Flow Transducer Block	
Parameter	**Description**
LOW_FLOW_CUT_OFF /SET.L.FL.CUT-OFF Entry Index: 20 Data type: Float Access: read, write, OOS	Enter the 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. → 80, CREEP_FLOW_SUPPRESSION_ENABLE/LOW FLOW CUT-OFF. **Prerequisite:** ■ Deltabar S differential pressure transmitter ■ CREEP_FLOW_SUPPRESSION_ENABLE / LOW FLOW CUT-OFF = On **Input range:** Switch-off point: 0 to 50% of end flow value (→ 55, parameter description for SCALE_OUT, EU_100 element/MAX. FLOW)  P01-PMD7xxxx-05-xx-xx-xx-000 **Factory setting:** 5% (of end flow value)
FLOW_MAX / MAX FLOW Entry Index: 21 Data type: Float Access: read, write, OOS	Enter maximum flow of primary device. → See also layout sheet of primary device. The maximum flow is assigned to the maximum pressure which you enter via MAX PRESS. FLOW. **Factory setting:** 1.0
PRESSURE_1_AFTER_ DAMPING/ PRESSURE MEASURED Display Index: 22 Data type: Float Access: read only	Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the MEASURED VALUE parameter in the "Pressure" measuring mode.  P01-xMD7xxxx-05-xx-xx-en-011
MAX PRESS. FLOW Entry Index: 23 Data type: Float Access: read, write	Enter maximum pressure of primary device. → See layout sheet of primary device. This value is assigned to the maximum flow value (→ see MAX. FLOW). **Factory settings:** High sensor limit (→ see PRESS. SENS HILIM, → 193)
PRESSURE_1_UNIT/ PRESS. ENG. UNIT Display Index: 24 Data type: unsigned16 Access: read, write	Display the pressure unit selected. The pressure unit is selected by means of the CAL_UNIT parameter (→ 52) in the Pressure Transducer Block.

DP Flow Transducer Block	
Parameter	**Description**
TOTALIZER_1_VALUE/ TOTALIZER 1 Display Index: 25 Data type: DS-65 Access: read only	The TOTALIZER_1_VALUE parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the total flow value of totalizer 1. You can reset the value with the TOTALIZER_1_RESET/RESET TOTALIZER1 parameter. **STATUS** ■ Displays the status. ✎ Note! ■ You can transmit the value and status of this parameter via the CHANNEL parameter (→ 92) in the Analog Input Block. The CHANNEL must be set to "6" for this purpose. ■ You can transmit the value and status of this parameter via the CHANNEL parameter in the Discrete Output Block. The CHANNEL must be set to "2" for this purpose.
TOTALIZER_1_UNIT/ TOTALIZER 1 UNIT Selection Index: 26 Data type: unsigned16 Access: read, write, OOS	Select the unit for totalizer 1. Depending on the setting in the FLOW_TYPE/FLOW-MEAS. TYPE parameter (→ 78) 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. **Factory setting:** m^3
TOTALIZER_1_MODE/ NEG. FLOW TOT. 1 Selection Index: 27 Data type: unsigned8 Access: read, write, OOS	Specify the way of counting negative flows for totalizer 1.  P01-xMD7xxxx-16-xx-xx-en-003 **Factory setting:** Positive
TOTALIZER_1_FAIL_ SAFE_MODE/ FAIL SAFE MODE Selection Index: 28 Data type: unsigned8 Access: read, write	Select the mode for totalizer 1 in the event of an error. Currently, only the "Actual" mode can be selected, i.e. totalizer 1 continues to count in the event of an error.
TOTALIZER_1_RESET/ RESET TOTALIZER1 Selection Index: 29 Data type: unsigned8 Access: read, write, OOS	You reset totalizer 1 to zero with this parameter. **Options:** ■ Abort (do not reset) ■ Reset **Factory setting:** Abort

DP Flow Transducer Block	
Parameter	**Description**
TOTALIZER_1_UNIT_ TEXT/ TOT. 1 USER UNIT Entry Index: 30 Data type: visible string Access: read, write	Enter text (unit) for customer-specific unit for totalizer 1. You can enter a maximum of eight alphanumeric characters here. → See also TOTALIZER_1_UNIT_SCALE/FACT.U.U.TOTAL.1. **Prerequisite:** ■ TOTALIZER_1_UNIT/TOTALIZER 1 UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. In the FF configuration program, the slash counts as a character, i.e. "crates/m2" would be displayed as "crates/m". **Factory setting:** _ _ _ _ _ _ _ _
TOTALIZER_1_UNIT_ SCALE/ FACT. U.U. TOTAL. 1 Entry Index: 31 Data type: float Access: read, write	Enter the 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. m^3 for the "Volume operat. cond." FLOW_TYP/FLOW-MEAS. TYPE. → See also TOTALIZER_1_UNIT_TEXT/TOT. 1 USER UNIT. **Prerequisite:** ■ TOTALIZER_1_UNIT/TOTALIZER 1 UNIT = User unit **Example:** You want the measured value to be displayed in "buckets". – PRIMARY_VALUE =1 m3 ≙ 100 bucket – Enter TOTALIZER_1_UNIT_TEXT/TOT. 1 USER UNIT: bucket – Enter TOTALIZER_1_UNIT_SCALE/FACT. U.U. TOTAL. 1: 100 – Result: PRIMARY_VALUE = 100 bucket **Factory setting:** 1.0
TOTALIZER_2_FLOAT / TOTALIZER 2 Display Index: 32 Data type: float Access: read only	Displays the total flow value of totalizer 2. You cannot reset totalizer 2. **Prerequisite:** ■ Deltabar S differential pressure transmitter
TOTALIZER_2_UNIT/ TOTAL. 2 ENG. UNIT Selection Index: 33 Data type: unsigned16 Access: read, write	Select the unit for totalizer 2. → 🖹 83, Totalizer Transducer Block, parameter description for TOTALIZER_1_UNIT_TEXT / TOT. 1 USER UNIT. **Prerequisite:** ■ Deltabar S differential pressure transmitter **Factory setting:** m^3
TOTALIZER_2_MODE / NEG. FLOW TOT. 2 Entry Index: 34 Data type: UNSIGNED8 Access: read, write, OOS	Specify the way of counting negative flows for totalizer 2. → 🖹 82, Totalizer Transducer Block, parameter description for TOTALIZER_1_MODE / NEG. FLOW TOT. 1 **Prerequisite:** ■ Deltabar S differential pressure transmitter
TOTALIZER_2_UNIT_ TEXT / TOT. 2 UNIT TEXT Selection Index: 35 Data type: visible string Access: read, write	Enter text (unit) for customer-specific unit for totalizer 2. → 🖹 83, Totalizer Transducer Block, parameter description for TOTALIZER_1_UNIT_TEXT / TOT. 1 USER UNIT. **Prerequisite:** ■ Deltabar S differential pressure transmitter ■ TOTALIZER_2_UNIT_TEXT / TOTAL. 2 ENG. UNIT = User unit **Factory setting:** _ _ _ _ _ _ _ _ _ _

DP Flow Transducer Block	
Parameter	**Description**
TOTALIZER_2_UNIT_ SCALE / FACT. U.U.TOTAL.2 Entry Index: 36 Data type: Float Access: read, write, OOS	Enter the conversion factor for a customer-specific unit for totalizer 2. → 🖹 83, Totalizer Transducer Block, parameter description for TOTALIZER_1_UNIT_SCALE / FACT. U.U.TOTAL.1. **Prerequisite:** ■ Deltabar S differential pressure transmitter ■ TOTALIZER_2_UNIT / TOTAL. 2 ENG. UNIT = User unit **Factory setting:** 1.0

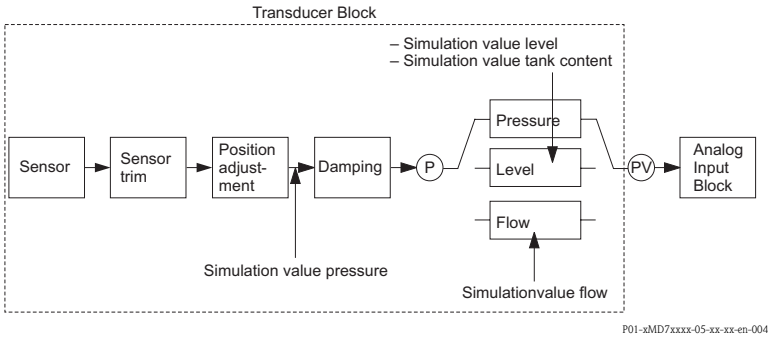
7.3.5 Display Transducer Block

Display Transducer Block	
Parameter	**Description**
DISPLAY_MAINLINE_ CONTENT/ MAIN LINE CONT. Selection Index: 11 Data type: unsigned8 Access: auto, OOS	Specify the contents for the main line of the local operation in the measuring mode. **Options:** ■ Primary value (PV) ■ Main measured value (%) ■ Pressure ■ Flow ■ Level ■ Tank content ■ Temperature ■ Error number ■ Totalizer 1 ■ Totalizer 2 ■ ISEL In1 ■ ISEL In2 ■ ISEL In3 ■ ISEL In4 ■ PID In1 The selection depends on the measuring mode chosen. **Factory setting:** Primary value (PV)
AUTOMATIC_ MAINLINE_FORMAT/ MAIN DATA FORMAT Selection Index: 12 Data type: unsigned8 Access: auto, OOS	Specify the number of places after the decimal point for the value displayed in the main line. **Options:** ■ Auto ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx ■ x.xxxxx **Factory setting:** Auto
DISPLAY_ ALTERNATING_VALUES /ALTERNATE DATA Selection Index: 13 Data type: unsigned8 Access: auto, OOS	Switch on the "Alternating display" mode. In this display mode, the local operation alternates between the following measured values depending on the measuring mode selected. – Pressure: primary value (PV), main measured value (%), pressure and temperature – Level: primary value (PV), main measured value (%), pressure, level, tank contents and temperature – Flow: primary value (PV), main measured value (%), pressure, flow, temperature, totalizer 1 and totalizer 2 **Options:** ■ Off ■ On **Factory setting:** Off

Display Transducer Block	
Parameter	**Description**
DISPLAY_CONTRAST/ DISPLAY CONTRAST Entry Index: 14 Data type: unsigned8 Access: auto, OOS	Adjust contrast of local operation. You specify the contrast of the display with a number. **Input range:** 4 to 13, 4: contrast weaker (brighter), 13: contrast stronger (darker). **Factory setting:** 8
DISPLAY_LANGUAGE/ LANGUAGE Selection Index: 15 Data type: unsigned8 Access: auto, OOS	Select the menu language for the local operation. **Options**: ■ English ■ Deutsch ■ Français ■ Español ■ Katakana ■ Chinese **Factory setting**: English
SIL_DIGITS_TEST_ STRING/ DIGITS SET Display Index: 16 Data type: visible string Access: read only	This parameter is used to check whether characters and digits are displayed correctly on the local operation. "0123456789.-" is shown if the units are displayed correctly.

7.3.6 Diagnostic Transducer Block

Diagnostic Transducer Block	
Parameter	**Description**
SW_LOCK / Index: 11 Data type: unsigned16 Access: OOS	For entering a code to lock or unlock operation. ✎ Note! ■ The -symbol on the local operation 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 remote operation, you can only unlock operation again using remote operation. See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), Section 5.6 "Locking/unlocking operation". **Options:** ■ Lock: Enter a number between 0 and 9999 and 100 ≙. ■ Unlock: Enter the number 100. **Factory setting:** 100
STATUS_ LOCKING Index: 12 Data type: unsigned8 Access: OOS	Displays the current locking status of the device or conditions that can lock the device (hardware locking, software locking).

Diagnostic Transducer Block	
Parameter	**Description**
SIMULATION_MODE/ SIMULATION MODE Selection Index: 13 Data type: unsigned8 Access: auto, OOS	Switch on simulation and select simulation type. Any simulation running is switched off if the measuring mode or level mode is changed. **Options**: ■ None ■ Pressure ■ Flow (only differential pressure transmitter) ■ Level ■ Tank content ■ Alarm/warning  P01-xMD7xxxx-05-xx-xx-en-004 **Factory setting:** None
SCALE_OUT_UNITS_ INDEX/ UNITS INDEX Display Index: 14 Data type: unsigned16 Access: read only	Displays the unit selected via the SCALE_OUT parameter (→ 55) in the Pressure Transducer Block.
SIMULATION_VALUE/ SIMULATED VALUE Entry Index: 15 Data type: float Access: auto, OOS	Enter the simulation value. **Prerequisite:** ■ SIMULATION_MODE/SIMULATION MODE = Pressure, flow, level or tank content.
ALARM_SIMULATION_ VALUE/ SIM. ERROR NO. Entry Index: 16 Data type: unsigned16 Access: auto, OOS	Enter the message number for simulation. → See also these Operating Instructions, Section 12.1 "Messages", "Code" table column. **Prerequisite:** ■ SIMULATION_MODE/SIMULATION MODE = Alarm/warning **Factory setting:** 613 (simulation active)
DIAGNOSTIC_CODE/ ALARM STATUS Display Index: 17 Data type: unsigned16 Access: read only	Displays the current messages present. If two or more messages are present, the message with the highest priority is shown on the display. → See also these Operating Instructions, Section 12.1 "Messages" and Section 12.3 "Confirming messages".
LAST_DIAGNOSTIC_ CODE/LAST DIAG. CODE Display Index: 18 Data type: unsigned16 Access: read only	Displays the last error that occurred and was eliminated. ✎ Note! ■ The message displayed here can be deleted by means of the RESET_ALARM_HISTORY/ RESET ALL ALARMS parameter.

Diagnostic Transducer Block	
Parameter	**Description**
ACKNOWLEDGE_ALARM_MODE/ACK. ALARM MODE Selection Index: 19 Data type: unsigned8 Access: auto, OOS	Switch on the acknowledge alarm mode. → See also ACKNOWLEDGE_ALARM/ACK. ALARM. **Options:** ■ On ■ Off **Factory setting:** Off
ACKNOWLEDGE_ALARM/ ACK. ALARM Selection Index: 20 Data type: unsigned8 Access: auto, OOS	Acknowledge the alarm. **Prerequisite:** ■ ACKNOWLEDGE_ALARM_MODE/ACK. ALARM MODE = On **Options:** ■ Abort ■ Confirm The cause of the alarm must be eliminated, the message must be acknowledged via the ACKNOWLEDGE_ALARM/ACK. ALARM parameter and, where applicable, the ALARM_HOLD_TIME/ALARM DISPL. TIME (→ 87) has to have elapsed before the device starts measuring again following an alarm. → See also these Operating Instructions, Section 12.3 "Confirming messages". **Factory setting:** Abort
RESET_ALARM_HISTORY/ RESET ALL ALARMS Selection Index: 21 Data type: unsigned8 Access: auto, OOS	Use this parameter to reset the alarm of the LAST_DIAGNOSTIC_CODE/LAST DIAG. CODE parameter. **Options:** ■ Abort ■ Confirm **Factory setting:** Abort
REACTION_ON_ALARM_ NR/ ERROR No. Entry Index: 22 Data type: unsigned16 Access: auto, OOS	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 CHOOSE_ERROR_OR_WARNING/SELECT ALARMTYPE. → See also these Operating Instructions, Section 12.1 "Messages" and Section 12.2 "Response of outputs to errors".
CHOOSE_ERROR_OR_WARNING/ SELECT ALARMTYPE Entry Index: 23 Data type: unsigned8 Access: auto, OOS	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 REACTION_ON_ALARM_NR/ERROR No. → See also these Operating Instructions, Section 12.2 "Response of outputs to errors". **Options**: ■ Alarm (A): the primary value is transmitted with the status BAD. ■ Warning (W): device continues measuring. The primary value in question is transmitted with the status UNCERTAIN. **Operation:** 1. Enter the corresponding message number by means of the REACTION_ON_ALARM_NR/ERROR NO. parameter. Select the "Alarm" or "Warning" option by means of the CHOOSE_ERROR_OR_WARNING/ SELECT ALARMTYPE parameter.
ALARM SETUP TIME/ ALARM DELAY Entry Index: 24 Data type: float Access: auto, OOS	Enter the alarm response time. ✎ Note! There is no alarm if the cause of the error is eliminated within the alarm delay time. **Input range:** 0 to 100 s **Factory setting:** 0.0 s

Diagnostic Transducer Block	
Parameter	**Description**
ALARM HOLD TIME/ ALARM DISPL.TIME Entry Index: 25 Data type: float Access: auto, OOS	Enter the alarm display time. Once the cause of the error is rectified, the alarm display time starts running. ✎ Note! The following applies if ACKNOWLEDGE_ALARM_MODE/ACK. ALARM MODE = On: If an alarm appears and the alarm display time elapses before the alarm has been acknowledged, the message is cleared once it has been acknowledged. → See also these Operating Instructions, Section 12.3 "Confirming messages". **Input range:** 0 to 999.9 s **Factory setting:** 0.0 s
PRESSURE_1_UNIT/ PRESS. ENG. UNIT Display Index: 26 Data type: unsigned16 Access: read only	Displays the pressure unit selected. The pressure unit is selected via the CAL_UNIT parameter (→ 🖹 52) in the Pressure Transducer Block.
PRESSURE_1_USER_ LOW_LIMIT/ PminALARM WINDOW Entry Index: 27 Data type: float Access: auto, OOS	Customer-specific process monitoring – enter lower pressure limit. You can use the REACTION_ON_ALARM_NR/SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure undershoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages", Table, code E730 and Section 12.2 "Response of outputs to errors". **Factory setting:** Low sensor limit ■1.1 (→ For the low sensor limit, see SENSOR_RANGE, EU_0 element, → 🖹 52.)
PRESSURE_1_USER_ HIGH_LIMIT/ PmaxALARM WINDOW Entry Index: 28 Data type: float Access: auto, OOS	Customer-specific process monitoring – enter upper pressure limit. You can use the REACTION_ON_ALARM_NR/SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure overshoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages", Table, code E731 and Section 12.2 "Response of outputs to errors". **Factory setting:** High sensor limit ■1.1 (→ For the high sensor limit, see SENSOR_RANGE, EU_100 element, → 🖹 52.)
TEMPERATURE_UNIT/ TEMP. ENG. UNIT Display Index: 29 Data type: Unsigend16 Access: read only	Displays the temperature unit selected. You can select the temperature unit by means of the SECONDARY_VALUE_UNIT parameter (→ 🖹 53) in the Pressure Transducer Block.
TEMPERATURE_1_ USER_LOW_LIMIT/ TminALARM WINDOW Entry Index: 30 Data type: float Access: auto, OOS	Customer-specific process monitoring – enter lower temperature limit. You can use the REACTION_ON_ALARM_NR/SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure undershoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages" Table, code E732 and Section 12.2 "Response of outputs to errors". **Factory setting:** Lower sensor temperature operating limit – 10 K (→ for the lower sensor temperature operating limit, see TEMPERATURE_1_SENSOR_LIMIT_ LOW/Tmin SENSOR, → 🖹 72)
TEMPERATURE_1_ USER_HIGH_LIMIT/ TmaxALARM WINDOW Entry Index: 31 Data type: float Access: auto, OOS	Customer-specific process monitoring – enter upper temperature limit. You can use the REACTION_ON_ALARM_NR/SELECT ALARMTYPE parameter to enter how the device responds if the operating pressure overshoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages" Table, code E733 and Section 12.2 "Response of outputs to errors". **Factory setting:** Upper sensor temperature operating limit +10 K (→ for the upper sensor temperature operating limit, see TEMPERATURE_1_SENSOR_LIMIT_ HIGH/Tmax SENSOR, → 🖹 72)

Diagnostic Transducer Block	
Parameter	**Description**
RESET_INPUT_VALUE/ ENTER RESET CODE Entry Index: 32 Data type: unsigned16 Access: auto, OOS	Reset parameters completely or partially to factory values or delivery status. → See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Factory setting" (reset) section. **Factory setting:** 0
OPERATING_HOURS/ OPERATING HOURS Display Index: 33 Data type: Unsigned32 Access: read only	Displays the hours of operation. This parameter cannot be reset.
ALARM_TABLE_ARRAY /ALARM TABLE ARRAY Display Index: 34 Data type: visible string Access: read only	This parameter displays pending alarms and warnings in hexadecimal numerical format (max. 18). Each message is assigned to a bit in the order of the error code in accordance with Section 12.1 "Messages".

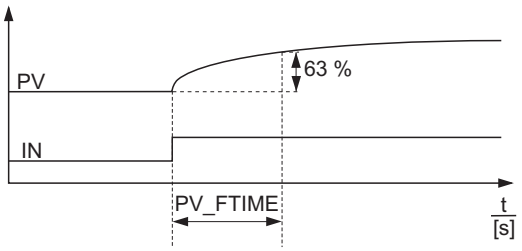
7.4 Analog Input Block (function block)

Analog Input Block	
Parameter	**Description**
ST_REV Display Index: 1 Data type: usigned16 Access: read only	Displays the counter for static parameters of the Analog Input Block. The counter is incremented by one with each change of a static parameter of the Analog Input Block. The counter counts up to 65535 and then starts again at zero.
TAG_DESC Entry Index: 2 Data type: octet string Access: auto, OOS	Enter a description for the related block or the measuring point e.g. TAG number (max. 32 alphanumeric characters).
STRATEGY Entry Index: 3 Data type: unsigned16 Access: auto, man, OOS	Enter user-specific value for grouping and thus faster evaluation of the blocks. Grouping takes place by entering the same numerical value for the STRATEGY parameter of the block in question. **Input range:** 0 to 65535 **Factory setting:** 0
ALERT_KEY Entry Index: 4 Data type: unsigned8 Access: auto, man, OOS	Enter the identification number for the measuring device or for each individual block. The control level uses this identification number to sort alarm and event messages and initiate other processing steps. **Input range:** 1 to 255 **Factory setting:** 0

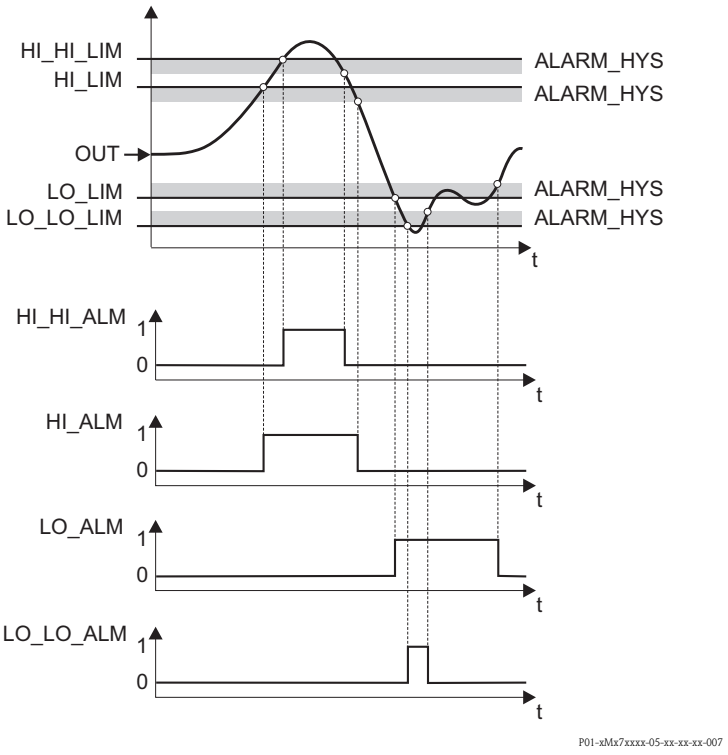
Analog Input Block	
Parameter	**Description**
MODE_BLK Selection, display Index: 5 Data type: DS-69 Access: auto, man, OOS	The MODE_BLK parameter is a structured parameter consisting of four elements. The Analog Input Block supports the "Auto" (automatic), "Man" (value and status of the OUT parameter can be specified directly by the operator) and OOS (out of service) modes. **TARGET** ■ Change the block mode. **ACTUAL** ■ Displays the current block mode. **PERMITTED** ■ Displays the modes supported by the block. **NORMAL** ■ Displays the block mode during standard operation.
BLOCK_ERR Display Index: 6 Data type: bit string Access: read only	Displays the active block error. **Possibilities**: ■ Out of service (OOS): – The Analog Input Block is in the OOS block mode. – The Resource Block is in the OOS block mode. ■ Simulation active: DIP switch 2 "Simulation" on the electronic insert is set to "on", i.e. simulation is possible. – The simulation mode for the Analog Input Block is active. → 📄 91, parameter description for SIMULATE. – The simulation function is switched on in the Diagnostic Transducer Block. → 📄 86, parameter description for SIMULATION_MODE. ■ Input failure: The input value transmitted by the Pressure or DP Flow Transducer Block is not valid (BAD status). This could be due to the following: – The Pressure or DP Flow Transducer Block is in the OOS block mode. – A device error is present. In the Diagnosis Transducer Block, the DIAGNOSTIC_CODE parameter (→ 📄 86) displays an error code. → See also these Operating Instructions, Section 12.1 "Messages". ✎ Note! The "Input failure" block error is relayed to downstream function blocks or high-order process control systems by means of the BAD status of the output value of the OUT Analog Input Block. ■ Block configuration error: There is a configuration error in the Analog Input Block. This could be due to the following: – By means of the XD_SCALE parameter, a unit was selected that does not suit the input value configured in the CHANNEL parameter. – No valid input value was selected by means of the CHANNEL parameter. → 📄 92, parameter description for CHANNEL. – An unsuitable linearization mode was selected by means of the L_TYPE parameter. → 📄 93, parameter description for L_TYPE. – The "Direct" linearization mode was selected by means of the L_TYPE parameter. The scalings for the XD_SCALE and OUT_SCALE parameters do not match. – If you assign the same process variable, such as "Primary value", to two Analog Input Blocks, the same scaling values and units have to be set for both blocks.
PV Display Index: 7 Data type: DS-65 Access: read only	The PV parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the process variable used for block execution **STATUS** ■ Displays the status of the process variable. ✎ Note! The unit used by the OUT_SCALE parameter is accepted.

Analog Input Block	
Parameter	**Description**
OUT Display, entry Index: 8 Data type: DS-65 Access: auto, man, OOS	The OUT parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the output value of the Analog Input Block. **STATUS** ■ Displays the status of the OUT value. ✎ Note! ■ The OUT output value is also transmitted if it is outside the scaling range of OUT_SCALE. ■ The unit used by the OUT_SCALE parameter is accepted. ■ If the "MAN" (manual) block mode was selected by means of the MODE_BLK parameter, the output value OUT and its status can be specified manually here.
SIMULATE Entry, display Index: 9 Data type: DS-82 Access: auto, man, OOS	The SIMULATE parameter is a structured parameter consisting of five elements. As the value and status specified here run through the complete algorithm, the behavior of the Analog Input Block can be checked. **SIMULATE_STATUS** ■ Enter the status for simulation. **SIMULATE_STATUS** ■ Enter the simulation value. **TRANSDUCER_STATUS** ■ Displays the current status of the Transducer Block which is linked to the Analog Input Block via the CHANNEL parameter. **TRANSDUCER_VALUE** ■ Displays the current process value of the Transducer Block which is linked to the Analog Input Block via the CHANNEL parameter. **ENABLE_DISABLE** ■ Switch the simulation mode on and off. ✎ Note! The "Simulation" DIP switch on the electronic insert must be set to "On". → See also Operating Instructions BA301P (Deltabar S) and BA302P (Cerabar S) or BA372P (Deltapilot S), "Simulation" section. **Factory setting:** Simulation disabled (simulation mode not active)
XD_SCALE Entry, selection Index: 10 Data type: DS-68 Access: man, OOS	The XD_SCALE parameter is a structured parameter consisting of four elements. **EU_100**: ■ Enter the upper limit for the input value of the Analog Input Block. ■ Factory setting: 100 **EU_0**: ■ Enter the lower limit for the input value of the Analog Input Block. ■ Factory setting: 0 **UNITS_INDEX**: ■ Select the unit. ■ Factory setting: % **DECIMAL:** ■ Displays the number of places after the decimal point for the input value. ■ Factory setting: 2 ✎ Note! ■ The XD_SCALE parameter corresponds to the PRIMARY_VALUE_RANGE parameter (→ 🖹 51) in the Transducer Block. ■ If you have selected the "Direct" option via the L_TYPE parameter, the settings for the XD_SCALE and OUT_SCALE parameters must be identical. If this is not the case, the block goes to the OOS mode and the "Block config error" message is displayed in the BLOCK_ERROR parameter.

Analog Input Block	
Parameter	**Description**
OUT_SCALE Entry, display Index: 11 Data type: DS-68 Access: auto, man, OOS	The OUT_SCALE parameter is a structured parameter consisting of four elements. **EU_100**: ■ Enter the upper limit for the output value of the AI Block OUT (→ 91). ■ Factory setting: 100 **EU_0**: ■ Enter the lower limit for the output value of the AI Block OUT. ■ Factory setting: 0 **UNITS_INDEX**: ■ Select the unit. ■ Factory setting: % **DECIMAL:** ■ Displays the number of places after the decimal point for the OUT output value. ■ Factory setting: 2 Note! ■ The OUT output value is also transmitted if it is outside the scaling range. The status changes to BAD. ■ If you have selected the "Direct" option via the L_TYPE parameter, the settings for the XD_SCALE and OUT_SCALE parameters must be identical. If this is not the case, the block goes to the OOS mode and the "Block config error" message is displayed in the BLOCK_ERROR parameter.
GRANT_DENY Selection Index: 12 Data type: DS-70 Access: auto, man, OOS	Grant or restrict access authorization for a fieldbus host system to the device. This parameter is not evaluated by Deltabar S, Cerabar S and Deltapilot S.
IO_OPTS Selection Index: 13 Data type: bit string Access: OOS	Activate options for processing the input and output values of the function block. **Factory setting:** No option activated
STATUS_OPTS Selection Index: 14 Data type: bit string Access: OOS	Specify status processing and processing of the output parameter OUT. **Factory setting:** No options active
CHANNEL Selection Index: 15 Data type: Access: OOS	Assign the output variables (process variables) of the "Pressure" or "Totalizer" Transducer Blocks to an Analog Input Block as the input value. **Possibilities** ■ 1: Primary value from the Pressure Transducer Block - a pressure, level or flow value depending on the measuring mode selected ■ 2: Secondary value from the Pressure Transducer Block, here the sensor temperature ■ 6: Totalizer 1 from the DP Flow Transducer Block **Factory setting:** ■ Analog Input Block 1: CHANNEL = 1: Primary value (pressure measured value) ■ Analog Input Block 2: CHANNEL = 2: Secondary value (sensor temperature) ■ Analog Input Block 3: CHANNEL = 6: Totalizer 1

Analog Input Block	
Parameter	**Description**
L_TYPE Selection Index: 16 Data type: unsigned8 Access: OOS	Select the linearization mode for the input value. **Options**: ■ Direct: In this setting, the input value bypasses the linearization function and is looped unchanged with the same unit through the Analog Input function block. With this option the scaling and unit of the XD_SCALE and OUT_SCALE parameters must be identical. If this is not the case, the block goes to the OOS mode and the "Block config error" message is displayed in the BLOCK_ERROR parameter. ■ Indirect: The input value is rescaled linearly via the XD_SCALE input scaling to the desired OUT_SCALE output range. ■ Indirect square root: The input value is rescaled via the XD_SCALE parameter and recalculated using a root function. It is then rescaled again to the desired output range via the OUT_SCALE parameter. **Factory setting:** Direct
LOW_CUT Entry Index: 17 Data type: float Access: auto, man, OOS	Enter the limit value for the low flow cut off. If the converted measured value is below this limit value, the PV parameter displays "0". ✎ Note! This parameter is only active if the "Low cutoff" option was activated via the IO_OPTS parameter. **Input range:** Range and unit of OUT_SCALE (→ see Page 92) **Factory setting:** 0
PV_FTIME Entry Index: 18 Data type: float Access: auto, man, OOS	Enter the filter time constant for the 1st order digital filter. This time is required in order for 63% of a change in the controlled variable IN to have an effect on the value of PV.  P01-xxxxxxxx-05-xx-xx-xx-021 **Factory setting:** 0 s
FIELD_VALUE Display Index: 19 Data type: Access: read only	The FIELD_VALUE parameter is a structured parameter consisting of two elements. **VALUE** ■ Displays the process variables after input scaling of the Analog Input Block. The value relates to a percentage of the input range XD_SCALE and is replaced by the simulation value when simulation is active. **STATUS** ■ Displays the current status.
UPDATE_EVT Display Index: 20 Data type: DS-73 Access: read only	The UPDATE_EVT parameter is a structured parameter consisting of five elements. **ACKNOWLEDGED** ■ This element is set to "Unacknowledged" as soon as a static parameter changes. **REPORTED** ■ Displays the date and time when the message was generated. **TIME_STAMP** ■ Displays the date and time when a static parameter was changed. **STATIC_REVISION** ■ This revision counter is increased with the alarm. **RELATIVE_INDEX** ■ Displays the altered parameter in the form of the relative index. See also this Table, "Parameter, Index" column.

Analog Input Block	
Parameter	**Description**
BLOCK_ALM Display, selection Index: 21 Data type: DS-72 Access: auto, man, OOS	The BLOCK_ALM parameter is a structured parameter consisting of five elements. **UNACKNOWLEDGED** ■ If the "Deactivated" option was selected for the alarm that occurred by means of the ACK_OPTION parameter, this alarm can only be acknowledged by means of this element. **ALARM_STATE** ■ Use this function to display the current block condition with information on pending configuration, hardware or system errors. The following block alarm messages are possible with the Analog Input Block: – Simulate active – Input failure – Block config error – Out of service **TIME_STAMP** ■ Displays the time when the alarm occurred. **SUB_CODE** ■ Displays the reason why the alarm was reported. **VALUE** ■ Displays the value of the corresponding parameter at the time the alarm was reported.
ALARM_SUM Display, selection Index: 22 Data type: DS-74 Access: auto; man, OOS	The ALARM_SUM parameter is a structured parameter consisting of four elements. **CURRENT** ■ Displays the current status of the process alarms in the Analog Input Block. The following alarms are possible: HiHiAlm, HiAlm, LoLoAlm, LoAlm and BlockAlm. **UNACKNOWLEDGED** ■ Displays the process alarms not confirmed. **UNREPORTED** ■ Displays the process alarms not reported. **DISABLED** ■ Possibility of deactivating process alarms.
ACK_OPTION Selection Index: 23 Data type: bit string Access: auto, man, OOS	Use this parameter to specify the process alarm to be acknowledged automatically as soon as it is detected by the fieldbus host system. If the option is activated for a process alarm, this process alarm is acknowledged automatically by the fieldbus host system. **Options**: ■ HiHiAlm: upper critical limit value alarm ■ HiAlm: upper limit value alarm ■ LoLoAlm: lower critical limit value alarm ■ LoAlm: lower limit value alarm ■ BlockAlm: block alarm ✎ Note! The message has to be acknowledged via the BLOCK_ALM parameter, UNACKNOWLEDGE element for process alarms for which automatic confirmation is not active. **Factory setting:** The option is not active for any process alarm, i.e. every process alarm message must be acknowledged manually.

Analog Input Block	
Parameter	**Description**
ALARM_HYS Entry Index: 24 Data type: float Access: auto, man, OOS	Enter hysteresis value for the upper and lower alarm value or critical alarm value. The hysteresis affects the following alarm or critical alarm limit values: ■ HI_HI_ALM: upper critical alarm limit value ■ HI_ALM: upper alarm limit value ■ LO_ALM: lower alarm limit value ■ LO_LO_ALM: lower critical alarm limit value  *Fig. 18: Illustration of the output value OUT with limit values and hysteresis as well as the alarms HI_HI_ALM, HI_ALM, LO_ALM and LO_LO_ALM* **Input range:** 0.0 to 50.0 % with regard to the range of the OUT_SCALE group (→ 🖹 92) **Factory setting:** 0.5 %
HI_HI_PRI Entry Index: 25 Data type: unsigned8 Access: auto, man, OOS	Specify how the system should react if the HI_HI_LIM limit value (→ 🖹 95) is overshot. **Input range:** ■ 0 to 15 ■ 0: The alarm is suppressed. ■ 1: The alarm is detected by the system. No notification is issued. ■ 2: Reserved for block alarms. ■ 3-7: Informative alarm with increasing priority, 3: Low priority, 7: High priority ■ 8-15: Critical alarm with increasing priority, 8: Low priority, 15: High priority **Factory setting:** 0
HI_HI_LIM Entry Index: 26 Data type: float Access: auto, man, OOS	Enter upper critical limit value. **Input range:** Range and units of OUT_SCALE (→ 🖹 92) **Factory setting:** +INF

Analog Input Block	
Parameter	**Description**
HI_PRI Entry Index: 27 Data type: unsigned8 Access: auto, man, OOS	Specify how the system should react if the HI_LIM limit value (→ Page 96) is overshot. **Input range:** ■ 0 to 15 ■ 0: The alarm is suppressed. ■ 1: The alarm is detected by the system. No notification is issued. ■ 2: Reserved for block alarms. ■ 3-7: Informative alarm with increasing priority, 3: Low priority, 7: High priority ■ 8-15: Critical alarm with increasing priority, 8: Low priority, 15: High priority **Factory setting:** 0
HI_LIM Entry Index: 28 Data type: float Access: auto, man, OOS	Enter upper limit value. **Input range:** Range and units of OUT_SCALE (→ 92) **Factory setting:** +INF
LO_PRI Entry Index: 29 Data type: unsigned8 Access: auto, man, OOS	Specify how the system should react if the LO_LIM limit value (→ 96) is undershot. **Input range:** ■ 0 to 15 ■ 0: The alarm is suppressed. ■ 1: The alarm is detected by the system. No notification is issued. ■ 2: Reserved for block alarms. ■ 3-7: Informative alarm with increasing priority, 3: Low priority, 7: High priority ■ 8-15: Critical alarm with increasing priority, 8: Low priority, 15: High priority **Factory setting:** 0
LO_LIM Entry Index: 30 Data type: float Access: auto, man, OOS	Enter lower limit value. **Input range:** Range and units of OUT_SCALE (→ 92) **Factory setting:** –INF
LO_LO_PRI Entry Index: 31 Data type: unsigned8 Access: auto, man, OOS	Specify how the system should react if the LO_LO_LIM limit value (→ 96) is undershot. **Input range:** ■ 0 to 15 ■ 0: The alarm is suppressed. ■ 1: The alarm is detected by the system. No notification is issued. ■ 2: Reserved for block alarms. ■ 3-7: Informative alarm with increasing priority, 3: Low priority, 7: High priority ■ 8-15: Critical alarm with increasing priority, 8: Low priority, 15: High priority **Factory setting:** 0
LO_LO_LIM Entry Index: 32 Data type: float Access: auto, man, OOS	Enter lower critical limit value. **Input range:** Range and units of OUT_SCALE (→ 92) **Factory setting:** –INF
LO_LO_ALM Display, selection Index: 33 Data type: DS-71 Access: auto, man, OOS	Status display for the LO_LO_LIM limit value (→ 96).

Analog Input Block	
Parameter	**Description**
HI_HI_ALM Display, selection Index: 33 Data type: DS-71 Access: auto, man, OOS	Status display for the HI_HI_LIM limit value (→ 95).
HI_ALM Display, selection Index: 34 Data type: DS-71 Access: auto, man, OOS	Status display for the HI_LIM limit value (→ 96).
LO_ALM Display, selection Index: 35 Data type: DS-71 Access: auto, man, OOS	Status display for the LO_LIM limit value (→ 96).
FSAFE_TYPE/ FAIL SAFE TYPE Selection Index: 37 Data type: unsigned8 Access: man, OOS	If the Analog Input Block receives an input value or simulation value with the status BAD, the Analog Input Block continues working with the failsafe mode defined by means of this parameter. The following options are available by means of the FSAFE_TYPE parameter: ■ Last Good Value The last valid value is used for further processing with the status UNCERTAIN. ■ Fail Safe Value The value specified by means of the FSAFE_VALUE parameter is used for further processing with the status UNCERTAIN. → See this Table, FSAFE_TYPE parameter description. ■ Wrong Value The current value is used for further processing with the status BAD. ✎ Note! The failsafe mode is also activated if the "Out of service" option was selected by means of the BLK_MODE parameter, "Target" element. **Factory setting:** Fail Safe Value
FSAFE_VALUE/ FAIL SAFE VALUE Entry Index: 38 Data type: float Access: OOS	Enter the value for the "Fail Safe Value" option selected by means of the FSAFE_TYPE parameter. → See also this Table, FSAFE_TYPE parameter description. **Factory setting:** 0
HIHI_ALM_OUT_D Index: 39 Data type: DS66 Access: auto, OOS, man	Digital outputs (1 or 0) for limit value monitoring. If "PV ≥ HIHI_LIM", the output is set to "1".
HI_ALM_OUT_D Index: 40 Data type: DS66 Access: auto, OOS, man	Digital outputs (1 or 0) for limit value monitoring. If "PV ≥ HI_LIM", the output is set to "1".
LO_ALM_OUT_D Index: 41 Data type: DS66 Access: auto, OOS, man	Digital outputs (1 or 0) for limit value monitoring. If "PV ≤ LOLO_LIM", the output is set to "1".

Analog Input Block	
Parameter	**Description**
LOLO_ALM_OUT_D Index: 42 Data type: DS66 Access: auto, OOS, man	Digital outputs (1 or 0) for limit value monitoring. If "PV ≤ LO_LIM", the output is set to "1".
ALARM_MODE Index: 43 Data type: DS66 Access: auto, OOS, man	Facilitates alarm mode settings for the ALM_OUT_D parameter **Options:** ■ LOW_CUT ■ HIHI_LOLO ■ HI_LO
ALM_OUT_D Selection Index: 44 Data type: DS-66 Access: auto, OOS, man	The ALM_OUT_D parameter comprises the 4 alarms (LO, LOLO, HI, HIHI). The 3 values make it possible to view the current, activated alarm depending on the alarm selected. **Options**: ■ LOW_CUT alarm (default): The ALM_OUT_D output returns 1 if the LOW_CUT function restricts the measured value to 0. Otherwise the ALM_OUT_D output is 0. ■ HIHI/LOLO collective alarm: The ALM_OUT_D output returns 1 if the measured value corresponds to the HIHI limit value or overshoots this value if the measured value corresponds to the LOLO limit value or undershoots this value. The output returns 0 if the measured value is between the limit values HIHI and LOLO. ■ HI/LO collective alarm: The ALM_OUT_D output returns 1 if the measured value corresponds to the HI limit value or overshoots this value if the measured value corresponds to the LO limit value or undershoots this value. The output returns 0 if the measured value is between the limit values HI and LO. **Factory setting:** ??
BLOCK_ERROR_ DESCRIPTION Index: 45 Data type: UNSIGNED32 Access: auto, OOS, man	Detailed description of the errors that occur within the block. **Error messages:** ■ RS_BLOCK in OOS ■ Block not scheduled ■ Channel undefined ■ L-Type undefined ■ AI / TRD unit inconsistent

8 Pressure measurement (via local operation and FieldCare)

Note!
- The Cerabar S and the Deltabar S are configured for the pressure measuring mode as standard. The Deltapilot S is configured for the level measuring mode as standard. The measuring range and the unit in which the measured value is transmitted, as well as the digital output value of the Analog Input Block OUT, correspond to the data on the nameplate.
- See also Operating Instructions for Deltabar S (BA301P) "Pressure measurement" section, Cerabar S (BA302P), "Pressure measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 138, Table 7: OPERATING MENU → SETTINGS → BASIC SETUP "Pressure".
- For a description of further relevant parameters, see
  – → 178, Table 15: OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure"
  – → 195, Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure".

Note!
- You can also specify a customer-specific unit. See parameter description for PRESS. ENG. UNIT (060) (→ 139).

9 Level measurement (via local operation and FieldCare)

9.1 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.	– Calibration with reference pressure – wet calibration, see→ 101, Section 9.2.1 – Calibration without reference pressure – dry calibration, see → 103, Section 9.2.2	– Incorrect entries are possible – Customized units are not possible	The measured value display and the LEVEL BEFORE LIN. parameter display 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.	– Calibration with reference pressure – wet calibration, see → 105, Section 9.3.1 – Calibration without reference pressure – dry calibration, see → 107, Section 9.3.2	– Incorrect entries are possible – Customized units are not possible	The measured value display and the LEVEL BEFORE LIN. parameter display 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: – % (level) – Level – Volume – Mass	– Calibration with reference pressure – wet calibration, see → 109, Section 9.4.1 – Calibration without reference pressure – dry calibration, see → 111, Section 9.4.2	– Incorrect entries are rejected by the device – Customized level, volume and mass units are possible	The measured value display and the LEVEL BEFORE LIN. parameter display the measured value.
The measured variable is not in direct proportion to the measured pressure as is the case with tanks with a conical outlet, for example. A linearization table has to be entered for the calibration.	LEVEL SELECTION: Level standard/ LEVEL MODE: Pressure linearized	Via LINd MEASURAND parameter: – Pressure + % – Pressure + volume – Pressure + mass	– Calibration with reference pressure: semiautomatic entry of linearization table, see → 113, Section 9.5.1 – Calibration without reference pressure: manual entry of linearization table, see → 116, Section 9.5.2.	– Incorrect entries are rejected by the device – Customized level, volume and mass units are possible	The measured value display and the TANK CONTENT parameter show the measured value.
– Two measured variables are required or – The container shape is given by value pairs, such as height and volume. 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 linearization 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.	LEVEL SELECTION: Level standard/ LEVEL MODE: Height linearized	Via COMB. MEASURAND parameter: – Height + volume – Height + mass – Height + % – %-height + volume – %-height + mass – %-height + %	– Calibration with reference pressure: wet calibration and semiautomatic entry of linearization table, see → 119, Section 9.6.1 – Calibration without reference pressure: dry calibration and manual entry of linearization table, see → 122, Section 9.6.2.	– Incorrect entries are rejected by the device – Customized level, volume and mass units are possible	The measured value display and the TANK CONTENT parameter show the 2nd measured value (volume, mass or %). The LEVEL BEFORE LIN parameter displays the 1st measured value (%-height or height).

9.2 "Level easy pressure" level selection

9.2.1 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. The pressure range is set to 0–300 mbar.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for EMPTY CALIB. and FULL CALIB. must be at least 1% apart 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
  – → 📄 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 📄 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 📄 141, Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure".
- For a description of further relevant parameters, see
  – → 📄 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 📄 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	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 BA301P.
2	Carry out position adjustment if necessary. → 📄 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
3	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE
4	If necessary, select the "Level easy pressure" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION

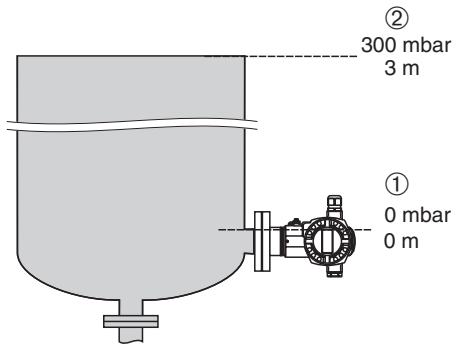


Fig. 19: Calibration with reference pressure – wet calibration

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

	Description
5	Local operation: Select the 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	The hydrostatic pressure for the lower calibration point is present at the device, here 0 mbar for example.
	Select the EMPTY CALIB. parameter.
	Enter the level value, here 0 m for example. The pressure value present is assigned to the lower level value by confirming the value.
10	The hydrostatic pressure for the upper calibration point is present at the device, here 300 mbar for example.
	Select the FULL CALIB. parameter.
	Enter the level value, here 3 m for example. The pressure value present is assigned to the upper level value by confirming the value.
11	Result: The measuring range is set for 0 to 3 m.

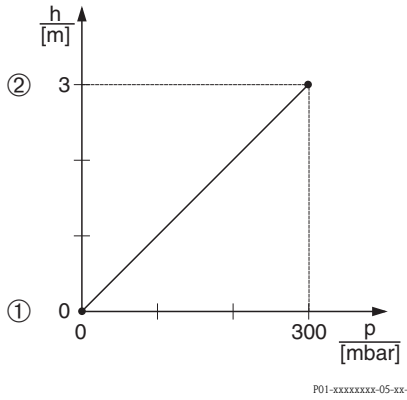


Fig. 20: Calibration with reference pressure – wet calibration

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

Note!

1. You can also perform calibration with reference pressure by means of the QUICK SETUP menu. → 133 ff, Table 4: QUICK SETUP "Level".
2. For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT, → 143.
3. If operating via the local operation, the EMPTY CALIB. (010) (→ 144) and FULL CALIB. (004) (→ 144) parameters also show the pressure present at the device. For operation using FieldCare, the pressure present at the device is displayed in the PROCESS VALUES group.

9.2.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in liters. The maximum volume of 1000 liters corresponds to a pressure of 450 mbar. The minimum volume of 0 liters corresponds to a pressure of 50 mbar since 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.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for EMPTY CALIB. (010) and FULL CALIB. (004) must be at least 1 % apart 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. → For information on how to perform position adjustment, → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
- For a description of the parameters mentioned, see
  – → 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 141, Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"
- For a description of further relevant parameters, see
  – → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	Description
1	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE
2	If necessary, select the "Level easy pressure" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION
3	Local operation: Select the BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP

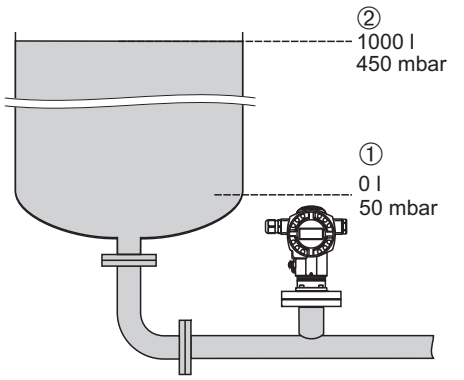


Fig. 21: Calibration without reference pressure – dry calibration

1 See Table, Step 10.
2 See Table, Step 11.
3 See Table, Step 12.
4 See Table, Step 13.

	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 (liters) 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 for example.
9	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l for example.
10	Enter the pressure value for the upper calibration point via the FULL PRESSURE parameter, here 450 mbar for example.
11	Result: The measuring range is set for 0 to 1000 l.

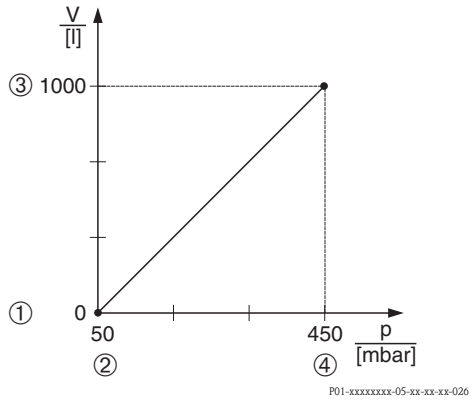


Fig. 22: Calibration with reference pressure – wet calibration

1 See Table, Step 7.
2 See Table, Step 8.
3 See Table, Step 9.
4 See Table, Step 10.

Note!

1. For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT (023), → 143.

9.3 "Level easy height" level selection

9.3.1 Calibration with reference pressure – wet calibration

Example:
In this example, the volume in a tank should be measured in liters. The maximum volume of 1000 liters corresponds to a level of 4.5 m. The minimum volume of 0 liters corresponds to a level of 0.5 m since the device is mounted below the level lower-range value. The density of the fluid is 1 kg/dm^3.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE and EMPTY HEIGHT/FULL HEIGHT must be at least 1% apart for the "Level easy height" level mode. The value will be rejected with a 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
  – → 📄 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 📄 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 📄 145, Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height".
- For a description of further relevant parameters, see
  – → 📄 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 📄 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	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 BA301P.
2	Carry out position adjustment if necessary. → 📄 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
3	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE

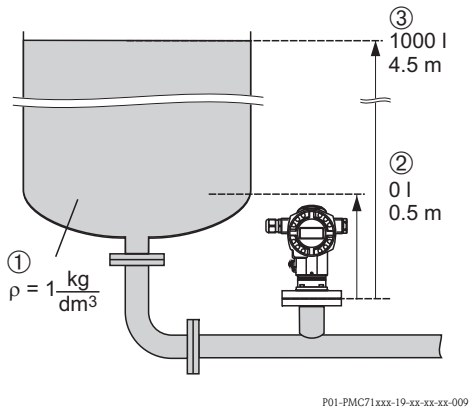
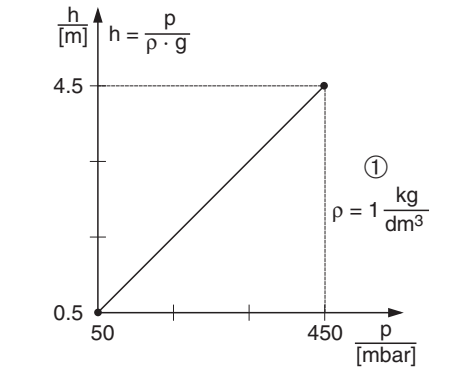


Fig. 23: Calibration with reference pressure – wet calibration

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

	Description
4	If necessary, select the "Level easy height" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION
5	Local operation: Select the 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 volume unit via the OUTPUT UNIT parameter, here l (liters) for example.
8	Select a height unit via the HEIGHT UNIT parameter, here m for example.
9	Select the "Wet" option by means of the CALIBRATION MODE parameter.
10	Select a density unit via the DENSITY UNIT parameter, here kg/dm³ for example.
11	Enter the density of the fluid using the ADJUST DENSITY parameter, here 1 (liter) for example.
12	Enter the volume value for the lower calibration point via the EMPTY CALIB. parameter, here 0 l for example. (The hydrostatic pressure currently measured is displayed as a height value, here 0.5 m for example.)
13	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l for example. (The hydrostatic pressure currently measured is displayed as a height value, here 4.5 m for example.)
14	Result: The measuring range is set for 0 to 1000 l.



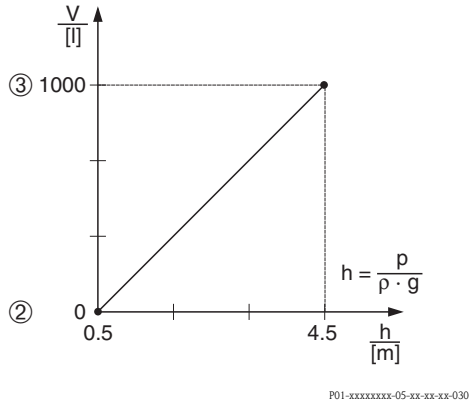


Fig. 24: Calibration with reference pressure – wet calibration

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

Note!

1. For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT (023), → 147.

9.3.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in liters. The maximum volume of 1000 liters corresponds to a level of 4.5 m. The minimum volume of 0 liters corresponds to a level of 0.5 m since the device is mounted below the level lower-range value. The density of the fluid is 1 kg/dm^3.

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.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- The values entered for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE and EMPTY HEIGHT/FULL HEIGHT must be at least 1% apart 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. → For information on how to perform position adjustment, → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
- For a description of the parameters mentioned, see
  – → 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 145, Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height".
- For a description of further relevant parameters, see
  – → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	Description
1	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE
2	If necessary, select the "Level easy height" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION
3	Local operation: Select the BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP

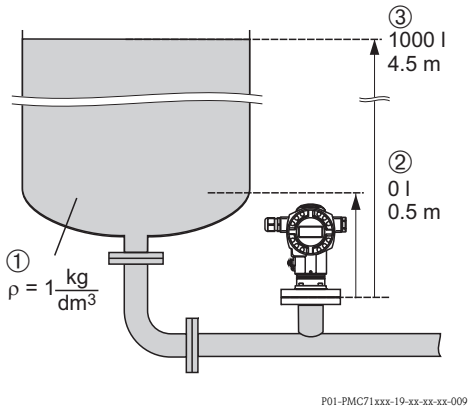


Fig. 25: Calibration without reference pressure – dry calibration

1 See Table, Step 11.
2 See Table, Steps 13 and 14.
3 See Table, Steps 15 and 16.

	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 (liters) for example.
6	Select a height unit via the HEIGHT UNIT parameter, here m for example.
7	Select the "Dry" option by means of 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 1 kg/dm^3 for example.
10	Enter the volume value for the lower calibration point via the EMPTY CALIB. parameter, here 0 l (liters) for example.
11	Enter the height value for the lower calibration point via the EMPTY HEIGHT parameter, here 0.5 mbar for example.
12	Enter the volume value for the upper calibration point via the FULL CALIB. parameter, here 1000 l (liters) for example.
13	Enter the height value for the upper calibration point via the FULL HEIGHT parameter, here 4.5 mbar for example.
14	Result: The measuring range is set for 0 to 1000 l (liters).

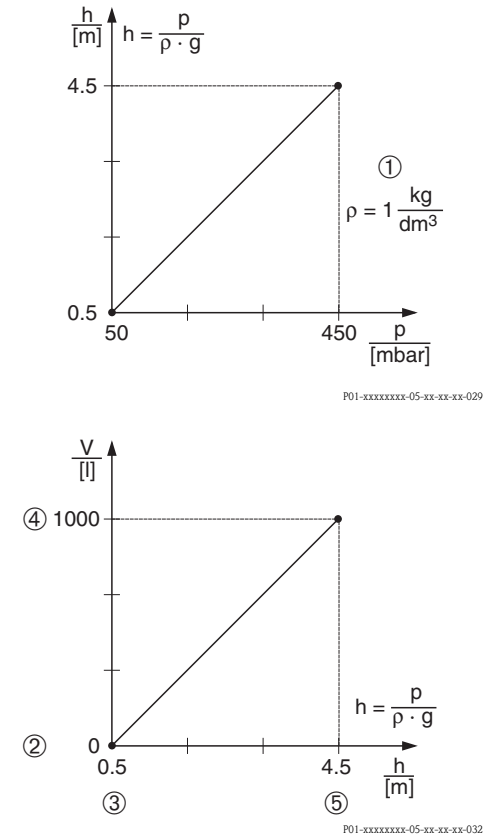


Fig. 26: Calibration with reference pressure – wet calibration

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

Note!

1. For this level mode, the measured variables %, level, volume and mass are available. → See also parameter description for OUTPUT UNIT (023), → 147.

9.4 "Level standard" level selection, "Linear" level mode

9.4.1 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. The pressure range is set to 0–300 mbar.

Prerequisite:
- The measured variable is in direct proportion to the pressure.
- The tank can be filled and emptied.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For a description of the parameters mentioned, see
  – → 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"
  – → 153, Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear".
- For a description of further relevant parameters, see
  – → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	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 BA301P.
2	Carry out position adjustment if necessary. → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
3	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE
4	If necessary, select the "Level standard" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE

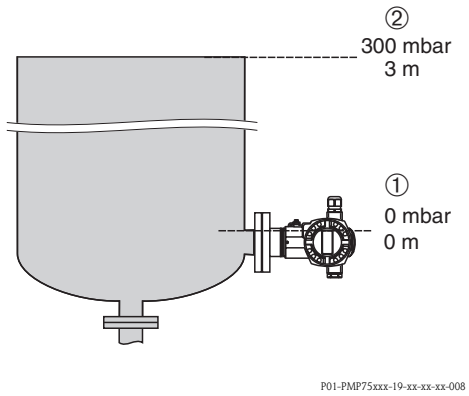
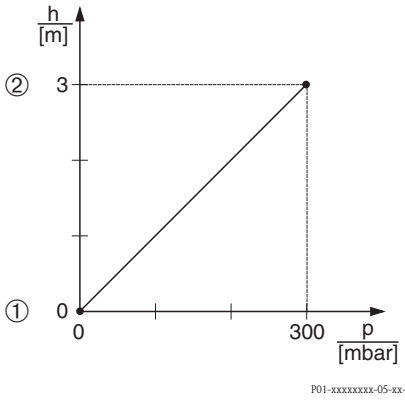


Fig. 27: Calibration with reference pressure – wet calibration

1 See Table, Step 11.
2 See Table, Step 12.

	Description	
5	Local operation: Select the BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP	 1 See Table, Step 11. 2 See Table, Step 12.
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 the EMPTY CALIB. parameter.	
	Enter the level value, here 0 m for example. The pressure value present is assigned to the lower level value by confirming the value.	
12	The pressure for the upper calibration point is present at the device, here 300 mbar for example.	
	Select the FULL CALIB. parameter.	
	Enter the level value, here 3 m for example. The pressure value present is assigned to the upper level value by confirming the value.	
14	Result: The corresponding pressure value has been assigned to the lower and upper level value. The device is ready for level measurement.	

Note!

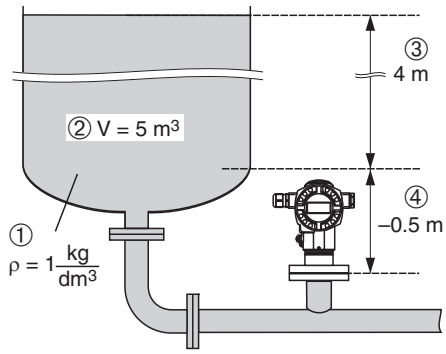
1. You can also perform calibration with reference pressure by means of the QUICK SETUP menu. → 133 ff, Table 4: QUICK SETUP "Level".
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 153), UNIT VOLUME (313) (→ 154) and MASS UNIT (709) (→ 155).
3. For this level mode, the measured variables %, level, volume and mass are available. → 153 ff.
4. The EMPTY PRESSURE (710) (→ 156) and FULL PRESSURE (711) (→ 156) parameters display the pressure values belonging to the EMPTY CALIB. and FULL CALIB. parameters.

9.4.2 Calibration without reference pressure – dry calibration

Example:
In this example, the volume in a tank should be measured in m^3. The maximum volume is 5 m^3 and the maximum height is 4 m. The density of the fluid is 1 kg/dm^3. 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.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- 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. → For information on how to perform position adjustment, → 📄 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
- For a description of the parameters mentioned, see
  – → 📄 129, Table 2: GROUP SELECTION → MEASURING MODE
  – → 📄 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"
  – → 📄 153, Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear".
- For a description of further relevant parameters, see
  – → 📄 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 📄 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	Description	
1	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE	 *Fig. 28: Calibration without reference pressure – dry calibration* *1 See Table, Step 9.* *2 See Table, Step 10.* *3 See Table, Step 11.* *4 See Table, Step 12.*

	Description	
2	If necessary, select the "Level standard" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION	
3	Local operation: Select the BASIC SETUP function group. Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → BASIC SETUP	
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.	
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 for example.	
12	Enter the level offset via the ZERO POSITION parameter, here –0.5 m for example.	
13	Result: The device is ready for level measurement	

Note!

1. For this level mode, the measured variables %, level, volume and mass are available. → 153 ff.
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 153), UNIT VOLUME (313) (→ 154) and MASS UNIT (709) (→ 155).

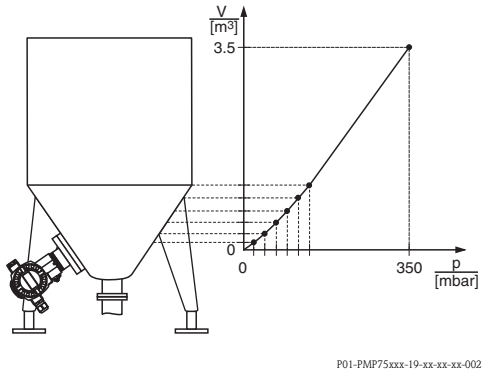
9.5 "Level standard" level selection, "Pressure linearized" level mode

9.5.1 Semiautomatic entry of the linearization table

Example:
In this example, the volume in a tank with a conical outlet should be measured in m^3.

Prerequisite:
- The tank can be filled. The linearization characteristic must rise continuously.

Note!
- See also Operating Instructions for Deltabar S (BA301P) or Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For a description of the parameters mentioned, see
  - → 129, Table 2: GROUP SELECTION → MEASURING MODE
  - → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  - → 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"
  - → 153, Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"
  - → 181, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation
  - → 184, Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare
- For a description of further relevant parameters, see
  - → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  - → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	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 BA301P.	 P01-PMP75xxx-19-xx-xx-xx-002
2	Carry out position adjustment if necessary. → 133, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.	
	Carry out basic setup:	
3	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE	
4	If necessary, select the "Level standard" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION	

	Description
5	Local operation: Select the 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 Point 3 in the following note.
8	Select the "Pressure and 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 the HYDR. PRESS MIN. parameter.
	Enter the minimum hydrostatic pressure to be expected, here 0 mbar for example.
11	Select the HYDR. PRESS MAX parameter.
	Enter the maximum hydrostatic pressure to be expected, here 350 mbar for example.
	Carry out linearization:
12	Change the function group. Local operation: Menu path: GROUP SELECTION →OPERATING MENU → SETTINGS → LINEARIZATION FieldCare: Menu path: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION
13	Select the TANK CONTENT MIN parameter.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
14	Select the TANK CONTENT MAX parameter .
	Specify the maximum tank contents to be expected, here 3.5 m^3 for example. See also Point 4 in the following note.
15	Local operation: 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.
18	Enter the linearization table (min. 2 points, max. 32 points).
	Fill the tank to the height of the 1st point.
	LINE-NUMB: enter the value of the corresponding point.
	X-VAL.: The hydrostatic pressure present is displayed. The X-VAL. displayed is saved by confirming the Y-value. See following line, Y-VAL.
	Y-VAL.: Enter the volume value, here 0 m^3 for example, and confirm the value.

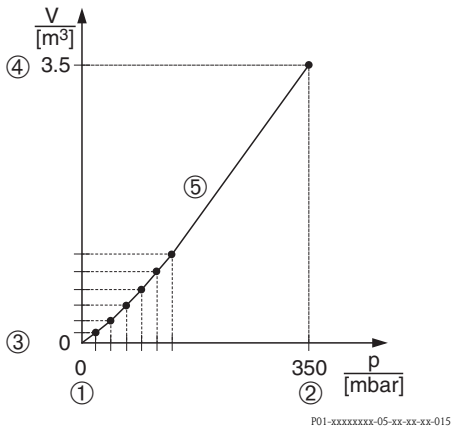


Fig. 29: Semiautomatic entry of the linearization table

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 to 19.

	Description	
19	Local operation: If you want to enter another point for the linearization 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 linearization table, select the "Accept input table" option. FieldCare: You can enter further points for the linearization 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.	
20	Where necessary scale the OUT value of the Analog Input Block, see Page 89 parameter descriptions. For this purpose, equate XD SCALE and OUT SCALE or the OUT value with the measured value.	
21	Result: The linearization table has been entered and the device is ready for level measurement.	

Note!

1. For this level mode, the measured variables %, volume and mass are available. → 161 ff.
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 158), UNIT VOLUME (313) (→ 161) and MASS UNIT (709) (→ 162).
3. Once you have selected the "Pressure linearized" level mode, the warning message "W710 Set span too small. Not allowed." can appear. At this stage, the linearization 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 linearization table, is smaller than the minimum span permitted (→ MINIMUM SPAN (591), → 193). The message disappears as soon as the highest X-VALUE is greater than the minimum span and the table entered is active.
4. Once you have entered the maximum tank contents to be expected for TANK CONTENT MAX., the alarm "A719 Y-Val of lin. table out of edit limits" can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest Y-VALUE of the linearization table, is greater than the value entered for TANK CONTENT MAX. The message disappears as soon as no Y-VALUE is greater than the value for TANK CONTENT MAX. and the table entered is active.

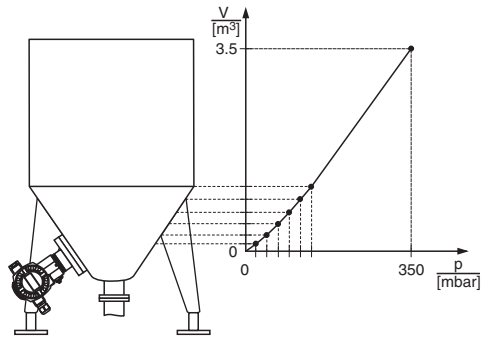
9.5.2 Manual entry of the linearization table

Example:
In this example, the volume in a tank with a conical outlet should be measured in m^3.

Prerequisite:
- This is a theoretical calibration, i.e. the points for the linearization table are known.

Note!
- See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- 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. → For information on how to perform position adjustment, → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
- For a description of the parameters mentioned, see
  - → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  - → 141, Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"
  - → 161, Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized"
  - → 181, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation
  - → 184, Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare
- For a description of further relevant parameters, see
  - → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  - → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	Description
1	Perform calibration as per Section 9.5.1, Steps 3 to 11.
	Carry out linearization:
2	Change the function group. Local operation: Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION FieldCare: Menu path: OPERATING MENU → SETTINGS → LINEARIZATION
3	Select the TANK CONTENT MIN parameter.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
4	Select the TANK CONTENT MAX parameter .
	Specify the maximum tank contents to be expected, here 3.5 m^3 for example. See also Point 3 in the following note.
5	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 the linearization 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	Local operation: If you want to enter another point for the linearization 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 linearization table, select the "Accept input table" option. FieldCare: You can enter further points for the linearization 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	Where necessary scale the OUT value of the Analog Input Block, see Page 89 parameter descriptions. For this purpose, equate XD SCALE and OUT SCALE or the OUT value with the measured value.
11	Result: The linearization table has been entered and the device is ready for level measurement.



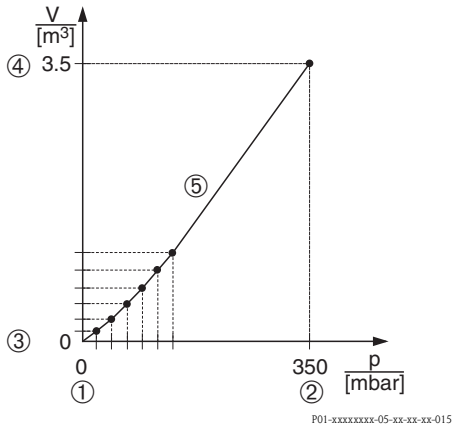


Fig. 30: Manual entry of the linearization table

1 See Section 9.5.1, Table, Step 10.
2 See Section 9.5.1, Table, Step 11.
3 See Table, Step 3.
4 See Table, Step 4.
5 See Table, Steps 5 to 9.

Note!

1. For this level mode, the measured variables %, volume and mass are available.
→ 161 ff.
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 158), UNIT VOLUME (313) (→ 161) and MASS UNIT (709) (→ 162).
3. Once you have selected the "Pressure linearized" level mode, the warning message "W710 Set span too small. Not allowed." can appear. At this stage, the linearization 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 linearization table, is smaller than the minimum span permitted (→ MINIMUM SPAN (591), → 193). The message disappears as soon as the highest X-VALUE is greater than the minimum span and the table entered is active.

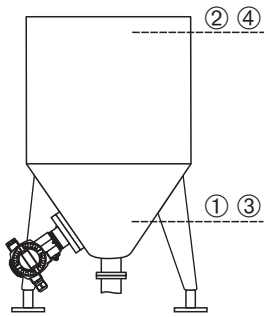
9.6 "Height linearized" level mode

9.6.1 Wet calibration and semiautomatic entry of the linearization table

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

Prerequisite:
- The tank can be filled. The linearization characteristic must rise continuously.

Note!
- See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P), "Level measurement" section or Deltapilot S (BA372P), "Level measurement" section.
- For a description of the parameters mentioned, see
  - → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  - → 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"
  - → 165, Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"
  - → 181, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation
  - → 184, Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare
- For a description of further parameters, see
  - → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  - → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	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 BA301P.	 P01-PMP75xxx-19-xx-xx-xx-004
2	Carry out position adjustment if necessary. → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.	
	Perform calibration for the 1st measured variable:	
3	Select the "Level" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE	
4	If necessary, select the "Level standard" level mode using the LEVEL SELECTION parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE "Level" → LEVEL SELECTION FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE "Level" → LEVEL SELECTION	

	Description
5	Local operation: Select the 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 "Height linearized" option by means of the LEVEL MODE parameter.
8	Select the "Height + volume" option by means of the COMB. MEASURAND parameter.
9	Select the unit for the 1st measured value via the HEIGHT UNIT parameter, here m for example.
10	Select the unit for the 2nd measured variable via the UNIT VOLUME parameter, here m^3 for example.
11	Select the LEVEL MIN parameter.
	Enter the minimum level to be expected, here 0 m for example.
12	Select the LEVEL MAX parameter.
	Enter the maximum level to be expected, here 3 m for example. See also Point 3 in the following note.
13	Select the "Wet" option via the CALIBRATION MODE parameter (calibration mode for the 1st measured variable).
14	The pressure for the lower calibration point is present at the device, here 0 mbar for example.
	Select the EMPTY CALIB. parameter.
	Enter the level value, here 0 m for example. The pressure value present is assigned to the lower level value by confirming the value.
15	The pressure for the upper calibration point is present at the device, here 300 mbar for example.
	Select the FULL CALIB. parameter.
	Enter the level value, here 3 m for example. The pressure value present is assigned to the upper level value by confirming the value.
16	Result: The calibration for the 1st measured variable is carried out.
	Perform linearization (calibration for the 2nd measured variable)
17	Change the function group. Local operation: Menu path: GROUP SELECTION →OPERATING MENU → SETTINGS → LINEARIZATION FieldCare: Menu path: OPERATING MENU → SETTINGS → LINEARIZATION
18	Select the TANK CONTENT MIN parameter.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
19	Select the TANK CONTENT MAX parameter .
	Specify the maximum tank contents to be expected, here 5 m^3 for example.

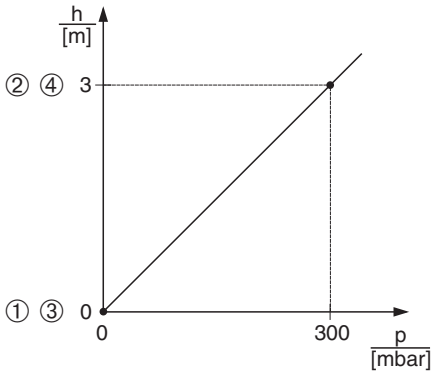


Fig. 31: Calibrating the 1st measured variable

1 See Table, Step 11.
2 See Table, Step 12.
3 See Table, Step 14.
4 See Table, Step 15.

	Description
20	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 the linearization 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. The X-VAL. displayed is saved by confirming the Y-value. See following line, Y-VAL.
	Y-VAL.: Enter the volume value, here 0 m^3 for example, and confirm the value.
24	Local operation If you want to enter another point for the linearization 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 linearization table, select the "Accept input table" option. FieldCare: You can enter further points for the linearization 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 linearization 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 Point 5 in the following note.

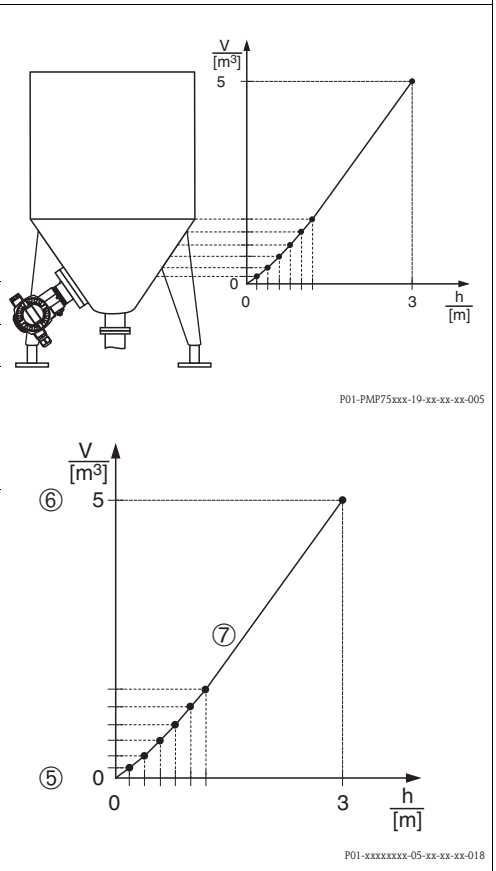


Fig. 32: Calibrating the 2nd measured variable

5 See Table, Step 18.
6 See Table, Step 19.
7 See Table, Steps 20 to 24.

Note!

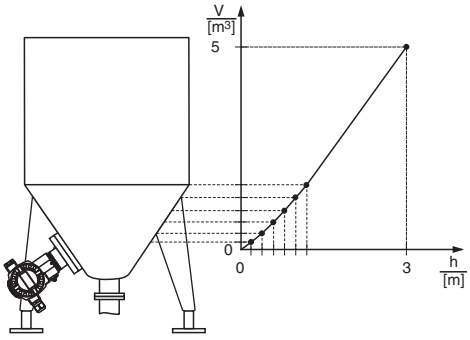
1. For this level mode, the measured variables "height + %", "height + volume", "height + mass", "%-height + %", "%-height + volume" and "%-height + mass" are available. → 161 ff.
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 165), UNIT VOLUME (313) (→ 166) and MASS UNIT (709) (→ 167).
3. Once you have entered the maximum level to be expected for LEVEL MAX., the alarm "A707 X-Val of lin. table out of edit limits" can appear. At this stage, the linearization table already consists of two points as standard. It could be the case that the 2nd value, and thus the highest X-VALUE of the linearization table, is greater than the maximum level entered. The message disappears as soon as the highest X-VALUE is greater than the maximum level and the table entered is active.
4. You can use the MENU DESCRIPTOR (416) parameter (→ 189) to specify which measured value should be displayed on the local operation.

9.6.2 Dry calibration and manual entry of the linearization 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 linearization table are known.

Note!
- See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P), "Level measurement" section or Deltapilot (BA372P), "Level measurement" section.
- 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. → For information on how to perform position adjustment, → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.
- For a description of the parameters mentioned, see
  – → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"
  – → 165, Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"
  – → 181, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation
  – → 184, Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare
- For a description of further parameters, see
  – → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
  – → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level".

	Description	
	Perform calibration for the 1st measured variable:	 P01-PMP75xxx-19-xx-xx-xx-005
1	Perform calibration as per Section 9.6.1, Steps 1 to 12.	
2	Select the "Dry" option via the CALIBRATION MODE parameter (calibration mode for the 1st measured variable).	
3	Select a density unit via the DENSITY UNIT parameter, here kg/dm³ for example.	
4	Enter the density of the fluid via the ADJUST DENSITY parameter, here 1.0 for example.	
5	If necessary, enter a level offset via the ZERO POSITION parameter, here 0 m for example.	
6	Result: The calibration for the 1st measured variable is carried out.	
	Perform linearization (calibration for the 2nd measured variable)	
7	Change the function group. Local operation: Menu path: GROUP SELECTION →OPERATING MENU → SETTINGS → LINEARIZATION FieldCare: Menu path: OPERATING MENU → SETTINGS → LINEARIZATION	

	Description
8	Select the TANK CONTENT MIN parameter.
	Specify the minimum tank contents to be expected, here 0 m^3 for example.
9	Select the TANK CONTENT MAX parameter .
	Specify the maximum tank contents to be expected, here 5 m^3 for example.
10	Select the "Editor table" option by means of the TABLE SELECTION parameter.
11	Select the "Manual" option by means of the LIN. EDIT MODE parameter.
12	Select the "New table" option by means of the EDITOR TABLE parameter.
13	Enter the linearization 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.
14	Local operation If you want to enter another point for the linearization table, select the "Next point" option and enter the point as described in Step 13. If you want to finish entering the values and activate the linearization table, select the "Accept input table" option. FieldCare: You can enter further points for the linearization table as explained in Step 13. Once all the points have been entered, the table must be activated by means of the TAB. ACTIVATE parameter.
15	Result: – The linearization 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 Point 3 in the following note.

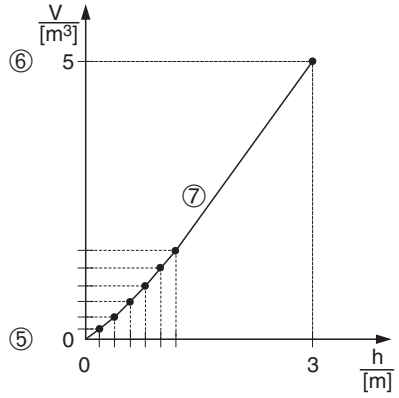


Fig. 33: Calibrating the 2nd measured variable

5 See Table, Step 8.
6 See Table, Step 9.
7 See Table, Steps 10 to 14.

Note!

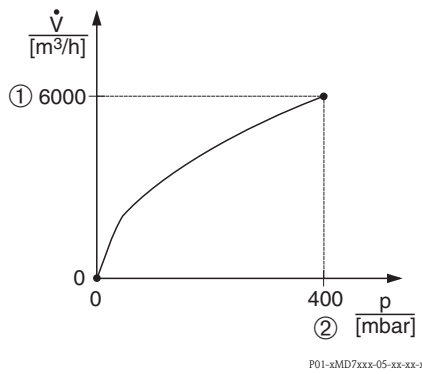
1. For this level mode, the measured variables "height + %", "height + volume", "height + mass", "%-height + %", "%-height + volume" and "%-height + mass" are available.
→ 161 ff.
2. You can also specify customer-specific units. See parameter descriptions for PRESS. ENG. UNIT (060) (→ 150), HEIGHT UNIT (708) (→ 165), UNIT VOLUME (313) (→ 166) and MASS UNIT (709) (→ 167).
3. You can use the MENU DESCRIPTOR (416) parameter (→ 189) to specify which measured value should be displayed on the local operation.

10 Flow measurement (via local operation and FieldCare)

10.1 Calibration

Example:
In this example, a volume flow should be measured in m^3/h.

Note!
- The "Flow measurement" measuring mode is only available for the Deltabar S differential pressure transmitter.
- See also Operating Instructions for Deltabar S (BA301P), "Flow measurement" section.
- For a description of the parameters mentioned, see
  – → 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT
  – → 173 ff, Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow".
- For a description of further parameters, see
  – → 179, Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"
  – → 197, Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow".

	Description	
1	Before configuring the device for your application, the pressure piping must be cleaned and the device filled with fluid. See Operating Instructions BA301P.	 *Fig. 34: Flow measurement calibration* *1 See Table, Step 7.* *2 See Table, Step 8.*
2	Carry out position adjustment if necessary. See Page 137, Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT.	
3	Select the "Flow" measuring mode via the MEASURING MODE parameter. Local operation: Menu path: GROUP SELECTION → MEASURING MODE FieldCare: Menu path: OPERATING MENU → SETTINGS → BASIC SETUP → MEASURING MODE	
4	Local operation: Select the 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 operat. 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 the MAX. FLOW parameter.	
	Enter the maximum flow value of the primary device, here 6000 m^3/h for example. See also the layout sheet of the primary device.	
9	Select the MAX PRESS. FLOW parameter.	
	Enter the maximum pressure, here 400 mbar for example. See also the layout sheet of the primary device.	
10	Result: The device is configured for flow measurement.	

Note!

1. You can also perform calibration by means of the QUICK SETUP menu. → 135 ff, Table 5: QUICK SETUP "Flow".
2. By means of the FLOW-MEAS. TYPE parameter, you can choose between the following flow types:
   – Volume operat. 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 descriptions for PRESS. ENG. UNIT (060) (→ 174), UNIT FLOW (391) (→ 175), NORM FLOW UNIT (661) (→ 176), STD. FLOW UNIT (660) (→ 176) and MASS FLOW UNIT (571) (→ 176).
4. In the lower measuring range, small flow quantities (creepages) can lead to large fluctuations in the measured value. You can activate low flow cut-off via the LOW FLOW CUT-OFF (442) parameter (→ 180).

10.2 Totalizer

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

Note!
- For a description of the parameters mentioned, see
  – → 📄 187 ff, Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP
  – → 📄 197 ff, Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"
- Totalizer 1 can be reset. Totalizer 2 cannot be reset.

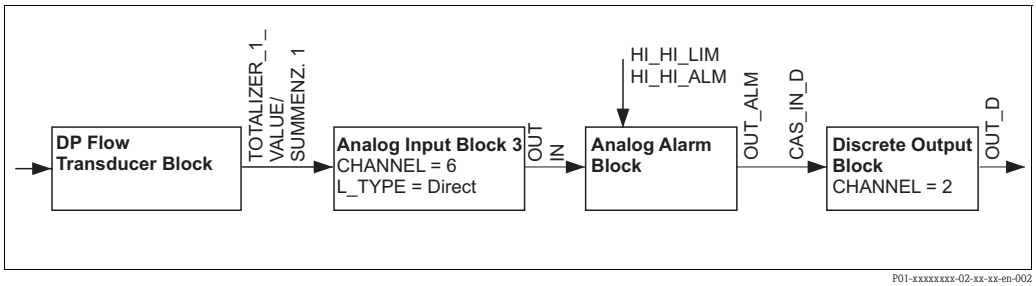
	Description
1	Calibrate the device in accordance with Section 10.1.
2	Change the function group. Local operation: Menu path: GROUP SELECTION → OPERATING MENU → SETTINGS → TOTALIZER SETUP FieldCare: Menu path: OPERATING MENU → SETTINGS → TOTALIZER SETUP
3	Select a flow unit via the TOTALIZER 1 UNIT parameter, here m^3 E^3 for example.
4	Use the NEG. FLOW TOT. 1 parameter to specify the totalizing 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 totalized volume flow.

Note!
- You can also specify a customer-specific unit. → See parameter descriptions for TOTALIZER 1 UNIT (398), (662), (664), (666) (→ 📄 187) and TOTALIZER 2 UNIT (399), (663), (665), (667) (→ 📄 188).
- The TOTALIZER 1 and TOTAL. 1 OVERFLOW parameters display the totalized flow value of the first totalizer. The TOTALIZER 2 and TOTAL. 2 OVERFLOW parameters display the totalized flow value of the second totalizer.
  → 📄 197 ff, PROCESS VALUES function group.
- You can use the MENU DESCRIPTOR (416) parameter (→ 📄 189) to specify which measured value should be displayed on the local operation.

10.2.1 Resetting totalizer 1 automatically

By means the Analog Alarm Block

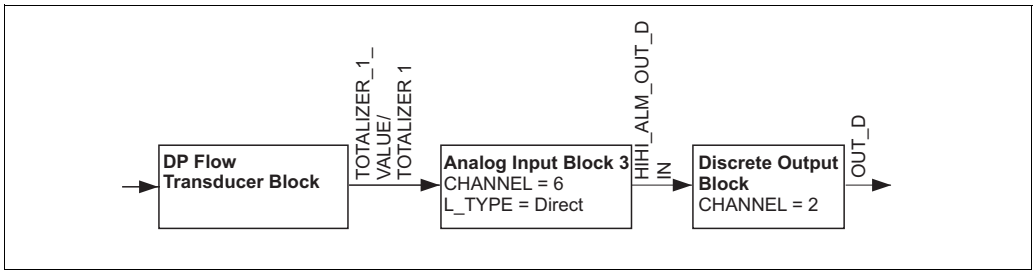
With the aid of the Analog Alarm and Discrete Output Block, totalizer 1 in the DP Flow Transducer Block can be reset automatically.



The DP Flow Transducer Block is connected to an Analog Input Block by means of the CHANNEL parameter (CHANNEL = 6). In the Analog Alarm Block, the HI_HI_LIM parameter is used to set a limit value at which the totalizer should be reset to zero. As soon as this limit value is overshot, the Analog Alarm Block transmits an alarm value to the downstream Discrete Output Block. The latter changes its output from 0 to 1 and thus resets the totalizer in the DP Flow Transducer Block to 0. The output of the Analog Alarm Block changes back to 0.

By means the Analog Input Block

With the aid of Analog Input and Discrete Output Block, totalizer 1 in the DP Flow Transducer Block can be reset automatically.



The DP Flow Transducer Block is connected to an Analog Input Block by means of the CHANNEL parameter (CHANNEL = 6). In the Analog Input Block, the HI_HI_LIM parameter is used to set a limit value at which the totalizer should be reset to zero. As soon as this limit valu is overshot, the Analog Input Block tranmits an alarm value to the downstream Discrete Output Block. The latter changes its output from 0 to 1 and thus resets the totalizer in the DP Flow Transducer Block to 0. The output of the Analog Input Block changes back to 0.

11 Parameter description (Local operation and FieldCare)

Note!
- The following tables list all the parameters as per the menu structure. Each table corresponds to a function group in the menu tree. The overall menu structure is illustrated in Section 13.1.
- The menu structure for local operation and FieldCare are slightly different. The differences mainly affect the MEASURING MODE and LANGUAGE parameters and the LINEARIZATION function group.
- In FieldCare, additional parameters are displayed. These parameters are marked accordingly.
- The menu path 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 "LINEARIZATION" 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 local operation.

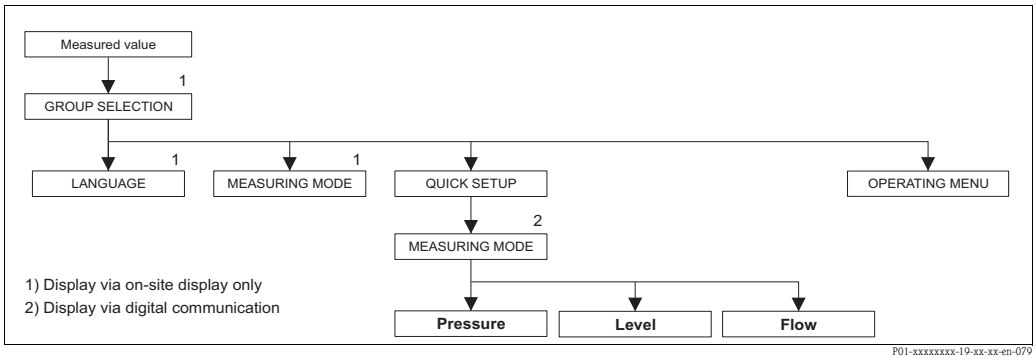


Fig. 35: 1st selection level in menu, LANGUAGE (→ 128, Table 1: GROUP SELECTION → LANGUAGE – Local operation) and MEASURING MODE (→ 129, Table 2: GROUP SELECTION → MEASURING MODE)

Table 1: GROUP SELECTION → LANGUAGE – Local operation	
Parameter name	**Description**
LANGUAGE (079) Selection	Select the menu language for the local operation. Note! ■ In FieldCare, the LANGUAGE parameter is arranged in the DISPLAY function group. ■ Select the menu language for FieldCare using the "Language button" in the configuration window. Select the menu language for the FieldCare frame via the "Extra" menu → "Options" → "Display" → "Language". **Options**: ■ Deutsch ■ English ■ Français ■ Español ■ Chinese (CHS) ■ Japanese (JPN) **Factory setting**: English

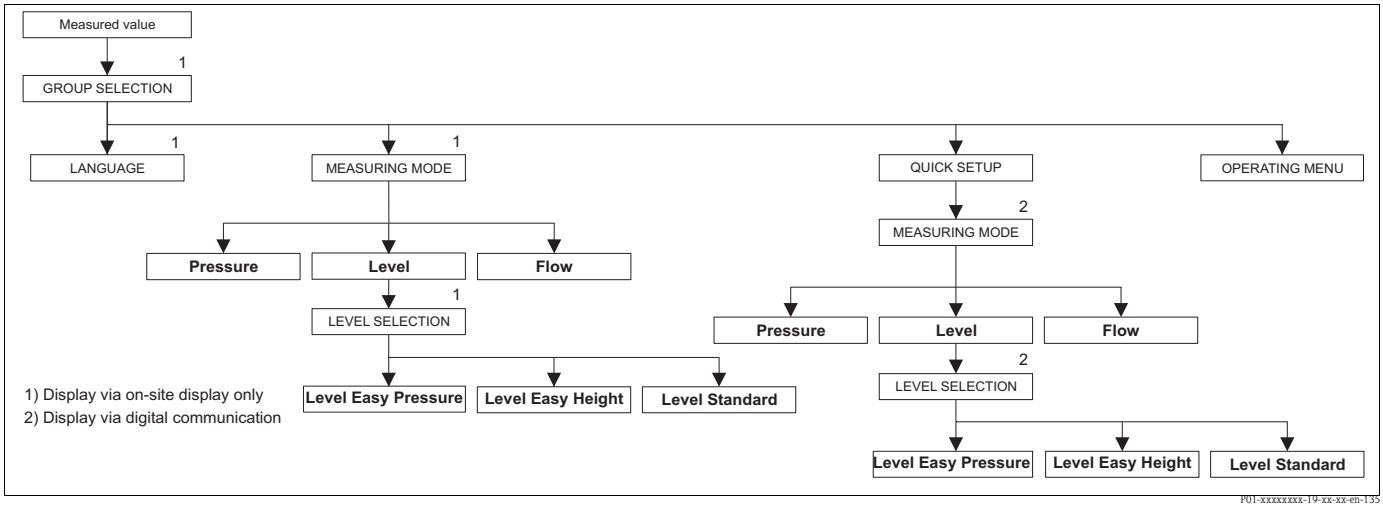


Fig. 36: "Level" measuring mode, LEVEL SELECTION parameter

Table 2: GROUP SELECTION → MEASURING MODE	
Parameter name	**Description**
MEASURING MODE (389) Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. Note! ■ When the measuring mode is changed, no conversion takes place. The device has to be recalibrated if the measuring mode is changed. ■ The MEASURING MODE parameter is displayed in FieldCare in the QUICK SETUP menus and in the BASIC SETUP function group (OPERATING MENU → SETTINGS → BASIC SETUP). **Options:** ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** ■ Cerabar S and Deltabar S: Pressure ■ Deltapilot S: Level

Table 2: GROUP SELECTION → MEASURING MODE	
Parameter name	**Description**
LEVEL SELECTION (020) Selection	Select the level mode. **Prerequisite:** ■ MEASURING MODE = Level ✎ Note! ■ 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 and EMPTY HEIGHT/FULL HEIGHT must be at least 1% apart 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, → 🖹 100, Section 9.1 "Overview of level measurement". ■ The "Level easy pressure" and "Level easy height" level modes comprise fewer parameters than the "Level standard" mode and are used to quickly and easily configure a level application. ■ Customer-specific units of level, volume and mass or a linearization table may only be entered in the "Level standard" level mode. **Options:** ■ 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 (023) parameter (→ 🖹 143). The two calibration modes, "Wet" and "Dry", are available. – 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, you specify two pressure-level value pairs via the EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE parameters. → Parameter descriptions → 🖹 144 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. The two calibration modes, "Wet" and "Dry", are available. – 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, you specify two height-level value pairs via the EMPTY CALIB., EMPTY HEIGHT, FULL CALIB. and FULL HEIGHT parameters. → Parameter descriptions → 🖹 148 ff. ■ Level standard Once you have selected this level mode, you can use the LEVEL MODE (718) parameter (→ 🖹 151) to choose between "Linear", "Pressure linearized" and "Height linearized". **Factory setting:** Level easy pressure
→ For LEVEL SELECTION = "Level easy pressure" → 🖹 141, Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure". → For LEVEL SELECTION = "Level easy height" → 🖹 145, Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height". → For LEVEL SELECTION = "Level standard" → 🖹 150, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard".	

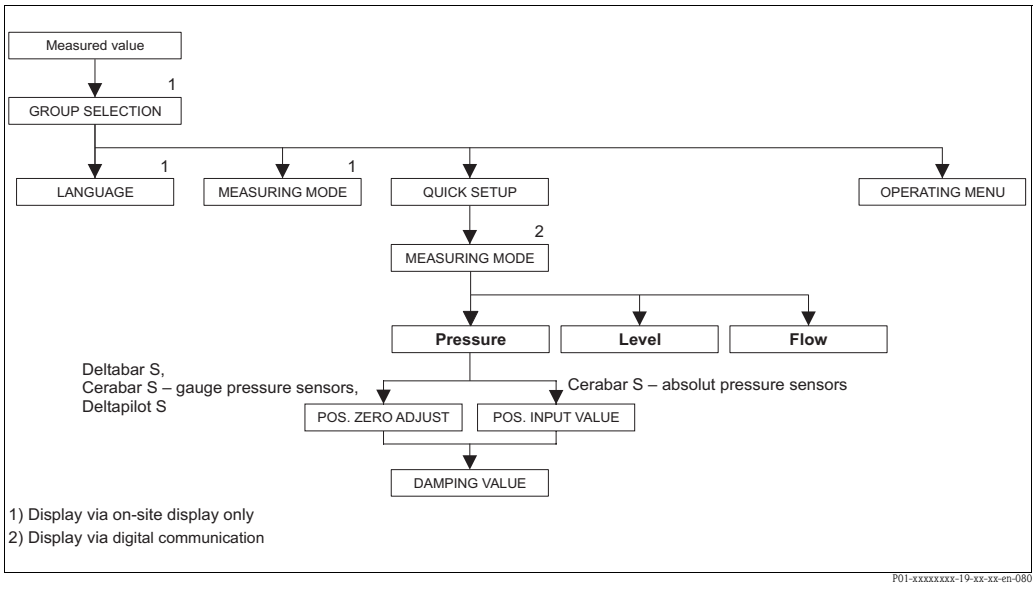


Fig. 37: Quick Setup menu for the "Pressure" measuring mode

Table 3: QUICK SETUP "Pressure"	
Parameter name	**Description**
This menu displays the most important parameters for the "Pressure" measuring mode. **Prerequisite**: ■ MEASURING MODE = Pressure **Note:** See also – → 📄 138 ff, Table 7: OPERATING MENU → SETTINGS → BASIC SETUP "Pressure" – → 📄 178, Table 15: OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure" – → 📄 195 ff, Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure" – → 📄 99 ff, Section 8 "Pressure measurement (via local operation and FieldCare)".	
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 📄 99, Section 8 "Pressure measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** ■ Cerabar S and Deltabar S: Pressure ■ Deltapilot S: Level

Table 3: QUICK SETUP "Pressure"	
Parameter name	**Description**
POS. ZERO ADJUST (685) Entry	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. **Example:** – MEASURED VALUE = 2.2 mbar – 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 CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. **Prerequisite:** ■ This parameter is displayed for Deltabar S, Cerabar S with gauge pressure sensors or Deltapilot S. **Options**: ■ Abort ■ Confirm **Factory setting:** 0.0
POS. INPUT VALUE (563) Entry	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. **Example:** – MEASURED VALUE = 0.5 mbar – For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2 mbar. (The following applies: MEASURED $VALUE_{new}$ = POS. INPUT VALUE) – MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar – The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. The following applies: CALIB. OFFSET = MEASURED $VALUE_{old}$ – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar – 2.0 mbar = – 1.5 mbar) **Prerequisite:** ■ This parameter is displayed for Cerabar S with absolute pressure sensors. **Factory setting:** 0.0
DAMPING VALUE (274) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

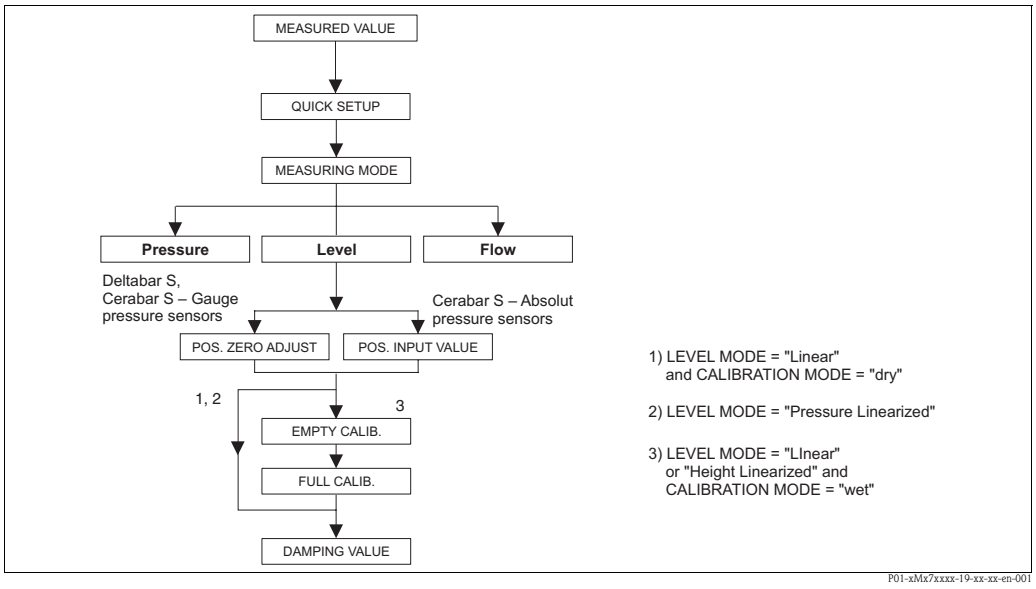


Fig. 38: Quick Setup menu for the "Level" measuring mode

Table 4: QUICK SETUP "Level"	
Parameter name	**Description**
This menu displays the most important parameters for the "Level" measuring mode. **Prerequisite**: ■ MEASURING MODE = Level **Note:** See also – → 📄 150 ff, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard" to Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized" – → 📄 178 ff, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level" – → 📄 181 ff, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation and Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare – → 📄 196 ff, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level" – → 📄 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 📄 100 ff, Section 9 "Level measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** ■ Cerabar S and Deltabar S: Pressure ■ Deltapilot S: Level
LEVEL SELECTION (020) Selection	Select the level mode. →Parameter description, → 📄 130. **Factory setting:** Level easy pressure

Table 4: QUICK SETUP "Level"	
Parameter name	**Description**
POS. ZERO ADJUST (685) Entry	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. **Example:** – MEASURED VALUE = 2.2 mbar – 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 CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. **Prerequisite:** ■ This parameter is displayed for Deltabar S, Cerabar S with gauge pressure sensors and Deltapilot S. **Options**: ■ Abort ■ Confirm **Factory setting:** 0.0
POS. INPUT VALUE (563) Entry	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. **Example:** – MEASURED VALUE = 0.5 mbar – For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2 mbar. (The following applies: MEASURED $VALUE_{new}$ = POS. INPUT VALUE) – MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar – The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. The following applies: CALIB. OFFSET = MEASURED $VALUE_{old}$ – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar – 2.0 mbar = – 1.5 mbar) **Prerequisite:** ■ This parameter is displayed for Cerabar S with absolute pressure sensors. **Factory setting:** 0.0
EMPTY CALIB. (314)/(010) Entry	Enter the 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. **Prerequisite:** ■ LEVEL SELECTION = Level easy pressure (→ 130), CALIBRATION MODE = Wet (→ 143) ■ LEVEL SELECTION = Level standard (→ 130), LEVEL MODE= Linear (→ 151), CALIBRATION MODE = Wet (→ 156) Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 0.0

Table 4: QUICK SETUP "Level"	
Parameter name	**Description**
FULL CALIB. (315)/(004) Entry	Enter the 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. **Prerequisite:** ■ LEVEL SELECTION = Level easy pressure (→ 130), CALIBRATION MODE = Wet (→ 143) ■ LEVEL SELECTION = Level standard (→ 130), LEVEL MODE= Linear (→ 151), CALIBRATION MODE = Wet (→ 156) Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **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 local operation, measured value and OUT value of the Analog Input Block 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

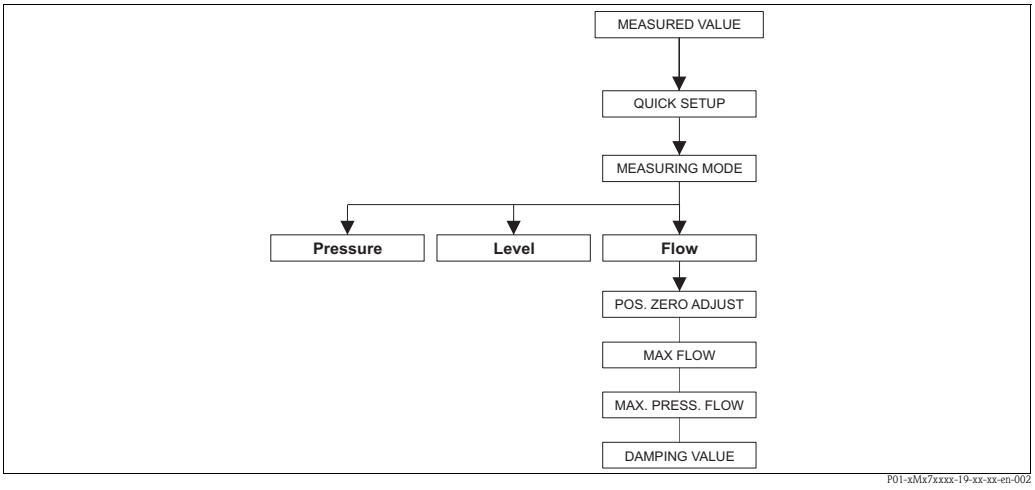


Fig. 39: Quick Setup menu, "Flow" measuring mode (differential pressure transmitter Deltabar S only)

Table 5: QUICK SETUP "Flow"	
Parameter name	**Description**
This menu displays the most important parameters for the "Flow" measuring mode. **Prerequisite**: ■ Deltabar S differential pressure transmitter ■ MEASURING MODE = Flow **Note:** See also – → 173 ff, Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow" – → 179 ff, Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow" – → 187 ff, Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP – → 124 ff, Section 10 "Flow measurement (via local operation and FieldCare)".	

Table 5: QUICK SETUP "Flow"	
Parameter name	**Description**
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 🖹 124, Section 10 "Flow measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** ■ Cerabar S and Deltabar S: Pressure ■ Deltapilot S: Level
POS. ZERO ADJUST (685) Entry	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. **Example:** – MEASURED VALUE = 2.2 mbar – 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 CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. **Options:** ■ Abort ■ Confirm **Factory setting:** 0.0
MAX. FLOW (311) Entry	Enter the maximum flow of the primary device. See also the layout sheet of the primary device. The maximum flow is assigned to the maximum pressure which you enter via MAX PRESS. FLOW. **Factory setting:** 1.0
MAX PRESS. FLOW (634) Entry	Enter the maximum pressure of the primary device. → See the layout sheet of primary device. This value is assigned to the maximum flow value (→ see MAX. FLOW). **Factory setting:** High sensor limit (→ see PRESS. SENS HILIM, → 🖹 193)
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

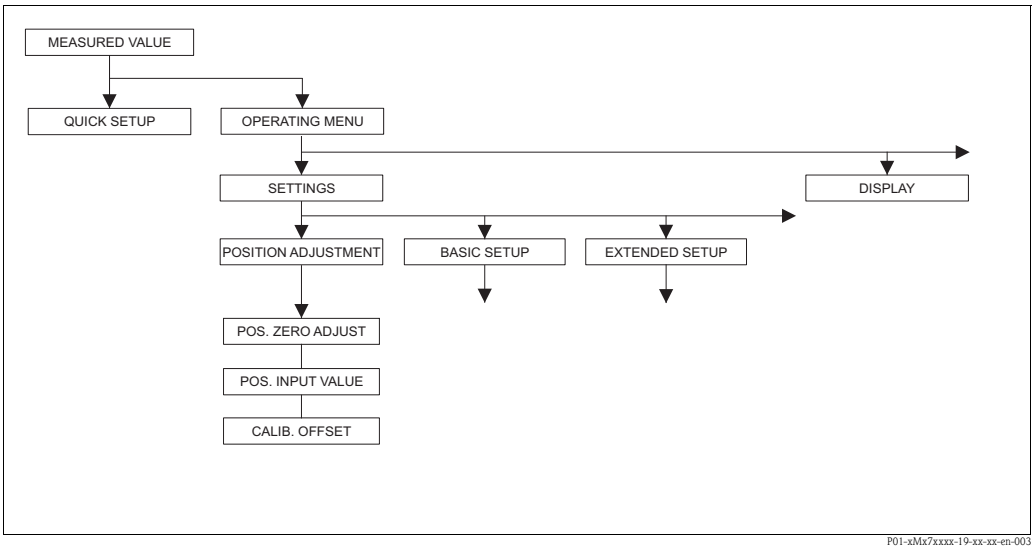


Fig. 40: POSITION ADJUSTMENT function group

Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT	
Parameter name	**Description**
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, Cerabar S and Deltapilot S offer three different ways of performing a position adjustment. Recommendation: ■ The pressure difference between zero (set point) and the measured pressure need not be known. – POS. ZERO ADJUST: Deltabar S or Cerabar S with gauge pressure sensors or Deltapilot S. – POS. INPUT VALUE: Cerabar S with absolute pressure sensors. ■ The pressure difference between zero (set point) and the measured pressure is known. – CALIB. OFFSET: Deltabar S, Cerabar S with gauge pressure sensors, Cerabar S with absolute pressure sensors or Deltapilot S.	
POS. ZERO ADJUST (685) Entry	Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known. **Example:** – MEASURED VALUE = 2.2 mbar – 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 CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. **Options:** ■ Abort ■ Confirm **Factory setting:** 0.0
POS. INPUT VALUE (563) Entry	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). **Example:** – MEASURED VALUE = 0.5 mbar – For the POS. INPUT VALUE parameter, specify the desired set point for the MEASURED VALUE, e.g. 2 mbar. (The following applies: MEASURED $VALUE_{new}$ = POS. INPUT VALUE) – MEASURED VALUE (after entry for POS. INPUT VALUE) = 2.0 mbar – The CALIB. OFFSET parameter displays the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. The following applies: CALIB. OFFSET = MEASURED $VALUE_{old}$ – POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar – 2.0 mbar = – 1.5 mbar) **Factory setting:** 0.0

Table 6: OPERATING MENU → SETTINGS → POSITION ADJUSTMENT	
Parameter name	**Description**
CALIB. OFFSET (319) Entry	Position adjustment – the pressure difference between zero (set point) and the measured pressure is known. (A reference pressure is not present at the device.) **Example:** – MEASURED VALUE = 2.2 mbar – 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. (The following applies: MEASURED VALUE $_{new}$ = MEASURED VALUE$_{old}$ – CALIB. OFFSET) – MEASURED VALUE (after entry for calib. offset) = 0.0 mbar **Factory setting:** 0.0

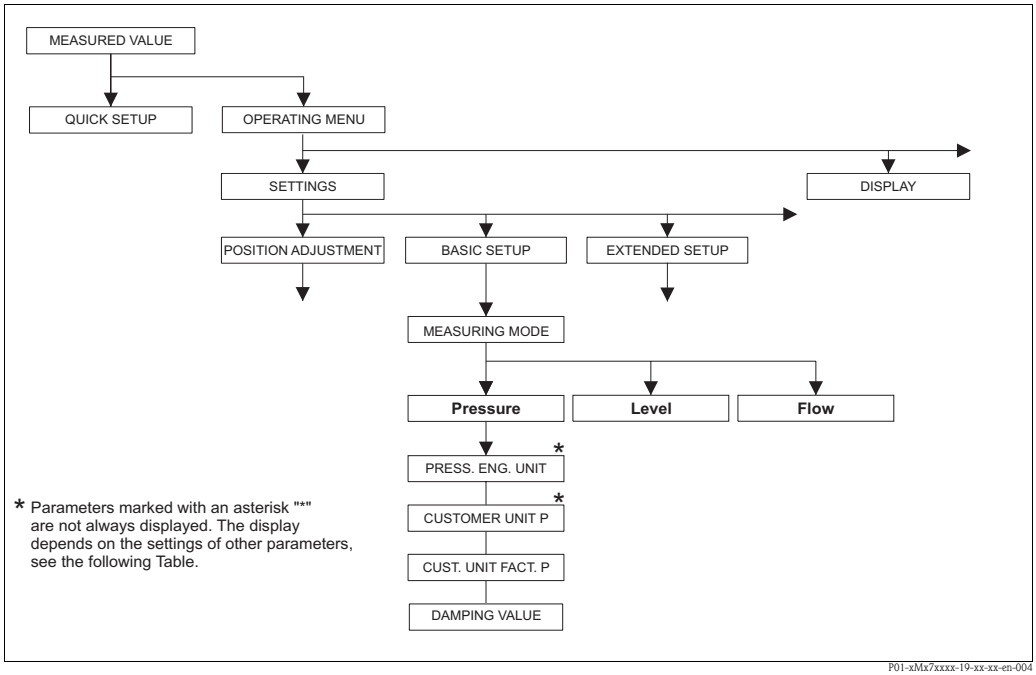


Fig. 41: BASIC SETUP function group for the "Pressure" measuring mode

Table 7: OPERATING MENU → SETTINGS → BASIC SETUP "Pressure"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Pressure **Note:** See also – → 131, Table 3: QUICK SETUP "Pressure" – → 178, Table 15: OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure" – → 195 ff, Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure" – → 99 ff, Section 8 "Pressure measurement (via local operation and FieldCare)".	

Table 7: OPERATING MENU → SETTINGS → BASIC SETUP "Pressure"	
Parameter name	**Description**
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 🖹 99, Section 8 "Pressure measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** Pressure
PRESS. ENG. UNIT (060) Selection	Select the 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 ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT P and CUST. UNIT FACT. P. ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications
CUSTOMER UNIT P (075) Entry	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. P **Prerequisite:** ■ PRESS. ENG. UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

Table 7: OPERATING MENU → SETTINGS → BASIC SETUP "Pressure"	
Parameter name	**Description**
CUST. UNIT FACT. P (317) Entry	Enter the 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. **Prerequisite:** ■ PRESS. ENG. UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

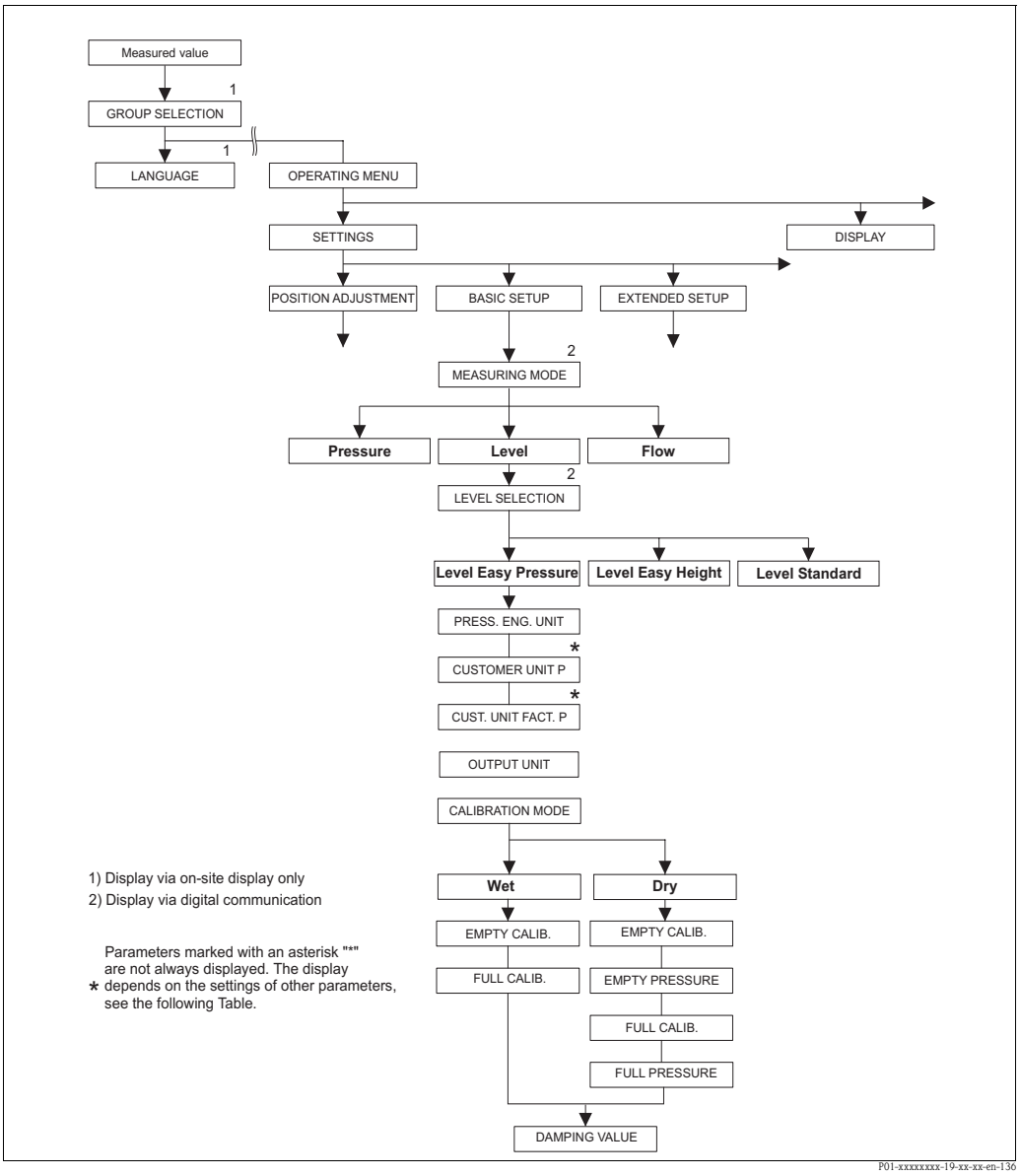


Fig. 42: BASIC SETUP function group for the "Level" measuring mode and "Level easy pressure" level selection

Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"	
Parameter name	**Description**
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. The two calibration modes, "Wet" and "Dry", are available. **Prerequisite**: ■ MEASURING MODE = Level (→ 🖹 129). ■ LEVEL SELECTION = Level easy pressure (→ 🖹 130.)	

Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"	
Parameter name	**Description**
PRESS. ENG. UNIT (060) Selection	Select the 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 ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT P and CUST. UNIT. FACT. P ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications
CUSTOMER UNIT P (075) Entry	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. P **Prerequisite:** ■ PRESS. ENG. UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. P (317) Entry	Enter the 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. **Prerequisite:** ■ PRESS. ENG. UNIT = User unit **Example:** – 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 **Factory setting:** 1.0

Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"	
Parameter name	**Description**
OUTPUT UNIT (023) Selection	Select the unit for the measured value display and the MEASURED VALUE parameter (→ 196). Note! 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. Example: ■ Current measured value: 0.3 ft ■ New output unit: m ■ New measured value: 0.3 m **Options:** ■ % ■ mm, cm, dm, m ■ ft, inch ■ cm^3, dm^3, m^3,m^3 E^3 ■ l, hl ■ ft^3, ft^3 E^3 ■ gal, bbl, Igal ■ g, kg, t ■ lb, ton, oz **Factory setting:** %
CALIBRATION MODE (008) Selection	Select the calibration mode. **Options:** ■ 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, you specify two pressure-level value pairs via the following parameters: EMPTY CALIB., EMPTY PRESSURE, FULL CALIB. and FULL PRESSURE. **Factory setting:** Wet
EMPTY CALIB. (010) Entry	Enter the level, volume, mass or percentage value for the lower calibration point (empty container). 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 (→ 143). **Prerequisite:** ■ CALIBRATION MODE = Wet Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 0.0

Table 8: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy pressure"	
Parameter name	**Description**
FULL CALIB. (004) Entry	Enter the 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 (→ 143). **Prerequisite:** ■ CALIBRATION MODE = Wet Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 100.0
EMPTY CALIB. (010) Entry	Enter the level, volume, mass or percentage value for the lower calibration point (empty container). 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 (→ 143). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0
EMPTY PRESSURE (011) Entry	Enter the pressure value for the lower calibration point (container empty). → See also EMPTY CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0
FULL CALIB. (004) Entry	Enter the 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 (→ 143). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 100.0
FULL PRESSURE (005) Entry	Enter the pressure value for the upper calibration point (container full). → See also FULL CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **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 local operation, measured value and OUT value of the Analog Input Block 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

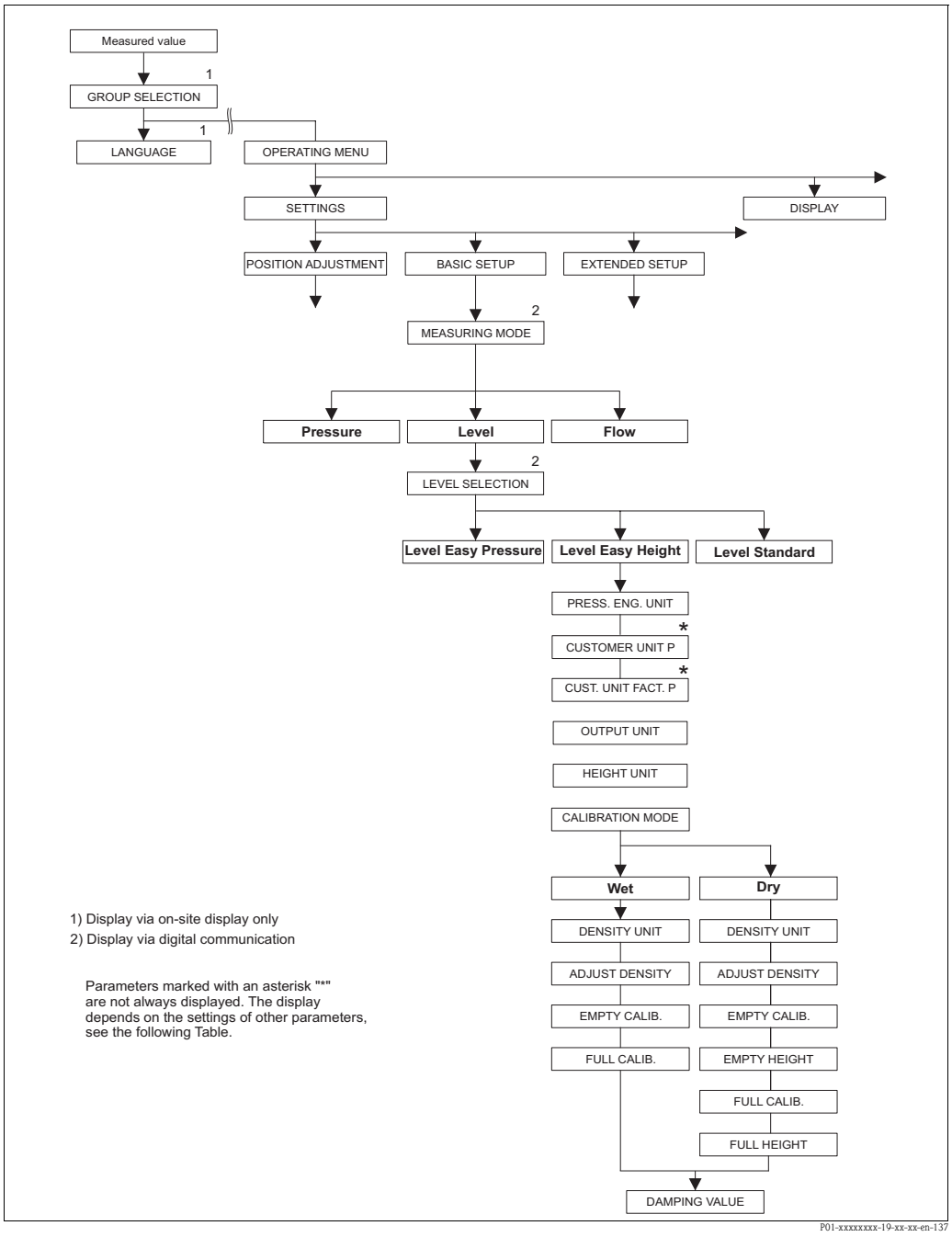


Fig. 43: BASIC SETUP function group for "Level" measuring mode and "Level easy height" level selection

Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height"	
Parameter name	**Description**
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, the 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. The two calibration modes, "Wet" and "Dry", are available. **Prerequisite**: ■ MEASURING MODE = Level (→ 🖹 129). ■ LEVEL SELECTION = Level easy height (→ 🖹 130.)	

Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height"	
Parameter name	**Description**
PRESS. ENG. UNIT (060) Selection	Select the 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 ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT P and CUST. UNIT. FACT. P ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications
CUSTOMER UNIT P (075) Entry	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. P **Prerequisite:** ■ PRESS. ENG. UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. P (317) Entry	Enter the 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. **Prerequisite:** ■ PRESS. ENG. UNIT = User unit **Example:** – 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 **Factory setting:** 1.0

Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height"	
Parameter name	**Description**
OUTPUT UNIT (023) Selection	Select the unit for the measured value display and the MEASURED VALUE parameter (→ 196). Note! 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. Example: ■ Current measured value: 0.3 ft ■ New output unit: m ■ New measured value: 0.3 m **Options:** ■ % ■ mm, cm, dm, m ■ ft, inch ■ cm^3, dm^3, m^3,m^3 E^3 ■ l, hl ■ ft^3, ft^3 E^3 ■ gal, bbl, Igal ■ g, kg, t ■ lb, ton, oz **Factory setting:** %
HEIGHT UNIT (003) Selection	Select the height unit. The measured pressure is converted to the chosen height unit using the DENSITY UNIT and ADJUST DENSITY parameters. **Options:** ■ mm ■ cm ■ dm ■ m ■ inch ■ ft **Factory setting:** m
CALIBRATION MODE (008) Selection	Select the calibration mode. **Options:** ■ 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, you specify two height-level value pairs via the EMPTY CALIB., EMPTY HEIGHT, FULL CALIB. and FULL HEIGHT parameters. **Factory setting:** Dry
DENSITY UNIT (001) Selection	Select the density unit. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters. **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 (007) Entry	Enter the density of the fluid. The measured pressure is converted to a height using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters. **Factory setting:** 1.0

Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height"	
Parameter name	**Description**
EMPTY CALIB. (010) Entry	Enter the level, volume, mass or percentage value for the lower calibration point (empty container). 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. By means of 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 (→ 147). **Prerequisite:** ■ CALIBRATION MODE = Wet Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 0.0
FULL CALIB. (004) Entry	Enter the level, volume, mass or percentage value for the upper calibration point (full container). The container is either completely or almost full. The measured pressure is converted to a height value using the HEIGHT UNIT, DENSITY UNIT and ADJUST DENSITY parameters and displayed. By means of 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 (→ 147). **Prerequisite:** ■ CALIBRATION MODE = Wet Note! For this parameter, the local operation 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 "+"- or "–" key before confirming with the "E" key. This applies also if the level value is to remain unchanged. **Factory setting:** 100.0
EMPTY CALIB. (010) Entry	Enter the level, volume, mass or percentage value for the lower calibration point (empty container). 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 (→ 147). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0
EMPTY HEIGHT (009) Entry	Enter the height value for the lower calibration point (container empty). The unit is selected via the HEIGHT UNIT parameter (→ 147). → See also EMPTY CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0
FULL CALIB. (004) Entry	Enter the level, volume, mass or percentage value for the upper calibration point (full container). 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 (→ 147). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 100.0

Table 9: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level easy height"	
Parameter name	**Description**
FULL HEIGHT (006) Entry	Enter the height value for the upper calibration point (container full). The unit is selected via the HEIGHT UNIT parameter (→ 147). → See also FULL CALIB. **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** Upper range limit (URL) is converted to a unit of height
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

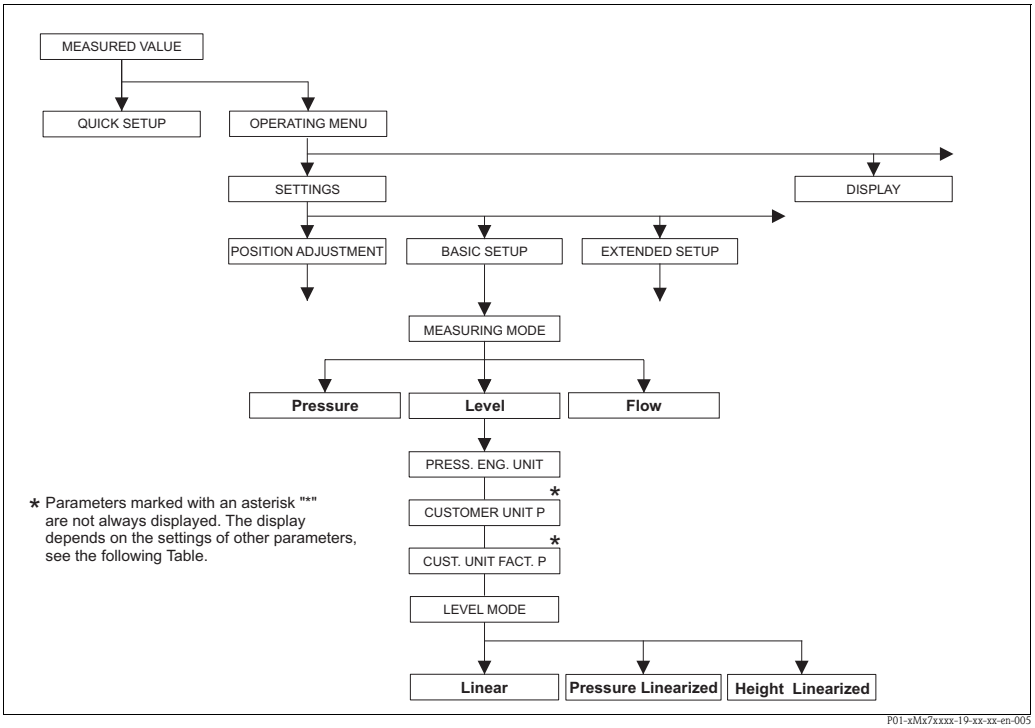


Fig. 44: BASIC SETUP function group for the "Level" measuring mode, depending on the setting for the LEVEL MODE parameter, → 152, → Fig. 45 BASIC SETUP function group for the "Level" measuring mode and "Linear" level mode → 160, → Fig. 47 BASIC SETUP function group for the "Level" measuring mode and "Pressure linearized" level mode → 164, → Fig. 48 BASIC SETUP function group for the "Level" measuring mode and "Height linearized" level mode.

Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Level **Note:** See also – → 153 ff, Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear" to Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized" – contd – → 178 ff, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level" – → 181 ff, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation – → 196 ff, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level" – → 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 100, Section 9 "Level measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** Pressure (Deltabar S, Cerabar S) **Factory setting:** Deltabar S, Cerabar S = Pressure Deltapilot S = Level easy pressure
PRESS. ENG. UNIT (060) Selection	Select the 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 ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT P and CUST. UNIT. FACT. P ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications

Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard"	
Parameter name	**Description**
CUSTOMER UNIT P (075) Entry	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. P **Prerequisite:** ■ PRESS. ENG. UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. P (317) Entry	Enter the 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. **Prerequisite:** ■ PRESS. ENG. UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
LEVEL MODE (718) Selection	Select level mode. **Options:** ■ Linear: The measured variable (level, volume, mass or %) is in direct proportion to the measured pressure. → 153 ff, Table 11. ■ 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 linearization table with at least 2 and not more than 32 points. → 161 ff, Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized". ■ Height linearized: Select this level mode 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: – Height + volume – Height + mass – Height + % – %-height + volume – %-height + mass – %-height + % Perform two calibrations for this level mode. 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. → 165 ff, Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized". **Factory setting:** Linear
→ For LEVEL MODE = Linear, → 153 ff, Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear". → For LEVEL MODE = Pressure linearized, → 161 ff, Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized". → For LEVEL MODE = Height linearized, → 165 ff, Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized".	

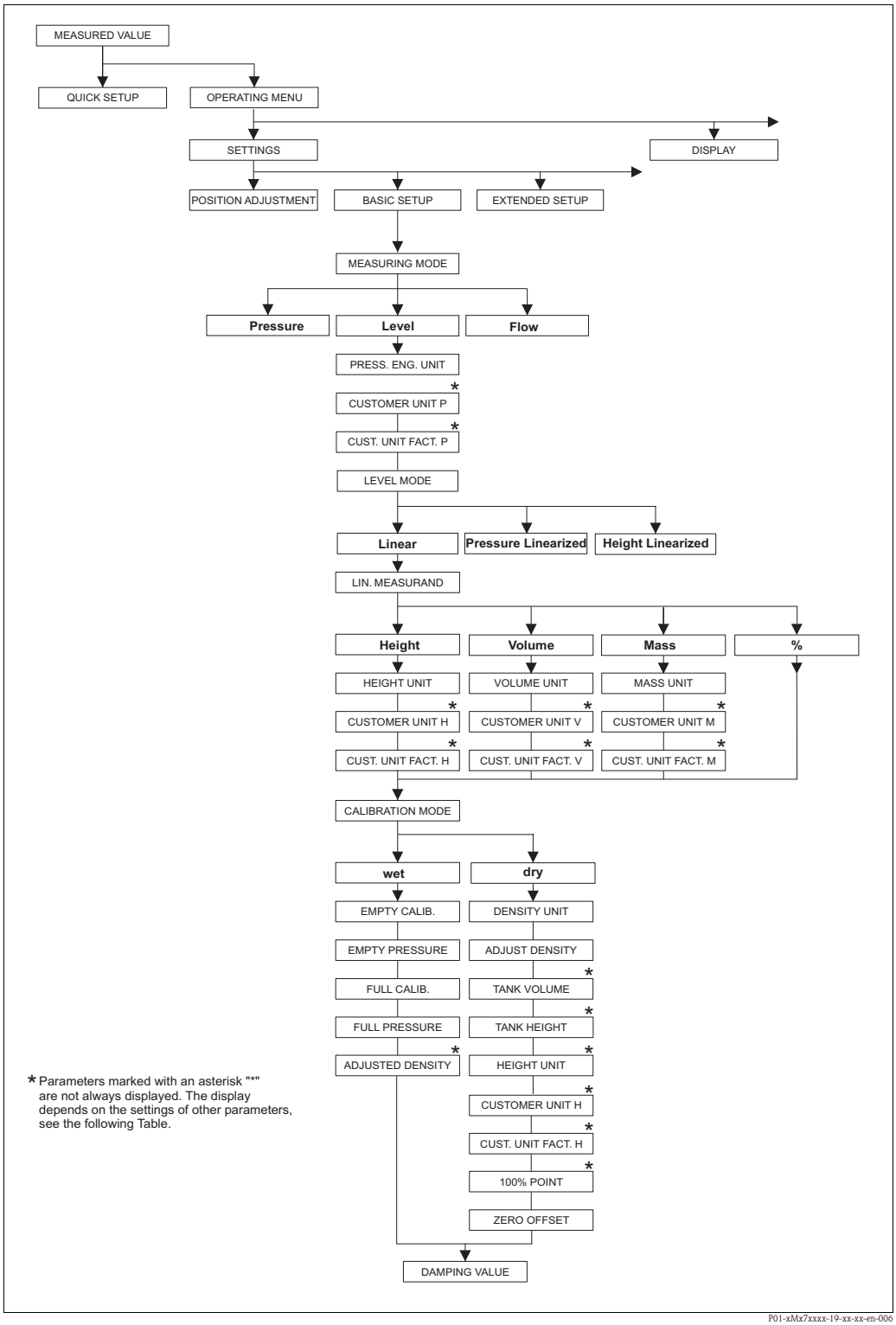


Fig. 45: BASIC SETUP function group for the "Level" measuring mode and "Linear" level mode

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
The following parameters are displayed if you selected the "Linear" option for the LEVEL MODE parameter. For this level mode, the measured variable (level, volume, mass or %) is in direct proportion to the measured pressure. **Prerequisite**: ■ MEASURING MODE = Level ■ LEVEL MODE = Linear (→ 🖹 151) **Note:** See also – → 🖹 150 ff, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard" – general – → 🖹 178 ff, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level" – → 🖹 196 ff, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level" – → 🖹 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
LIN. MEASURAND (804) Selection	Select the measured variable. **Options:** ■ Level ■ Volume ■ Mass ■ % (level) **Factory setting:** % (level)
HEIGHT UNIT (708) Selection	Select the level unit. **Prerequisite:** ■ LIN. MEASURAND = Level **Options:** ■ mm ■ cm ■ dm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT H and CUST. UNIT. FACT. H. ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **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:** ■ LIN. MEASURAND = Level, HEIGHT UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
CUST. UNIT FACT. H (705) Entry	Enter the 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:** ■ LIN. MEASURAND = Level, HEIGHT UNIT = User unit **Example:** – You want the measured value to be displayed in "PU" (PU: packing unit). – MEASURED VALUE = 0.5 m ≙ 1 PU – Entry CUSTOMER UNIT H: PU – Entry CUST. UNIT FACT. H: 2 – Result: MEASURED VALUE = 1 PU **Factory setting:** 1.0
UNIT VOLUME (313) Selection	Select the volume unit. **Prerequisite:** ■ LIN. MEASURAND = Volume **Options:** ■ l ■ hl ■ cm^3 ■ dm^3 ■ m^3 ■ m^3 E^3 ■ ft ■ ft^3 E^3 ■ gal ■ Igal ■ bbl ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT V and CUST. UNIT. FACT. V ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** m^3
CUSTOMER UNIT V (608) Entry	Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. V **Prerequisite:** ■ LIN. MEASURAND = Volume, UNIT VOLUME = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
CUST. UNIT FACT. V (607) Entry	Enter the conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m^3". → See also CUSTOMER UNIT V. **Prerequisite:** ■ LIN. MEASURAND = Volume, UNIT VOLUME = User unit **Example:** – 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 **Factory setting:** 1.0
MASS UNIT (709) Selection	Select the mass unit. **Prerequisite:** ■ LIN. MEASURAND = Mass **Options:** ■ g ■ kg ■ t ■ oz ■ lb ■ ton ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT M and CUST. UNIT. FACT. M ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** kg
CUSTOMER UNIT M (704) Entry	Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. M. **Prerequisite:** ■ LIN. MEASURAND = Mass, MASS UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. M (703) Entry	Enter the 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. **Prerequisite:** ■ LIN. MEASURAND = Mass, MASS UNIT = User unit **Example:** – 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 **Factory setting:** 1.0

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
CALIBRATION MODE (392) Selection	Select the calibration mode. **Options:** ■ 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. – For the "Level" measured variable, the density of the fluid (→ 157, 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 (→ 157, ADJUST DENSITY, TANK VOLUME and TANK HEIGHT). – For the "Mass" measured variable, the tank volume and the tank height must be entered (→ 158, TANK VOLUME and TANK HEIGHT). The density must also be entered in the case of a zero point shift (level offset) (→ 157, ADJUST DENSITY). – For the "%" measured variable, the density of the fluid must be entered and a level assigned to the 100 % point (→ 157 and 159, ADJUST DENSITY and 100% POINT). If the measurement should not start at the mounting location of the device, a level offset must be entered (→ 159, ZERO POSITION). **Factory setting:** Wet
EMPTY CALIB. (314) Entry	Enter the 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. **Prerequisite:** ■ CALIBRATION MODE = Wet **Factory setting:** 0.0
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 the 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 **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, → 193)
ADJUSTED DENSITY (810) Display	Displays the density calculated from the upper and lower level point. **Prerequisite:** ■ CALIBRATION MODE = Wet, LIN. MEASURAND = Level

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
DENSITY UNIT (812) Selection	Select the 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 the density of the fluid. **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 **Factory setting:** 1000.0
UNIT VOLUME (313) Selection	Select the volume unit. **Prerequisite:** ■ LIN. MEASURAND = Volume **Options:** ■ l ■ hl ■ cm^3 ■ dm^3 ■ m^3 ■ m^3 E^3 ■ ft ■ ft^3 E^3 ■ gal ■ Igal ■ bbl ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT V and CUST. UNIT. FACT. V ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** m^3
CUSTOMER UNIT V (608) Entry	Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. V **Prerequisite:** ■ LIN. MEASURAND = Volume, UNIT VOLUME = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
CUST. UNIT FACT. V (607) Entry	Enter the conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m^3". → See also CUSTOMER UNIT V. **Prerequisite:** ■ LIN. MEASURAND = Volume, UNIT VOLUME = User unit **Example:** – 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 **Factory setting:** 1.0
TANK VOLUME (858) Entry	Enter the tank volume. **Prerequisite:** ■ LIN. MEASURAND = Volume, CALIBRATION MODE = Dry ■ LIN. MEASURAND = Mass, CALIBRATION MODE = Dry **Factory setting:** 1.0 m^3
HEIGHT UNIT (708) Selection	Select the level unit. **Prerequisite:** ■ LIN. MEASURAND = % (level), CALIBRATION MODE = Dry **Options:** ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter descriptions 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:** ■ LIN. MEASURAND = % (level), CALIBRATION MODE = Dry, HEIGHT UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

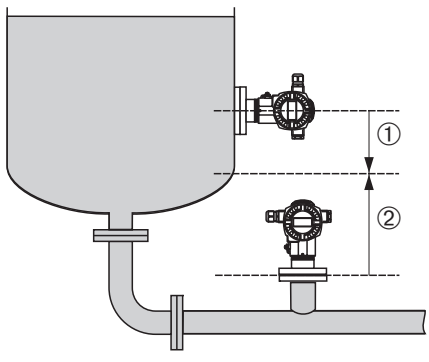
Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
CUST. UNIT FACT. H (705) Entry	Enter the conversion factor for a customer-specific level unit. The conversion factor must be entered in relation to the SI unit "m". → See also CUSTOMER UNIT H. **Prerequisite:** ■ LIN. MEASURAND = % (level), CALIBRATION MODE = Dry, HEIGHT UNIT = User unit **Example:** – You want the measured value to be displayed in "PU" (PU: packing unit). – MEASURED VALUE = 0.5 m ≙ 1 PU – Entry CUSTOMER UNIT H: PU – Entry CUST. UNIT FACT. H: 2 – Result: MEASURED VALUE = 1 PU **Factory setting:** 1.0
TANK HEIGHT (859) Entry	Enter the tank height. **Prerequisite:** ■ LIN. MEASURAND = Volume, CALIBRATION MODE = Dry ■ LIN. MEASURAND = Mass, CALIBRATION MODE = Dry **Factory setting:** 1.0 m
100% POINT (813) Entry	Enter the level value for the 100% point. **Prerequisite:** ■ LIN. MEASURAND = % (level), CALIBRATION MODE = Dry **Example:** – The 100 %-point should correspond to 4 m. – Select the "m" unit via the HEIGHT UNIT parameter. – Enter the value "4" for this parameter (100% POINT). **Factory setting:** 1.0
ZERO POSITION (814) Entry	Enter the value for level offset. 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). **Prerequisite:** ■ CALIBRATION MODE = Dry **Factory setting:** 0.0  *Fig. 46: Zero point shift* *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.*

Table 11: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Linear"	
Parameter name	**Description**
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

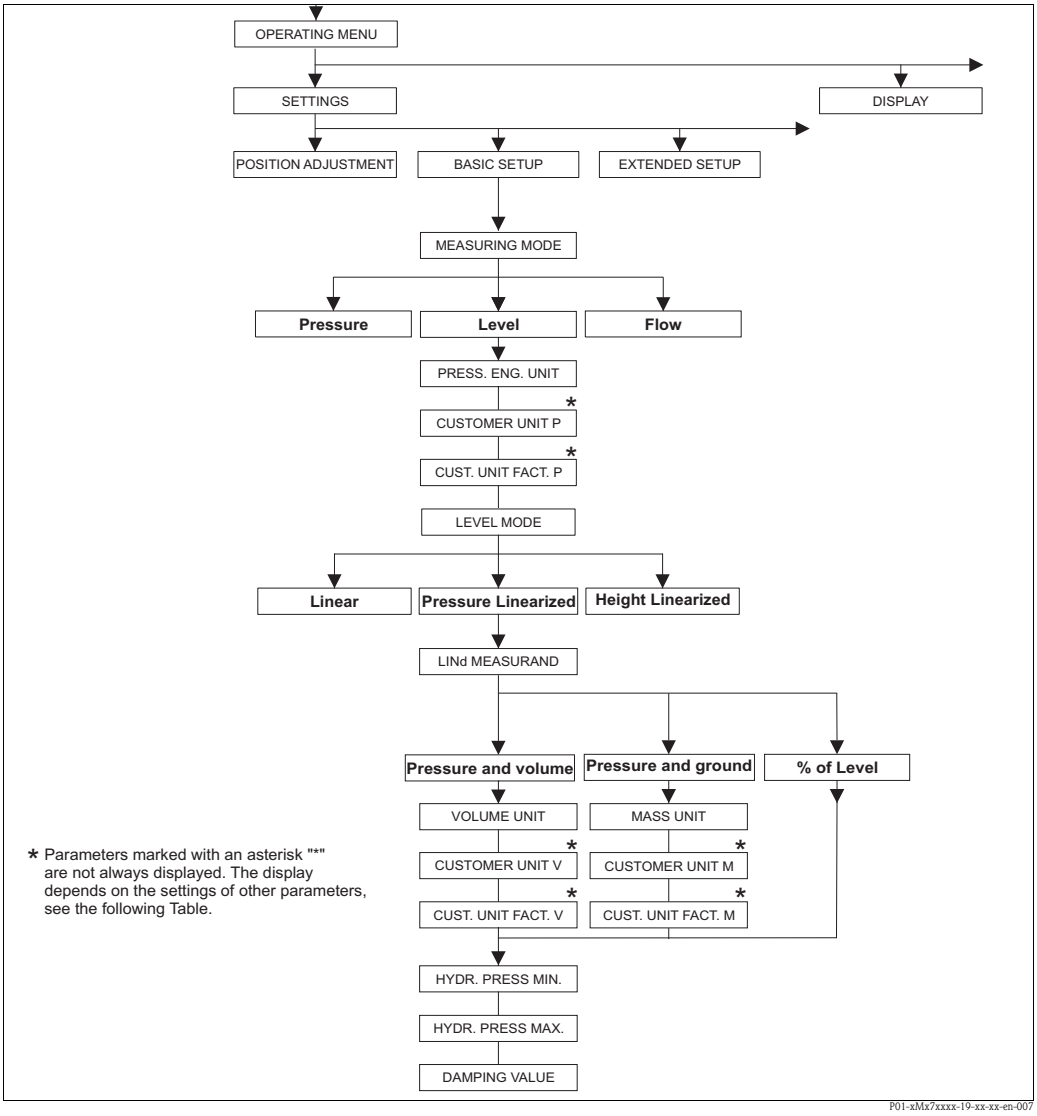


Fig. 47: BASIC SETUP function group for the "Level" measuring mode and "Pressure linearized" level mode, continue calibration with LINEARIZATION function group → 181 ff.

Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized"	
Parameter name	**Description**
The following parameters are displayed if you selected the "Pressure linearized" option for the LEVEL MODE parameter. For this level mode, the measured variable (volume, mass or %) is not in direct proportion to the measured pressure. For the calibration, enter a linearization table with at least 2 and not more than 32 points. **Prerequisite**: ■ MEASURING MODE = Level ■ LEVEL MODE = Pressure linearized (→ 🖹 151). **Note:** See also – → 🖹 150 ff, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard" – general – → 🖹 178 ff, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level" – → 🖹 181 ff, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation and Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare – → 🖹 196 ff, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level" – → 🖹 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
LINd. MEASURAND (805) Selection	Select the measured variable. **Options:** ■ Pressure and volume ■ Pressure and mass ■ Pressure and % **Factory setting:** Pressure and %
UNIT VOLUME (313) Selection	Select the volume unit. **Prerequisite:** ■ LINd. MEASURAND = Pressure and volume **Options:** ■ l ■ hl ■ cm^3 ■ dm^3 ■ m^3 ■ m^3 E^3 ■ ft ■ ft^3 E^3 ■ gal ■ Igal ■ bbl ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT V and CUST. UNIT. FACT. V ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** m^3

Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized"	
Parameter name	**Description**
CUSTOMER UNIT V (608) Entry	Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. V. **Prerequisite:** ■ LINd. MEASURAND = Pressure and volume, UNIT VOLUME = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. V (607) Entry	Enter the conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m^3". → See also CUSTOMER UNIT V. **Prerequisite:** ■ LINd. MEASURAND = Pressure and volume, UNIT VOLUME = User unit **Example:** – 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 **Factory setting:** 1.0
MASS UNIT (709) Selection	Select the mass unit. **Prerequisite:** ■ LINd. MEASURAND = Pressure and mass **Options:** ■ g ■ kg ■ t ■ oz ■ lb ■ ton ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT M and CUST. UNIT. FACT. M ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** kg

Table 12: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Pressure linearized"	
Parameter name	**Description**
CUSTOMER UNIT M (704) Entry	Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. M. **Prerequisite:** ■ LINd. MEASURAND = Pressure and mass, MASS UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. M (703) Entry	Enter the 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. **Prerequisite:** ■ LINd. MEASURAND = Pressure and mass, MASS UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
HYDR. PRESS MIN. (773) Entry	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. **Factory setting:** 0.0
HYDR. PRESS MAX. (774) Entry	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. **Factory setting:** High sensor limit (→ see PRESS. SENS HILIM, → 193)
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

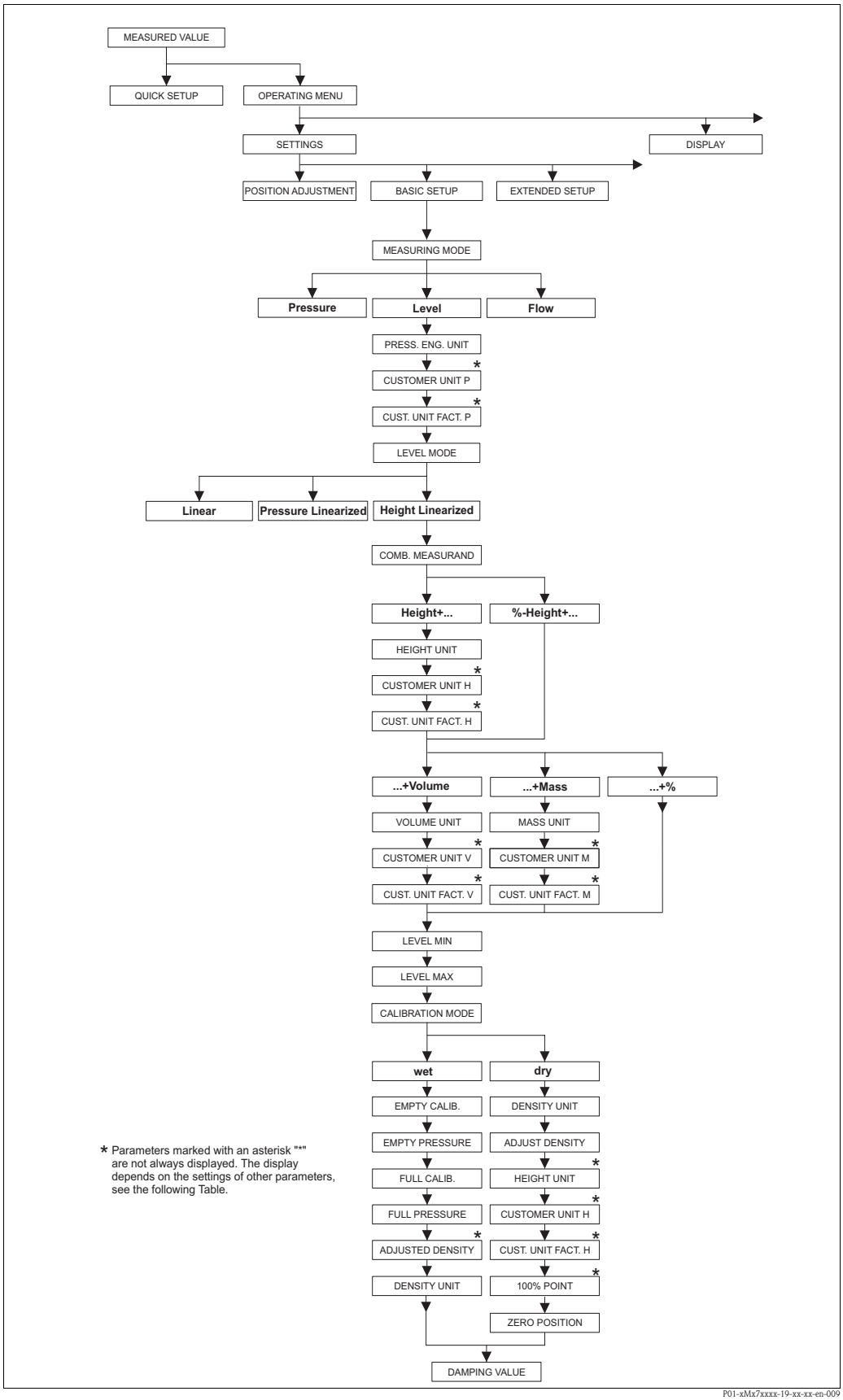


Fig. 48: BASIC SETUP function group for the "Level" measuring mode and "Height linearized" level mode, continue calibration with LINEARIZATION function group → 181 ff.

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
The following parameters are displayed if you selected the "Height linearized" option for the LEVEL MODE parameter. Select this level mode 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: ■ Height + volume ■ Height + mass ■ Height + % ■ %-height + volume ■ %-height + mass ■ %-height + % 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 linearization table has to be entered for the 2nd measured variable. The 2nd measured variable is assigned to the 1st measured variable by means of this table. **Prerequisite**: ■ MEASURING MODE = Level ■ LEVEL MODE = Height linearized (→ 📄 151). **Note:** See also – → 📄 150 ff, Table 10: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL SELECTION "Level standard" – general – → 📄 178 ff, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level" – → 📄 181 ff, Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation and Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare – → 📄 196 ff, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level" – → 📄 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
COMB. MEASURAND (806) Selection	Select the measured variable. **Options:** ■ 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 the level unit for the 1st measured variable. **Prerequisite:** ■ COMB. MEASURAND = Height and volume, height and mass or height and % **Options:** ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT H and CUST. UNIT. FACT. H. **Factory setting:** m

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
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:** ■ 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 ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. H (705) Entry	Enter the 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:** ■ 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:** – You want the measured value to be displayed in "PU" (PU: packing unit). – MEASURED VALUE = 0.5 m ≙ 1 PU – Entry CUSTOMER UNIT H: PU – Entry CUST. UNIT FACT. H: 2 – Result: MEASURED VALUE = 1 PU **Factory setting:** 1.0
UNIT VOLUME (313) Selection	Select the volume unit for the 2nd measured value. **Prerequisite:** ■ COMB. MEASURAND = Height and volume or %-height and volume **Options:** ■ l ■ hl ■ cm^3 ■ dm^3 ■ m^3 ■ m^3 E^3 ■ ft ■ ft^3 E^3 ■ gal ■ Igal ■ bbl ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT V and CUST. UNIT. FACT. V ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** m^3

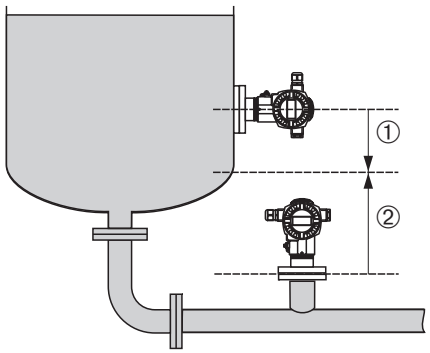
Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
CUSTOMER UNIT V (608) Entry	Enter text (unit) for customer-specific volume unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. V. **Prerequisite:** ■ COMB. MEASURAND = Height and volume, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-height and volume, HEIGHT UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. V (607) Entry	Enter the conversion factor for a customer-specific volume unit. The conversion factor must be entered in relation to the SI unit "m^3". → See also CUSTOMER UNIT V. **Prerequisite:** ■ COMB. MEASURAND = Height and volume, HEIGHT UNIT = User unit ■ COMB. MEASURAND = %-height and volume, HEIGHT UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
MASS UNIT (709) Selection	Select the mass unit for the 2nd measured value. **Prerequisite:** ■ COMB. MEASURAND = Height and mass or %-height and mass **Options:** ■ g ■ kg ■ t ■ oz ■ lb ■ ton ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT M and CUST. UNIT. FACT. M ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** kg

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
CUSTOMER UNIT M (704) Entry	Enter text (unit) for customer-specific mass unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. M. **Prerequisite:** ■ COMB. MEASURAND = Height and mass, MASS UNIT = User unit ■ COMB. MEASURAND = %-height and mass, MASS UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. M (703) Entry	Enter the 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. **Prerequisite:** ■ COMB. MEASURAND = Height and mass, MASS UNIT = User unit ■ COMB. MEASURAND = %-height and mass, MASS UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
LEVEL MIN (755) Entry	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. **Factory setting:** 0.0
LEVEL MAX (712) Entry	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. **Factory setting:** 100.0

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
CALIBRATION MODE (392) Selection	Select the calibration mode for the calibration of the 1st measured variable. **Options:** ■ 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. – For the "Level" measured variable, the density of the fluid (→ 🖹 170, 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 (→ 🖹 170, ADJUST DENSITY and 100% POINT). If the measurement should not start at the mounting location of the device, a level offset must be entered (→ 🖹 172, ZERO POSITION). ✎ Note! If you change to dry calibration after a wet calibration, the density must be entered correctly via the ADJUST DENSITY and PROCESS DENSITY parameters. → 🖹 179. **Factory setting:** Wet
EMPTY CALIB. (314) Entry	Enter the 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. **Prerequisite:** ■ CALIBRATION MODE = Wet **Factory setting:** 0.0
EMPTY PRESSURE (710) Display	Displays the pressure value for the lower calibration point (container empty). → See also EMPTY CALIB. **Prerequisite:** ■ CALIBRATION MODE = Wet
FULL CALIB. (315) Entry	Enter the 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 **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, → 🖹 193)
ADJUSTED DENSITY (810) Display	Displays the density calculated from the upper and lower level point. **Prerequisite:** ■ COMB. MEASURAND = Height and volume, CALIBRATION MODE = Wet ■ COMB. MEASURAND = Height and mass, CALIBRATION MODE = Wet ■ COMB. MEASURAND = Height and %, CALIBRATION MODE = Wet

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
DENSITY UNIT (812) Selection	Select the density unit. **Prerequisite:** ■ 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:** ■ 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 the density of the fluid. **Prerequisite:** ■ 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 **Factory setting:** 1.0
HEIGHT UNIT (708) Selection	Select the level unit. **Prerequisite:** ■ COMB. MEASURAND = %-height and volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-height and mass, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-height and %, CALIBRATION MODE = Dry **Options:** ■ mm ■ dm ■ cm ■ m ■ inch ■ ft ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT H and CUST. UNIT. FACT. H. **Factory setting:** m

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
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:** ■ 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 ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
CUST. UNIT FACT. H (705) Entry	Enter the 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:** ■ 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 **Example:** – You want the measured value to be displayed in "PU" (PU: packing unit). – MEASURED VALUE = 0.5 m ≙ 1 PU – Entry CUSTOMER UNIT H: PU – Entry CUST. UNIT FACT. H: 2 – Result: MEASURED VALUE = 1 PU **Factory setting:** 1.0
100% POINT (813) Entry	Enter the level value for the 100% point. **Prerequisite:** ■ COMB. MEASURAND = %-height and volume, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-height and mass, CALIBRATION MODE = Dry ■ COMB. MEASURAND = %-height and %, CALIBRATION MODE = Dry **Example:** – The 100 %-point should correspond to 4 m. – Select the "m" unit via the HEIGHT UNIT parameter. – Enter the value "4" for this parameter (100% POINT). **Factory setting:** 1.0

Table 13: OPERATING MENU → SETTINGS → BASIC SETUP "Level", LEVEL MODE "Height linearized"	
Parameter name	**Description**
ZERO POSITION (814) Entry	Enter the value for level offset. 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). **Prerequisite:** ▪ CALIBRATION MODE = Dry  P01-PMP75xxx-19-xx-xx-xx-001 *Fig. 49: Zero point shift* *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.* **Factory setting:** 0.0
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

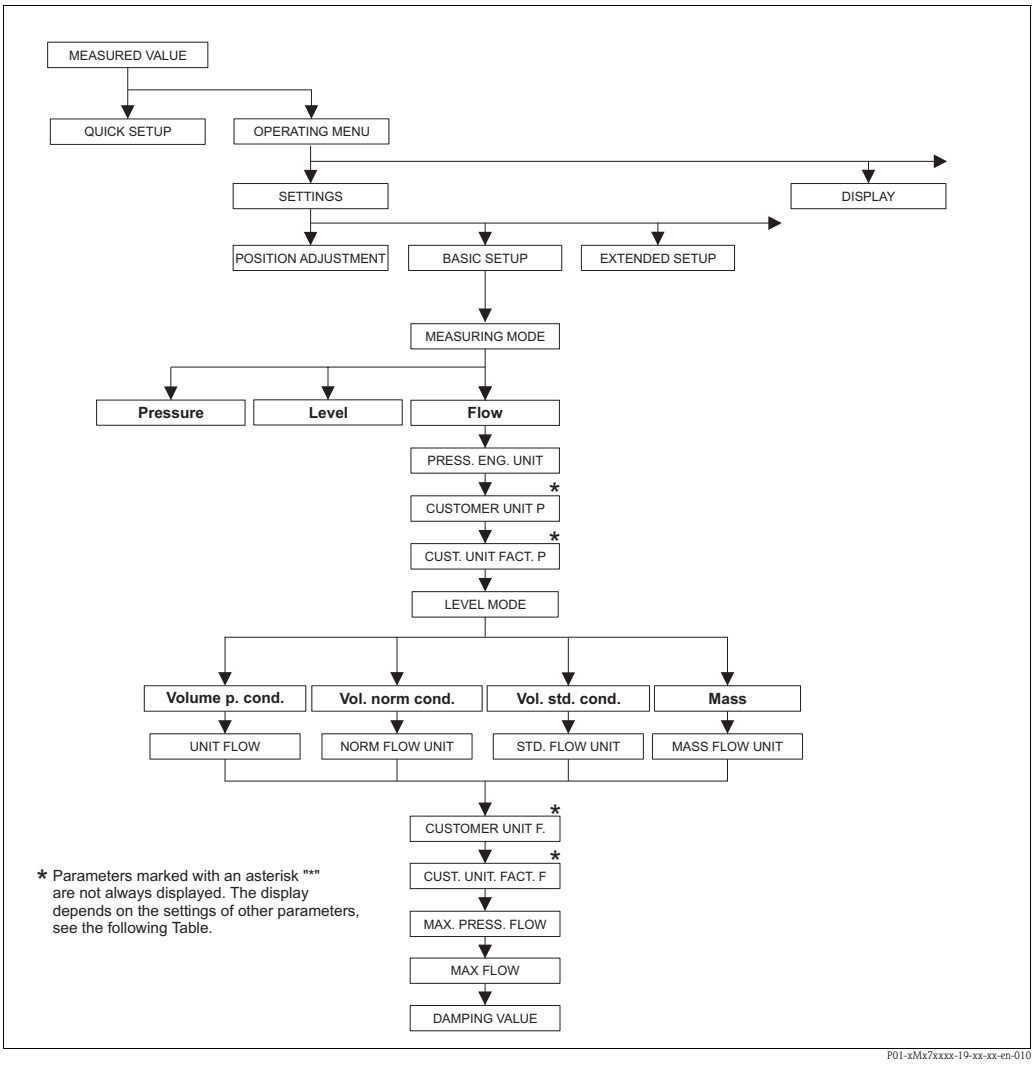


Fig. 50: BASIC SETUP function group for the "Flow" measuring mode

Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Flow **Note:** See also – → 📄 135, Table 5: QUICK SETUP "Flow" – → 📄 179, Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow" – → 📄 187, Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP – → 📄 197, Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow" – → 📄 124 ff, Section 10 "Flow measurement (via local operation and FieldCare)".	

Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	**Description**
MEASURING MODE Selection	Select the measuring mode. The operating menu is structured according to the selected measuring mode. ✎ Note! When the measuring mode is changed, no conversion takes place. The digital output value of the Analog Input Block OUT no longer displays the same value as the local operation or the MEASURED VALUE. The device has to be recalibrated if the measuring mode is changed. → 🖹 124, Section 10 "Flow measurement (via local operation and FieldCare)". **Options**: ■ Pressure ■ Level ■ Deltabar S: Flow **Factory setting:** Pressure
PRESS. ENG. UNIT (060) Selection	Select the 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 ■ Pa, hPa, kPa, MPa ■ psi ■ mmHg, inHg ■ Torr ■ g/cm^2, kg/cm^2 ■ lb/ft^2 ■ atm ■ gf/cm^2, kgf/cm^2 ■ User unit, → see also the following parameter descriptions for CUSTOMER UNIT P and CUST. UNIT. FACT. P ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Depends on the sensor nominal measuring range mbar or bar or as per order specifications
CUSTOMER UNIT P (075) Entry	Enter text (unit) for customer-specific pressure unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. P **Prerequisite:** ■ PRESS. ENG. UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _

Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	**Description**
CUST. UNIT FACT. P (317) Entry	Enter the 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. **Prerequisite:** ■ PRESS. ENG. UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
FLOW-MEAS. TYPE (640) Selection	Select the flow type. **Options:** ■ Volume operat. 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 **Factory setting:** Volume operat. cond.
UNIT FLOW (391) Selection	Select volume 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. **Prerequisite:** ■ FLOW-MEAS. TYPE = Volume operat. cond. **Options:** ■ 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 ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** m^3/s

Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	**Description**
NORM FLOW UNIT (661) Selection	Select the norm volume 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. **Prerequisite:** ■ FLOW-MEAS. TYPE = Gas norm conditions **Options:** ■ 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 ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Nm^3/s
STD. FLOW UNIT (660) Selection	Select the standard volume 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. **Prerequisite:** ■ FLOW-MEAS. TYPE = Gas std. conditions **Options:** ■ 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 ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** Sm^3/s
MASS FLOW UNIT (571) Selection	Select the 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. **Prerequisite:** ■ FLOW-MEAS. TYPE = Mass p. cond. **Options:** ■ 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 descriptions for CUSTOMER UNIT F and CUST. UNIT. FACT. F ✎ Note! Following a change in the unit, the digital output value of the Analog Input value OUT and the local operation or the MEASURED VALUE no longer display the same value. → See also parameter descriptions for XD SCALE, OUT SCALE and OUT value. **Factory setting:** kg/s

Table 14: OPERATING MENU → SETTINGS → BASIC SETUP "Flow"	
Parameter name	**Description**
CUSTOMER UNIT F (610) Entry	Enter text (unit) for customer-specific flow unit. You can enter a maximum of eight alphanumeric characters here. → See also CUST. UNIT. FACT. F. **Prerequisite:** ■ UNIT FLOW = User unit ■ NORM FLOW UNIT = User unit ■ STD. FLOW UNIT = User unit ■ MASS FLOW UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** – – – – – – – –
CUST. UNIT FACT. F (609) Entry	Enter the conversion factor for a customer-specific flow unit. The conversion factor must be entered in relation to an appropriate SI unit, e.g. m^3/s for the "Volume operat. cond." flow mode. → See also CUSTOMER UNIT F. **Prerequisite:** ■ UNIT FLOW = User unit ■ NORM FLOW UNIT = User unit ■ STD. FLOW UNIT = User unit ■ MASS FLOW UNIT = User unit **Example:** – 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 **Factory setting:** 1.0
MAX. FLOW (311) Entry	Enter the maximum flow of the primary device. → See also the layout sheet of the primary device. The maximum flow is assigned to the maximum pressure which you enter via MAX PRESS. FLOW. **Factory setting:** 1.0
MAX PRESS. FLOW (634) Entry	Enter the maximum pressure of the primary device. → See the layout sheet of primary device. This value is assigned to the maximum flow value (→ see MAX. FLOW). **Factory setting:** High sensor limit (→ see PRESS. SENS HILIM, → 193)
DAMPING VALUE (247) Entry	Enter damping time (time constant τ). The damping affects the speed at which all subsequent elements, such as the local operation, measured value and OUT value of the Analog Input Block 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

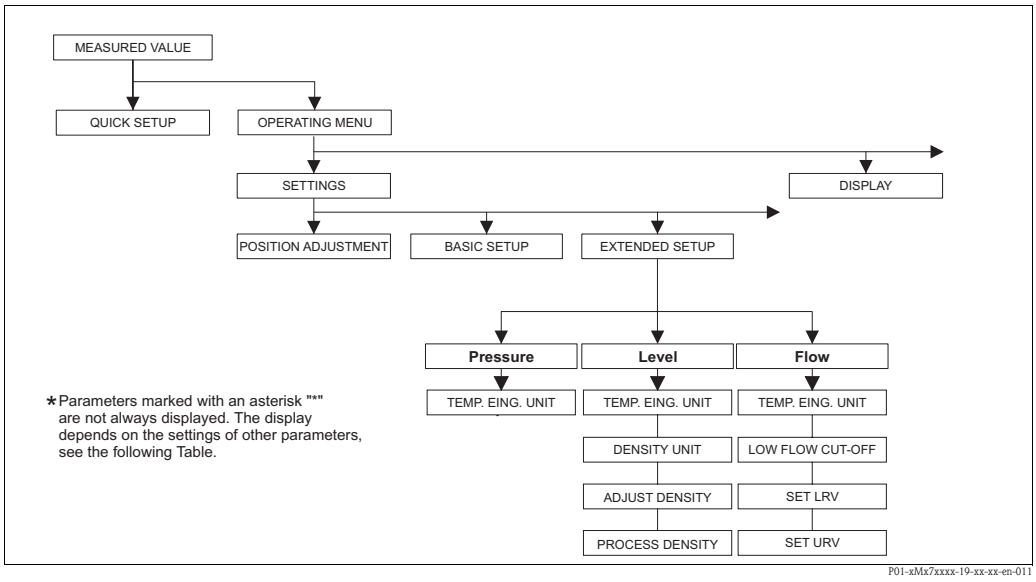


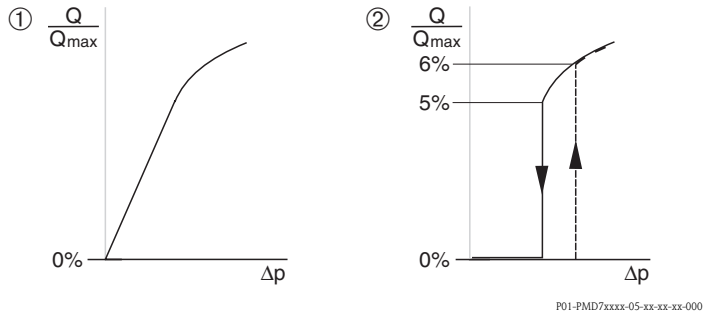
Fig. 51: EXTENDED SETUP function group
for the "Pressure" measuring mode, → 178, Table 15: OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure"
for the "Level" measuring mode, → 178, Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"
for the "Flow" measuring mode, → 179, Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"

Table 15: OPERATING MENU → SETTINGS → EXTENDED SETUP "Pressure"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Pressure **Note:** ■ See also → 99ff, Section 8 "Pressure measurement (via local operation and FieldCare)".	
TEMP. ENG. UNIT (318) Selection	Select the unit for the temperature measured values. → See also PCB TEMPERATURE (→ 192) and SENSOR TEMP. (→ 196). **Options:** ■ °C ■ °F ■ K ■ R **Factory setting:** °C

Table 16: OPERATING MENU → SETTINGS → EXTENDED SETUP "Level"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Level **Note:** ■ See also → 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	

Table 16: 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 (→ 192) and SENSOR TEMP. (→ 196). **Options:** ■ °C ■ °F ■ K ■ R **Factory setting:** °C
DENSITY UNIT (001)/(812) Selection	Select the density unit. **Options:** ■ g/cm³ ■ kg/dm³ ■ kg/m³ ■ US lb/in³ ■ US lb/ft³ **Factory setting:** kg/dm³
ADJUST DENSITY (007)/(316) Entry	Enter the density of the fluid. ✎ Note! LIN. MEASURAND: "% (Level)", "Mass" and "Volume" and COMB. MEASURAND: If you change to dry calibration after a wet calibration using the CALIBRATION MODE parameter (→ 156 or → 169), the density for the ADJUST DENSITY and PROCESS DENSITY parameters must be entered correctly before changing the calibration mode. If the pressure falls with increasing levels (LIN. MEASURED: volume), such as in the case of a residual volume measurement, a negative value must be entered for this parameter. **Factory setting:** 1.0
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. ✎ Note! LIN. MEASURAND: "% (Level)", "Mass" and "Volume" and COMB. MEASURAND: If you change to dry calibration after a wet calibration using the CALIBRATION MODE parameter (→ 156 or → 169), the density for the ADJUST DENSITY and PROCESS DENSITY parameters must be entered correctly before changing the calibration mode. If the pressure falls with increasing levels (LIN. MEASURED: volume), such as in the case of a residual volume measurement, a negative value must be entered for this parameter. **Factory setting:** 1.0

Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Flow **Note:** ■ See also → 124 ff, Section 10 "Flow measurement (via local operation and FieldCare)".	
TEMP. ENG. UNIT (318) Selection	Select the unit for the temperature measured value. → See also PCB TEMPERATURE (→ 192) and SENSOR TEMP. (→ 197). **Options:** ■ °C ■ °F ■ K ■ R **Factory setting:** °C

Table 17: OPERATING MENU → SETTINGS → EXTENDED SETUP "Flow"	
Parameter name	**Description**
LOW FLOW CUT-OFF (442) Selection	Switch the "low flow cut-off" function on and off. In the lower measuring range, small flow quantities (creepages) can lead to large fluctuations in the measured value. Switching on this function stops these flow quantities from being recorded. → See also SET. L. FL. CUT-OFF. **Options:** ■ Off ■ On **Factory setting:** Off
SET. L. FL. CUT-OFF (332) Entry	Enter the 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. **Prerequisite:** ■ LOW FLOW CUT-OFF = On **Input range:** Switch-off point: 0 to 50 % of end flow value (→ MAX. FLOW).  **Factory setting:** 5 % (of end flow value)

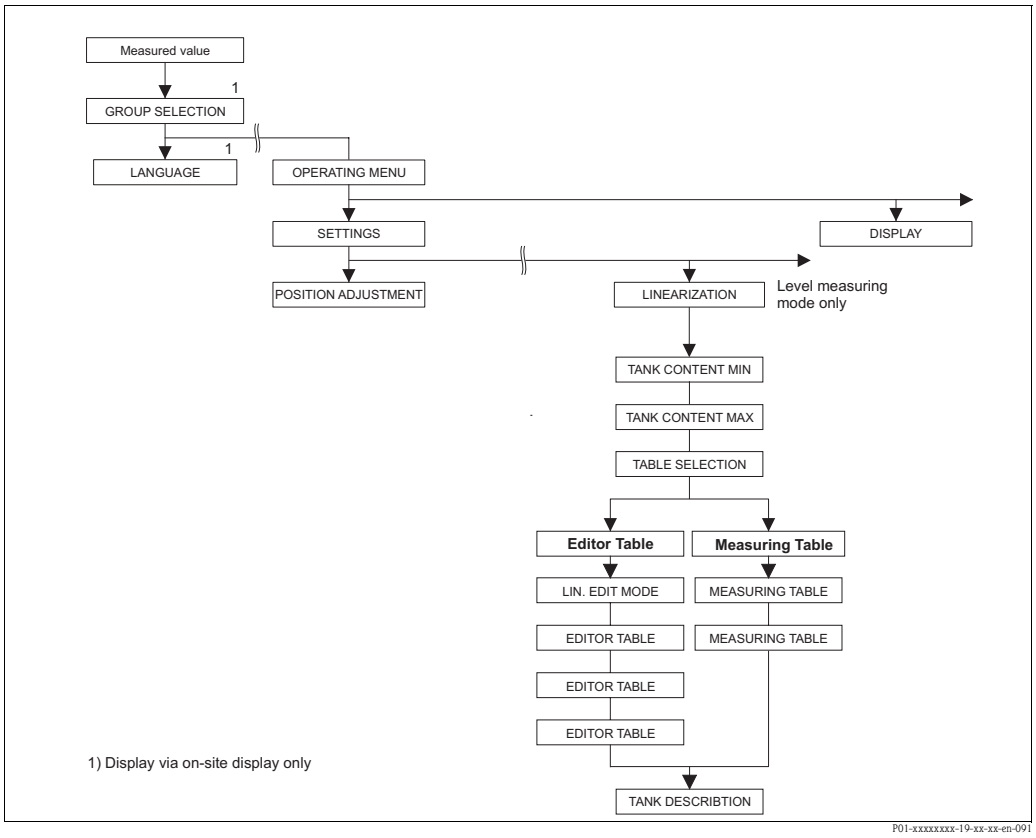


Fig. 52: LINEARIZATION function group for local operation

Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Level (→ 🖹 129). ■ LEVEL MODE = Pressure linearized or height linearized (→ 🖹 151). **Note:** – See also → 🖹 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
TANK CONTENT MIN (759) Entry	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. **Factory setting:** 0.0
TANK CONTENT MAX (713) Entry	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. **Factory setting:** 100.0
TABLE SELECTION (808) Selection	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. **Options:** ■ View meas. table ■ Editor table **Factory setting:** View meas. table

Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation	
Parameter name	**Description**
LIN. EDIT MODE (397) Selection	Select the entry mode for the linearization table. **Prerequisite:** ■ TABLE SELECTION = Editor table **Options:** ■ Manual: The container neither has to be filled nor emptied for this entry mode. Enter the value pairs for the linearization 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. **Factory setting:** Manual
EDITOR TABLE (809) Selection	Select table. **Prerequisite:** ■ TABLE SELECTION = Editor table **Options:** ■ New table: Enter a new linearization 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 EDITOR TABLE (770) **Factory setting:** New table
EDITOR TABLE Entry ("Semiautomatic" edit mode) – LINE-NUMB (549) – Y-VAL. (551)	Enter table in the "Semiautomatic" editing mode. A linearization 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. **Example:** Enter point for LEVEL MODE = Pressure linearized – 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. **Example:** Enter point for LEVEL MODE = Height linearized – 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. **Factory setting:** LINE-NUMB = 1, X-VAL. = 0.0, Y-VAL. = 0.0

Table 18: GROUP SELECTION → OPERATING MENU → SETTINGS → LINEARIZATION – Local operation	
Parameter name	**Description**
EDITOR TABLE Entry ("Manual" edit mode) – LINE-NUMB (549) – Y-VAL. (551) – X-VAL. (550)	Enter the table in the "Manual" editing mode. A linearization table must have at least 2 points and may not have more than 32 points. A point consists of an index, X-value and Y-value. The container neither has to be filled nor emptied for this editing mode. **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. **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. **Factory setting:** LINE-NUMB = 1, X-VAL. = 0.0, Y-VAL. = 0.0
EDITOR TABLE (770) Selection	Select the function for the editor table. **Options:** ■ Next point: enter next point. ■ Last input point: skip 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. **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 EDITOR TABLE (770) parameter, select the option "Insert point". – Point 5 is displayed for the EDITOR TABLE/LINE NUMB parameter. Enter new values for the X-VAL and Y-VAL parameters. **Example:** Delete point, in this case the 5th point for example – Select point 5 via the EDITOR TABLE/LINE NUMB parameter. – Using the EDITOR TABLE (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. **Factory setting:** Next point
MEASURING TABLE (549) Display	A point of the linearization table saved (measuring table) appears on the display. The parameter first displays the first point of the linearization table. By entering a line number, you can directly display the corresponding point in the linearization table.
MEASURING TABLE (717) Selection	Select the function for the measuring table. **Options:** ■ 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. **Factory setting:** Next point
TANK DESCRIPTION (815) Entry	Enter tank description. (max. 32 alphanumeric characters) **Factory setting:** _

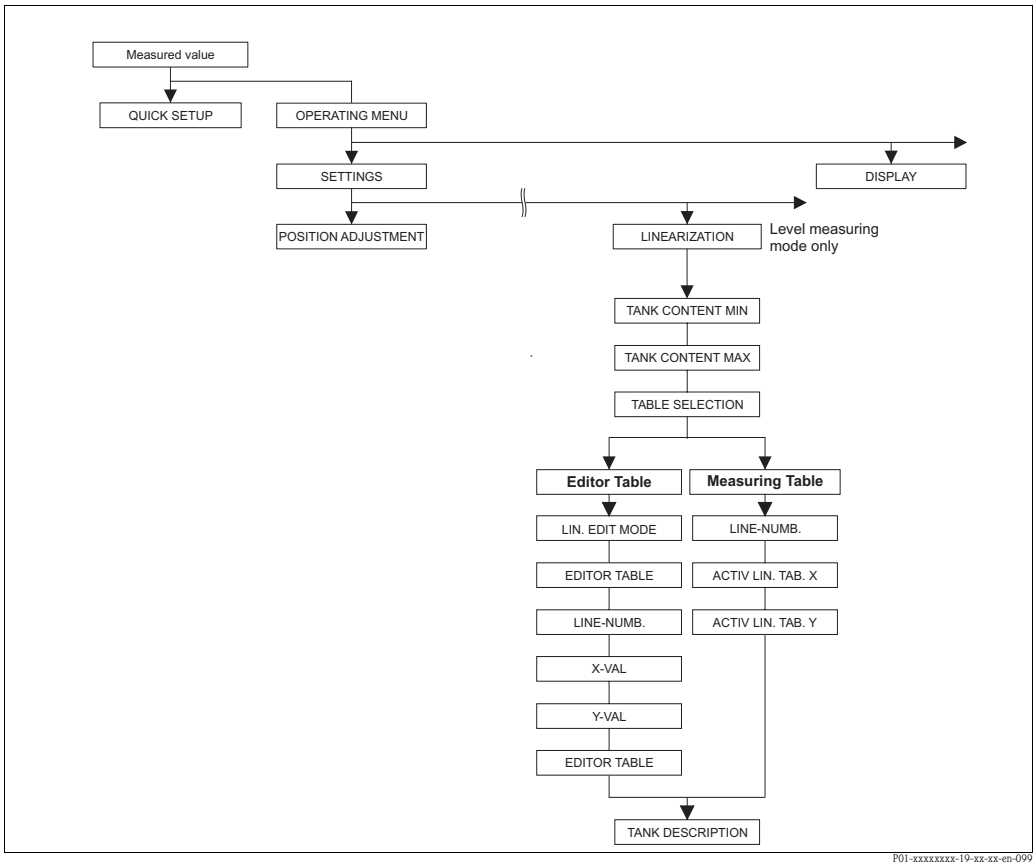


Fig. 53: LINEARIZATION function group for FieldCare

Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Level (→ 🖹 129). ■ LEVEL MODE = Pressure linearized or height linearized (→ 🖹 151). **Note:** – See also → 🖹 100 ff, Section 9 "Level measurement (via local operation and FieldCare)".	
TANK CONTENT MIN Entry	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. **Factory setting:** 0.0
TANK CONTENT MAX Entry	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. **Factory setting:** 100.0
TABLE SELECTION Selection	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. **Options:** ■ View meas. table ■ Editor table **Factory setting:** View meas. table

Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare	
Parameter name	**Description**
LIN. EDIT MODE Selection	Select the entry mode for the linearization table. **Prerequisite:** ■ TABLE SELECTION = Editor table **Options:** ■ Manual: The container neither has to be filled nor emptied for this entry mode. Enter the value pairs for the linearization 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. **Factory setting:** Manual
EDITOR TABLE Selection	Select table. **Prerequisite:** ■ TABLE SELECTION = Editor table **Options:** ■ New table: Enter a new linearization table. ■ View meas. table: View the measuring table saved and change points if necessary. ■ Continue edit: Edit an editor table that already exists. ✎ Note! FieldCare: ■ If you select the "View meas. table" option, the saved measuring table is loaded in FieldCare. Use the "Lin.-Tab." window to the 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. **Factory setting:** New table
LINE-NUMB Entry	Enter the line number for the linearization table. A linearization table must have at least 2 points and may not have more than 32 points. ■ TABLE SELECTION = View meas. table Via this parameter you can select the point of the linearization 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. ✎ Note! In FieldCare, you can enter a complete linearization table in one go, and view it, via the "Lin.-Tab." window.
X-VAL. ("Manual" entry mode) Entry	Enter the pressure value for the linearization table. → See also LIN. EDIT MODE, LINE-NUMB and Y-VAL. **Prerequisite:** ■ TABLE SELECTION = Editor table
X-VAL. ("Semiautomatic" entry mode) Display	In the "Semiautomatic" entry mode, the container is filled or emptied in stages. The X-VAL. displays the measured hydrostatic pressure. **Prerequisite:** ■ TABLE SELECTION = Editor table **FieldCare** The X-VAL. is saved by confirming the Y-value. → See also LIN. EDIT MODE, LINE-NUMB and Y-VAL.

Table 19: MANUFACTURER VIEW → OPERATING MENU → SETTINGS → LINEARIZATION – FieldCare	
Parameter name	**Description**
Y-VAL. Entry	Enter the volume, mass or %-value belonging to the X-VAL. for the linearization table. **Prerequisite:** ■ TABLE SELECTION = Editor table 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).
EDITOR TABLE Selection	Select the function for the editor table. **Options:** ■ Next point: no function ■ Last input point: no 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. **Example:** Add point, in this case between the 4th and 5th point for example – Select point 5 via the LINE NUMB parameter. – Using the EDITOR TABLE parameter, select the "Insert point" option. – Point 5 is displayed for the LINE NUMB parameter. Enter new values for the X-VAL and Y-VAL parameters. **Example:** Delete point, in this case the 5th point for example – Select point 5 via the LINE NUMB parameter. – Using the EDITOR TABLE parameter, select the "Delete point" option. – 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. **Factory setting:** Next point
ACTIV LIN. TAB. X Display	An X-value of the linearization table already saved appears on the display. You can select a point of the linearization table via the LINE-NUMB parameter. **Prerequisite:** ■ TABLE SELECTION = View meas. table Note! In FieldCare, you can view the entire saved table in the "Tables" window.
ACTIV LIN. TAB. Y Display	A Y-value of the linearization table already saved appears on the display. You can select a point of the linearization table via the LINE-NUMB parameter. **Prerequisite:** ■ TABLE SELECTION = View meas. table Note! In FieldCare, you can view the entire saved table in the "Tables" window.
TANK DESCRIPTION Entry	Enter tank description. (max. 32 alphanumeric characters) **Factory setting:** _

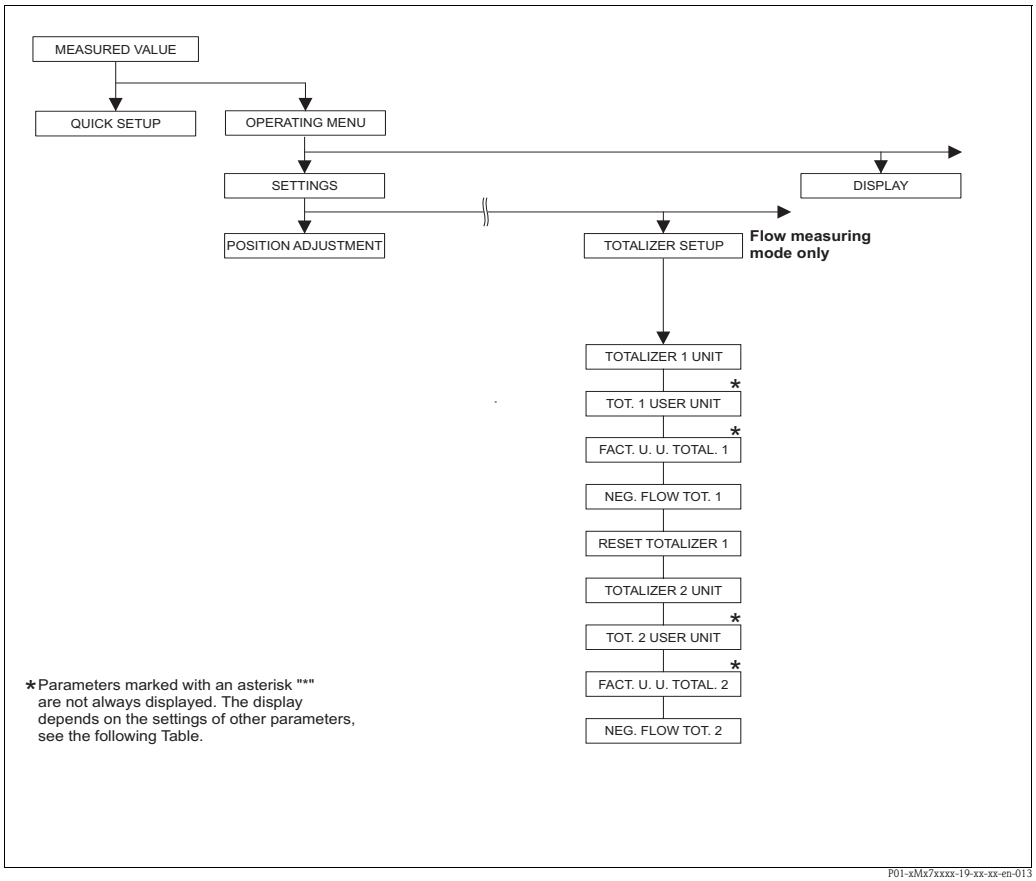


Fig. 54: TOTALIZER SETUP function group

Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Flow **Note:** ■ See also → 📄 124 ff, Section 10 "Flow measurement (via local operation and FieldCare)".	
TOTALIZER 1 UNIT (398), (662), (664), (666) Selection	Select the unit for totalizer 1. Depending on the setting in the FLOW-MEAS. TYPE parameter (→ 📄 175) 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. The index and the 3-digit ID number depends on the FLOW-MEAS. TYPE selected: – Index 102: TOTALIZER 1 UNIT (general) – Index 156 (398): FLOW-MEAS. TYPE "Volume operat. cond." – Index 168 (662): FLOW-MEAS. TYPE "Mass" – Index 170 (664): FLOW-MEAS. TYPE "Gas. std. cond." – Index 172 (666): FLOW-MEAS. TYPE "Gas. norm cond." **Factory setting:** m^3

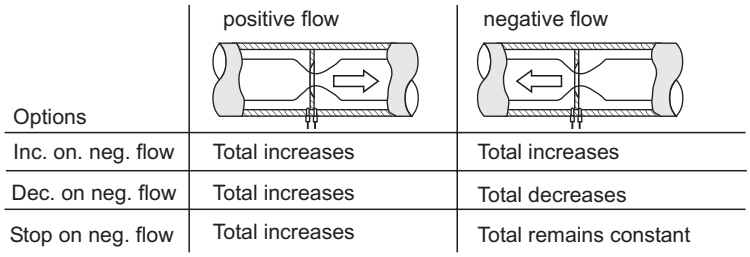
Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP	
Parameter name	**Description**
TOT. 1 USER UNIT (627) Entry	Enter text (unit) for customer-specific unit for totalizer 1. You can enter a maximum of eight alphanumeric characters here. → See also FACT. U.U.TOTAL.1. **Prerequisite:** ■ TOTALIZER 1 UNIT = User unit ✎ Note! Only the first five characters are shown on the local operation. For example, if the customer-specific unit "crates" was selected, only "crate" would be displayed. If the unit contains a slash, up to eight characters can be shown on the local operation. The maximum number of characters in the counter is again limited to five. For example if the customer-specific unit "crates/m2" was selected, "crate/m2" would be displayed. FieldCare accepts units with eight characters at most. The slash counts as one character. **Factory setting:** _ _ _ _ _ _ _ _
FACT. U.U. TOTAL. 1: (329) Entry	Enter the 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. m^3 for the "Volume operat. cond." FLOW-MEAS. TYPE. → See also TOT. 1 USER UNIT. **Prerequisite:** ■ TOTALIZER 1 UNIT = User unit **Example:** You want the measured value to be displayed in "buckets". – MEASURED VALUE =1 m3 ≙ 100 buckets – Entry TOT. 1 USER UNIT: bucket – Enter FACT. U.U. TOTAL. 1: 100 – Result: MEASURED VALUE = 100 buckets **Factory setting:** 1.0
NEG. FLOW TOT. 1 (400) Selection	Specify the way of counting negative flows for totalizer 1.  **Factory setting:** Inc. on neg. flow
RESET TOTALIZER1 (331) Selection	You reset totalizer 1 to zero with this parameter. **Options:** ■ Abort (do not reset) ■ Reset **Factory setting:** Abort
TOTALIZER 2 UNIT (399), (663), (665), (667) Selection	Select the unit for totalizer 2. → See also TOTAL 1. UNIT. The index depends on the FLOW-MEAS. TYPE selected: – Index 103: TOTALIZER 2 UNIT (general) – Index 157 (399): FLOW-MEAS. TYPE "Volume operat. cond." – Index 169 (663): FLOW-MEAS. TYPE "Mass" – Index 171 (665): FLOW-MEAS. TYPE "Gas. std. cond." – Index 173 (667): FLOW-MEAS. TYPE "Gas. norm cond." **Factory setting:** m^3

Table 20: OPERATING MENU → SETTINGS → TOTALIZER SETUP	
Parameter name	**Description**
TOT. 2 USER UNIT (628) Entry	Enter text (unit) for customer-specific unit for totalizer 2. → See also TOT. 1 USER UNIT. **Prerequisite:** ■ TOTALIZER 2 UNIT = User unit **Factory setting:** _ _ _ _ _ _ _ _
FACT. U.U. TOTAL 2 (330) Selection	Enter the conversion factor for a customer-specific unit for totalizer 2. → See also FACT. U.U.TOTAL.1. **Prerequisite:** ■ TOTALIZER 2 UNIT = User unit **Factory setting:** 1.0
NEG. FLOW TOT. 2 (416) Selection	Specify the way of counting negative flows for totalizer 2. → See NEG. FLOW TOT. 1. **Factory setting:** Inc. on neg. flow

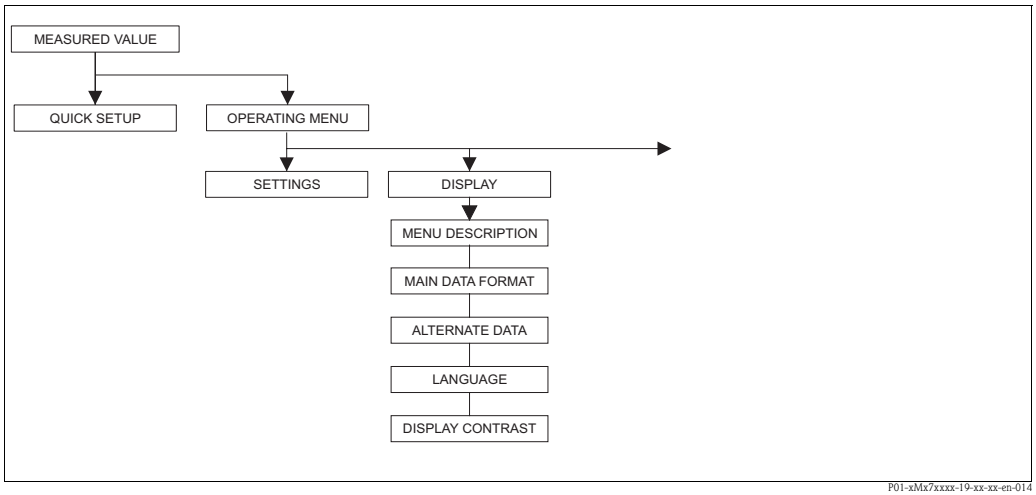


Fig. 55: DISPLAY group

Table 21: OPERATING MENU → DISPLAY	
Parameter name	**Description**
MENU DESCRIPTOR (416) Selection	Specify the contents for the main line of the local operation in the measuring mode. → See also Operating Instructions BA301P (Deltabar S) and BA302P (Cerabar S) or BA372P (Deltapilot S), "Local operation" section. **Options:** ■ Primary value (PV) ■ Main measured value (%) ■ Pressure ■ Flow ■ Level ■ Tank content ■ Temperature ■ Error number ■ Totalizer 1 ■ Totalizer 2 The selection depends on the measuring mode chosen. **Factory setting:** Primary value (PV)

Table 21: OPERATING MENU → DISPLAY	
Parameter name	**Description**
MAIN DATA FORMAT (688) Selection	Specify the number of places after the decimal point for the value displayed in the main line. → See also Operating Instructions BA301P (Deltabar S), BA302P (Cerabar S) or Deltapilot S (BA372P), "Local operation" section. **Options:** ■ Auto ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx ■ x.xxxxx **Factory setting:** Auto
ALTERNATE DATA (423) Selection	Switch on the "Alternating display" mode. In this display mode, the local operation alternates between the following measured values depending on the measuring mode selected. – Pressure: primary value (PV) or main measured value (%) (MEASURED VALUE), pressure (PRESSURE) and temperature (TEMP. SENSOR) – Level: primary value (PV) or main measured value (%) (MEASURED VALUE), pressure (PRESSURE) and temperature (TEMP. SENSOR) – Flow: primary value (PV) or main measured value (%) (MEASURED VALUE), pressure (PRESSURE), temperature (TEMP. SENSOR), totalizer 1 (TOTALIZER 1) and totalizer 2 (TOTALIZER 2) **Options:** ■ Off ■ On **Factory setting:** Off
LANGUAGE Selection	Select the menu language for the local operation. ✎ Note! ■ In local operation, the LANGUAGE parameter is arranged directly under the GROUP SELECTION (menu path: GROUP SELECTION → LANGUAGE, → 🖹 128). ■ Select the menu language for FieldCare using the "Language Button" in the configuration window. Select the menu language for the FieldCare frame via the "Extra" menu → "Options" → "Display" → "Language". **Options**: ■ Deutsch ■ English ■ Français ■ Español ■ Chinese (CHS) ■ Japanese (JPN) **Factory setting**: English
DISPLAY CONTRAST (339) Entry	Adjust contrast of local operation. 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 BA301P (Deltabar S) and BA302P (Cerabar S) or BA372P (Deltapilot S), "Function of the operating keys" section. **Input range:** 4 to 13, 4: contrast weaker (brighter), 13: contrast stronger (darker). **Factory setting:** 8

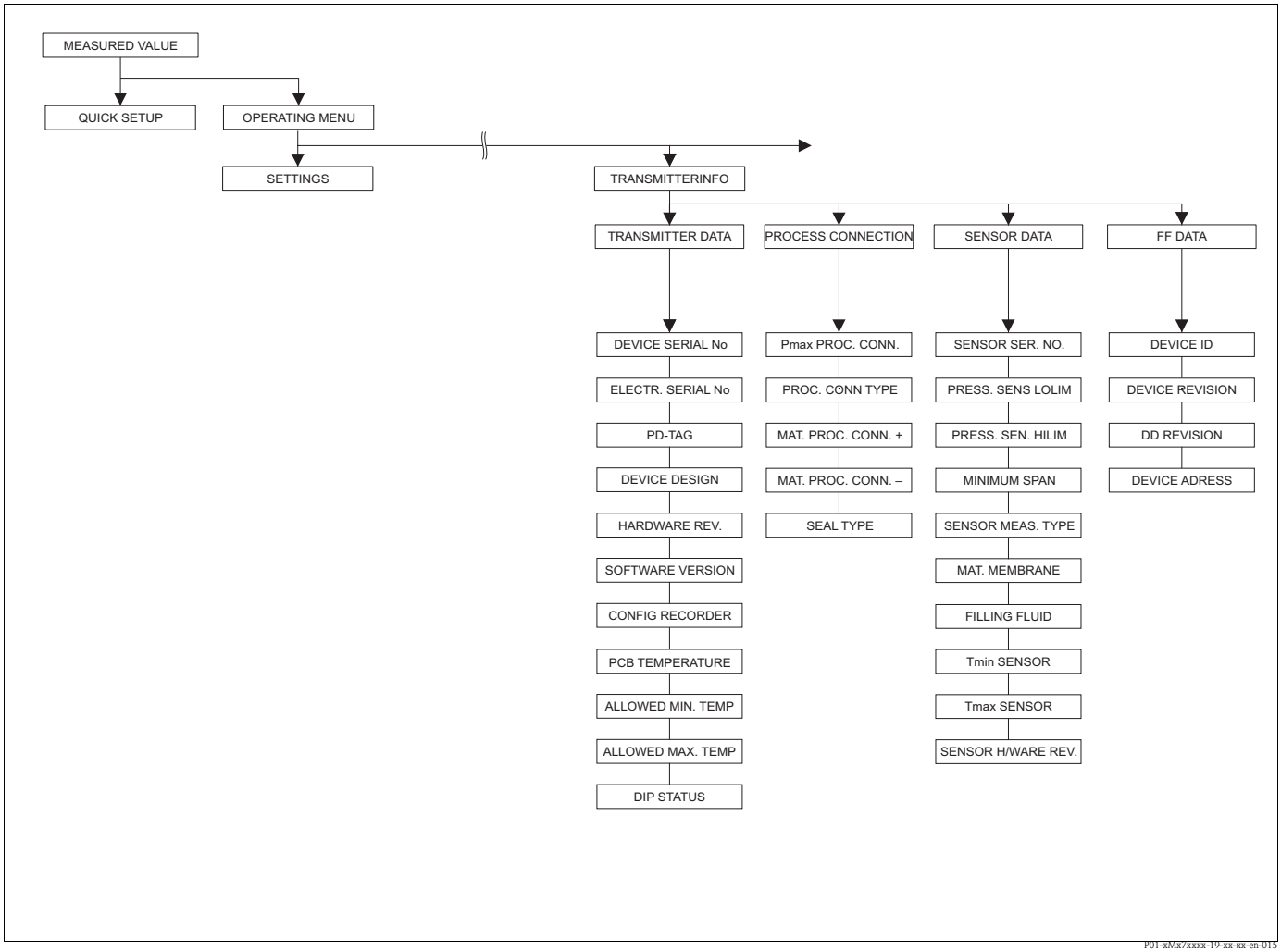


Fig. 56: TRANSMITTER INFO group for the TRANSMITTER DATA function group, → 191, Table 23: OPERATING MENU → TRANSMITTER INFO → TRANSMITTER DATA
for the PROCESS CONNECTION function group, → 192, Table 24: OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION
for the SENSOR DATA function group, → 193, Table 25: OPERATING MENU → TRANSMITTER INFO → SENSOR DATA
for the FF DATA function group, → 194, Table 26: OPERATING MENU → TRANSMITTER INFO → FF DATA

Table 23: 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).
PD-TAG (57)	Set tag number for the device.
DEVICE DESIGN. (350) Display	Displays the device designation and the 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.: V 03.00.00

Table 23: OPERATING MENU → TRANSMITTER INFO → TRANSMITTER DATA	
Parameter name	**Description**
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 up 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.
DIP STATUS (363) Display	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 200.) → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "Locking/unlocking operation" section. **Display:** ■ On (locking switched on) ■ Off (locking switched off) **Factory setting:** Off (locking switched off)

Table 24: OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION	
Parameter name	**Description**
Pmax PROC. CONN. (570) Entry	For entering and displaying the maximum permitted pressure of the process connection. **Factory setting:** In accordance with nameplate data (→ See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "Nameplates" section)
PROC. CONN. TYPE (482) Selection	For selecting and displaying the process connection type. **Options:** ■ Not used ■ Unknown ■ Special ■ Oval flange ■ Thread female ■ Thread male ■ Flange ■ Remote seal

Table 24: OPERATING MENU → TRANSMITTER INFO → PROCESS CONNECTION	
Parameter name	**Description**
MAT. PROC. CONN. + (360) Selection	For selecting and displaying the material of the process connection (P+). → See also parameter description for MAT. PROC. CONN. - **Options:** ■ 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 **Factory setting:** As per order specifications
MAT. PROC. CONN. - (361) Selection	For selecting and displaying the material of the process connection (P–). → See also parameter description for MAT. PROC. CONN. + **Prerequisite:** ■ Deltabar S differential pressure transmitter
SEAL TYPE (362) Selection	For selecting and displaying the material of the process seal. **Options:** ■ 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

Table 25: OPERATING MENU → TRANSMITTER INFO → SENSOR DATA	
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.

Table 25: OPERATING MENU → TRANSMITTER INFO → SENSOR DATA	
Parameter name	**Description**
SENSOR MEAS.TYPE (581) Display	■ Deltabar S = Differential ■ Cerabar S with gauge pressure sensors = Relative ■ Cerabar S with absolute pressure sensors = Absolute ■ Deltapilot S = Relative Displays the sensor type.
Pmin SENS.DAMAGE (251) Display	Displays the minimum permitted absolute pressure of the sensor (resistance to vacuum).
Pmax SENS.DAMAGE (252) Display	Displays the maximum permitted absolute pressure of the sensor (resistance to overpressure).
MAT. MEMBRANE (365) Display	Displays the membrane material **Factory setting:** As per version in the order code → See also Technical Information TI382P (Deltapilot S), TI383P (Cerabar S) or TI416P (Deltapilot S), "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 26: OPERATING MENU → TRANSMITTER INFO → FF DATA	
Parameter name	**Description**
DEVICE ID (987) Display	The DEVICE ID is the unique device ID in the control system or the FF bus. It consists of the manufacturer ID (452B48), device type number and device serial number. **Examples:** Deltabar S: 452B481009-6B032A0109D Deltapilot S: 452B48100B-6B032A0109E Cerabar S: 452B481007-6B032A0109F
DEVICE REVISION (986) Display	Displays the revision or version of a complete device (HW+SW) within a device type.
DD REVISION (985) Display	Displays the DD version initially certified.
DEVICE ADDRESS (984) Display	Displays the device address currently configured and valid. The default setting is 247.

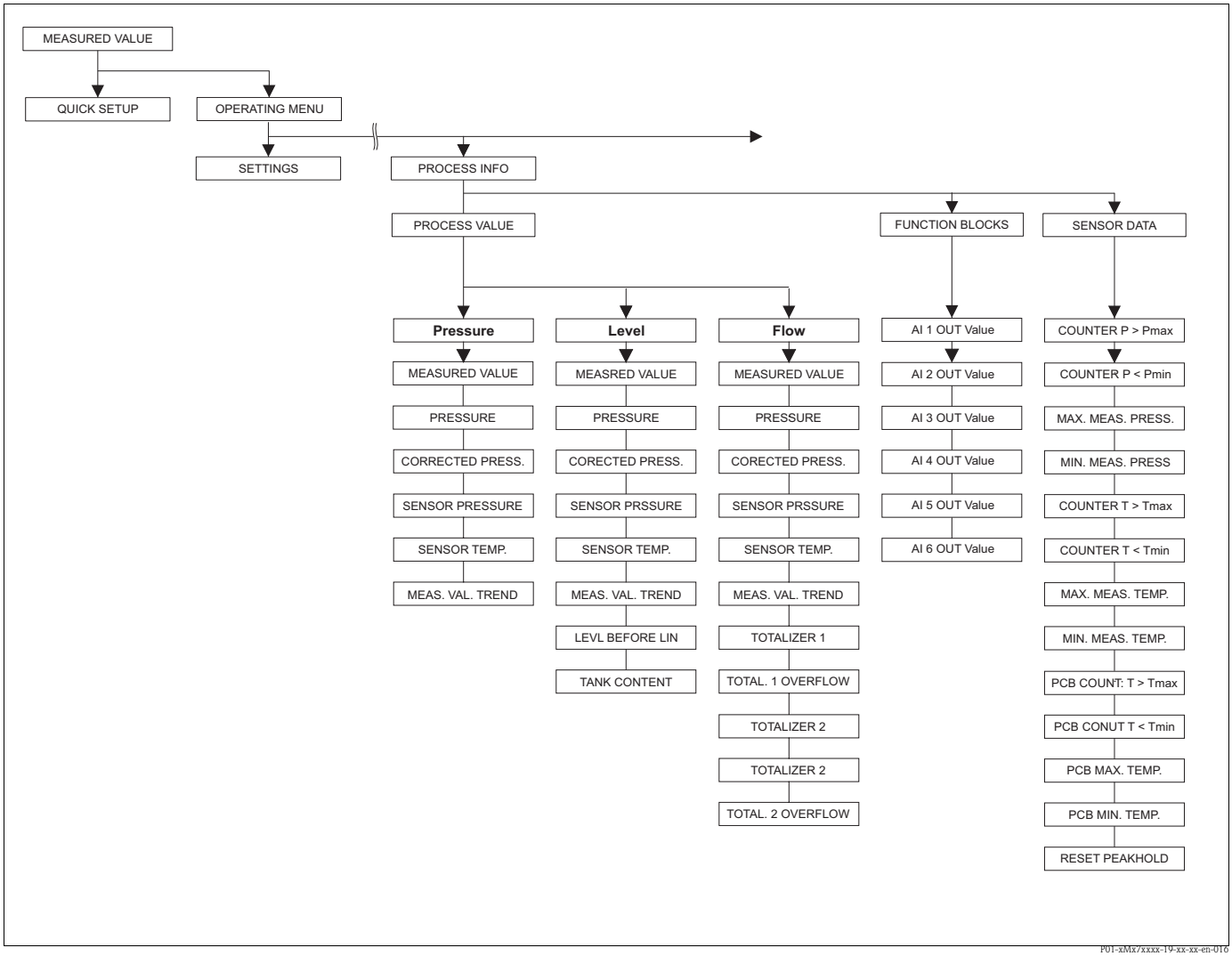


Fig. 57: PROCESSINFO group
for the PROCESS VALUES function group "Pressure" measuring mode, → 195, Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure"
for the PROCESS VALUES function group "Level" measuring mode, → 196, Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level"
for the PROCESS VALUES function group "Flow" measuring mode, → 197, Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"
for the FUNCTION Blocks function group, → 197, Table 30: OPERATING MENU → PROCESSINFO → Function Blocks
for the PEAKHOLD function group, → 198, Table 31: OPERATING MENU → PROCESSINFO → PEAK HOLD INDICATOR

Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Pressure	
MEASURED VALUE (679) Display	Displays the measured value In the "Pressure" measuring mode, this value corresponds to the PRESSURE parameter.

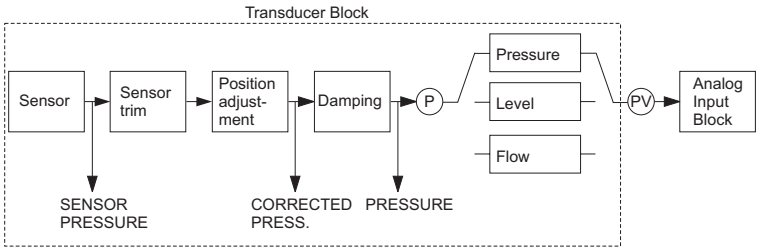
Table 27: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Pressure"	
Parameter name	**Description**
PRESSURE (301) Display	Displays the measured pressure after sensor recalibration, position adjustment and damping. This value corresponds to the MEASURED VALUE parameter in the "Pressure" measuring mode. 
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 can deviate from the process temperature.
MEAS. VAL. TREND (378) Display	Displays the trend of the primary value of the Transducer Block. Possibilities: increasing, decreasing, constant

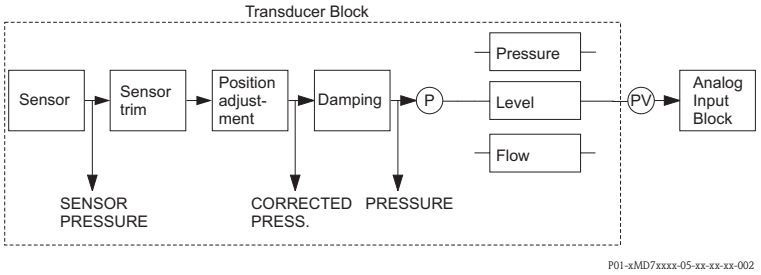
Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Level	
MEASURED VALUE (679) Display	Displays the measured value In the "Level" measuring mode with "Linear" or "Pressure linearized" level mode, this value corresponds to the LEVEL BEFORE LIN. parameter. In the "Level" measuring mode with "Height linearized" level mode, this value corresponds to the TANK CONTENT parameter.
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 can deviate from the process temperature.
MEAS. VAL. TREND (378) Display	Displays the trend of the primary value of the Transducer Block. Possibilities: increasing, decreasing, constant

Table 28: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Level"	
Parameter name	**Description**
LEVEL BEFORE LIN (050) Display	Displays the level value prior to linearization. **Prerequisite:** ■ LEVEL MODE = Linear or height linearized 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.
TANK CONTENT (370) Display	Displays the level value after linearization. **Prerequisite:** ■ LEVEL MODE = Pressure linearized or height linearized 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.

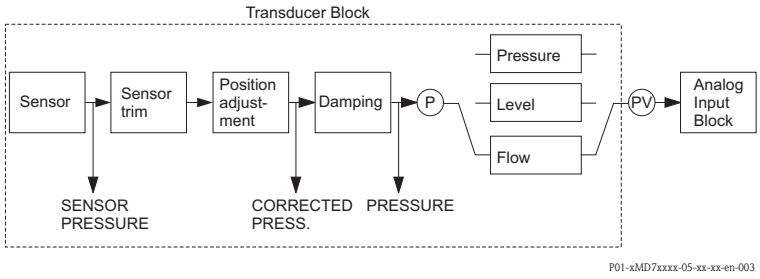
Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"	
Parameter name	**Description**
Prerequisite: ■ MEASURING MODE = Flow	
MEASURED VALUE (679) Display	Displays the measured value In the "Flow" measuring mode, this value corresponds to the SUPPRESSED FLOW parameter.
PRESSURE (301) Display	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 can deviate from the process temperature.
MEAS. VAL. TREND (378) Display	Displays the trend of the primary value of the Transducer Block. 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.

Table 29: OPERATING MENU → PROCESSINFO → PROCESS VALUES "Flow"	
Parameter name	**Description**
TOTAL. 2 OVERFLOW (658) Display	Displays the overflow value of totalizer 2. → See also TOTALIZER 2 and example for TOTALIZER 1.

Table 30: OPERATING MENU → PROCESSINFO → Function Blocks			
Parameter name	**Description**		
AI 1 OUT Value (983) Display	The current values are displayed for instantiated analog inputs, with their individual units and status. The first line displays the AI text. The second line displays the current value for the parameter and the unit. The third line displays the status of the value.		
AI 2 OUT Value (982) Display	The following list indicates the status and the related text of the AI OUT value:		
	Status		**Text**
AI 3 OUT Value (981) Display	Bad	=	BAD
	Uncertain	=	UNCERTAIN
	Good non-cascaded	=	GOOD
	Good cascaded	=	GOOD
Note: ■ When delivered: – Two AI Blocks are preinstantiated for Cerabar S and Deltapilot S – Three AI Blocks are preinstantiated for Deltabar S ■ Up to three additional AI Blocks are instantiated.			

Table 31: 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 highest 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 lowest measured pressure value (peak hold indicator). You can reset this indicator by means of the RESET PEAKHOLD parameter.
COUNTER:T > Tmax (404) Display	Displays the number of times the specified temperature range of the sensor has been overshot. You can reset this counter by means of the RESET PEAKHOLD parameter.
MAX. MEAS. TEMP. (471) Display	Displays the highest 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 lowest 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 overshot.
PCB MAX. TEMP. (490) Display	Displays the highest electronics temperature measured.
PCB COUNT:T < Tmin (492) Display	Displays the number of times the specified temperature range of the electronics has been undershot.

Table 31: OPERATING MENU → PROCESSINFO → PEAK HOLD INDICATOR	
Parameter name	**Description**
PCB MIN. TEMP. (494) Display	Displays the lowest electronics temperature measured.
RESET PEAKHOLD (382) Selection	This parameter lists all the peak hold indicator parameters that can be reset. You can select the peak hold indicators you want to reset. **Options:** ■ None ■ Max. pressure ■ Min. pressure ■ Pmax history ■ Pmin history ■ Max. temp. ■ Min. temp. ■ Tmax history ■ Tmin history ■ Reset all **Factory setting:** None

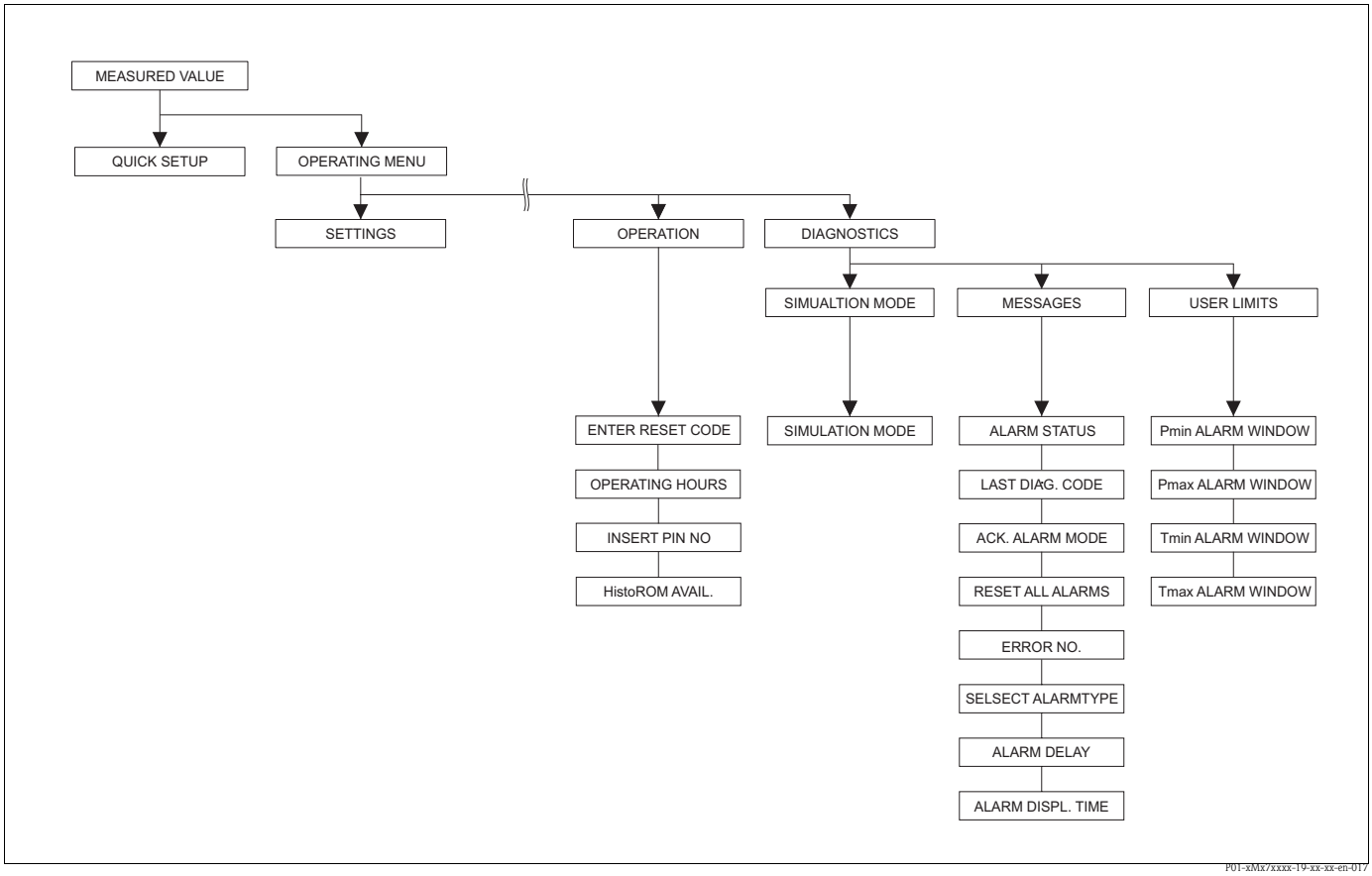


Fig. 58: OPERATION and DIAGNOSTICS group
for the OPERATION group, → 200, Table 32: OPERATING MENU → OPERATION
for the SIMULATION function group, → 201, Table 33: OPERATING MENU → DIAGNOSTICS → SIMULATION
for the MESSAGES function group, → 202, Table 34: OPERATING MENU → DIAGNOSTICS → MESSAGES
for the USER LIMITS function group, → 203, Table 35: OPERATING MENU → DIAGNOSTICS → USER LIMITS

Table 32: OPERATING MENU → OPERATION	
Parameter name	**Description**
ENTER RESET CODE (047) Entry	Reset parameters completely or partially to factory values or delivery status. → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "Factory setting" (reset) section. **Factory setting:** 0
OPERATING HOURS (409) Display	Displays the hours of operation. This parameter cannot be reset.
INSERT PIN NO (048) Entry	For entering a code to lock or unlock operation. Note! ■ The -symbol on the local operation 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 remote operation e.g. FieldCare, you can only unlock operation again using remote operation. → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "Locking/unlocking operation" section. **Options:** ■ Lock: Enter the number 0. ■ Unlock: Enter the number 2457. **Factory setting:** *2457*
HistoROM AVAIL. (831) Display	Indicates whether the optional HistoROM®/M-DAT memory module is connected to the electronic insert. → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "HistoROM®/M-DAT (optional)" section. **Options:** ■ Yes (HistoROM®/M-DAT is attached to the electronic insert) ■ No (HistoROM®/M-DAT is not attached to the electronic insert)
DOWNLOAD SELECT (014) Selection	Select download function from HistoROM to device. The option selected has no effect on an upload from the device to the HistoROM. **Prerequisite:** ■ A HistoROM®/M-DAT is attached to the electronic insert (HistoROM AVAIL. = Yes) **Options:** ■ Configuration copy: With this option, all parameters apart from the TRANSMITTER SERIAL No, DEVICE DESIGNATION and the parameters of the POSITION ADJUSTMENT and PROCESS CONNECTION group are overwritten. ■ Device replacement: With this option, all parameters except for TRANSMITTER SERIAL No, DEVICE DESIGNATION 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. **Factory setting:** Configuration copy (if HistoROM®/M-DAT is attached to the electronic insert)
HistoROM CONTROL (832) Selection	For selecting the direction for copying the data. → See also Operating Instructions for Deltabar S (BA301P), Cerabar S (BA302P) or Deltapilot S (BA372P), "HistoROM®/M-DAT (optional)" section. **Prerequisite:** ■ A HistoROM®/M-DAT is attached to the electronic insert (HistoROM AVAIL. = Yes) **Options:** ■ Abort ■ HistoROM → Device ■ Device → HistoROM **Factory setting:** Abort (if HistoROM®/M-DAT is attached to the electronic insert)

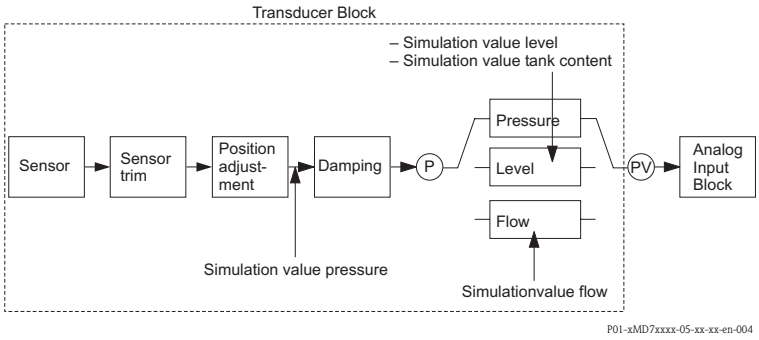
Table 33: OPERATING MENU → DIAGNOSTICS → SIMULATION	
Parameter name	**Description**
SIMULATION MODE (413) Selection	Switch on simulation and select simulation type. Any simulation running is switched off if the measuring mode or level mode is changed. **Options**: ■ None ■ Pressure, → see also this table, 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. ■ Alarm/warning, → see also this table, parameter description for SIM. ERROR NO.  **Factory setting:** None
SIM. PRESSURE (414) Entry	Enter the simulation value. → See also SIMULATION MODE. **Prerequisite:** ■ SIMULATION MODE = Pressure **Factory setting:** Current pressure measured value
SIM. FLOW VALUE (639) Entry	Enter the simulation value. → See also SIMULATION MODE. **Prerequisite:** ■ MEASURING MODE = Pressure and SIMULATION MODE = Flow ■ MEASURING MODE = Flow and SIMULATION MODE = Flow
SIM. LEVEL (714) Entry	Enter the simulation value. → See also SIMULATION MODE. **Prerequisite:** ■ MEASURING MODE = Level and SIMULATION MODE = Level
SIM. TANK CONT. (715) Entry	Enter the simulation value. → See also SIMULATION MODE. **Prerequisites:** ■ 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. ERROR NO. (476) Entry	Enter the message number. → See also SIMULATION MODE. → See also these Operating Instructions, Section 12.1 "Messages", "Code" table column. **Prerequisite:** ■ SIMULATION MODE = Alarm/warning **Factory setting:** 613 (simulation active)

Table 34: OPERATING MENU → DIAGNOSTICS → MESSAGES	
Parameter name	**Description**
ALARM STATUS (046) Display	Displays the current message present. → See also these Operating Instructions, Section 12.1 "Messages" and Section 12.3 "Confirming messages". **Local operation** ■ 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 ⊞ or ⊟ key. **FieldCare** ■ The ALARM STATUS parameter shows the message with the highest priority.
LAST DIAG. CODE (564) Display	Displays the last message that occurred and was eliminated. ✎ Note! ■ Local operation: you can scroll through the last 15 messages with the ⊞ or ⊟ key. ■ FieldCare: 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	Switch on the acknowledge alarm mode. → See also ACK. ALARM. **Options:** ■ On ■ Off **Factory setting:** Off
ACK. ALARM (500) Selection	Acknowledge the alarm. **Prerequisite:** ■ ACK. ALARM MODE = On **Options:** ■ Abort ■ Confirm 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 (→ 🗎 203) has to have elapsed before the device starts measuring again following an alarm. → See also these Operating Instructions, Section 12.3 "Confirming messages". **Factory setting:** Abort
RESET ALL ALARMS (603) Selection	Use this parameter to reset all the alarms of the LAST DIAG. CODE parameter. **Options:** ■ 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 12.1 "Messages" and Section 12.2 "Response of outputs to errors".

Table 34: OPERATING MENU → DIAGNOSTICS → MESSAGES	
Parameter name	**Description**
SELECT ALARMTYPE (595) – Entry (600) – Selection 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 12.2 "Response of outputs to errors". **Options**: ■ Alarm (A): the process variable in question is transmitted with the status BAD. ■ Warning (W): device continues measuring **Local operation:** 1. Enter the corresponding message number for ERROR No. field. 2. Select "Alarm" or "Warning" option. **FieldCare** 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 the alarm response time for all "Error"-type messages. ✎ Note! There is no alarm if the cause of the error is eliminated within the alarm delay time. **Input range:** 0 to 100 s **Factory setting:** 0.0 s
ALARM DISPL. TIME (480) Entry	Enter the alarm delay time for all "Error"-type messages. Once the cause of the error is rectified, the alarm display time starts running. ✎ Note! 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 is cleared once it has been acknowledged. → See also these Operating Instructions, Section 12.3 "Confirming messages". **Input range:** 0 to 999.9 s **Factory setting:** 0.0 s

Table 35: 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 12.1 "Messages" Table, code E730 and Section 12.2 "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 undershoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages" Table, code E731 and Section 12.2 "Response of outputs to errors". **Factory setting:** High sensor limit ■ 1.1 (→ For the high sensor limit, see PRESS. SENS HILIM.)

Table 35: OPERATING MENU → DIAGNOSTICS → USER LIMITS	
Parameter name	**Description**
TminALARM 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 operating pressure undershoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages" Table, code E732 and Section 12.2 "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 operating pressure undershoots the specified value. → See also these Operating Instructions, Section 12.1 "Messages" Table, code E733 and Section 12.2 "Response of outputs to errors". **Factory setting:** Upper sensor temperature application limit +10 K (→ For the upper temperature application limit, see Tmax SENSOR)

12 Troubleshooting

12.1 Messages

The following table lists all the messages that can occur.
The device makes a distinction between the message types "Alarm", "Warning" and "Error".
For "Error"-type messages, you can enter whether the device should react as in the event of an alarm or as in the event of a warning. → See "Message type/NA 64" column and Section 12.2 "Response of outputs to errors".

In addition, the "Message 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 "I" (in service)

Message display:
- Local operation:
  - The measured value display shows the message with the highest priority. → See the "Priority" column.
  - The ALARM STATUS parameter shows all the messages present in descending order of priority. You can scroll through all the messages pending using the − or + key.
- FieldCare: The ALARM STATUS parameter shows the message with the highest priority. → See the "Priority" column.
- Diagnostic Transducer Block (FF configuration program):
  The DIAGNOSTIC_CODE/ALARM STATUS parameter displays the message with the highest priority. This parameter is displayed in the MESSAGES group in the Diagnostic Transducer Block or in FieldCare. See also Section 12.2 "Response of outputs to errors".
  Every message is also output as per the FOUNDATION Fieldbus Specification by means of the XD_ERROR and BLOCK_ERROR parameters in the Pressure, Service and DP Flow Transducer Block.
  Numbers are given for these parameters in the following table which are explained → 📄 212.

Note!
- If the device detects a defect in the local operation during initialization, special error messages are generated. → For the error messages, → 📄 212, Section 12.1.1 "Local operation error messages".
- For support and further information, please contact Endress+Hauser Service.

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Priority
101 (A101)	Alarm B	B>Sensor electronic EEPROM error	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). This message normally only appears briefly. – Sensor defect.	– Wait a few minutes. – Restart the device. Perform reset (Code 62). – Block off electromagnetic effects or eliminate source of disturbance. – Replace sensor.	18
102 (W102)	Warning C	C>Checksum error in EEPROM: peakhold segment	23	11	– Main electronics defect. Correct measurement can continue as long as you do not need the peak hold indicator function.	– Replace main electronics.	52
106 (W106)	Warning C	C>Downloading - please wait	17	0	– Downloading.	– Wait for download to complete.	51
110 (A110)	Alarm B	B>Checksum error in EEPROM: configuration segment	23	11	– The supply voltage is disconnected when writing. – Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Main electronics defect.	– Reestablish supply voltage. Perform reset if necessary (code 7864) and recalibrate the device. – Block off electromagnetic effects or eliminate sources of disturbance. – Replace main electronics.	6
113 (A113)	Alarm B	B>ROM failure in transmitter electronic	20	9	– Main electronics defect.	– Replace main electronics.	1
115 (E115)	Error C	C>Sensor overpressure	17	0	– Overpressure present. – Sensor defect.	– Reduce pressure until message disappears. – Replace sensor.	30
116 (W116)	Warning C	C>Download error, repeat download	17	0	– 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.	– Use another file. – Check cable connection PC – transmitter. – Block off electromagnetic effects or eliminate sources of disturbance. – Perform reset (code 7864) and recalibrate the device. – Repeat download.	37
120 (E120)	Error C	C>Sensor low pressure	17	0	– Pressure too low. – Sensor defect.	– Increase pressure until message disappears. – Replace sensor.	31
121 (A121)	Alarm B	B>Checksum error in factory segment of EEPROM	23	11	– Main electronics defect.	– Replace main electronics.	5

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Prio-rity
122 (A122)	Alarm B	B>Sensor not connected	20	5	– Cable connection sensor –main electronics disconnected. – Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Main electronics defect. – Sensor defect.	– Check cable connection and repair if necessary. – Block off electromagnetic effects or eliminate source of disturbance. – Replace main electronics. – Replace sensor.	14
130 (A130)	Alarm B	B>EEPROM is defect.	23	11	– Main electronics defect.	– Replace main electronics.	10
131 (A131)	Alarm B	B>Checksum error in EEPROM: min/max segment	23	11	– Main electronics defect.	– Replace main electronics.	9
132 (A132)	Alarm B	B>Checksum error in totalizer EEPROM	23	11	– Main electronics defect.	– Replace main electronics.	7
133 (A133)	Alarm B	B>Checksum error in History EEPROM	23	11	– An error occurred when writing. – Main electronics defect.	– Perform reset (code 7864) and recalibrate the device. – Replace main electronics.	8
134 (W135)	Warning C	C>EEPROM lifetime WARNING	17	0	– Writing too often to EEPROM.	– Reduce write accessing to EEPROM.	55
135 (A135)	Alarm B	B>Checksum error in EEPROM FF segment	23	11	– Main electronics defect.	– Replace main electronics.	10
602 (W602)	Warning C	C>Linearization curve not monoton	19	8	– The linearization table is not monotonic increasing.	– Add to or correct linearization table. Then accept linearization table again.	57
604 (W604)	Warning C	C>linearization table invalid. Min. 2 points	19	8	– The linearization table consists of less than 2 points.	– Add to linearization table. Accept linearization table again if necessary.	58
613 (W613)	Warning I	I>Simulation is active	17	3	– Simulation is switched on, i.e. the device is not measuring at present.	– Switch off simulation.	60
700 (W700)	Warning C	C>Last configuration not stored	23	11	– An error occurred when writing or reading configuration data or the power supply was disconnected. – Main electronics defect.	– Perform reset (code 7864) and recalibrate the device. – Replace main electronics.	53
702 (W702)	Warning C	C>HistoROM data not consistent.	17	11	– 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.	– Repeat upload. – Perform reset (code 7864) and recalibrate the device. – Copy suitable data to the HistoROM. (→ See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Copying configuration data" section.)	54
703 (A703)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	23

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Prio-rity
704 (A704)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	13
705 (A705)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	22
706 (W706)	Warning C	C>Configuration in HistoROM and device not identical	23	11	– Configuration (parameters) in the HistoROM and in the device not identical.	– Copy data from the device to the HistoROM. (→ See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Copying configuration data" section.) – Copy data from the HistoROM to the device. (→ See also Operating Instructions BA301P (Deltabar S) or BA302P (Cerabar S) or BA372P (Deltapilot S), "Copying configuration data" section.) The message remains if the HistoROM and the device have different software versions. The message disappears if you copy the data from the device to the HistoROM. – Device reset codes such as 7864 (onsite) or 40846 (bus) do not have any effect on the HistoROM. That means that if you perform a reset, the configurations in the HistoROM and in the device may not be the same.	59
707 (A707)	Alarm B	B>X-VAL. (TAB_XY _VALUE) of lin. table out of edit limits.	18	8	– At least one X-VALUE (TAB_XY_VALUE) in the linearization table is either below the value for SCALE_IN, EU_0/HYDR. PRESS MIN. or LINEAR_ LEVEL_MIN/MIN. LEVEL or above the value for SCALE_IN, EU_100/HYDR. PRESS. MAX. or LINEAR_LEVEL_MAX/LEVEL MAX.	– Carry out calibration again. (→ See also these Operating Instructions, Section 4 and Section 8)	38
710 (W710)	Warning C	B>Set span too small. Not allowed.	18	8	– 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.	– Adjust calibration to suit sensor. (→ 52 and → 193, parameter description for CAL_MIN_SPAN/MINIMUM SPAN.) – Adjust calibration to suit sensor. – Replace sensor with a suitable sensor. – Check configuration and perform download again.	50
713 (A713)	Alarm B	B>100% POINT (LEVEL_100_PERCENT _VALUE) level out of edit limits	18	8	– The sensor was replaced.	– Carry out calibration again.	39

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Priority
715 (E715)	Error C	C>Sensor over temperature	17	0	– The temperature measured in the sensor is greater than the upper nominal temperature of the sensor. (→ 72 and → 194, parameter description for TEMPERATURE_1 _SENSOR_LIMIT_HIGH/ Tmax SENSOR) – Unsuitable download carried out.	– Reduce process temperature/ ambient temperature. – Check configuration and perform download again.	33
716 (A716)	Alarm B	B>Sensor diaphragm broken	20	5	– Sensor defect.	– Replace sensor.	25
717 (E717)	Error C	C>Transmitter over temperature	17	0	– The temperature measured in the electronics is greater than the upper nominal temperature of the electronics (+88 °C). – Unsuitable download carried out.	– Reduce ambient temperature. – Check configuration and perform download again.	35
718 (E718)	Error C	C>Transmitter under temperature	17	0	– The temperature measured in the electronics is smaller than the lower nominal temperature of the electronics (–43 °C). – Unsuitable download carried out.	– Increase ambient temperature. Insulate device if necessary. – Check configuration and perform download again.	36
719 (A719)	Alarm B	B>Y-VAL (TAB_XY_VALUE) of lin. table out of edit limits	19	8	– At least one Y-VALUE (TAB_XY_VALUE) in the linearization table is below the SCALE_OUT, EU_0/TANK CONTENT MIN. or above the SCALE_OUT, EU_100/TANK CONTENT MAX.	– Carry out calibration again. (→ See also these Operating Instructions, Section 4 and Section 8)	40
720 (E720)	Error C	C>Sensor under temperature	17	0	– The temperature measured in the sensor is smaller than the lower nominal temperature of the sensor. (→ 72 and → 194, parameter description for TEMPERATURE_1 _SENSOR_ LIMIT_LOW/ Tmin SENSOR.) – Unsuitable download carried out.	– Increase process temperature/ ambient temperature. – Check configuration and perform download again.	34
721 (A721)	Alarm B	B>ZERO POSITION (LEVEL OFFSET) level out of edit limits	18	8	– LEVEL MIN (LINEAR_LEVEL_ MIN) or LEVEL MAX (LINEAR_LEVEL_MAX) has been changed.	– Perform reset (code 2710) and recalibrate the device.	41
722 (A722)	Alarm B	B>EMPTY CALIB. (SCALE_OUT, EU_0) or FULL CALIB. (SCALE_OUT, EU_100) out of edit limits	18	8	– LINEAR_ LEVEL_MIN/LEVEL MIN or LINEAR_LEVEL_MAX/ LEVEL MAX has been changed.	– Perform reset (code 2710) and recalibrate the device.	42
723 (A723)	Alarm B	B>MAX. FLOW (SCALE_OUT, EU_100) out of edit limits	18	8	– FLOW_TYPE/FLOW-MEAS. TYPE has been changed.	– Carry out calibration again.	43

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Priority
725 (A725)	Alarm B	B>Sensor connection error, cycle disturbance	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Sensor or main electronics defect.	– Block off electromagnetic effects or eliminate source of disturbance. – Replace sensor or main electronics.	26
726 (E726)	Error C	C>Sensor temperature error - overrange	20	5	– Electromagnetic effects are greater than specifications in the technical data. →See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Process temperature is outside permitted range. – Sensor defect.	– 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.	32
727 (E727)	Error C	C>Sensor pressure error - overrange	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Pressure is outside permitted range. – Sensor defect.	– 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.	29
728 (A728)	Alarm B	B>RAM error	20	9	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	2
729 (A729)	Alarm B	B>RAM error	20	9	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	3
730 (E730)	Error C	C>PminALARM WINDOW (PRESSURE_1_USER_ LOW_LIMIT) undershot	19	8	– Pressure measured value has undershot the value specified for the PRESSURE_1_USER_ LOW_LIMIT/Pmin ALARM WINDOW parameter.	– Check system/pressure measured value. – Change value for PRESSURE_1_USER_ LOW_ LIMIT/Pmin ALARM WINDOW if necessary. (→ 88 and → 203)	47
731 (E731)	Error C	C>PmaxALARM WINDOW (PRESSURE_1_UER_ HIGH_LIMIT) overshot	19	8	– Pressure measured value has overshot the value specified for the PRESSURE_1_USER_ HIGH_LIMIT/Pmax ALARM WINDOW parameter.	– Check system/pressure measured value. – Change value for PRESSURE_1_USER_ HIGH_ LIMIT/Pmax ALARM WINDOW if necessary. (→ 88 and → 203.)	46

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Priority
732 (E732)	Error C	C>TminALARM WINDOW (TEMPERATURE_1_ USER_LOW_LIMIT) undershot	19	8	– Temperature measured value has undershot the value specified for the TEMPERATURE_1_USER_ LOW_LIMIT/Tmin ALARM WINDOW parameter.	– Check system/temperature measured value. – Change value for TEMPERATURE_1_USER_ LOW_ LIMIT/Tmin ALARM WINDOW if necessary. (→ 88 and → 204.)	49
733 (E733)	Error C	C>TmaxALARM WINDOW (TEMPERATURE_1_ USER_HIGH_LIMIT) overshot	19	8	– Temperature measured value has overshot the value specified for the TEMPERATURE_1_USER_ HIGH_LIMIT/Tmax ALARM WINDOW parameter.	– Check system/temperature measured value. – Change value for TEMPERATURE_1_USER_HIG H_LIMIT/Tmax ALARM WINDOW if necessary. (→ 88 and → 204.)	48
736 (A736)	Alarm B	B>RAM error	20	9	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	4
737 (A737)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	21
738 (A738)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	20
739 (A739)	Alarm B	B>Measurement error	20	5	– Fault in the main electronics. – Main electronics defect.	– Briefly disconnect device from the power supply. – Replace main electronics.	24
740 (E740)	Error C	C>Calculation overflow, bad configuration	20	5	– Level measuring mode: the measured pressure has undershot the value for SCALE_IN, EU_0/HYDR. PRESS. MIN. or overshot the value for SCALE_IN, EU_100/ HYDR. PRESS MAX. – Flow measuring mode: the measured pressure has undershot the value for SCALE_IN, EU_100/MAX. PRESS FLOW.	– 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. – Select a device with a suitable measuring range.	28
741 (A741)	Alarm B	B>TANK HEIGHT (LEVEL_TANK_ HEIGHT) out of edit limits	18	8	– LINEAR_LEVEL_MIN/LEVEL MIN or LINEAR_LEVEL_MAX/ LEVEL MAX has been changed.	– Perform reset (code 2710) and recalibrate the device.	44
742 (A742)	Alarm B	B>Sensor connection error (upload)	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). This message normally only appears briefly. – Cable connection sensor –main electronics disconnected. – Sensor defect.	– Wait a few minutes. – Perform reset (code 7864) and recalibrate the device. – Check cable connection and repair if necessary. – Replace sensor.	19

Code	Error type/ NA 64	Message/description	XD_ ERROR Value	BLOCK_ ERROR Value	Cause	Measure	Prio-rity
743 (E743)	Alarm B	B>Electronic PCB error during initialization	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). This message normally only appears briefly. – Main electronics defect.	– Wait a few minutes. – Restart the device. Perform reset (Code 62). – Replace main electronics.	15
744 (A744)	Alarm B	B>Main electronic PCB error	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Main electronics defect.	– Restart the device. Perform reset (Code 62). – Block off electromagnetic effects or eliminate source of disturbance. – Replace main electronics.	12
745 (W745)	Warning C	C>Sensor data unknown	17	0	– Sensor does not suit the device (electronic sensor nameplate). Device continues measuring.	– Replace sensor with a suitable sensor.	55
746 (W746)	Warning C	C>Sensor connection error - initializing	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). This message normally only appears briefly. – Overpressure or low pressure present.	– Wait a few minutes. – Restart the device. Perform reset (Code 7864). – Block off electromagnetic effects or eliminate source of disturbance. – Reduce or increase pressure.	27
747 (A747)	Alarm B	B>Sensor software not compatible to electronics	17	0	– Sensor does not suit the device (electronic sensor nameplate).	– Replace sensor with a suitable sensor.	17
748 (A748)	Alarm B	B>Memory failure in signal processor	20	5	– Electromagnetic effects are greater than specifications in the technical data. → See Technical Information TI382P (Deltabar S), TI383P (Cerabar S) or TI416P (Deltapilot S). – Main electronics defect.	– Block off electromagnetic effects or eliminate source of disturbance. – Replace main electronics.	16
750 (A750)	Alarm B	B>Configuration not permitted	19	8	– By means of operation, options were selected for the configuration of the device that do not suit one another. e.g. if the "1 (linearization table)" option was selected for LIN_TYPE and the "1347 (m^3/s)" unit for PRIMARY_VALUE_UNIT.	– Check configuration. – Perform reset (code 7864) and recalibrate the device.	45

Explanation of XD_ERROR and BLOCK_ERROR

Error type	Code	XD_ERROR Value	XD_ERROR Text	BLOCK_ ERROR Value	BLOCK_ERROR Text	PV Status
Alarm	747	17	General Error	0	Other	Bad Sensor Failure
	707, 711, 713, 721, 722, 723, 741	18	Calibration Error	8	Output Failure	Uncertain Config Error
	719, 750	19	Configuration Error	8	Output Failure	Uncertain Config Error
	101, 122, 703, 704, 705, 716, 725, 737, 738, 739, 742, 743, 744, 746, 748	20	Electronics Failure	5	Device Fault State Set	Bad Device Failure
	113, 728, 729, 736	20	Electronics Failure	9	Memory Failure	Bad Device Failure
	110, 121, 130, 131, 132, 133, 135	23	Data Integrity Error	11	Lost NV Data	Bad Device Failure
Error	115, 120, 715, 717, 718, 720	17	General Error	0	Other	– Alarm: Bad Non Specific – Warning: Status Uncertain
	730, 731, 732, 733	19	Configuration Error	8	Output Failure	– Alarm: Bad Non Specific – Warning: Status Uncertain
	122, 727, 726, 740	20	Electronics Failure	5	Device Fault State	– Alarm: Bad Non Specific – Warning: Status Uncertain
Warning	106, 116, 134, 745	17	General Error	0	Other	Uncertain Config Error
	613	17	General Error	3	Simulate active	Uncertain Sim
	702	17	General Error	11	Lost NV Data	Status Uncertain
	710	18	Calibration Error	8	Output Failure	Status Uncertain
	602, 604	19	Configuration Error	8	Output Failure	Uncertain Config Error
	746	20	Electronics Failure	5	Device Fault State Set	Status Uncertain
	102, 700, 706	23	Data Integrity Error	11	Lost NV Data	Status Uncertain

12.1.1 Local operation error messages

If the device detects a defect in the local operation during initialization, the following error messages can be displayed:

Message	Measure
Initialization, VU Electr. Defect A110	Exchange local operation.
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	

12.2 Response of outputs to errors

The device makes a distinction between the message types "Alarm", "Warning" and "Error".
→ See the following table and → 📄 204, Section 12.1 "Messages".

Output	A (Alarm)	W (Warning)	E (Error: Alarm/Warning)
FOUNDATION Fieldbus	The process variable in question is transmitted with the status BAD.	Device continues measuring. The process variable in question is transmitted with the status UNCERTAIN.	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. (→ 📄 87 and → 📄 203, parameter description for REACTION_ON_ ALARM_NR/SELECT ALARMTYPE.)
Local operation	– The measured value and message are displayed alternately – Measured value display: ↯-symbol is permanently displayed. Message display – A + 3-digit number such as A122 and – Description	– The measured value and message are displayed alternately – Measured value display: ↯-symbol flashes. Message display: – W + 3-digit number such as W613 and – Description	– The measured value and message are displayed alternately – Measured value display: see corresponding "Alarm" or "Warning" column Message display: – E + 3-digit number such as E731 and – Description
Remote operation (FF configuration program/FieldCare)	In the event of an alarm, the DIAGNOSTIC_CODE/ALARM STATUS[1] parameter displays a 3-digit number such as 122 for "Sensor connection error, incorrect data."	In the event of a warning, the DIAGNOSTIC_CODE/ALARM STATUS parameter displays a 3-digit number such as 613 for "Simulation is active".	In the event of an error, the DIAGNOSTIC_CODE/ALARM STATUS parameter displays a 3-digit number such as 731 for "Pmax ALARM WINDOW undershot".

1) FF configuration program: Diagnostic Transducer Block. Menu path FieldCare: OPERATING MENU → MESSAGES

12.2.1 Analog Input Block

If the Analog Input Block receives an input or simulation value with the status BAD, the Analog Input Block uses the failsafe mode defined in the FSAFE_TYPE[1] parameter.

The following options are available by means of the FSAFE_TYPE parameter:
- Last Good Value
  The last valid value is used for further processing with the status UNCERTAIN.
- Fail SafeValue
  The value specified by means of the FSAFE_VALUE[1] parameter is used for further processing with the status UNCERTAIN.
- Wrong Value
  The current value is used for further processing with the status BAD.

Factory setting:
- FSAFE_TYPE: FsafeValue
- FSAFE_VALUE: 0

Note!
The failsafe mode is also activated if the "Out of service" option was selected by means of the MODE_BLK parameter, "Target" element.

1 These parameters are not available by means of the FieldCare operating program.

12.3 Confirming messages

Depending on the settings for the ALARM_HOLD_ON_TIME/ALARM DISPL. TIME and ACKNOWLEDGE_ALARM_MODE/ACK. ALARM MODE parameters, the following measures should be taken to clear a message:

Settings [1]	**Measures**
– ALARM_HOLD_ON_TIME// ALARM DISPL. TIME = 0 s – ACKNOWLEDGE_ALARM_MODE/ ACK. ALARM MODE = Off	– Rectify the cause of the message (see also Section 12.1).
– ALARM_HOLD_ON_TIME/ ALARM DISPL. TIME > 0 s – ACKNOWLEDGE_ALARM_MODE/ ACK. ALARM MODE = Off	– Rectify the cause of the message (see also Section 12.1). – Wait for the alarm display time to elapse.
– ALARM_HOLD_ON_TIME/ ALARM DISPL. TIME = 0 s – ACKNOWLEDGE_ALARM_MODE/ ACK. ALARM MODE = On	– Rectify the cause of the message (see also Section 12.1). – Confirm message using ACKNOWLEDGE_ALARM/ACK. ALARM parameter.
– ALARM_HOLD_ON_TIME/ ALARM DISPL. TIME > 0 s – ACKNOWLEDGE_ALARM_MODE/ ACK. ALARM MODE = On	– Rectify the cause of the message (see also Section 12.1). – Confirm message using ACKNOWLEDGE_ALARM/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 is cleared once it has been acknowledged.

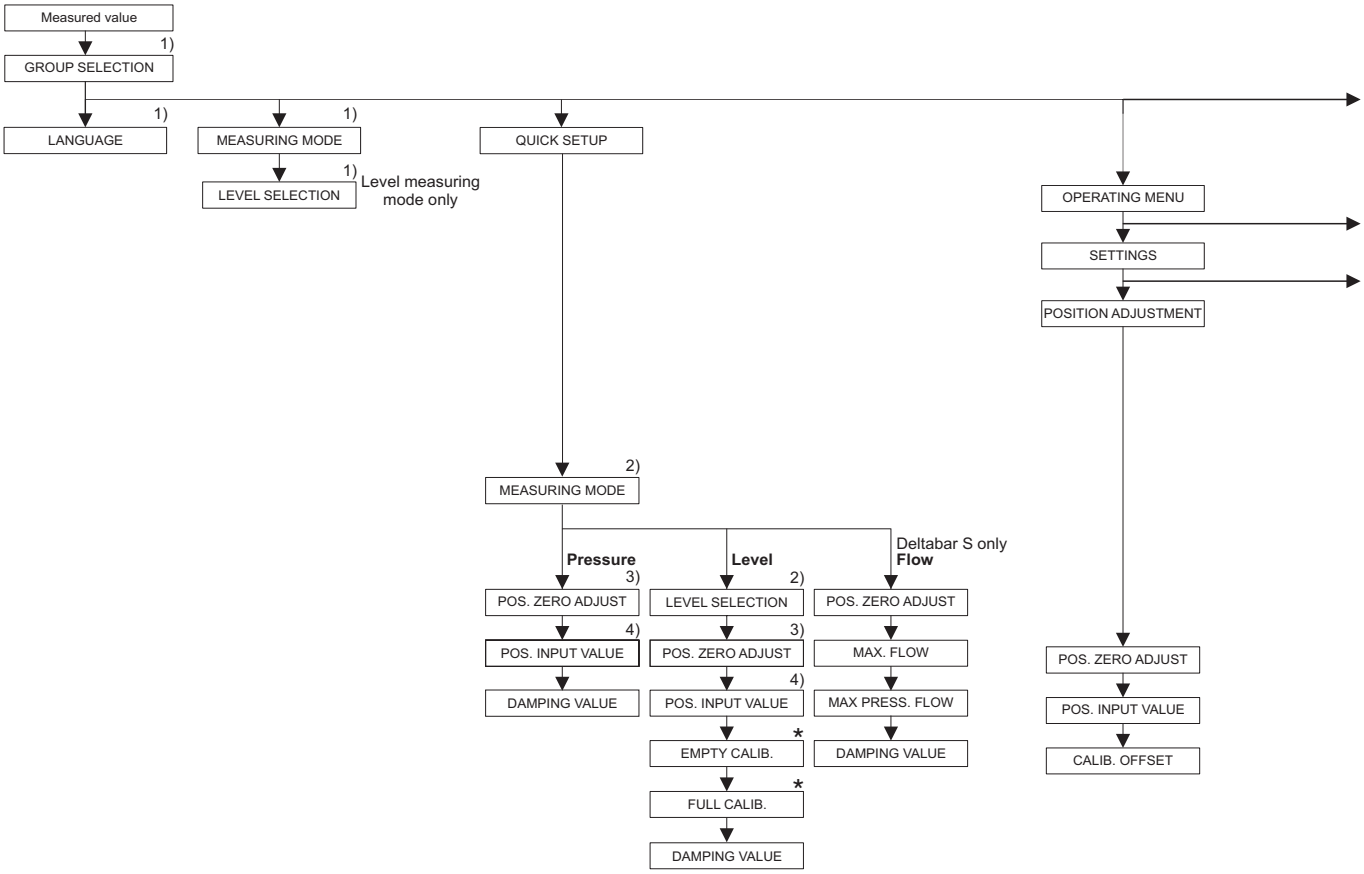
1) FF configuration program: The parameters are in the Diagnostic Transducer Blocks.
FieldCare: Menu path for ALARM DISPL. TIME and ACK. ALARM MODE: OPERATING MENU → DIAGNOSTICS → MESSAGES

13 Appendix

13.1 Operating menu

Note!

- The entire menu is depicted on the following pages.
- 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 "LINEARIZATION" function group for the "Level" measuring mode.
- In addition, there are also parameters that are only displayed if other parameters are appropriately configured. For example the CUSTOMER UNIT P parameter is only displayed if the "User unit" option was selected for the PRESS. ENG. UNIT parameter. These parameters are indicated with a "*".
- For a description of the parameters, see Section 11 "Parameter description (Local operation and FieldCare)". The exact dependency of individual parameters on one another is explained here.



1) Display via on-site display only

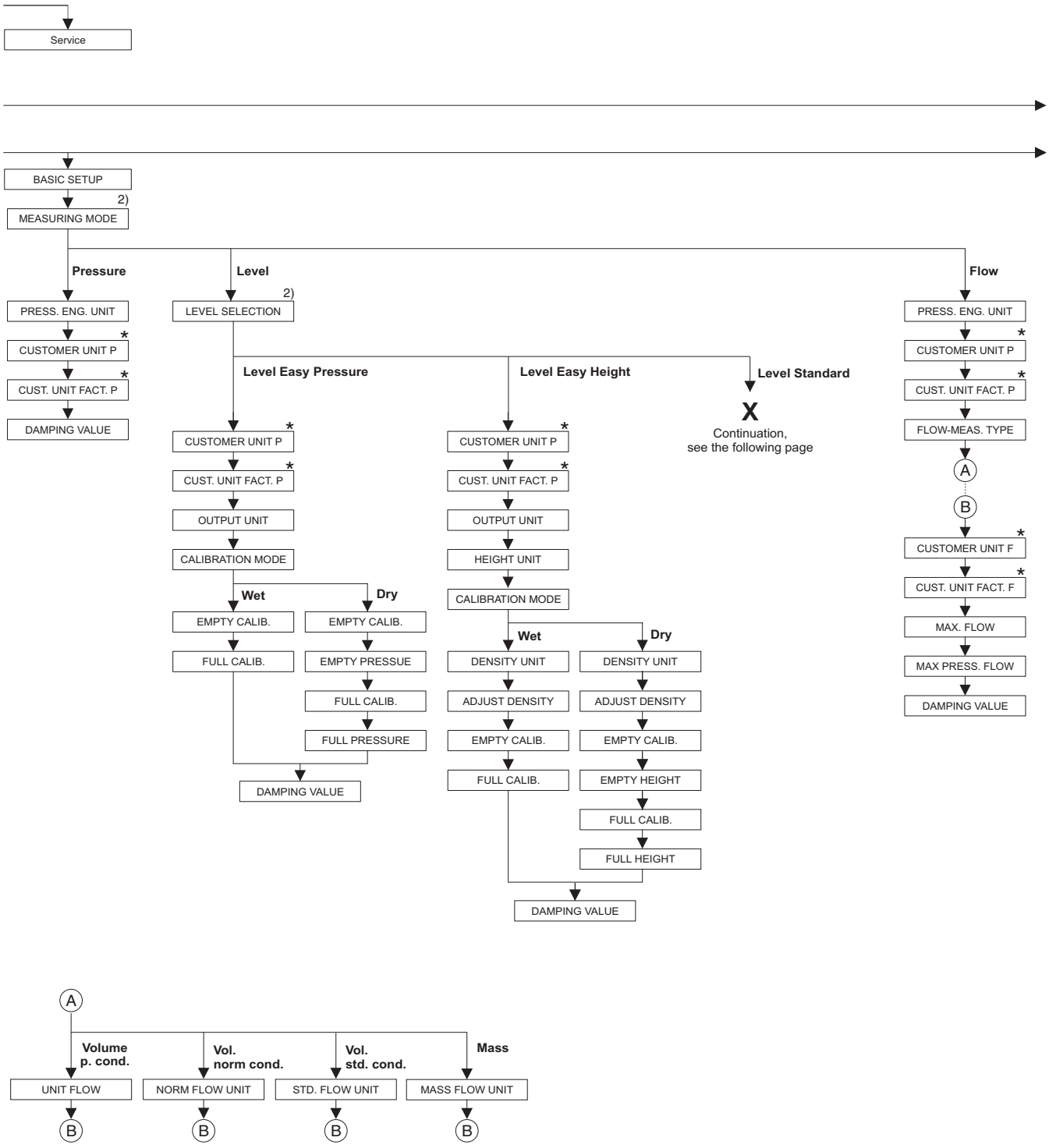
2) Display via FieldCare

3) Cerabar S with gauge pressure sensor, Deltabar S or Deltapilot S

4) Cerabar S with absolute pressure sensor

* There are parameters that are only displayed if other parameters are appropriately configured.
For example the CUSTOMER UNIT P parameter is only displayed if the "User unit" option was selected for the PRESS. ENG. UNIT parameter.
These parameters are indicated with a "*".

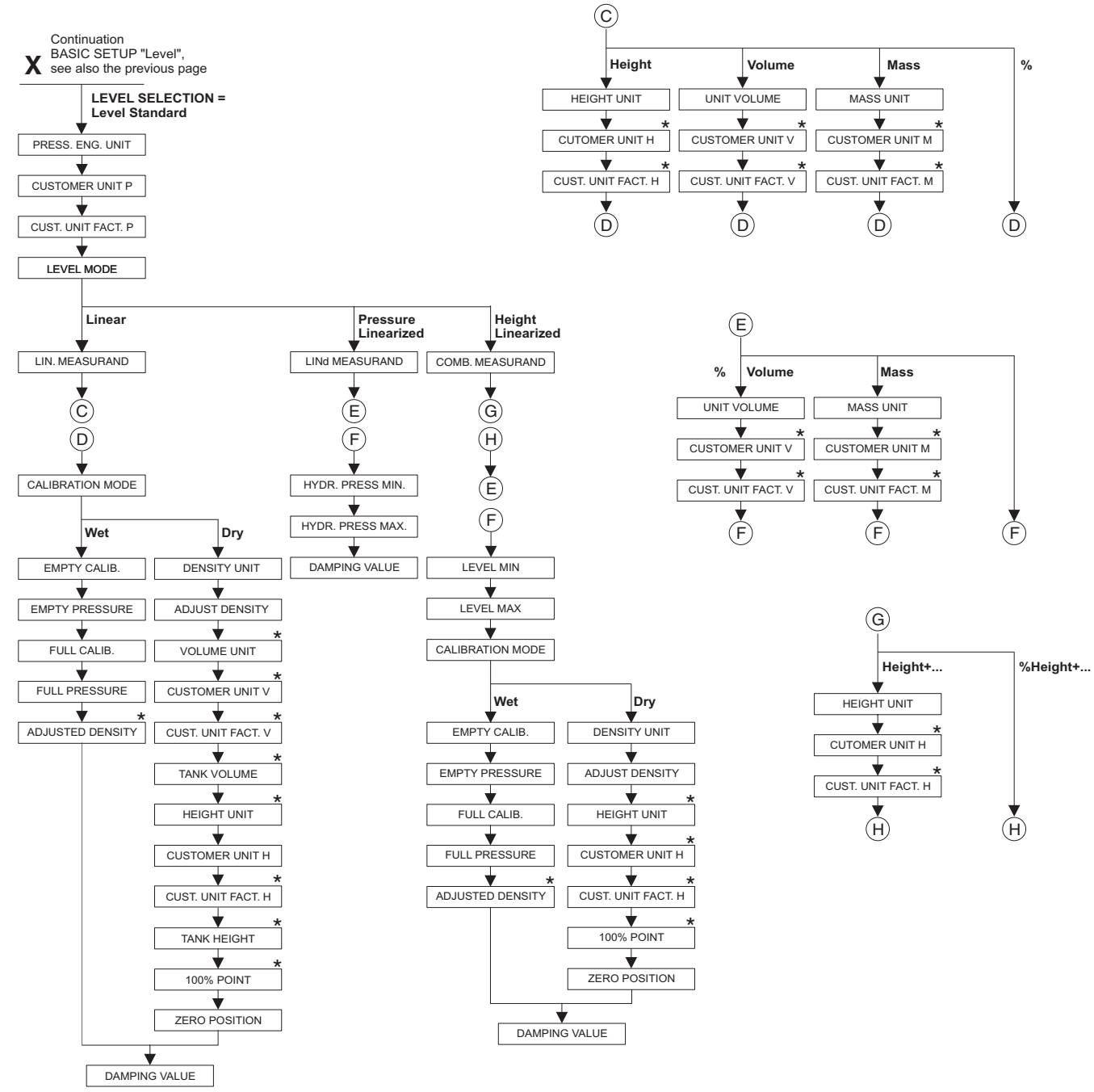
P01-xxxxxxxx-19-xx-xx-en-167



2) Display via FieldCare

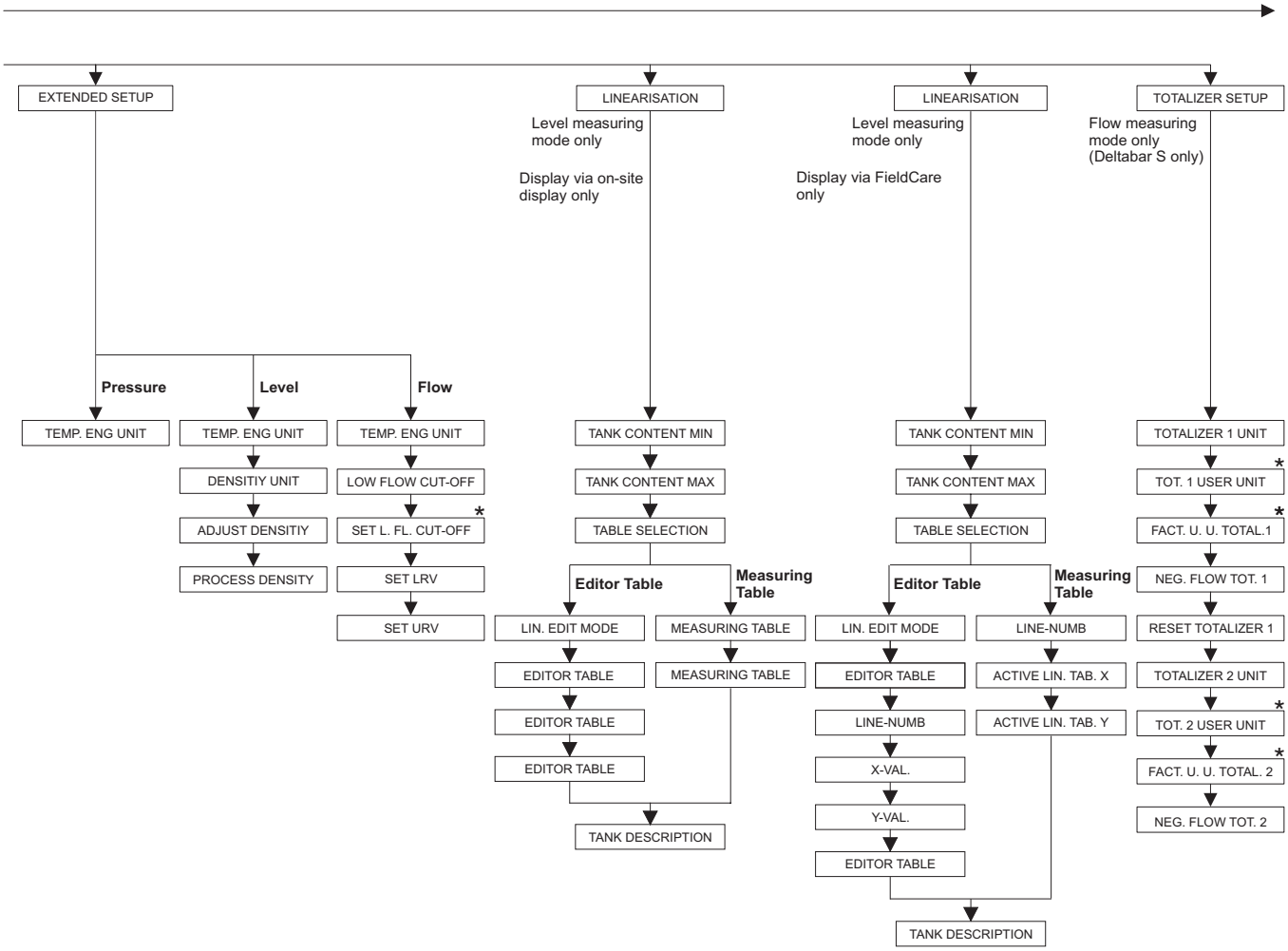
* There are parameters that are only displayed if other parameters are appropriately configured.
For example the CUSTOMER UNIT P parameter is only displayed if the "User unit" option was selected for the PRESS. ENG. UNIT parameter.
These parameters are indicated with a "*".

P01-xxxxxxxx-19-xx-xx-en-149



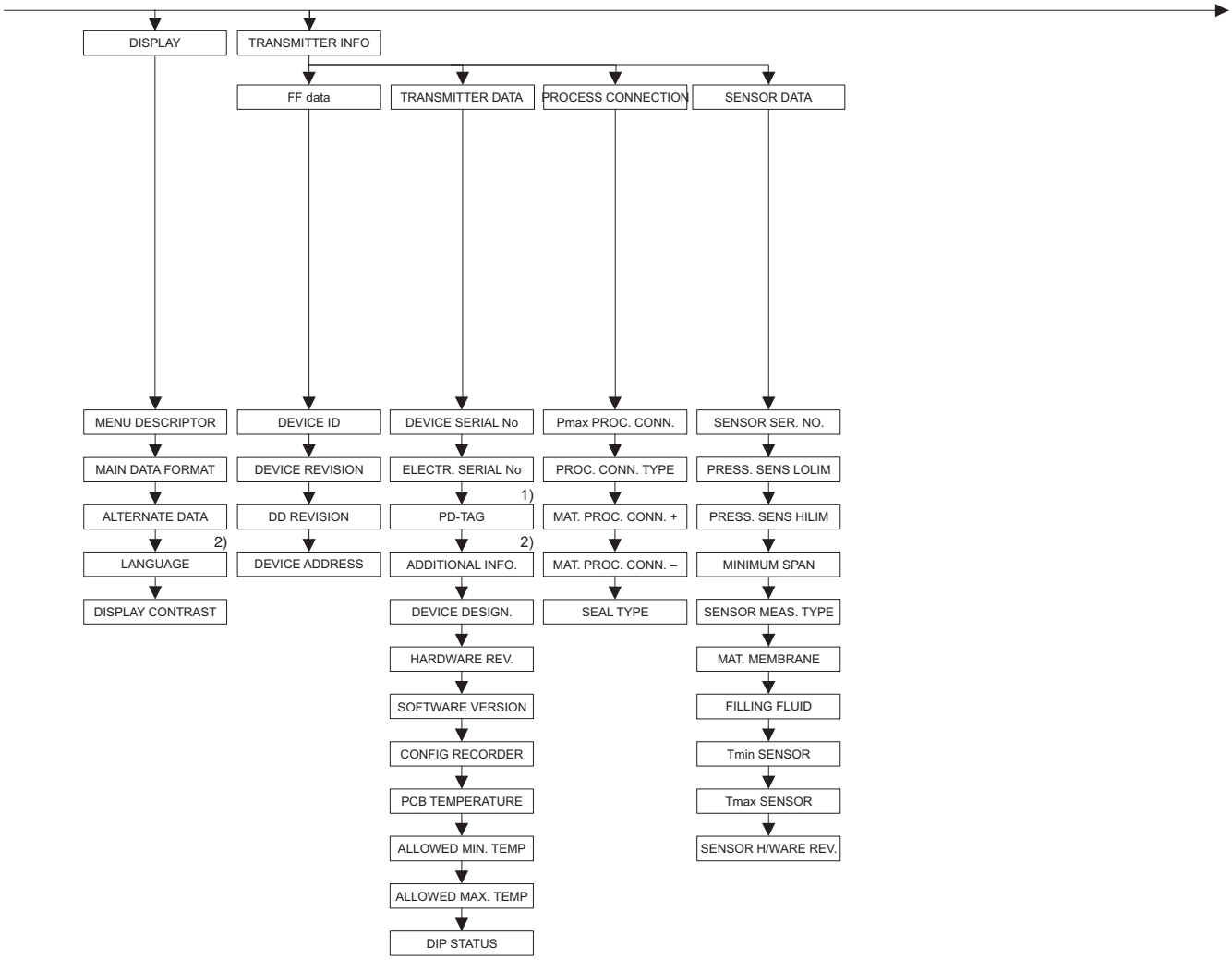
* There are parameters that are only displayed if other parameters are appropriately configured.
For example the CUST. UNIT FACT. H parameter is only displayed if the "User unit" option was selected for the HEIGHT UNIT parameter.
These parameters are indicated with a "*".

P01-xxxxxxxx-19-xx-xx-en-150



* There are parameters that are only displayed if other parameters are appropriately configured.
For example the TOT. 1 USER UNIT parameter is only displayed if the "User unit" option was selected for the TOTALIZER 1 UNIT parameter.
These parameters are indicated with a "*".

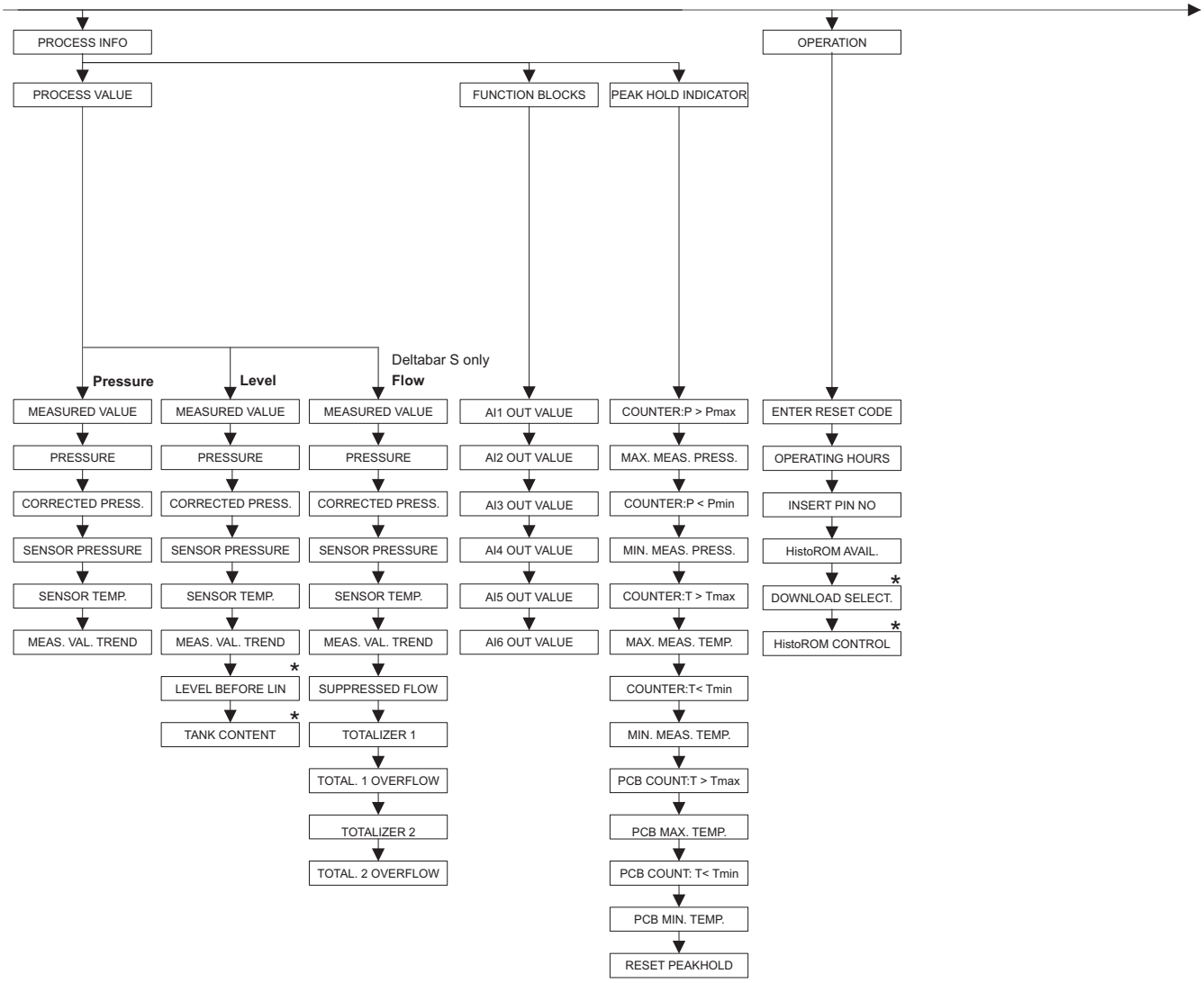
P01-xxxxxxxx-19-xx-xx-en-151



1) Display via on-site display only

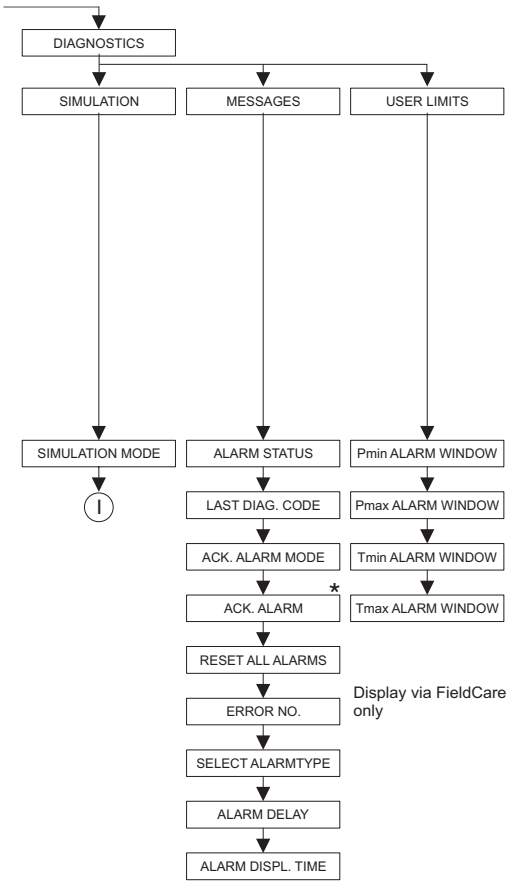
2) Display via FieldCare

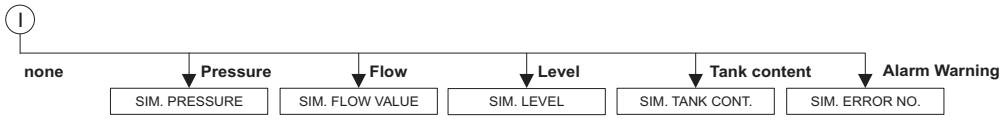
P01-xxxxxxxx-19-xx-xx-en-152



* There are parameters that are only displayed if other parameters are appropriately configured.
These parameters are indicated with a "*".

P01-xxxxxxxx-19-xx-xx-en-170





* There are parameters that are only displayed if other parameters are appropriately configured.
These parameters are indicated with a "*".

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