Indicator/Controller for Standard Signals
Type 202568

Operating Manual

20256800T90Z002K999

V2.00/EN/00544929

WARNING:

A sudden malfunction of the device, or one of the sensors connected to it, could potentially result in dangerous, imprecise dosing! Suitable preventive measures to stop this happening must be in place.

Note:

Please read these operating instructions before commissioning the device. Keep the manual in a place which is accessible to all users at all times.

Resetting the brightness of the LC display:

If the brightness/contrast setting has been adjusted so that the display text is no longer legible, the basic setting can be restored as follows:

* Switch off the supply voltage.
* Switch on the supply voltage and immediately press and hold the ▼ and ▲ keys simultaneously.

Reset the language to "English":

If the language has been adjusted so that the display text is no longer comprehensible, use the Administrator password, 7485, to reset the language to "English":

* Press the PGM key for longer than 3 seconds.
* Press the ▼ key once.
* Briefly press the PGM key.
* Enter 7485.
* Briefly press the PGM key.

The required language can then be set in
ADMINISTR. LEVEL / PASSWORD / PARAMETER LEVEL / DISPLAY / LANGUAGE.

Contents

Contents

1.1 Warning signs

Danger

This symbol is used when there may be **danger to personnel** if the instructions are ignored or not followed correctly!

Caution

This symbol is used when there may be **damage to equipment or data** if the instructions are ignored or not followed correctly!

1.2 Reference signs

Note

This symbol is used to draw your **special attention** to a remark.

abc[1]

Footnote

Footnotes are remarks that **refer to specific points** in the text. Footnotes consist of two parts:

A marker in the text and the footnote text.

The markers in the text are arranged as consecutive superscript numbers.

✱

Action instruction

This symbol indicates that an **action to be performed** is described.

The individual steps are marked by this asterisk.

Example:

✱ Loosen Phillips-head screws.

2 Description

General

The device has two analog inputs and one binary input. The first analog input is suitable for connecting standard signals (0 - 10 V or 0(4) - 20 mA), which can be prepared by any transmitter or sensor (such as a 2-wire transmitter). Pt100, Pt1000 or NTC/PTC resistance thermometers (up to 4 k ohms) can be connected to the second analog input. The power supply for a 2-wire transmitter is integrated in the device.

Input signals can be shown as numbers or as a bar graph on the graphic display. Parameters are displayed in plain text for easily comprehensible and secure operation.

With two optional relay switching contacts, it is possible to implement both simple switching or alarm functions and demanding control tasks with P, PI, PD and PID action. If required, the device can also be provided with two freely configurable and scalable analog outputs (0 - 10 V or 0(4) - 20 mA).

The device is suitable, for example, for displaying, measuring and controlling:

- Free chlorine, chlorine dioxide, ozone, hydrogen peroxide and peracetic acid, in combination with sensors as per data sheet 202630.
- The pH value or redox potential with 2-wire transmitters as per data sheet 202701.
- (Hydrostatic) liquid levels with 2-wire transmitters (level probes) as per data sheet 402090 or data sheet 404390.
- Flow rate in conjunction with transmitters as per data sheet 406010.
- Two temperature measuring points.
- Most sensors and transmitters that output standard signals (0 - 10 V or 0(4) - 20 mA).

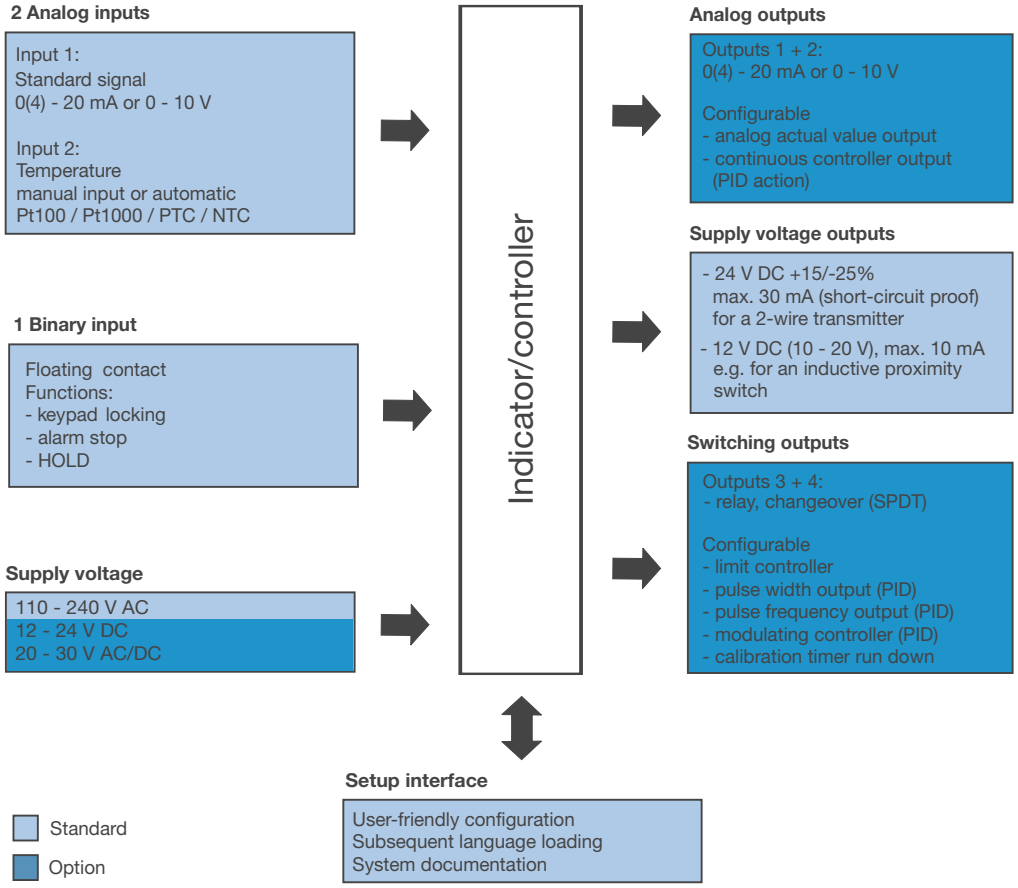
Because temperature measurement is integrated, temperature compensation takes place quickly and precisely, which is particularly important for many analytical measurements.

Key features

- Display: pH, mS/cm, µS/cm, ppm, %, mV, etc.
  Special visualizations can also be configured with the setup program.
- Large, backlit LC graphic display.
- A choice of display visualizations: large numbers, bar graph or trend display.
- Integrated calibration routines.
- Calibration logbook.
- IP67 enclosure protection for surface mounting
  IP65 enclosure protection for switch cabinet mounting
- Selectable languages: German, English, French; additional languages can be loaded later through the setup program.
- Through the setup program: user-friendly configuration, system documentation, subsequent loading of additional languages.

2 Description

Block diagram

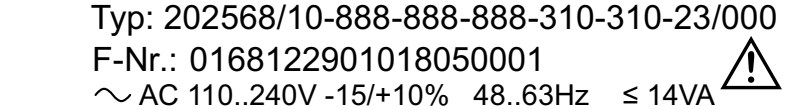


3 Identifying the device version

3.1 Nameplate

on the transmitter

TN: 00528743
Typ: 202568/10-888-888-888-310-310-23/000
F-Nr.: 01681229010180500 01
~ AC 110..240V -15/+10% 48..63Hz ≤ 14VA



The date of manufacture is encoded in "F-Nr." (serial number):
1805 means year of manufacture 2018 / calendar week 05

3 Identifying the device version

3.2 Order details

(1) Basic type
202568 Indicator/controller for standard signals

(2) Basic type extensions
10 for panel mounting
20 in surface-mounted housing

(3) Input (freely configurable)
888 0(4) - 20 mA and 0 - 10 V

(4) Output 1 (for main value or continuous controller)
000 no output
888 analog output 0(4) - 20 mA and 0 - 10 V

(5) Output 2 (for temperature or continuous controller)
000 no output
888 analog output 0(4) - 20 mA and 0 - 10 V

(6) Output 3
000 no output
310 relay with changeover contact

(7) Output 4
000 no output
310 relay with changeover contact

(8) Supply voltage
23 110 - 240 V AC, +10% / -15%, 48 - 63 Hz
25 20 - 30 V AC/DC, 48 - 63 Hz
30 12 - 24 V DC, ± 15%[1]

(9) Extra codes
000 none

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
Order code		/		-		-		-		-		-		-		/		, ...
Sample order	202568	/	20	-	888	-	888	-	000	-	310	-	000	-	23	/	000	

[1] List extra codes in sequence, separated by commas.

3.3 Accessories (included in delivery)

4 x pluggable screw terminals
1 x small plug-in link
1 x large plug-in link
1 x mounting clip for cable diameters > 5 mm
2 x mounting clips for cable diameters < 5 mm
1 x mounting clip for cable diameters < 3 mm
2 x pan head screws, 3.5x6.5
4 x spacing rollers for panel mounting
4 x hexagonal nuts for panel mounting
4 x countersunk screws, M6x10
4 x fixings
1 x cable gland, M12x1.5
1 x sealing ring for M12x1.5 cable gland
1 x reducing washer, M12x1.5
2 x cable glands, M16x1.5
2 x sealing rings for M16x1.5 cable gland
1 x multi-sealing insert for M16x1.5 cable gland
1 x PVC-insulated flexible cord

3.4 Accessories (optional)

Type	Part no.
Protective cover for type 202568	00398161
Pipe installation set for type 202568[1]	00483664
DIN rail installation set for type 202568[2]	00477842
Support pillar with base clamp, arm and chain	00398163
Holder for suspension fitting	00453191
Back panel set 202560/65	00506351
PC setup software	00483602
PC interface cable including USB/TTL converter and two adapters (USB connecting cable)	00456352

1 With the pipe installation set, the type 202568 can be attached to a pipe (e. g. a support pillar or a railing).
2 With the DIN rail installation set, the type 202568 can be attached to a 35 mm x 7.5 mm DIN rail as per EN 60715 A.1.

4.1 General

Mounting location

Find a location that ensures easy accessibility for the later calibration.

The fastening must be secure and must ensure low vibration for the device.

Avoid direct sunlight!

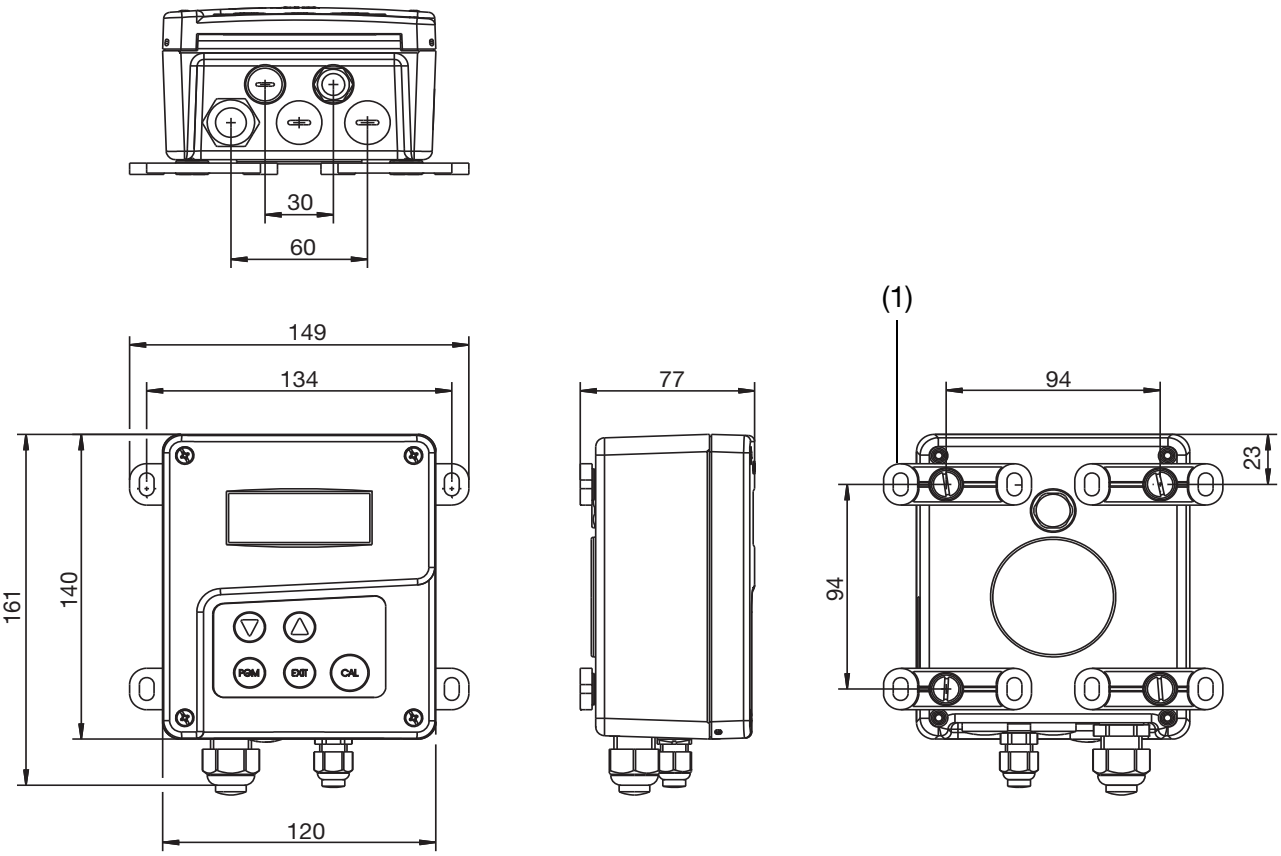
Permissible ambient temperature at the installation location: -10 to 55°C with max. 95% rel. humidity, no condensation.

Installation position

The device can be mounted in any position.

4.2 Surface mounting

Fixing brackets (1) are included with delivery.

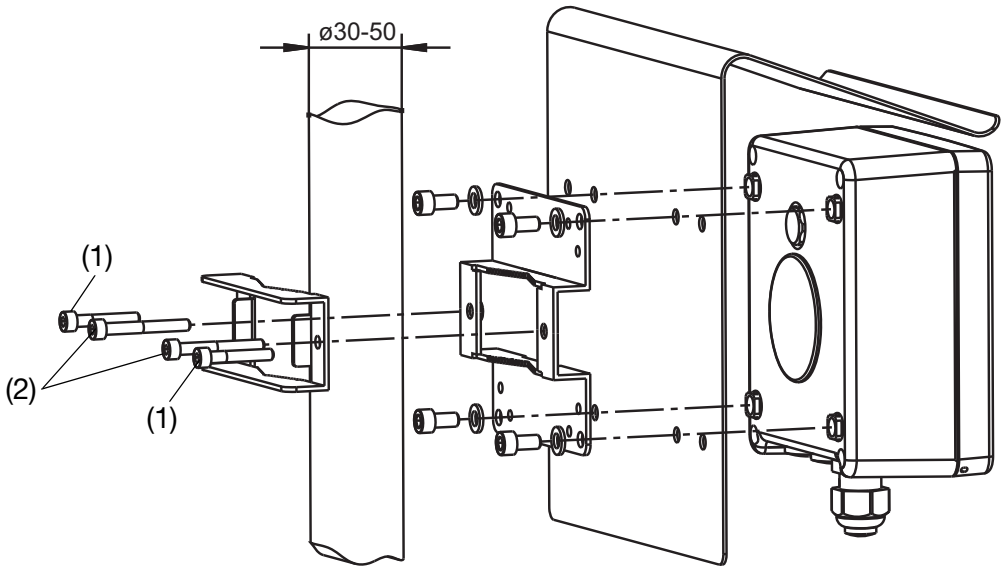


✱ Screw four fixing brackets (1) onto the enclosure.
The fixing brackets can be turned in increments of 90°.

✱ Fasten the enclosure onto the fixing brackets (with screws, plugs, etc.) on a surface or plate.

4.3 Pipe installation set / weather protection roof

The pipe installation set for type 202568 (item no.: 00483664) can be used to fasten the device (and optionally the protective roof for type 202568, item no.: 00398161) onto pipes or railings with a diameter from 30 to 50 mm.



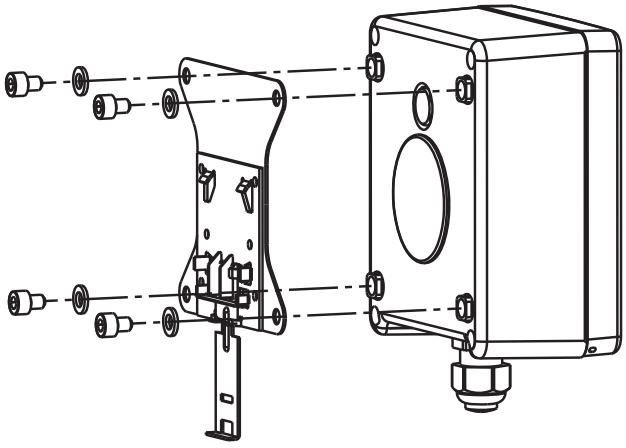
Screws (1) M5 x 30 for pipe diameters from 30 to 40 mm.

Screws (2) M5 x 40 for pipe diameters from 40 to 50 mm.

The pipe installation set is also suitable for horizontal pipes.

4.4 DIN rail installation set

The DIN rail installation set for type 202568 (item no.:00477842) can be used to attach the device to a 35 mm x 7.5 mm DIN rail as defined in DIN EN 60715 A.1.

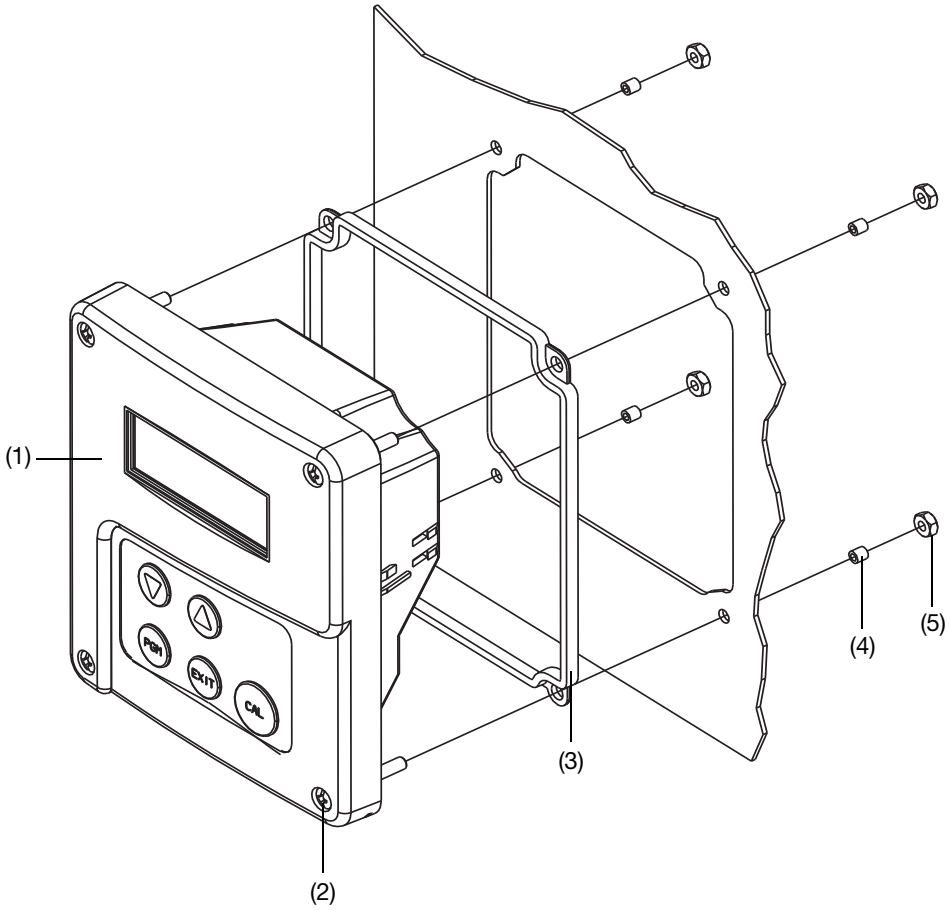


4 Mounting

4.5 Mounting in a panel

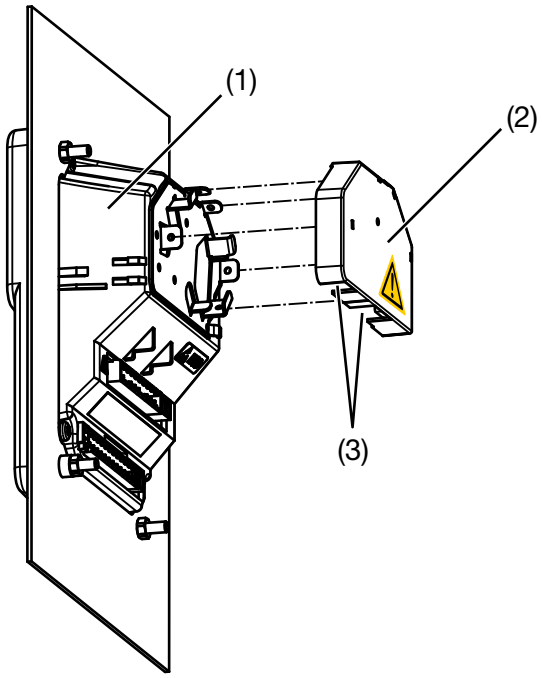
Drilling template See section 15.4 "Panel cut-out", page 128.

The panel must be sufficiently thick to achieve the specified IP65 enclosure protection!



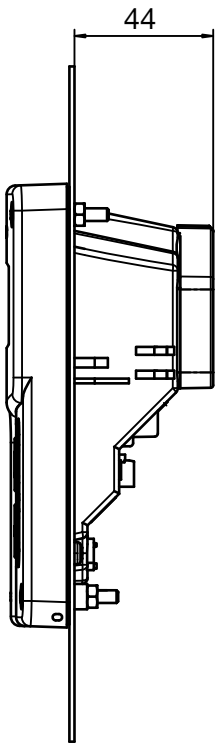
* Prepare the panel cut-out and holes based on the drill template.
* Place the control panel (1) with gasket (2) in the panel cut-out and fasten it with screws (2) spacing rollers (4) and nuts (5).

To ensure electrical safety, the cable cover must be mounted, see next page!



- ✱ Make the electrical connection.
- ✱ Break off the required flap(s) (3) from the cable cover (2) so that the cable can be laid in the cable path.
- ✱ Attach the cable cover (2) onto the control panel (1).

Depth behind panel



5.1 Installation instructions

The electrical connection must only be performed by qualified personnel!

The choice of cable, the installation and the electrical connection must conform to the requirements of VDE 0100 “Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V” or the appropriate local regulations. **Only flexible cables and wires shall be used!**

If contact with live parts is possible while working on the device, it must be completely disconnected from the electrical supply.

Load circuits must be fused for the maximum relay current in each case, in order to prevent welding of the relay contacts in the event of a short circuit.

The electromagnetic compatibility conforms to EN 61326.

Run input, output and supply cables separately and not parallel to one another.

Use shielded sensor cables with twisted conductors. Do not run these cables close to current-carrying components or cables. Ground shielding at one end.

Sensor leads should be implemented as uninterrupted cables (not routed via terminal blocks etc.).

Do not connect any additional loads to the supply terminals of the device.

The device is not suitable for use in areas with an explosion hazard (Ex areas).

Apart from faulty installation, incorrect settings on the device may also affect the proper functioning of the subsequent process or lead to damage. Safety devices independent of the device should therefore always be provided and should only be capable of adjustment by specialist personnel.

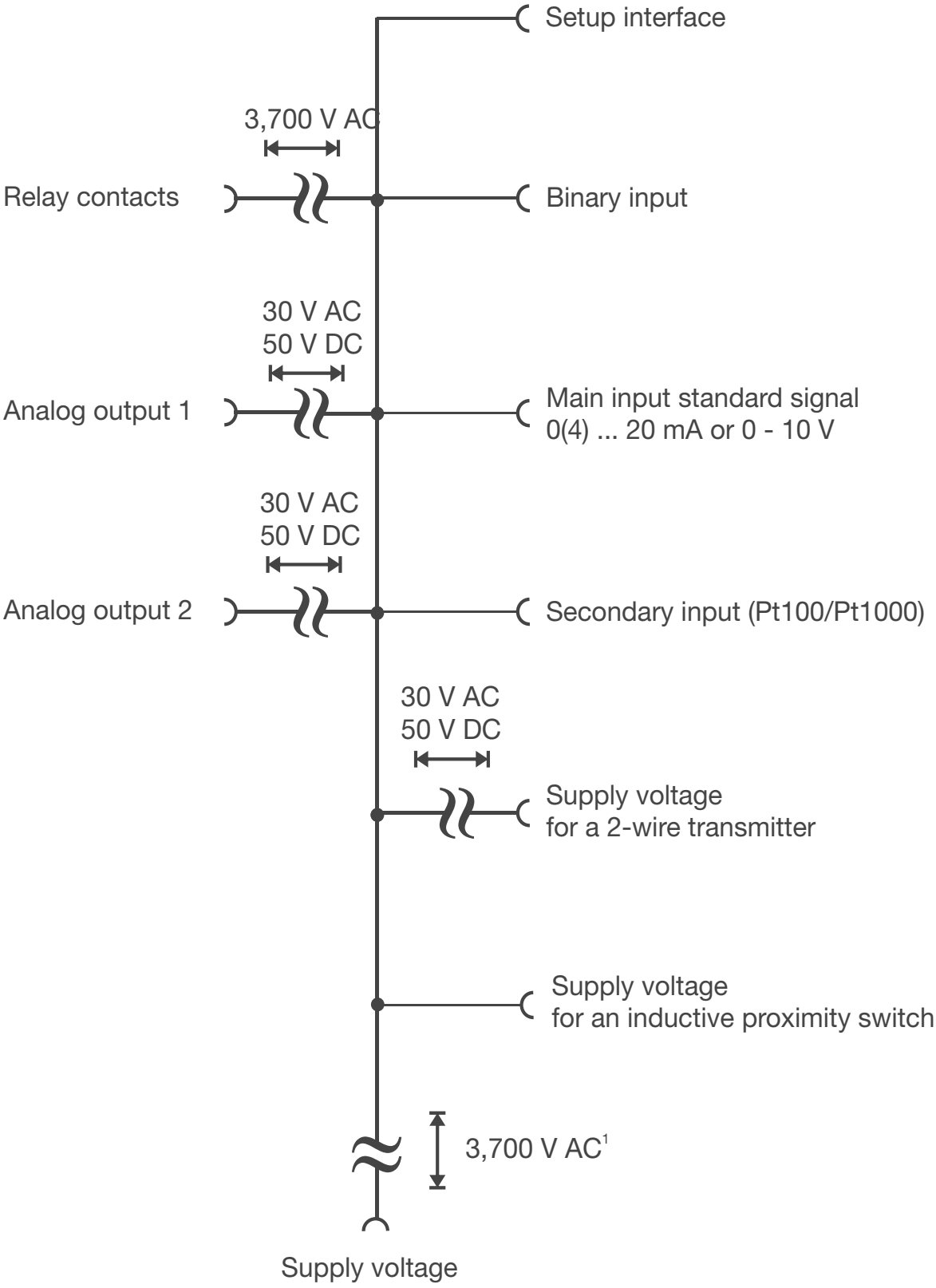
Conductor cross-sections and ferrules

Mounting information

	Minimum cross-section	Maximum cross-section	Minimum ferrule length
Without ferrule	0.34mm^2	2.5mm^2	10mm (stripped)
Ferrule without collar	0.25mm^2	2.5mm^2	10mm
Ferrule with collar, up to 1.5mm^2	0.25mm^2	1.5mm^2	10mm
Ferrule with collar, from 1.5mm^2	1.5mm^2	2.5mm^2	12mm
Twin ferrule with collar	0.25mm^2	1.5mm^2	12mm

The enclosure protection specified for the device (IP67) is only achievable if not more than one cable runs into the device through each cable gland.

5.2 Electrical isolation



[1] Not for SELV/PELV of 30 (12 - 24 V DC) supply voltage!

5 Electrical connection

5.3 Opening and closing the device

Opening the device

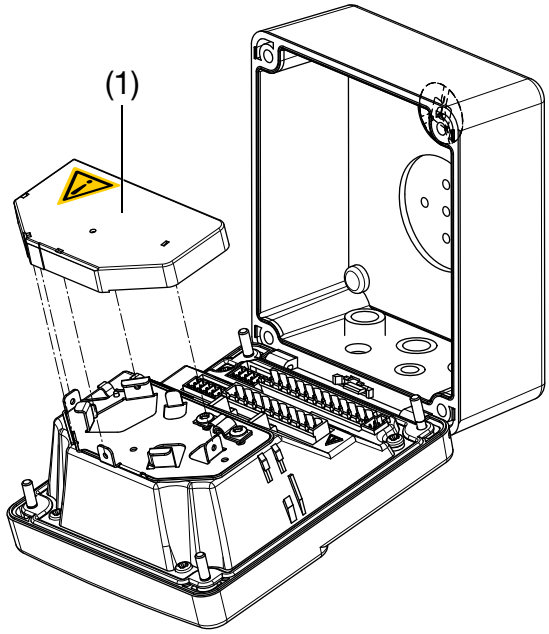
- ✱ Prior to opening, loosen all cable fittings (2) so that the cables are moveable.
- ✱ Push connection cable a little into the case so that enough cable reserve is available for opening.
- ✱ Loosen the 4 front-panel screws (1) of the case lid and pull them out as much as possible.
- ✱ Pull the lid to the front and then fold to the front. The user needs to be able to easily open the lid. Do not use force while opening!

Closing the device

- ✱ When closing the device, pull the connecting cables to the outside while the cable fittings are in a released state and make sure that the lines in the inside of the device run properly. Pay attention to the corresponding sheathing measurement to ensure strain relief and protection type (IP67) of the cable fitting.
- ✱ The user must be able to close the lid with the 4 screws without a high degree of pressure.
- ✱ Tighten cable fittings.

5.4 Connecting the cables

The electrical connection for the surface-mountable housing is easily accessible when the device is folded out.



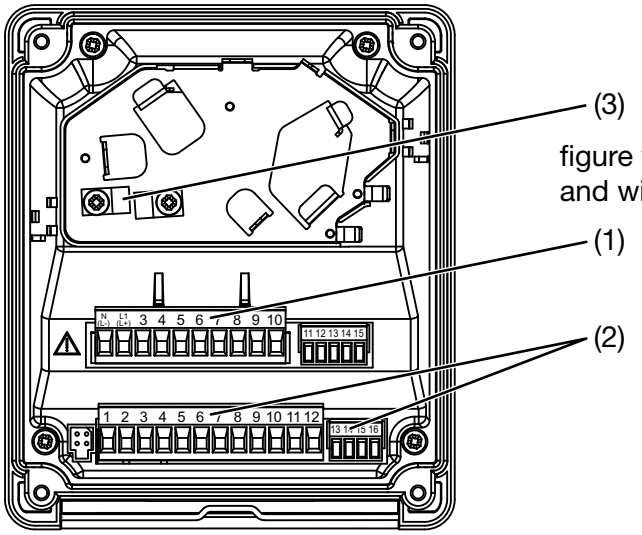
The device contains a guide plate that ensures an optimum cable path. **After laying the cables, the cable cover (1) must be attached until it clicks, like shown above. This is important to ensure the electrical safety!**

To connect the individual core wires, remove pluggable screw terminals from the control panel.

Run the connecting cables through the cable glands.

5 Electrical connection

Interior view



✱ Lead the connecting cables in through the cable fittings.

✱ Use the cable clip (3) to clamp the signal cable to the shielding.

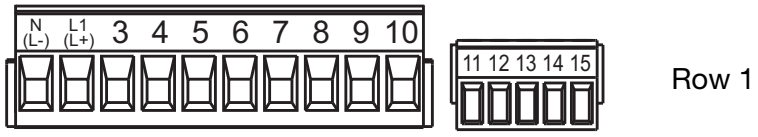
The clip (3) (see next page) must **only** be attached by a 3.5 x 6.5 pan head screw! If the screw is any longer, dangerous voltage could be directed to the cable shielding!

✱ Break off the required flap(s) from the cable cover so that the cable can be laid in the cable path. Attach the cable cover.

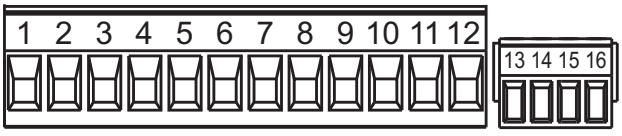
✱ Connect the cores as assigned below, and as seen in section 5.6 "Pin configuration", page 21.

✱ Push the plug-in terminals for row 1 (1) and row 2 (2) into the sockets in the device.

5.5 Terminal assignment

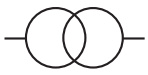
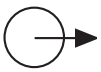
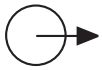
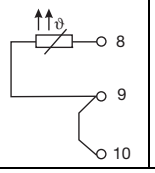
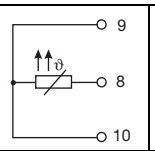
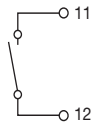


Row 1

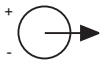
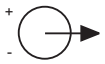
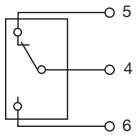
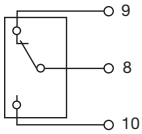


Row 2

5.6 Pin configuration

Connection		Terminal	Row
Power supply voltage for transmitter/controller			
Supply voltage (23): 110 — 240 V AC -15/+10%, 48 — 63 Hz Supply voltage (25): 20 — 30 V AC/DC, 48 — 63 Hz Supply voltage (30): 12 — 24 V DC +/-15% (permissible only for connection to SELV/PELV circuits)		1 N (L-) 2 L1 (L+)	1
NC		3	
Power supply voltage for proximity switch			
12 V DC (10 - 20 V)		11 L+ 12 ⊥	1
Power supply voltage for transmitter			
24 V DC (-15 / +20 %)		14 L+ 15 L-	1
Inputs			
NC		1 2 3 6 7	2
Standard signal input 0(4) - 20 mA or 0 - 10 V and 10 - 0 V		4 - 5 +	
Resistance thermometer in 2-wire circuit		8 9 10	
Inputs			
Resistance thermometer in 3-wire circuit		9 8 10	2
Binary input		11 12	
Outputs			

5 Electrical connection

Connection		Terminal	Row
Analog output 1 0 - 20 mA and 20 - 0 mA or 4 - 20 mA and 20 - 4 mA or 0 - 10 V and 10 - 0 V (electrically isolated)		+ 13 - 14	2
Analog output 2 0 - 20 mA and 20 - 0 mA or 4 - 20 mA and 20 - 4 mA or 0 - 10 V and 10 - 0 V (electrically isolated)		+ 15 - 16	
Switching output K1 (floating)		4 pole 5 NC 6 NO	1
NC		7	
Switching output K2 (floating)		8 pole 9 NC 10 NO	

6 Operation

device operation via the optional set-up program, See section 12 "Setup program", page 104.

Operation via the device keypad is described below.

6.1 Controls

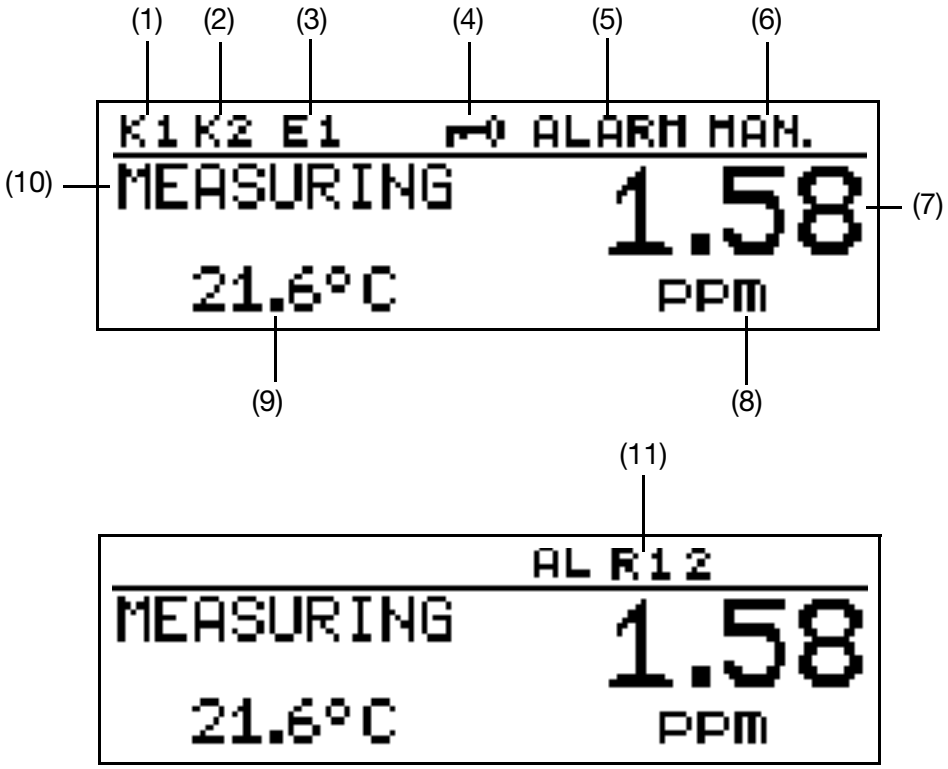
(1)	Display	backlit (during operation)
(2)	CAL key	Start calibration
(3)	EXIT key	Cancel entry / Exit level
(4)	PGM key	Change level Forward selection Confirm selection
(5)	▼ key	Reduce numerical value Forward selection
(6)	▲ key	Increase numerical value Forward selection

6 Operation

6.2 Display

6.2.1 Measuring mode (normal display)

Example



(1) Relay K1 is active

(2) Relay K2 is active

(3) Binary input 1 is triggered

(4) Keypad is locked

(5) device status (notes)
- Alarm (e.g. overrange)
- Calib flashes (calibration timer expired)
- Calib (customer calibration active)

(6) Output mode
- Man (manual mode)
- Hold (hold mode)

(7) Measurement value

(8) Measurement unit

(9) Temperature of measuring material

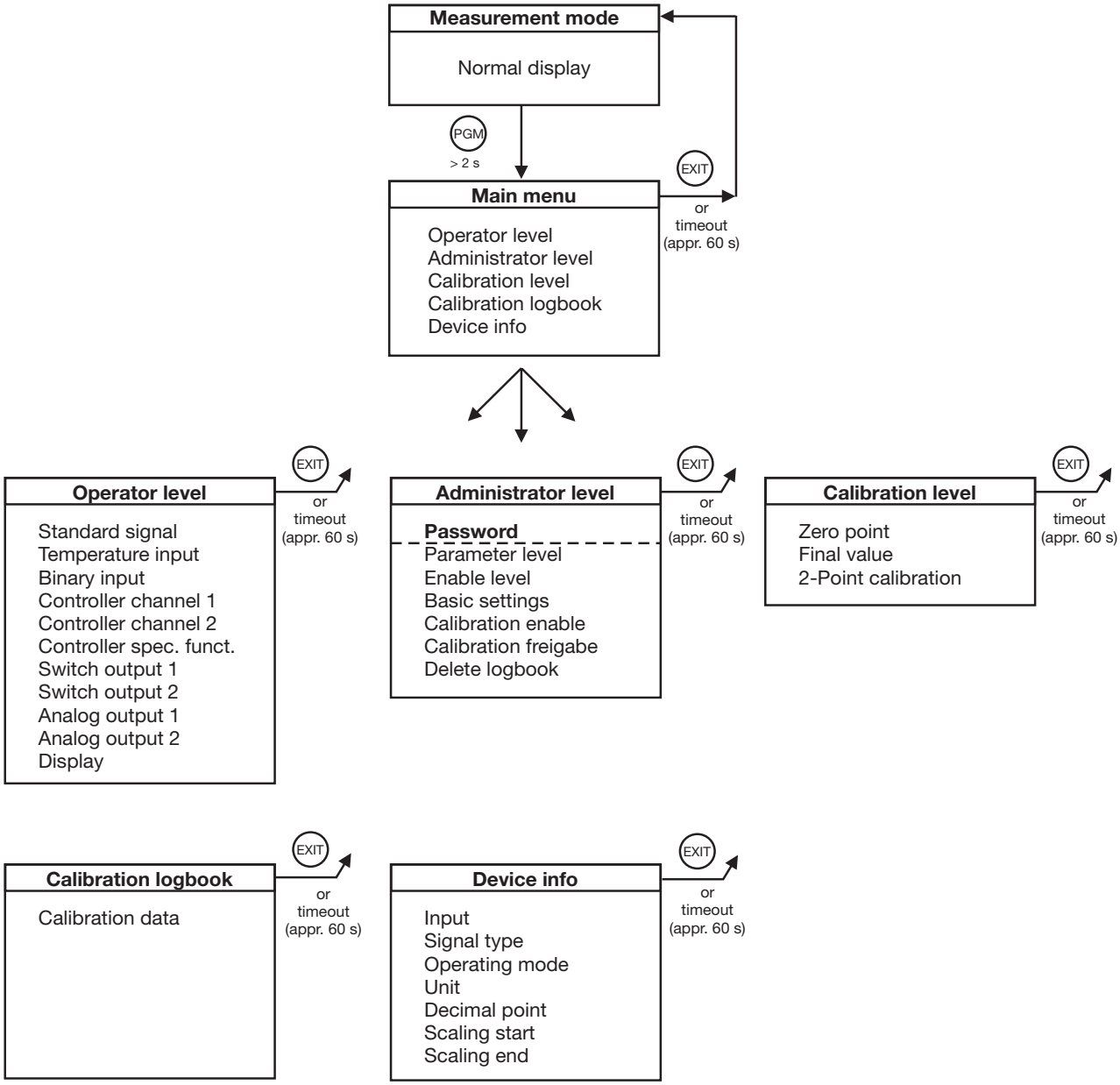
(10) device status e.g.
- Measuring (normal)
- Calibration status

(11) AL R1 = Alarm, controller 1
AL R2 = Alarm, controller 2
AL R12 = Alarm, controllers 1 and 2

To return to measuring mode (MEASURING):
press the EXIT key or wait for a "timeout".

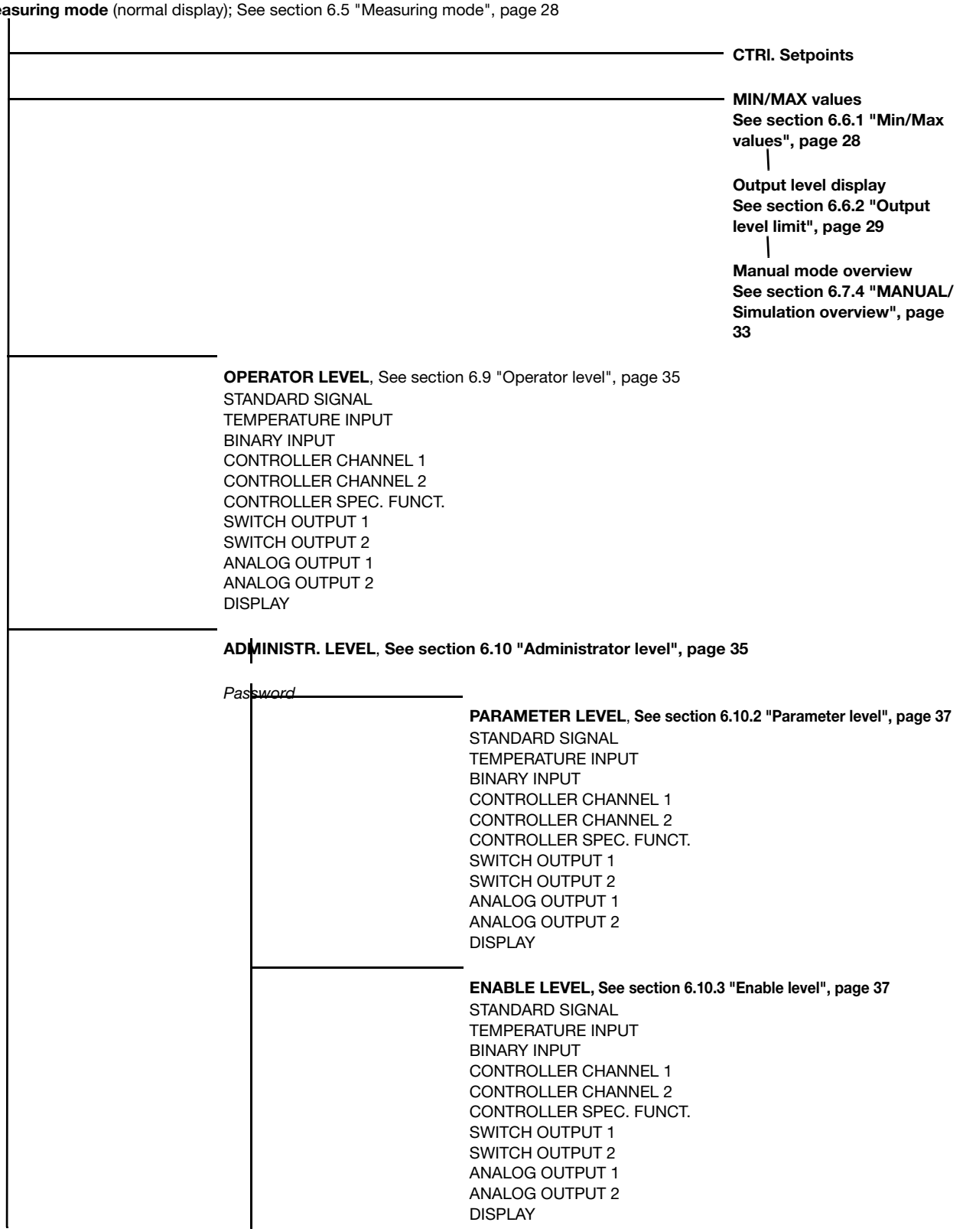
6.3 Principle of operation

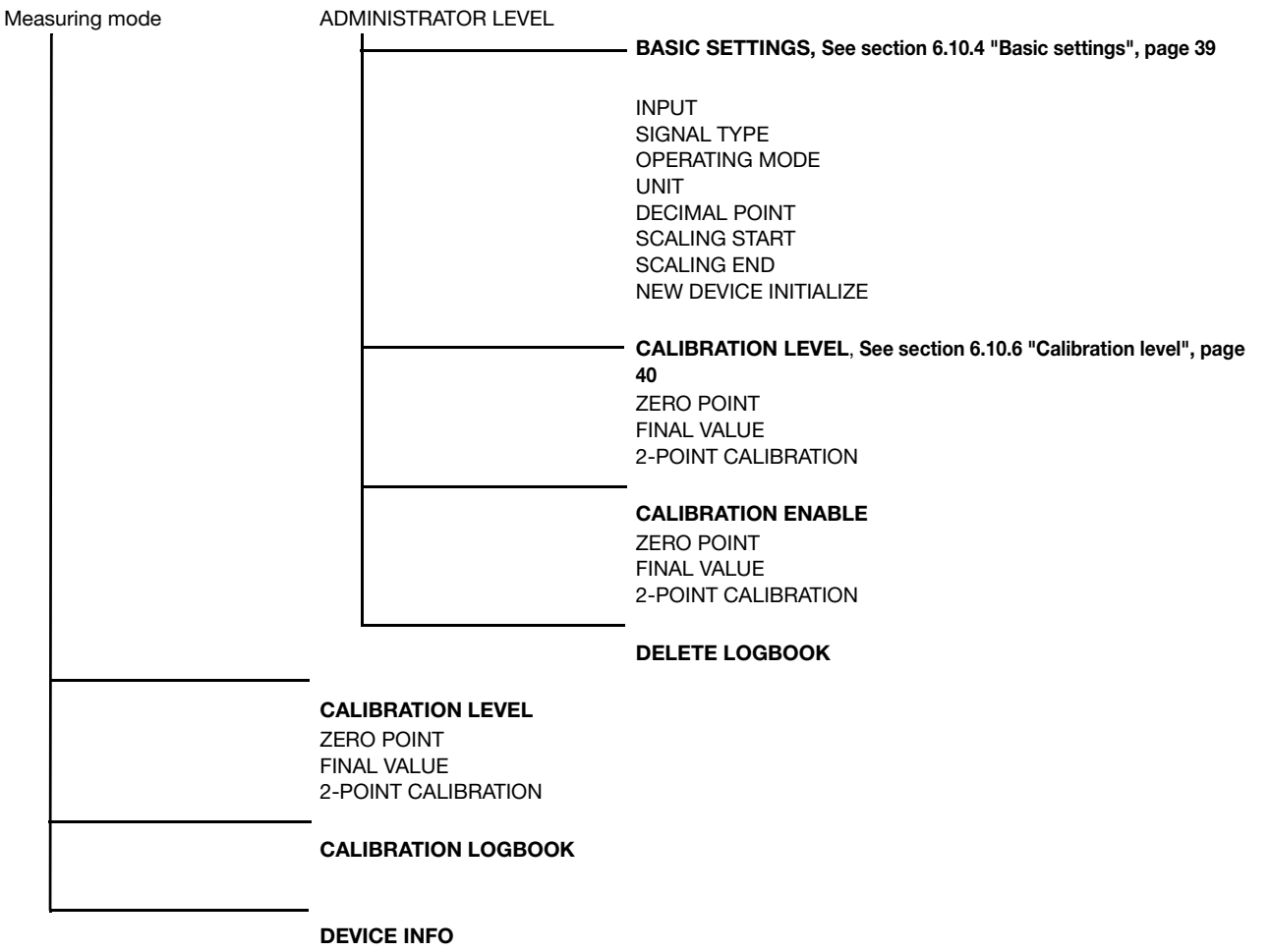
6.3.1 Operation in levels



6.4 Parameter overview

Measuring mode (normal display); See section 6.5 "Measuring mode", page 28




Measuring mode
ADMINISTRATOR LEVEL
BASIC SETTINGS, See section 6.10.4 "Basic settings", page 39
INPUT
SIGNAL TYPE
OPERATING MODE
UNIT
DECIMAL POINT
SCALING START
SCALING END
NEW DEVICE INITIALIZE
CALIBRATION LEVEL, See section 6.10.6 "Calibration level", page 40
ZERO POINT
FINAL VALUE
2-POINT CALIBRATION
CALIBRATION ENABLE
ZERO POINT
FINAL VALUE
2-POINT CALIBRATION
DELETE LOGBOOK
CALIBRATION LEVEL
ZERO POINT
FINAL VALUE
2-POINT CALIBRATION
CALIBRATION LOGBOOK
DEVICE INFO

6 Operation

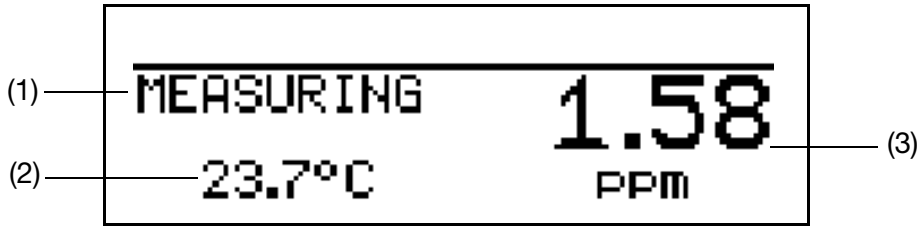
6.5 Measuring mode

6.5.1 Normal display

Visualization

The following are displayed in measuring mode:

- the analog input signal
- the unit: (configurable as pH, mS/cm, µS/cm, ppm, %, mV, etc.)
- the temperature of the measuring material



(1) MEASURING -> measuring mode

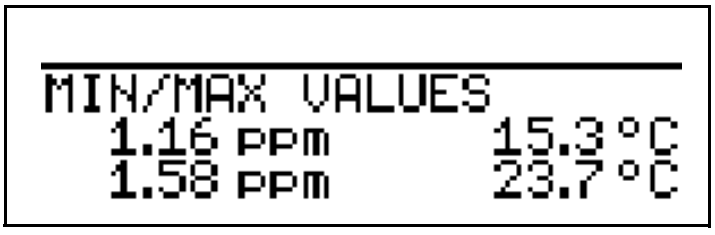
(2) 23.7°C -> the temperature of the measuring material

(3) 1.58 ppm -> the measurement value calculated from the standard signal at the input

The "trend display" or "bar graph" display types can also be selected in measuring mode, see "MEAS. DISPLAY TYPE" page 118.

6.6 Input/output information

6.6.1 Min/Max values



Activating the display of min/ max values

The device is in measuring mode (normal display)

✱ Press the PGM key for less than 2 seconds.
The minimum and maximum values of the main variable (ppm, pH, conductivity, etc.), and the temperature are displayed.

The extreme values of the main measurement variable and the temperature are **not** mutually assigned (e. g. not 1.16 ppm at 15.3°C).

To return to measuring mode:
press the EXIT key or wait for a "timeout".

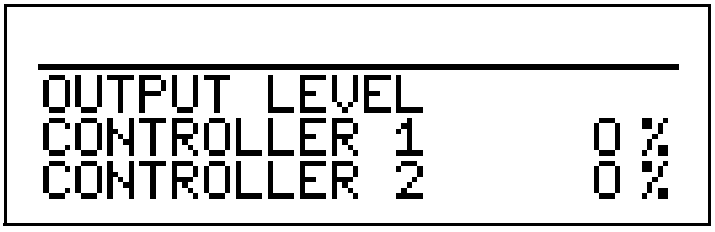
Measurements with "out of range" are ignored.

Press the PGM key again briefly to go to "Output level limit" mode.

The min/max value memory can be reset:
Operator level/ Display / Min/Max reset.

If the basic setting is changed or there is a loss of power,
the min and max values are deleted.

6.6.2 Output level limit



The device is in measuring mode (normal display)

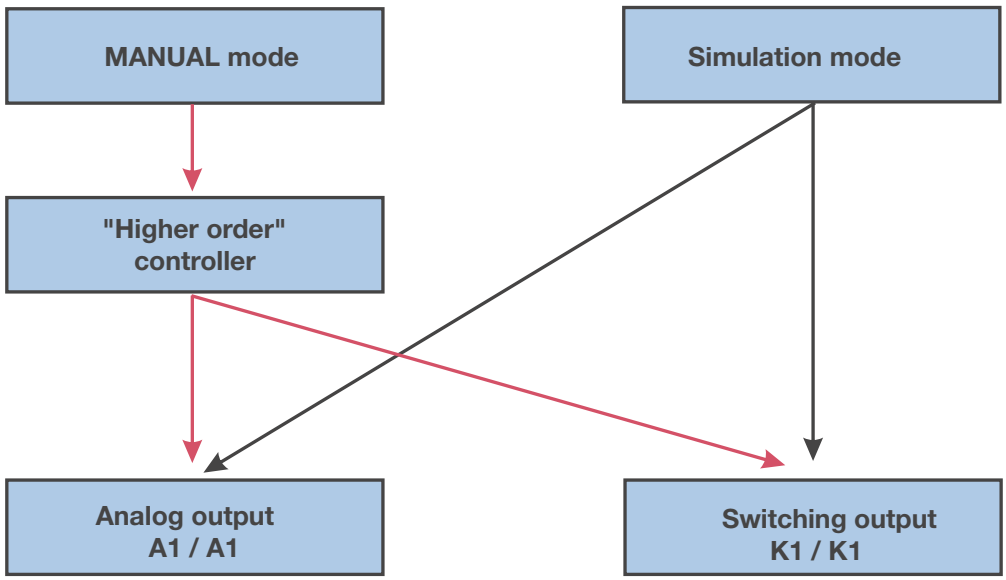
* Press the PGM key twice for less than 2 seconds.
  The output level of both controller contacts will be displayed (if available).

The output level of an output can only be displayed if the output concerned has been configured:
e.g. Administr. level/ Parameter level/ Ctr. chan.1 or 2.

To return to the normal display:
Press the EXIT key or wait for a "time out".
Press the PGM key again to go to "Manual mode overview" mode.

6.7 MANUAL mode / simulation mode

These functions can be used to set the switching outputs and analog outputs of the device manually to a defined state. This facilitates dry startup, troubleshooting and customer service.



Simulation mode **directly** accesses switching outputs K1/2 or analog outputs 1/2. When simulation mode has been selected, MANUAL mode is **not** possible!

In MANUAL mode the settings for "higher order controllers" are taken into consideration.

6.7.1 MANUAL mode via "higher order control functions"

Higher order switching functions

The type 202568 is configured for **higher order control functions** when the following setting is made:

User level / controller channel 1 or 2 / control type **Limit value or pulse length or pulse frequency or modulating or continuous controller.**

When the configuration is set to continuous controller, analog outputs 1 and/or 2 are activated. In other configurations switching outputs K1 or K2 are switched.

Select manual mode

In the factory setting of the device the MANUAL mode parameter is disabled and can **only be activated by the administrator**!
This parameter must first be enabled for other users.

✱ Set to Administrator level / Password / Parameter level / Special controller functions / Manual mode locked, **Momentary action** or **Switching**.

Locked = No manual mode, control via type 202568.

Momentary action = the outputs are active as long as the ▲ or ▲ key is pressed.

Switching = the outputs are active if the ▼ or ▲ key is pressed. If the corresponding key is pressed again, the output becomes inactive again.

Activate manual mode

The device is in display mode

✱ Press the EXIT and ▲ keys for less than 2 seconds.
The word MANUAL appears in the status line of the display.

☞ If the EXIT and ▲ keys are pressed for longer than 3 seconds, the device goes into HOLD mode.

Then the outputs of the device respond according to the default settings.

To exit HOLD mode, press the EXIT and ▲ keys for longer than 3 seconds.

Control is no longer through the type 202568. The output level of the controller channels is 0%.

Controller channel 1 is activated by the ▲ key. In this case the output level of controller channel 1 is 100%.

Controller channel 2 is activated by the ▼ key. In this case the output level of controller channel 2 is 100%.

Deactivation

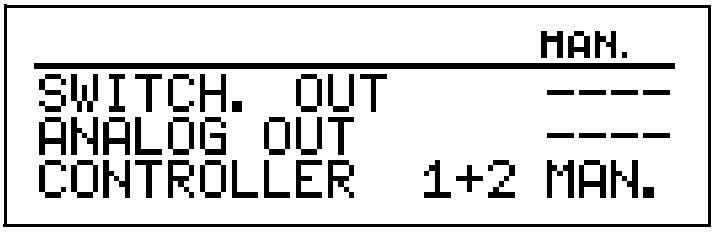
✱ Press the EXIT key.

Control is once again through the outputs of the device.
The word MANUAL appears in the status line of the display.

Overview of MANUAL/ Simulation mode

You can display which outputs and/or controllers are in MANUAL mode.
The device is in "normal display" mode.

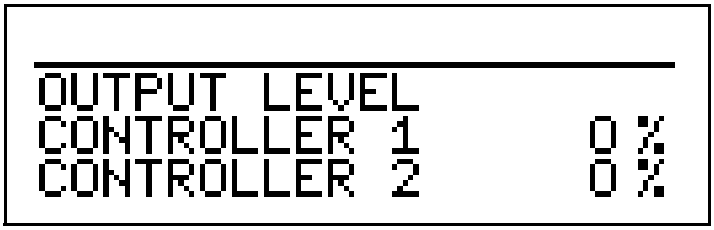
Press the PGM key several times for less than 2 seconds (the number of times varies depending on the equipment and configuration of the device).



Output level of controller channels

The device is in "normal display" mode

Press the PGM key several times for less than 2 seconds (the number of times varies depending on the equipment and configuration of the device).



The display changes when the ▲ key or the ▼ key is pressed.

To return to measuring mode:
press the EXIT key or wait for a "timeout".

6.7.2 Simulation of switching outputs

Simple witching functions

The switching outputs are configured when the following setting is made:
Operator level / Controller channels 1 and/or 2 / Controller type **Off**
and
Switching output 1 or 2 / function ⎍ or ⎍ or ⎍ or ⎍.

Activate simulation

In the factory setting of the device the MANUAL mode parameter is set to "No simulation" and can **only be activated by the administrator**!
This parameter must first be enabled for other users.

✱ Set Administrator level / Password / Parameter level / Switching output 1 or 2 / Manual mode no simulation, **Inactive** or **Active**.

No simulation	= No manual mode, control is via the type 202568.
Inactive	= Relay K1 or K2 is de-energized.
Active	= Relay K1 or K2 is energized.

Deactivate manual mode

No simulation = No manual mode, control via type 202568.

6.7.3 Simulation of analog outputs via MANUAL mode

Enabling and activation

✱ Select activation of simulation of the actual value output: Administrator level / Password / Parameter level / Analog output 1 or 2 / Simulation / Off or **On**.

With "On" the output takes on the value of the "Simulation value" parameter.

When the type 202568 is in display mode, the word MANUAL appears in the status line of the display.

Deactivation

✱ Administrator level / Password / Parameter level / Analog output 1 or 2 / Simulation / Off.

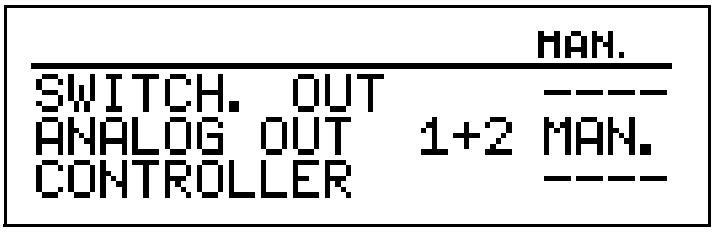
The corresponding output of the type 202568 works again.

When the type 202568 is in display mode, the word MANUAL disappears from the status line of the display.

6.7.4 MANUAL/Simulation overview

You can display which outputs and/or controllers are in MANUAL mode.
The device is in "normal display" mode

Press the PGM key several times for less than 2 seconds (the number of times varies depending on the equipment and configuration of the device).



.

To return to measuring mode:
press the EXIT key or wait for a "timeout".

6.8 HOLD mode

In HOLD status the outputs take on the states programmed in the relevant parameter (controller channel, switching output or analog output).

This function can be used to "freeze" switching outputs and the analog outputs of the device. This means the current status of the output will be retained even when the measured value changes. Control is not via the device.

If MANUAL mode is activated while HOLD mode is activated, MANUAL mode takes precedence and MANUAL then appears in the status line of the display!
MANUAL mode can be terminated by pressing the EXIT key.
If HOLD mode is still activated (by the binary input or by keyboard), the device then returns to HOLD mode!

HOLD mode can be activated by pressing the key or by the binary input.

Activation by pressing key

✱ Press and hold the EXIT and ▲ keys longer than 3 seconds.
Then the outputs of the device respond according to the default settings.
The word HOLD appears in the status line of the display.

If the EXIT and ▲ keys are pressed for less than 3 seconds, the device goes into manual mode.

Then the outputs of the device respond according to the default settings.

Pressing a key to deactivate HOLD mode

✱ Press the EXIT and ▲ keys for longer than 3 seconds.

If the EXIT and ▲ keys are pressed for less than 3 seconds, the device goes into Manual mode.

Then the outputs of the device respond according to the default settings.

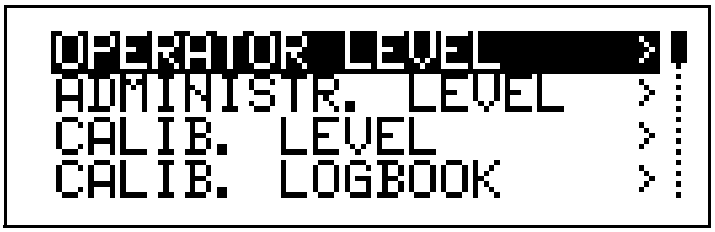
Control is through the outputs of the device again. The word MANUAL disappears from the status line of the display.

6.9 Operator level

All the parameters that the Administrator (**See section 6.10 "Administrator level", page 35**) has enabled can be edited at this level. All the other parameters (marked by a key) are read only.

✱ Press the PGM key for longer than 2 seconds.

✱ Select "OPERATOR LEVEL".



6.10 Administrator level

- All the parameters can be edited at this level.
- At this level, it is also possible to define which parameters can be edited by a "normal" operator and which calibrations can be performed.

To get to the Administrator level, proceed as follows:

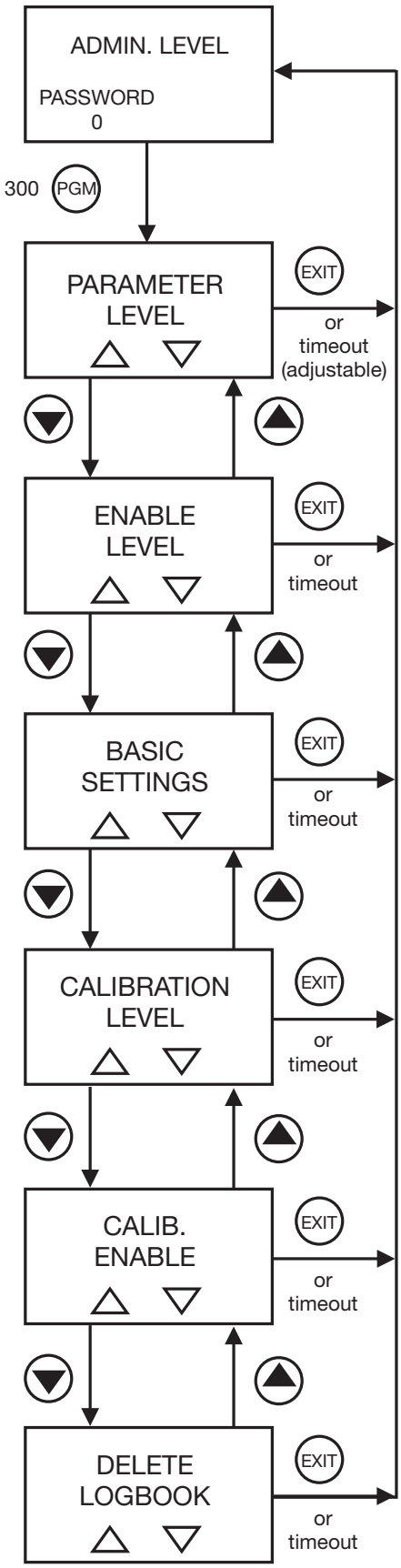
✱ Press the PGM key for longer than 2 seconds.

✱ Use the ▼ or ▲ keys to select "ADMINISTR. LEVEL".

✱ Use the ▼ or ▲ keys to enter the password 300.

✱ Confirm the PGM key.

6.10.1 Administrator levels



6.10.2 Parameter level

The settings that can be made here are the same as those at operator level, See section 6.9 "Operator level", page 35.
As the operator has administrator rights here, the parameters that are locked at operator level can now also be modified.

6.10.3 Enable level

All parameters can be enabled (modification possible) or locked (no modification possible) for editing at operator level.

The enable level is reached via ADMINISTR. LEVEL / PASSWORD / ENABLE LEVEL.

STANDARD SIGNAL

Signal type
Scaling start
Scaling end
Relative cell constant
Zero point
Slope
Compensation type
Temperature coefficient
Reference temperature
Filter time const.
Calibration interval

TEMPERATURE INPUT

Sensor type
Unit
Filter time const.
Offset

BINARY INPUT

Function
- No function
- Key lock
- Hold mode
- Hold inverse

CTRL. CHAN. 1 and CTRL. CHAN. 2

Controller type
Setpoint
Setpoint 2
Min/Max contact
Proportional band
Reset time
Derivate time
Pulse period
Actr. stroke time
Hysteresis
Min. on time

Max. pulse freq.
Output level limit
Pull-in delay
Drop-out delay
Controller alarm
Alarm tolerance
Alarmdelay
In hold mode
Hold output level
On error
Max. setpoint
Min. setpoint

Ctrl.Spec.Funct. (Controller special functions)

I switch-off
Separate controller
Manual mode

Switching output 1 and Switching output 2

Function
Switching point
USP pre-alarm
Spacing
Hysteresis
Switch-on delay
Switch-off delay
Pulse time
During calibration
On error
In hold mode
Manual mode
No simulation
Break/make contact

ANALOG OUTPUT 1 and ANALOG OUTPUT 2

Signal selector
Signal type
Scaling start
Scaling end
During calibration
On error
In hold mode
Save value
Simulation
Simulation value

DISPLAY

Language
Lighting
LCD inverse
Meas. display type
Upper display
Lower display

Bargr. scale start
Bargr. scale end
Min/max reset
Op. timeout
Contrast

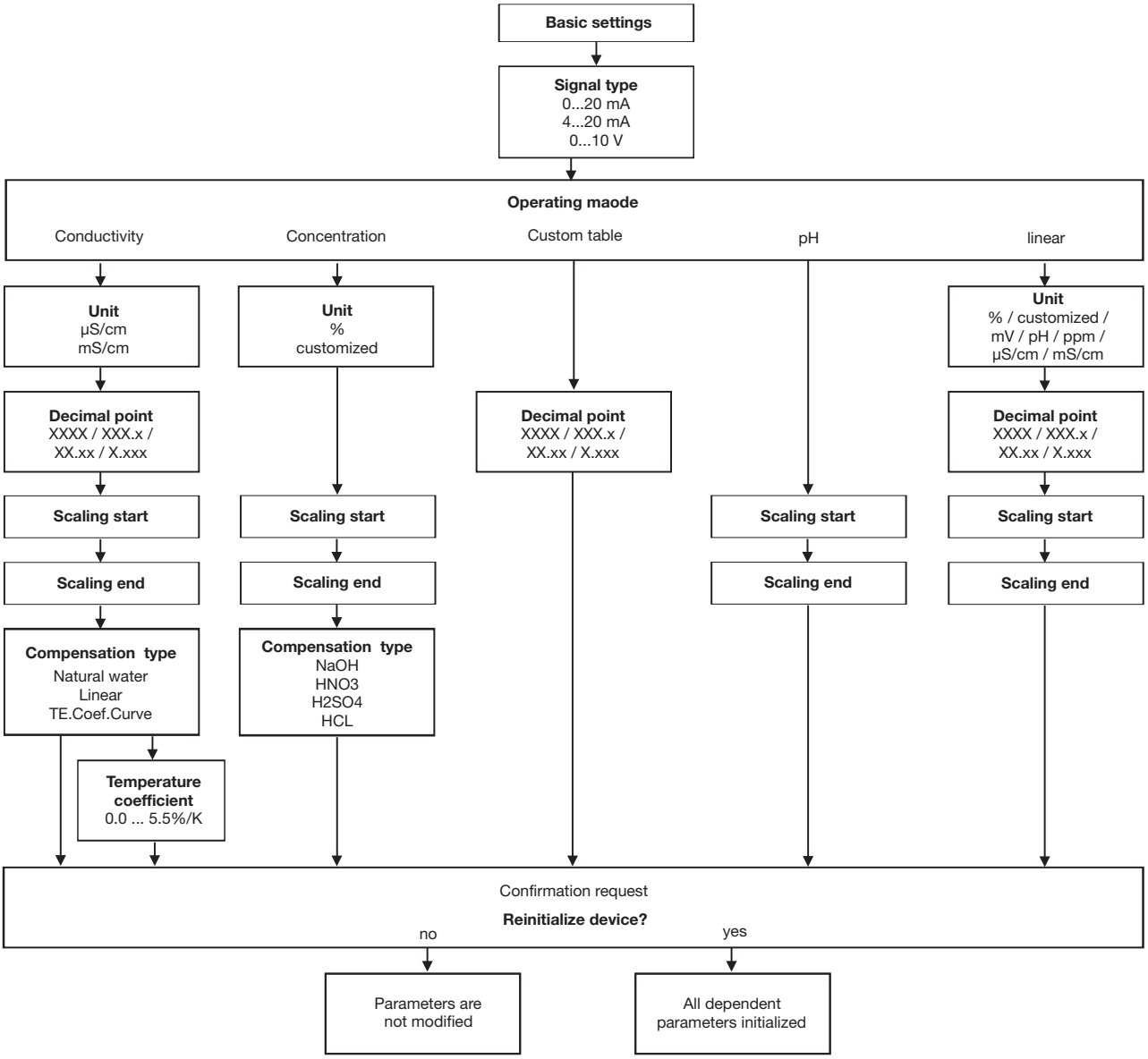
6.10.4 Basic settings

The type 202568 has a basic settings wizard, to make it easier for the user to configure the extensive setting options of the device and to avoid configuration conflicts.
The basic settings are reached via: ADMINISTR. LEVEL / PASSWORD / BASIC SETTINGS.

Here all the important settings are systematically queried. At the end, once a request for conformation has been acknowledged, the device is initialized with the new settings. Dependent parameters are checked and adjusted.

6.10.5 Basic settings wizard

The basic settings of the device are specified here.



6.10.6 Calibration level

Depending on which operating mode has been configured (in the Basic Settings menu), one or more of the following calibration options will be available:

- Zero point
- Final value
- 2-Point calibration
- Temperature coefficient linear
- Temperature coefficient curve
- Relative cell constant

The calibration level is reached via: ADMINISTR. LEVEL / PASSWORD / CALIB. LEVEL.

6.10.7 Calibration enable

The setting made here determines which calibration procedure may or may not be run via the "CAL" key after starting calibration at the operator level.

Calibration enable is reached via: ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.

The following can be locked or enabled:

- Zero point
- Final value
- 2-Point calibration
- Temperature coefficient linear
- Temperature coefficient curve
- Relative cell constant

6.10.8 Delete logbook

The last five calibration processes are archived in the calibration logbook.

If required, the logbook can be deleted once a request for confirmation has been acknowledged.

6.11 Device info

Here is a list of the current configuration of all the important parameters (from the Basic Settings menu).

Example

SIGNAL TYPE	-> 4...20 mA
OPERATING MODE	-> LINEAR
UNIT	-> e.g. ppm, pH or customized unit
DECIMAL POINT	-> XX.xx
SCALING START	-> 0.00 ppm
SCALING END	-> 2.00 ppm

6 Operation

6.12 Controller functions

Simple switching functions

In the type 202568, simple switching functions such as alarm contact, limit value monitoring or calibration timer signaling are configured at parameter level via the parameters of "Switching output 1 and 2".

In this case, the parameters of controller channel 1 and 2 must be set to "Off".

Higher-order control functions

Higher-order control functions are configured at parameter level via the parameters of "Controller channel 1 and 2".

In this case, the parameters of the switching outputs must be set to "Controller 1 and Controller 2".

Typical operator level parameters

Switching output 1 / 2	**Explanation**
None	No switching function and no control function required
Controller 1	device control should be of a "higher order"
Controller 2	device control should be of a "higher order"
Controller alarm 1 / 2	"Simple" switching functions
Controller alarm	
Main variable	AF1 main variable
Main variable	AF2 main variable
Main variable	AF7 main variable
Main variable	AF8 main variable
Temp.	AF1 temperature
Temp.	AF2 temperature
Temp.	AF7 temperature
Temp.	AF8 temperature
Sensor error	
Calibration timer	
Controller channel 1 / 2	
Limit value Pulse width Pulse frequency Steady Modulating	"Higher order" control functions
Off	Must be selected if "simple" switching functions are required.

6.13 Manual mode

In manual mode, controller outputs can be activated manually.

The keys assigned to the outputs can have a "pulsed" or "switched" action.

- Pulsed: the assigned output is only activated while the key is being pressed.
- Switched: the assigned output is activated by pressing the key and the key must be pressed again to deactivate it.

Activating manual mode:

✱ Press the [EXIT] and [▲] keys for less than 1 second.

Deactivating manual mode:

✱ Press the [EXIT] key briefly - the device returns to normal mode (automatic mode).

Key assignment:

The [▲] key switches output K1

The [EXIT] key switches output K2

6.14 Hold mode

When Hold mode is activated, the outputs adopt their configured states.

Activating Hold mode:

✱ Press the [EXIT] and [▲] keys for longer than 2 seconds.

Deactivating Hold mode:

✱ Press the [EXIT] and [▲] keys once again for longer than 2 seconds - the device returns to normal mode (automatic mode).

7.1 Getting started

Below is a suggestion for configuring the device reliably in little time.

By checking the setting options of this list before starting the configuration, you can avoid timeouts during the configuration.

- Mount the device, See section 4 "Mounting", page 12.
- Install the device, See section 5 "Electrical connection", page 16 ff.
- Call up Administrator level (ADMINISTR. LEVEL).
- Enter password 300.
- Call PARAMETER LEVEL / DISPLAY / OP. TIMEOUT.
- Set OP. TIMEOUT to 0 minutes (no timeout).
- Exit the parameter level.
- Call up Administrator level (ADMINISTR. LEVEL).
- Enter password 300.
- Select BASIC SETTINGS and work through all the menu items
- Answer "YES" to the "Reinitialize device" query
- Configure the required parameters.
- Calibrate the device to the sensor and the measuring material.

7.2 Setting examples

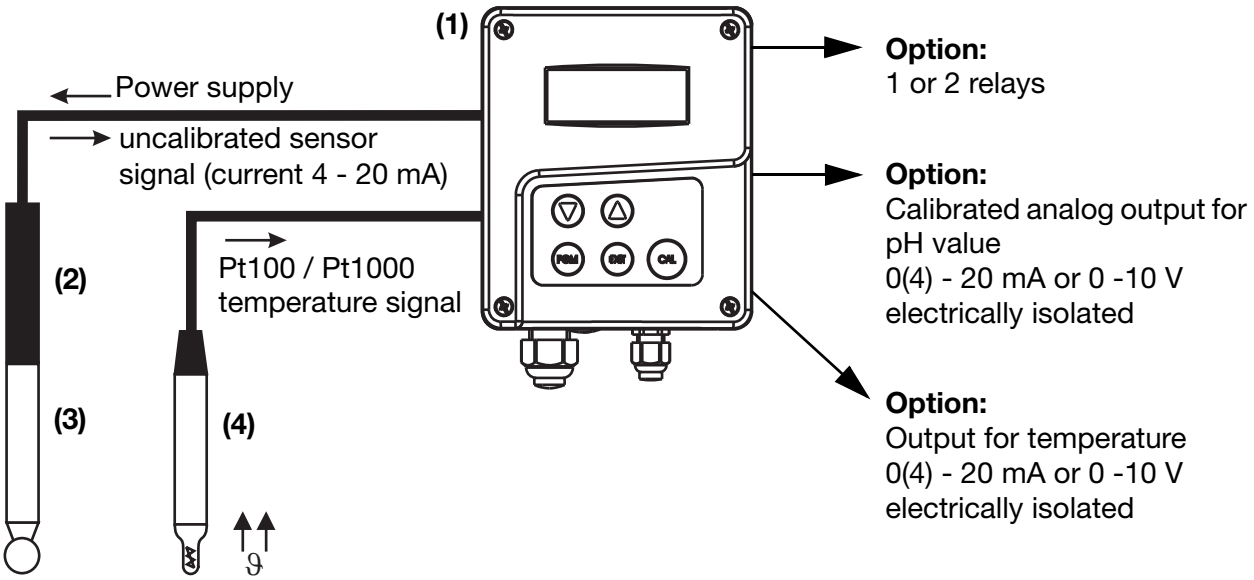
7.2.1 Measuring the pH value with a pH combination electrode and a 2-wire transmitter

For pH electrodes, see data sheets 201005, 201020 and 201030.
For 2-wire transmitter, see data sheet 202701.
For compensation thermometer, see data sheet 201085.

Task

Measuring range:	2 - 12 pH
Output signal:	4 - 20 mA
Temperature measurement	Pt100
Control function:	Pulse width controller
Setpoint 1:	pH 6.5
Setpoint 2:	pH 8.5

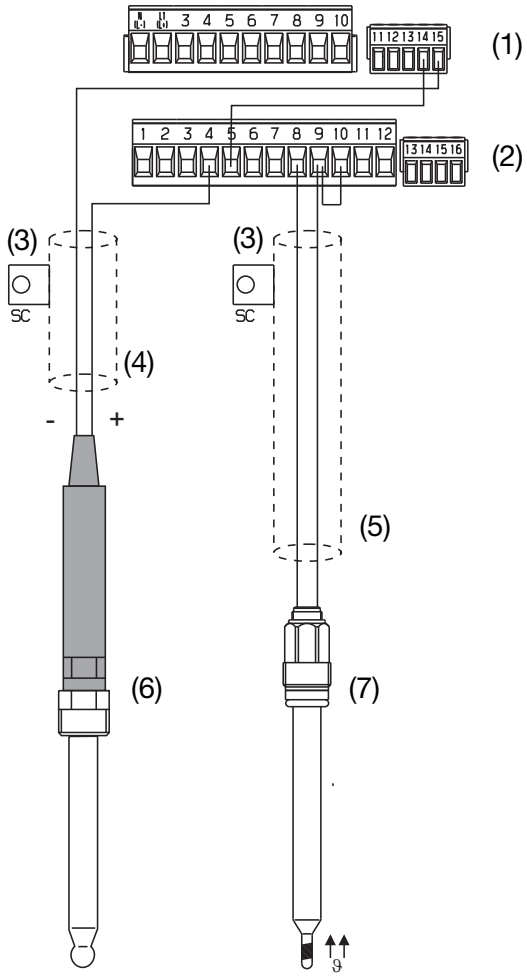
Measuring setup

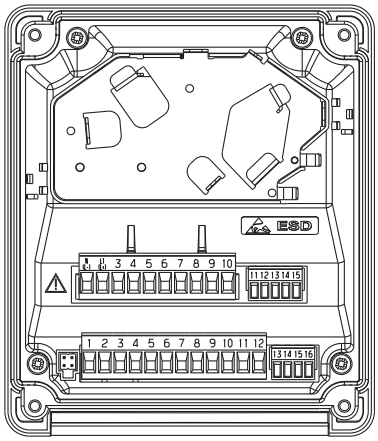


(1) Type 202568
(2) 2-wire transmitter, type 202701
(3) pH combination electrode
(4) Compensation thermometer, type 201085/16-89-1003-22-120

7 Commissioning

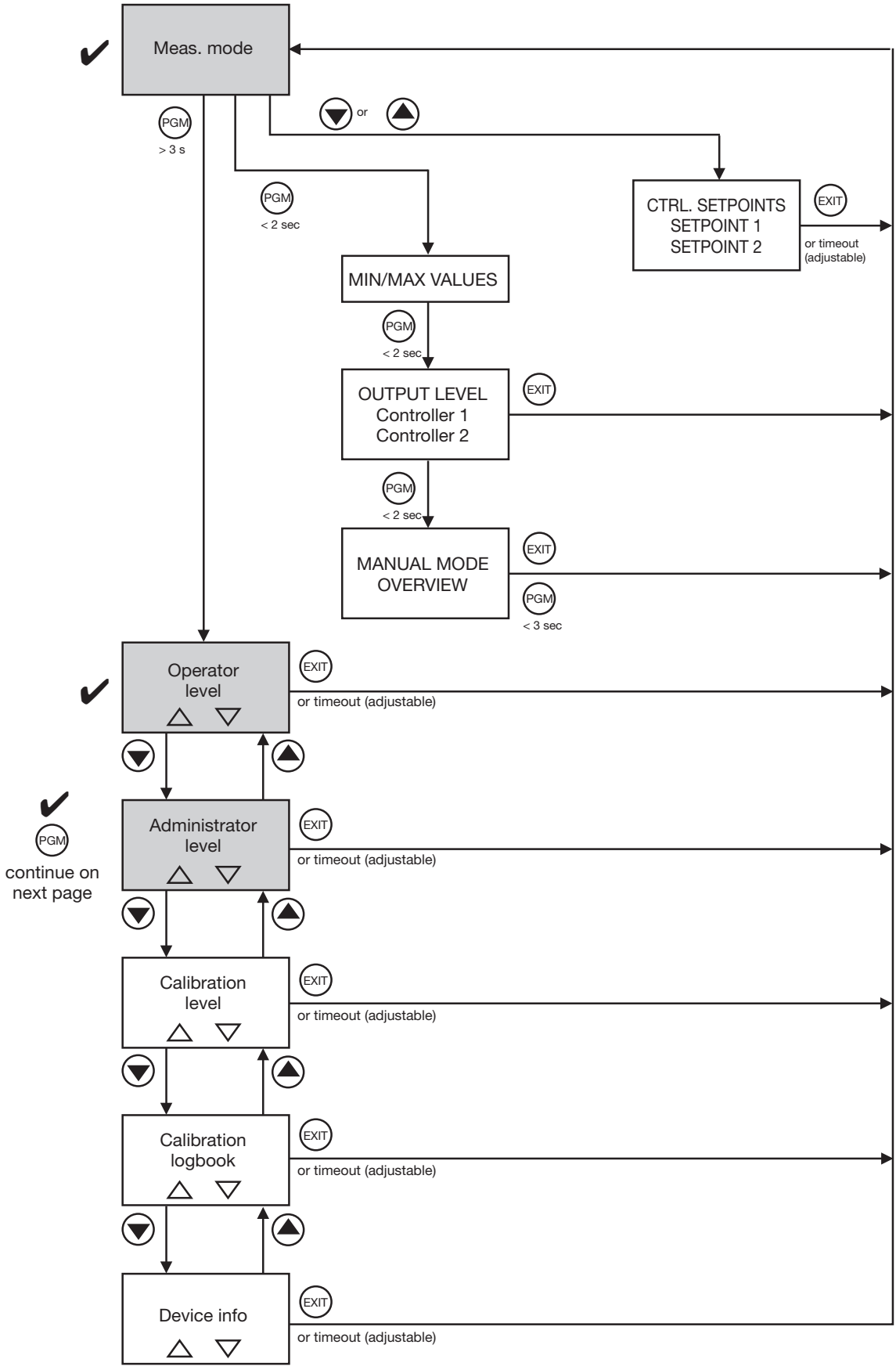
Electrical Connection





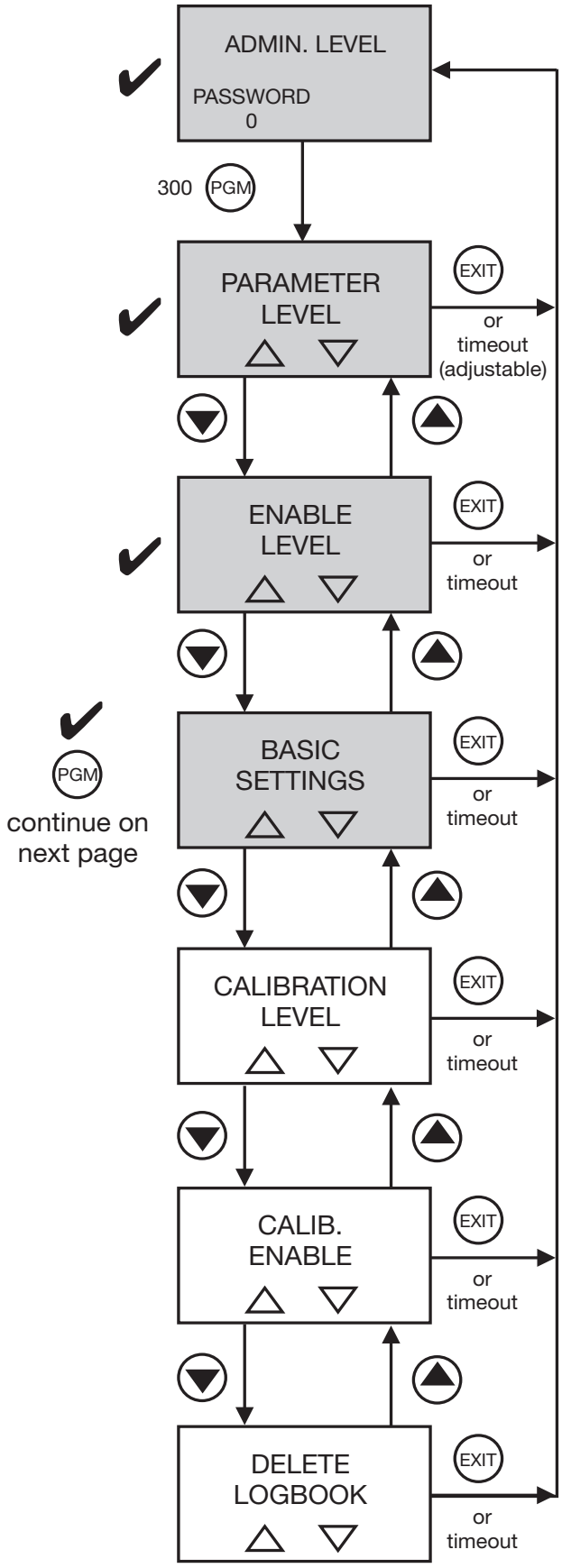
(1) Terminal block1
(2) Terminal block 2
(3) SC = shield
(4) Coaxial cable as per data sheet 202990
(5) 2-wire shielded cable as per data sheet 202990
(6) pH combination electrode with mounted 2-wire transmitter
(7) Compensation thermometer

Calling up Administrator level

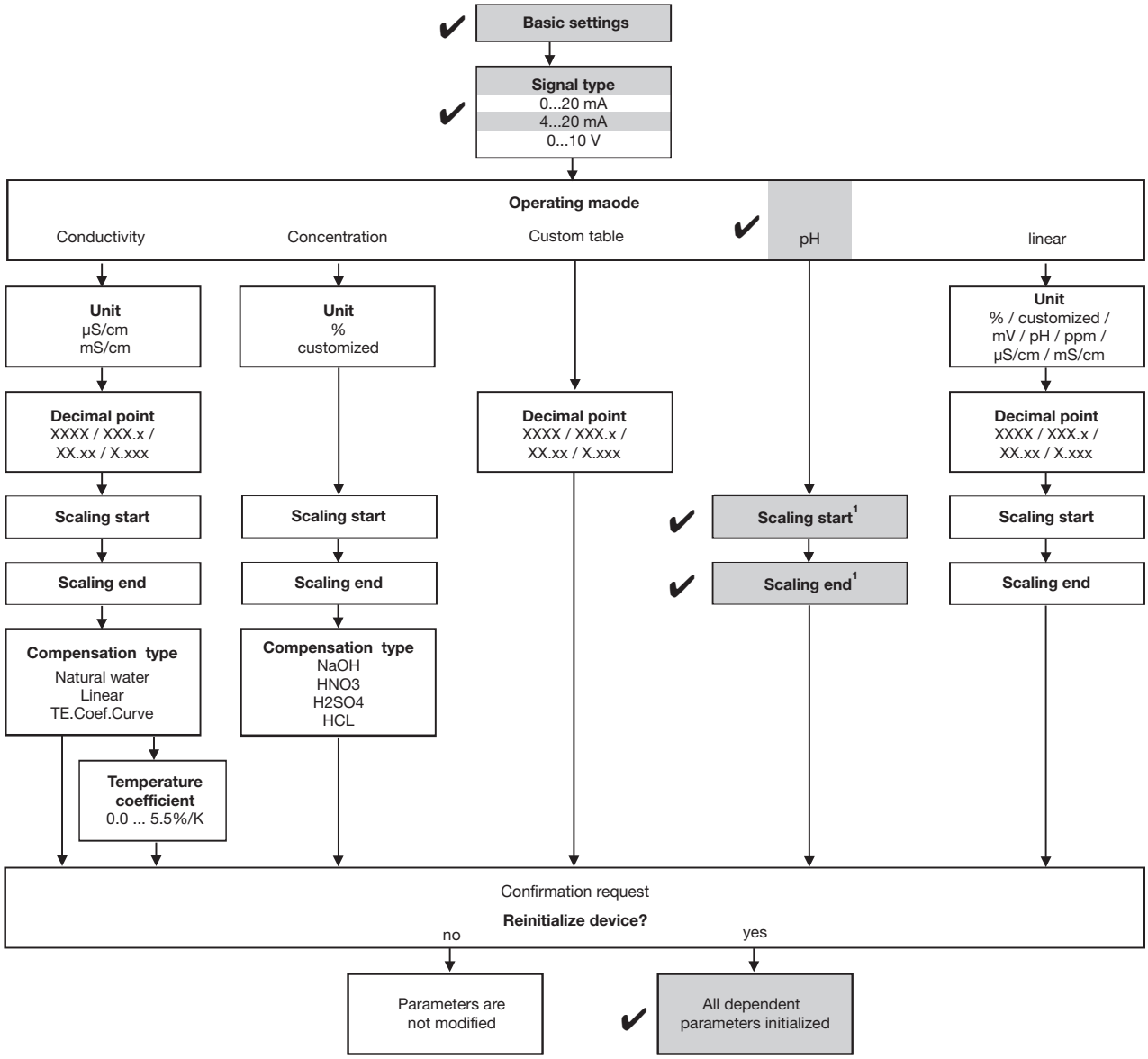


7 Commissioning

Calling up the basic settings

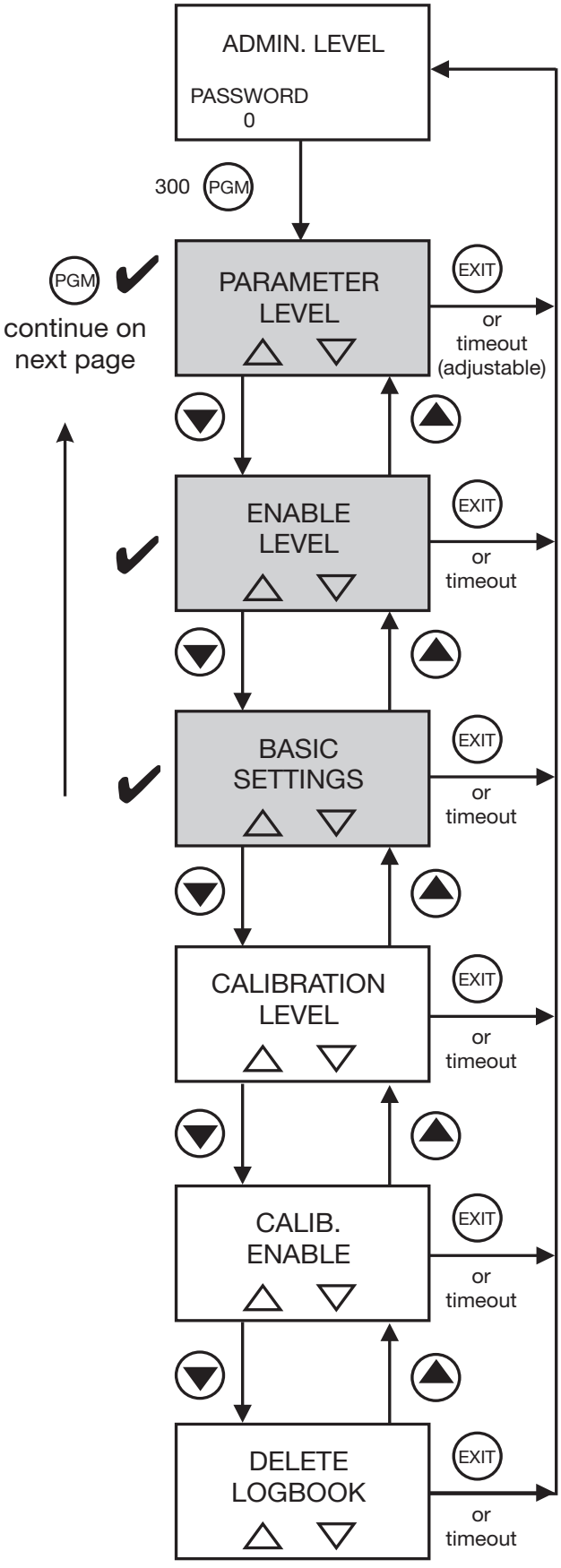


Make the basic settings for the main input



1 Value relevant to the 2-wire transmitter.

Calling up Parameter level



Concluding device settings / checks

Input for temperature	Sensor type:	Pt100/Pt1000
	Unit:	°C
	Filter time constant:	2 s
	Offset:	0.0°C
Controller channel 1	Controller type:	Pulse width controller
	Setpoint:	pH 6.5
	Min./Max. contact:	Min. contact
	Proportional band:	As required
	Reset time:	As required
	Derivative time:	As required
	Pulse period:	As required
	Minimum ON time:	As required
	Output level limit:	As required
	Controller alarm:	As required
	Alarm tolerance:	As required
	Alarm delay:	As required
	In Hold mode:	As required
	Hold output level:	As required
	On error:	As required
	Max. setpoint:	As required
	Min. setpoint:	As required
Controller channel 2	Controller type:	Pulse width controller
	Setpoint:	pH 8.5
	Min./Max. contact:	Max. contact
	Proportional band:	As required
	Reset time:	As required
	Derivative time:	As required
	Pulse period:	As required
	Minimum ON time:	As required
	Output level limit:	As required
	Controller alarm:	As required
	Alarm tolerance:	As required
	Alarm delay:	As required
	In Hold mode:	As required
	Hold output level:	As required
	On error:	As required
	Max. setpoint:	As required
	Min. setpoint:	As required

Controller special functions	I switch-off:	As required
	Manual mode:	As required
	Separate controllers:	As required
Switching output 1	Function:	Controller 1
	Manual mode:	As required
	Break/make contact:	As required
Switching output 2	Function:	Controller 2
	Manual mode:	As required
	Break/make contact:	As required
Analog output 1	Signal selector:	Main variable
	Signal type:	4 - 20 mA
	Scaling start:	2.00 pH
	Scaling end:	12.00 pH
	During calibration:	As required
	On error:	As required
	In Hold mode:	As required
	Safe value:	As required
	Simulation:	As required
	Simulation value:	As required
Display	Language:	As required
	Lighting:	As required
	Inverse LCD:	As required
	Meas. display type:	As required
	Lower display:	As required
	Upper display:	As required
	Max./Min. reset:	As required
	Op. timeout:	As required
	Contrast:	As required

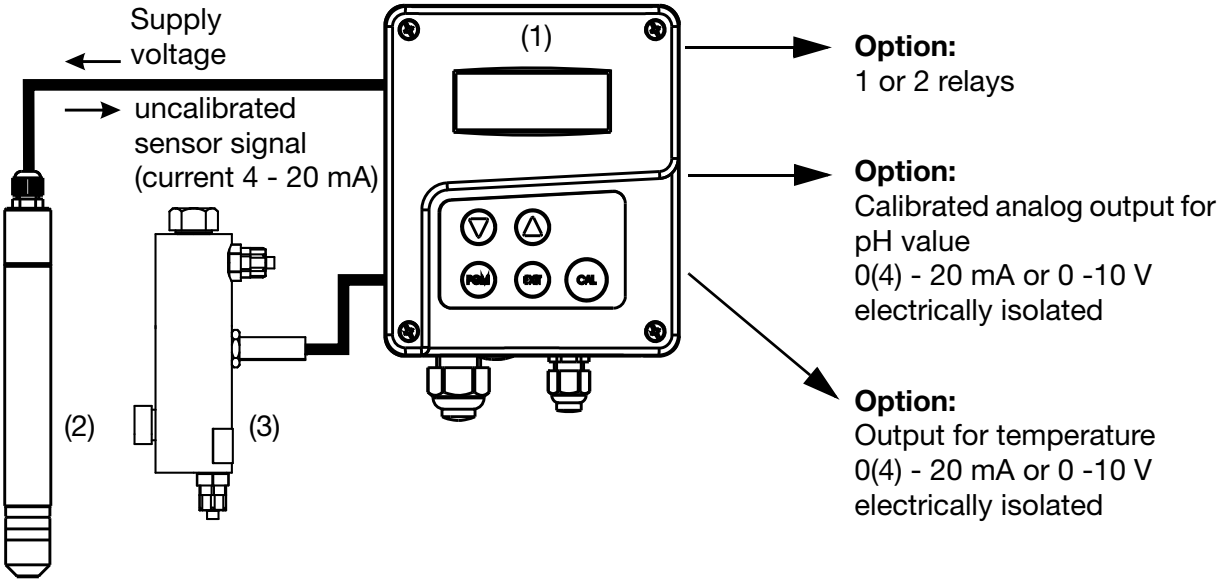
7.2.2 Measuring the concentration of free chlorine

For sensor for chlorine, see data sheet 202630.
For optional flow monitor, see data sheet 202811

Task

Measuring range:	0 - 2 ppm
Output signal:	0 - 20 mA
Control function:	off

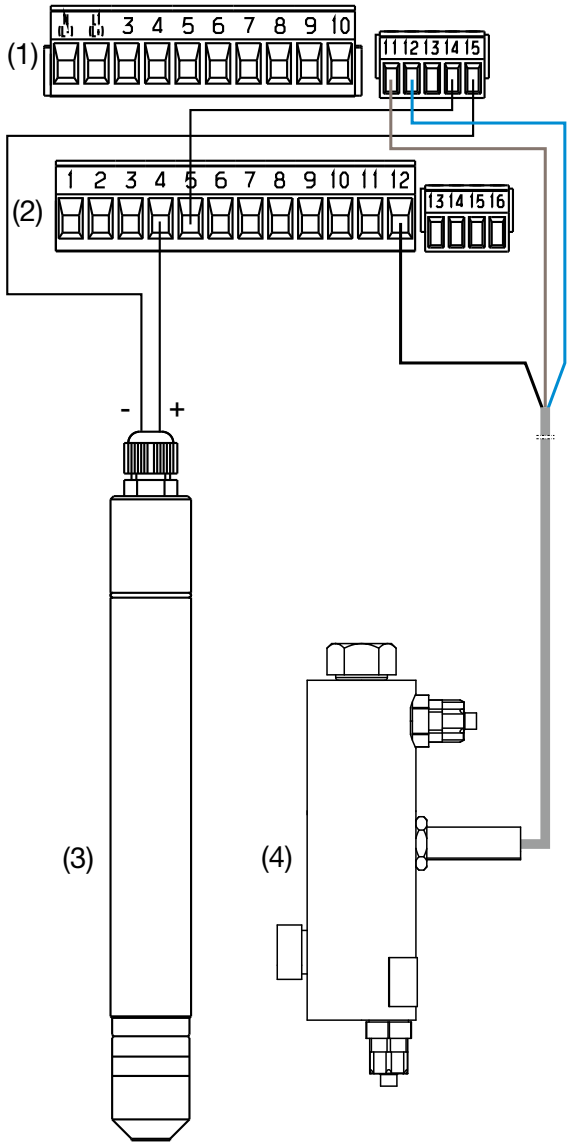
Measuring setup

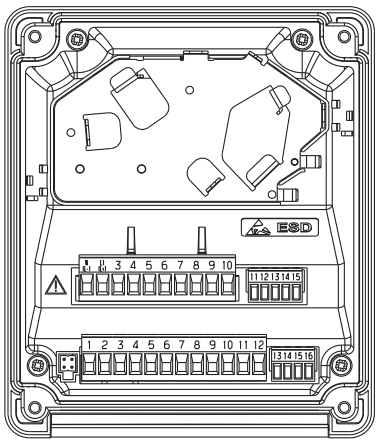


(1) Type 202568
(2) Sensor for free chlorine, type 202630
(3) Flow monitor, type 202811/20...

7 Commissioning

Electrical connection

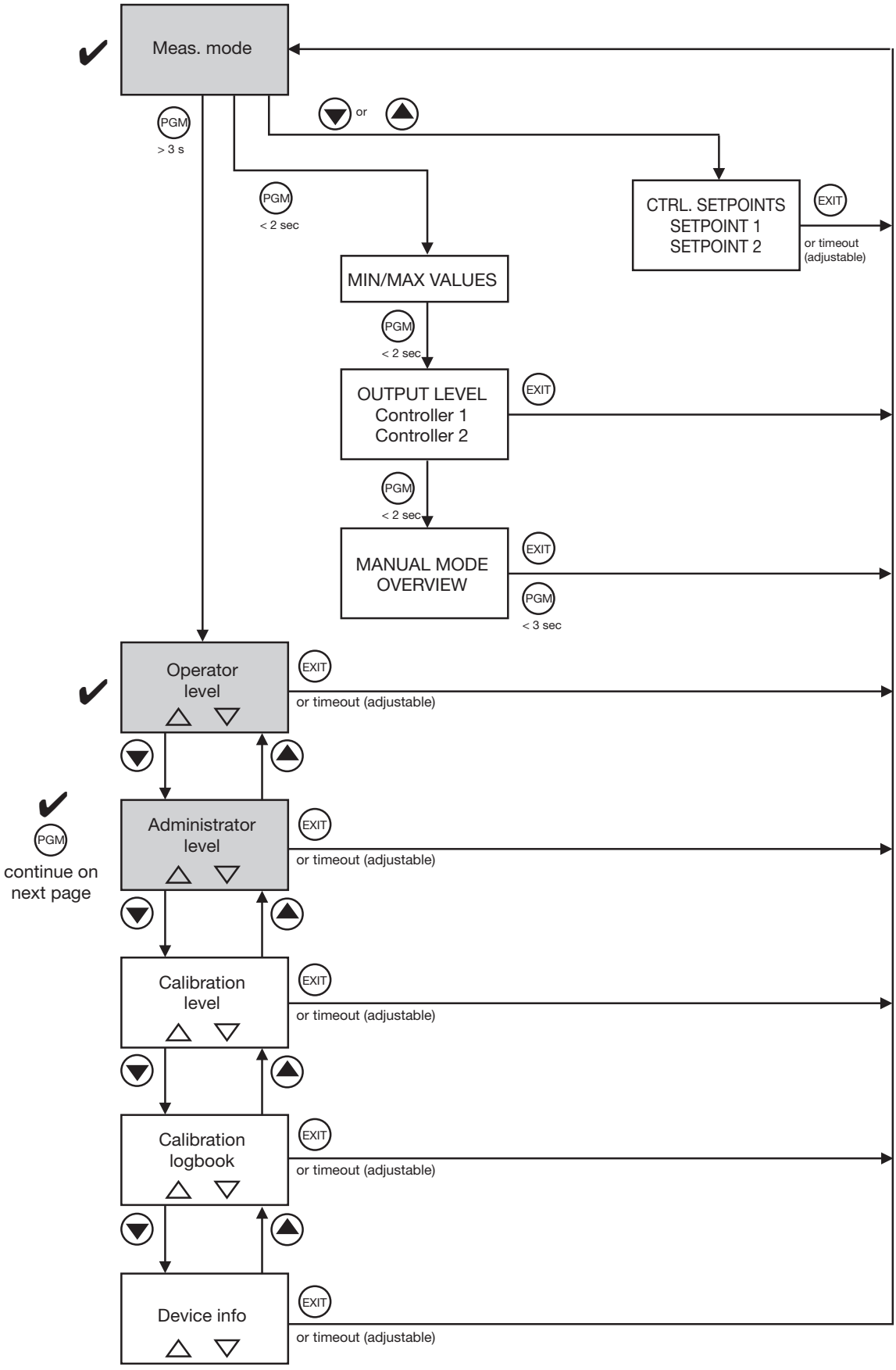




Terminal assignment of flow monitor		
Wire color	**Function**	**Connection**
Brown	+12 V	Row 1, terminal 11
Black	Contact (NPN N/O contact)	Row 2, terminal 12
Blue	GND	Row 1, terminal 12

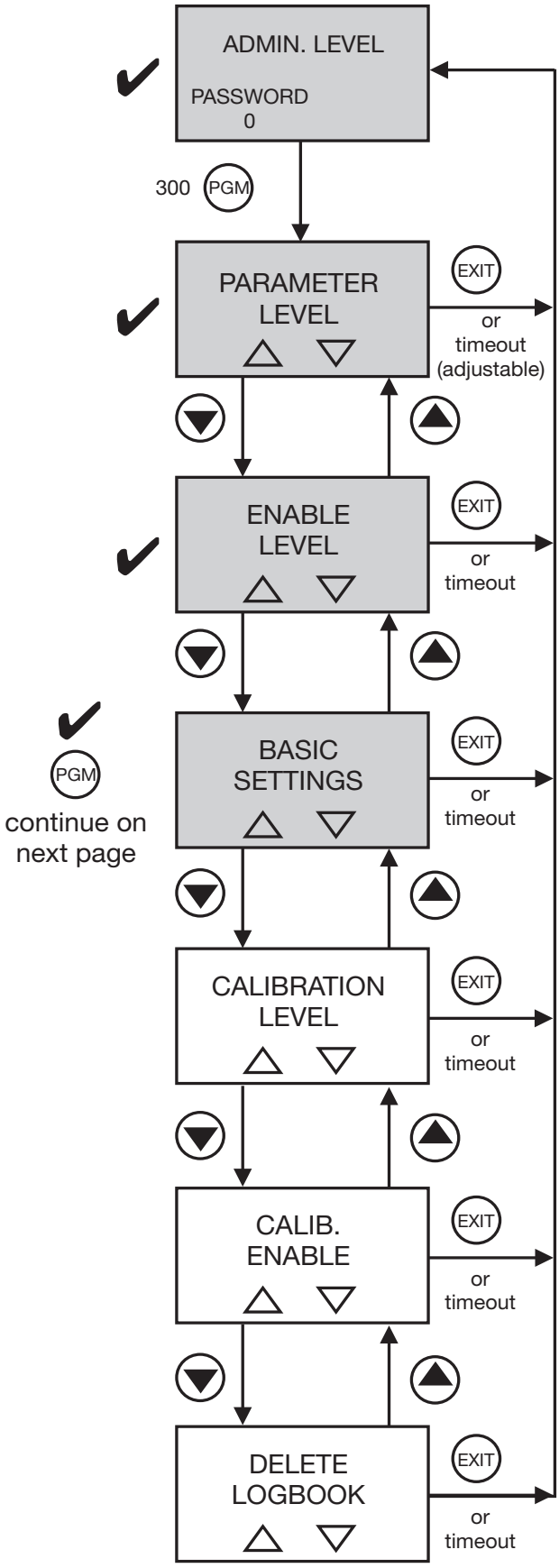
(1) Terminal block 1
(2) Terminal block 2
(3) Sensor for free chlorine), type 202630/40 or /43...
(4) Flow monitor, type 202811/20...

Calling up Administrator level

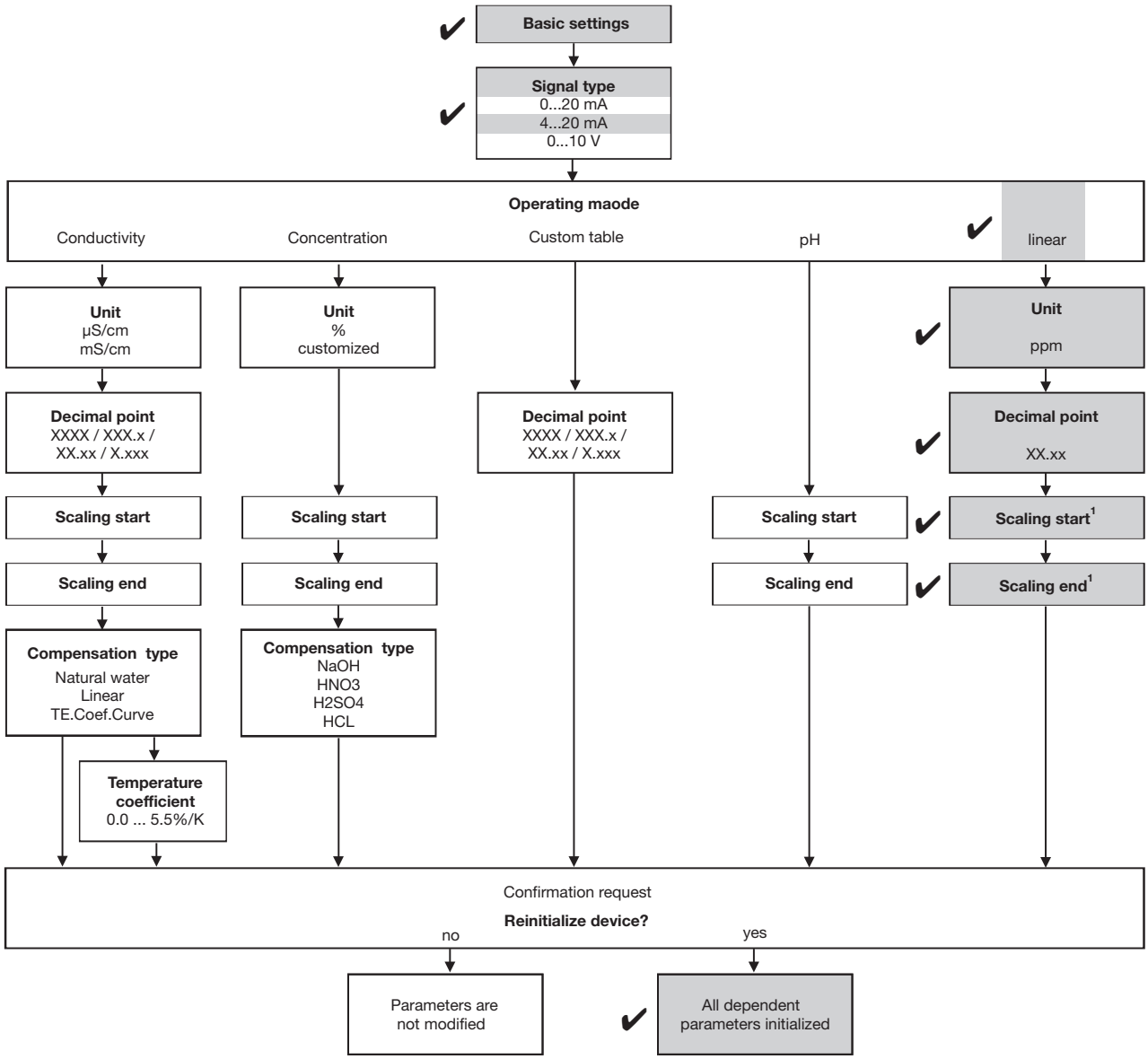


7 Commissioning

Calling up the basic settings



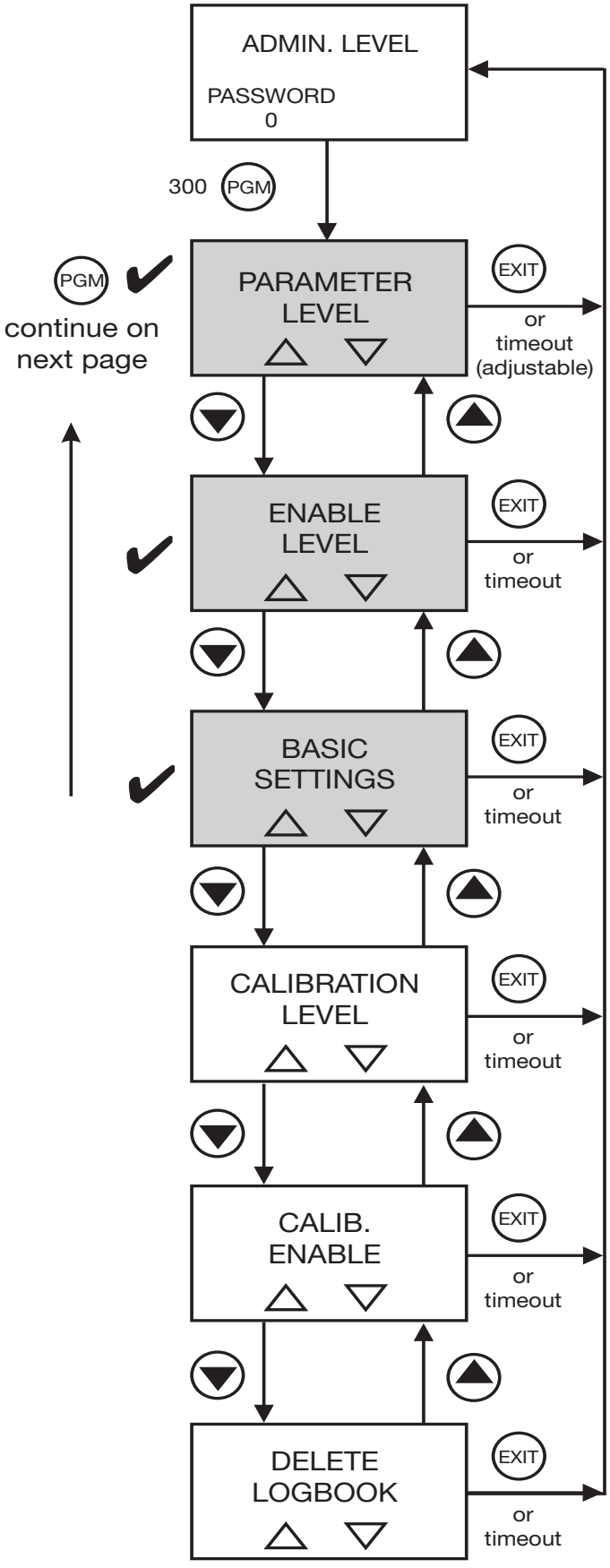
Make the basic settings for the main input



1 Value relevant to the 2-wire transmitter.

7 Commissioning

Calling up Parameter level



Concluding device settings / checks

Input for temperature	Sensor type:	No sensor
	Unit:	°C
	Filter time constant:	2 s
	Manual temperature:	As required
Binary input	Function:	Hold mode
Analog output 1	Signal type:	0 - 20 mA
	Scaling start:	0.00 ppm
	Scaling end:	2.00 ppm
	During calibration:	As required
	On error:	As required
	In Hold mode:	As required
	Safe value:	As required
	Simulation:	As required
Display	Language:	As required
	Lighting:	As required
	LCD inverse:	As required
	Meas. display type:	As required
	Lower display:	None
	Upper display:	Main variable
	Max./Min. reset:	As required
	Op. timeout:	As required
	Contrast:	As required

7.2.3 Liquid level or level measurement or pressure measurement

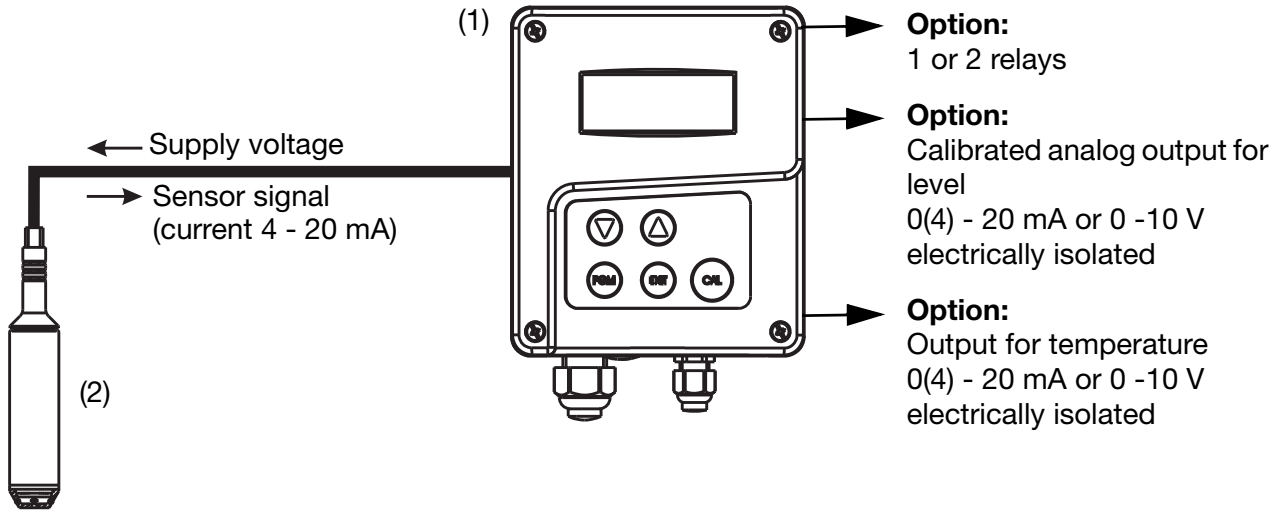
For level measurement probes, see data sheets 402090, 404390, 404391 and 404753.

Pressure transmitter, see data sheet 401010 e.g.

Task

Measuring range:	0 - 100%
Output signal:	4 - 20 mA
Control function:	Limit controller
Limit value 1:	10%
Limit value 2:	80%

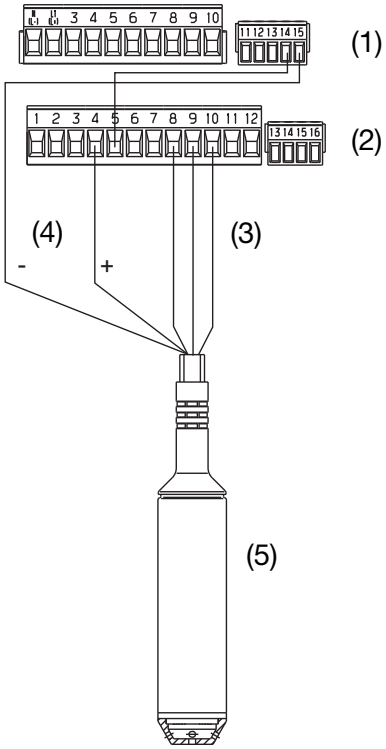
Measuring setup

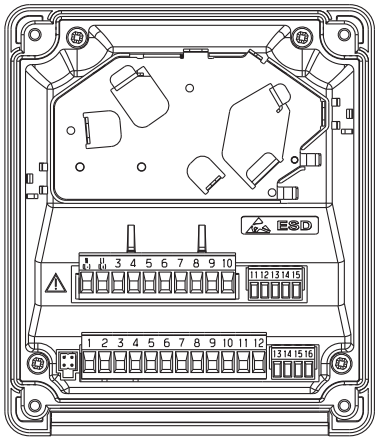


(1) Type 202568

(2) Level probe, type 402090 or type 403490 or type 404391 or pressure transmitter type 401010 e.g.

Electrical connection

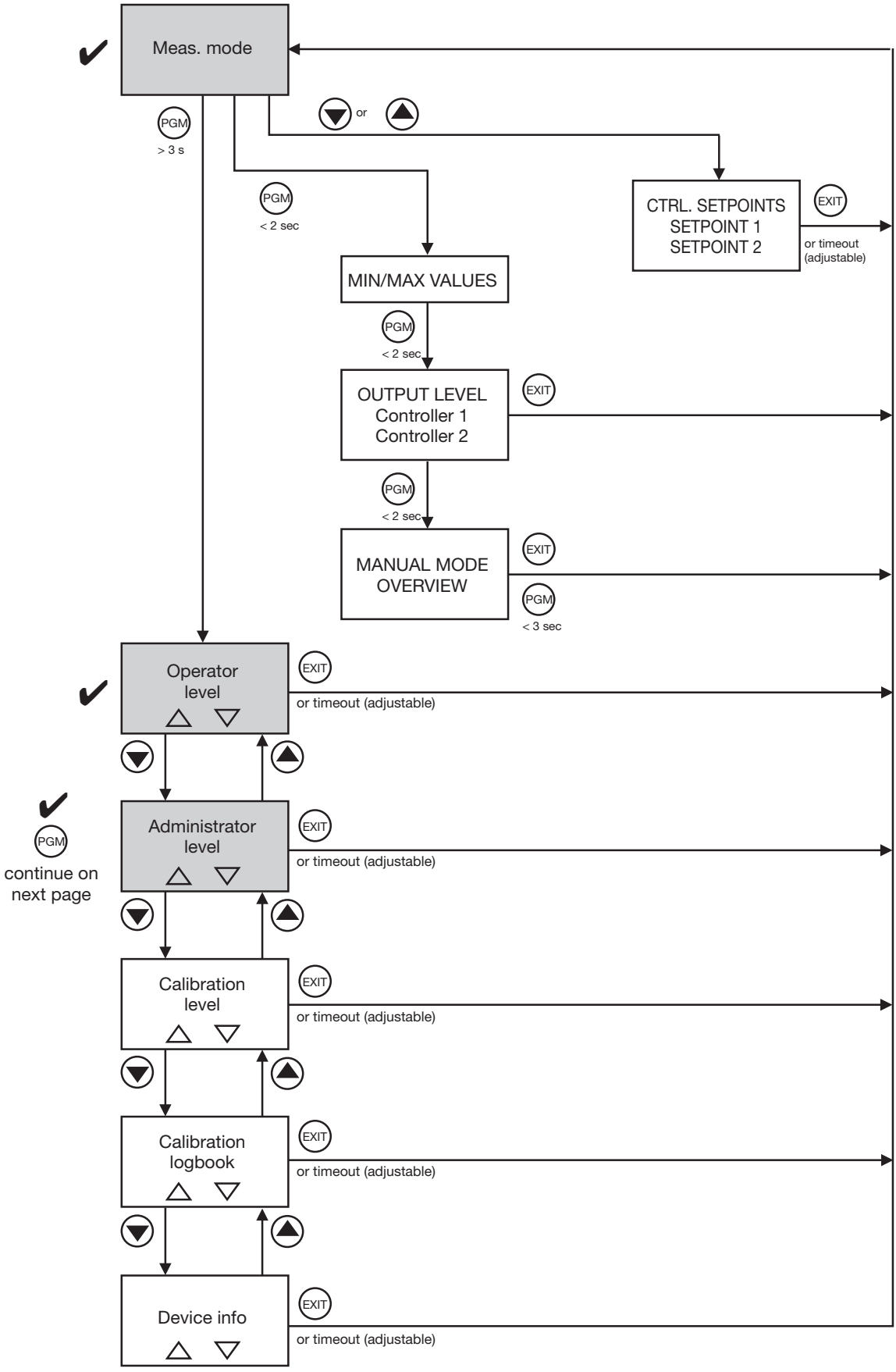




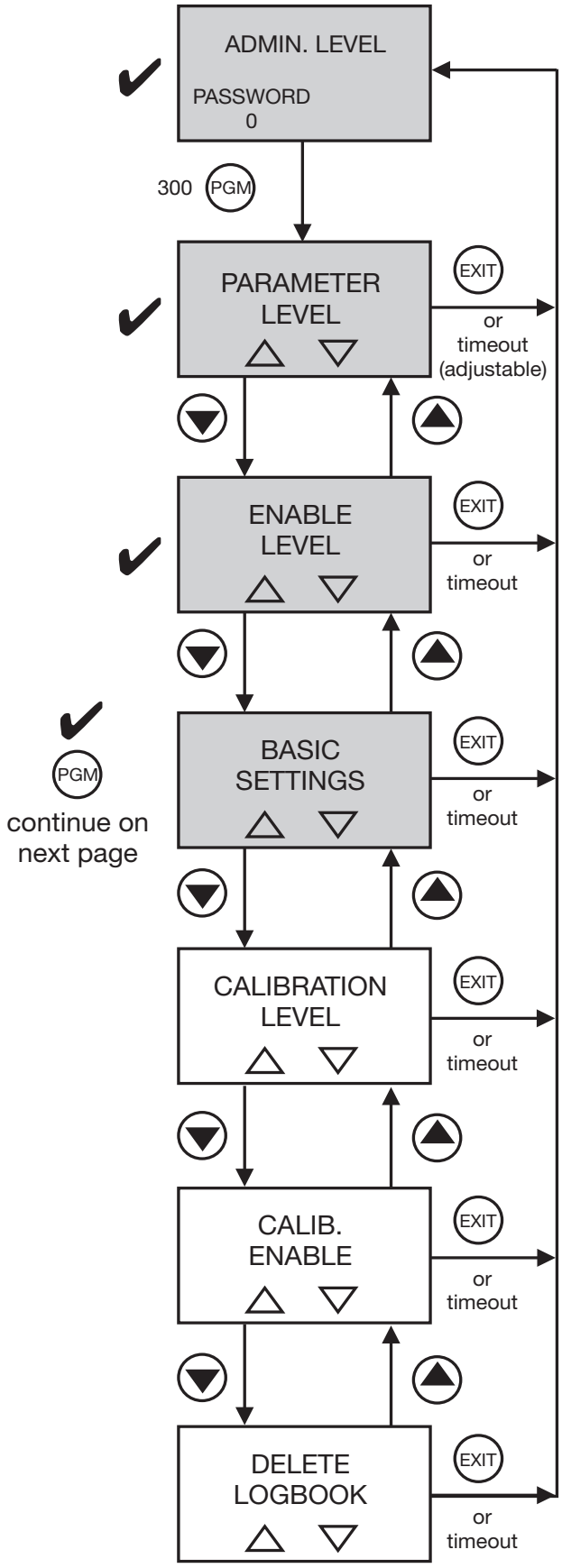
(1) Terminal block 1
(2) Terminal block 2
(3) Temperature signal connection
(4) Level signal connection
(5) Level probe or pressure transmitter

7 Commissioning

Calling up Administrator level

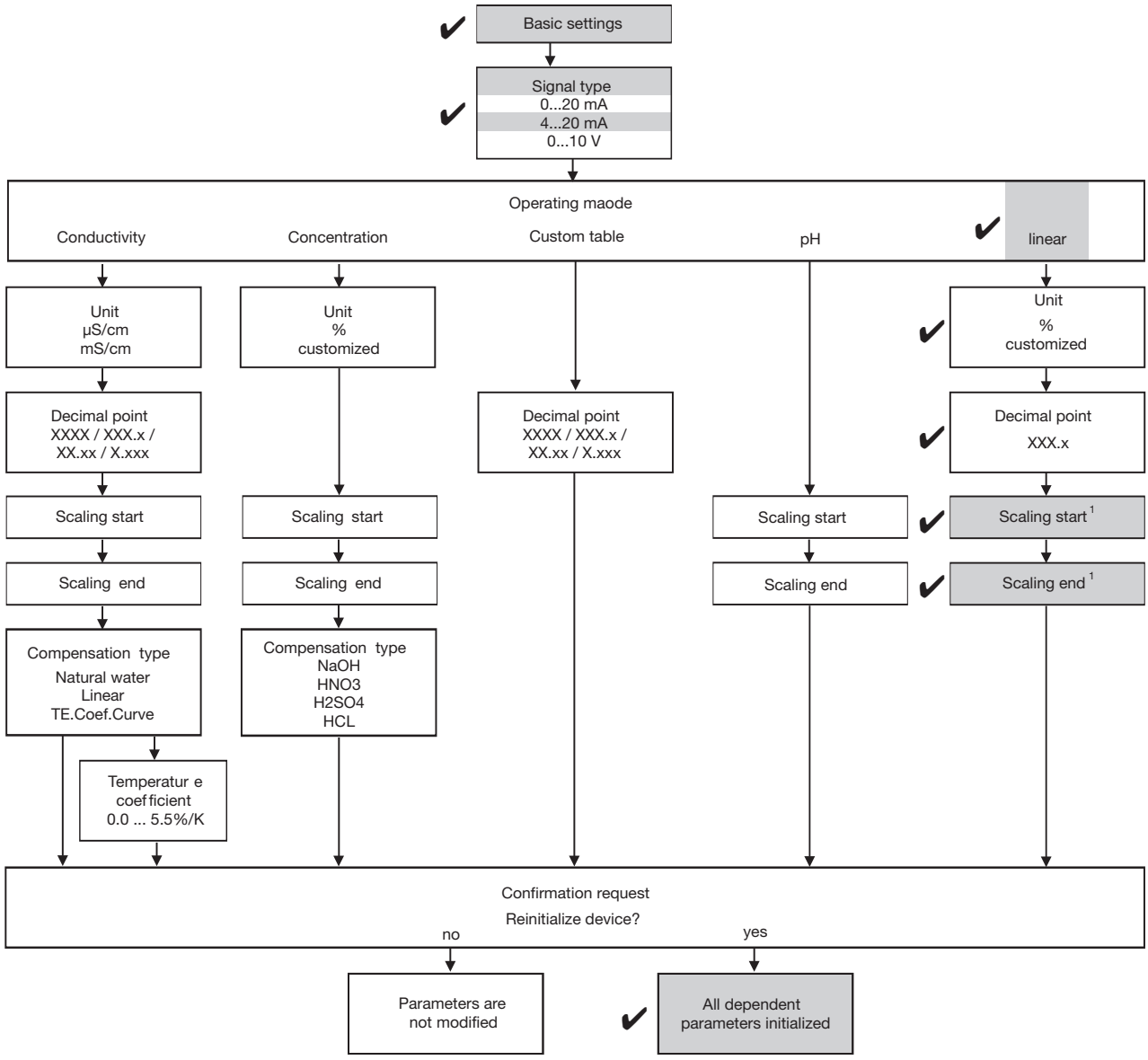


Calling up the basic settings



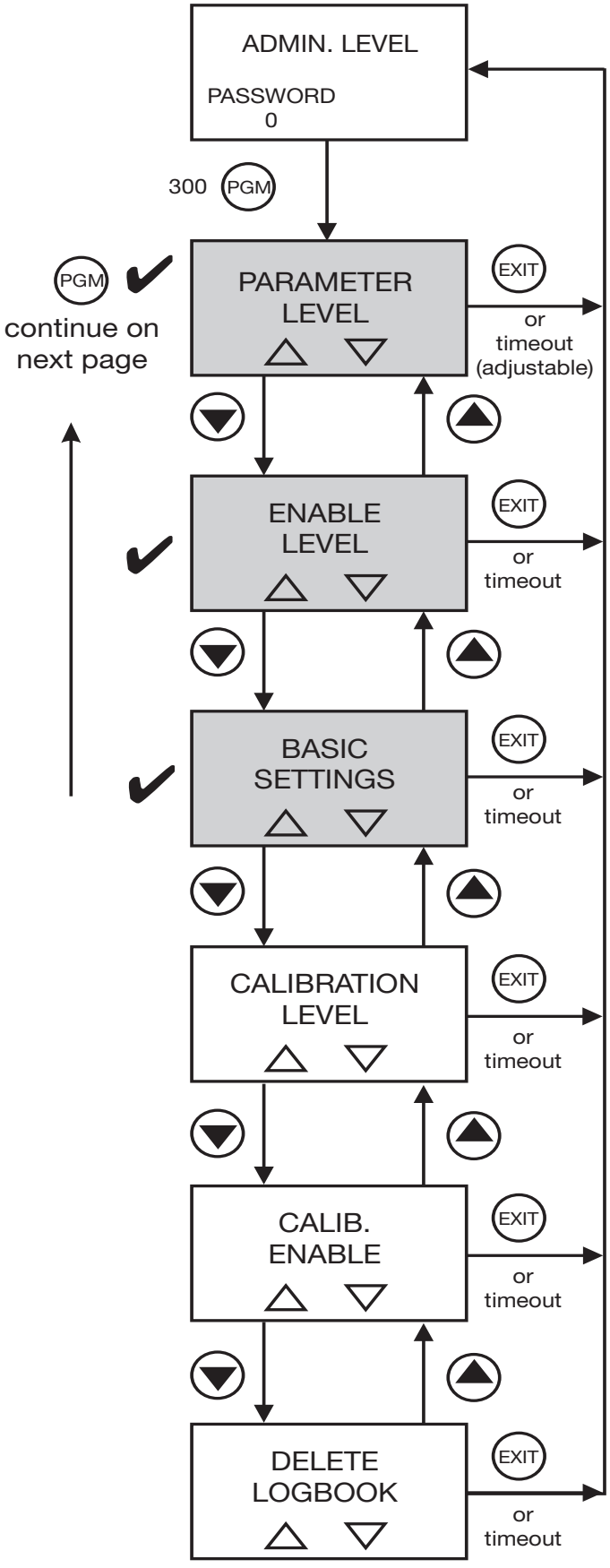
7 Commissioning

Make the basic settings for the main input



1 Value relevant to level measurement probe or pressure transmitter.

Calling up Parameter level



7 Commissioning

Concluding device settings / checks

Input for temperature	Sensor type:	Pt100/Pt1000
	Unit:	°C
	Filter time constant:	2 s
	Manual temperature:	As required
Controller channel 1	Controller type:	Limit controller
	Setpoint:	10%
	Min./Max. contact:	Min. contact
	Hysteresis:	As required
	Pull-in delay:	As required
	Drop-out delay:	As required
	Controller alarm:	As required
	Alarm tolerance:	As required
	Alarm delay:	As required
	In Hold mode:	As required
	On error:	As required
	Max. setpoint:	As required
	Min. setpoint:	As required
Controller channel 2	Controller type:	Limit controller
	Setpoint:	80%
	Min./Max. contact:	Max. contact
	Hysteresis:	As required
	Pull-in delay:	As required
	Drop-out delay:	As required
	Controller alarm:	As required
	Alarm tolerance:	As required
Switching output 1	Function:	Controller 1
	Manual mode:	As required
Switching output 2	Function:	Controller 2
	Manual mode:	As required
Display	Language:	As required
	Lighting:	As required
	LCD inverse:	As required
	Meas. display type:	As required
	Lower display:	Temperature
	Upper display:	Compensated
	Max./Min. reset:	As required
	Op. timeout:	As required
	Contrast:	As required

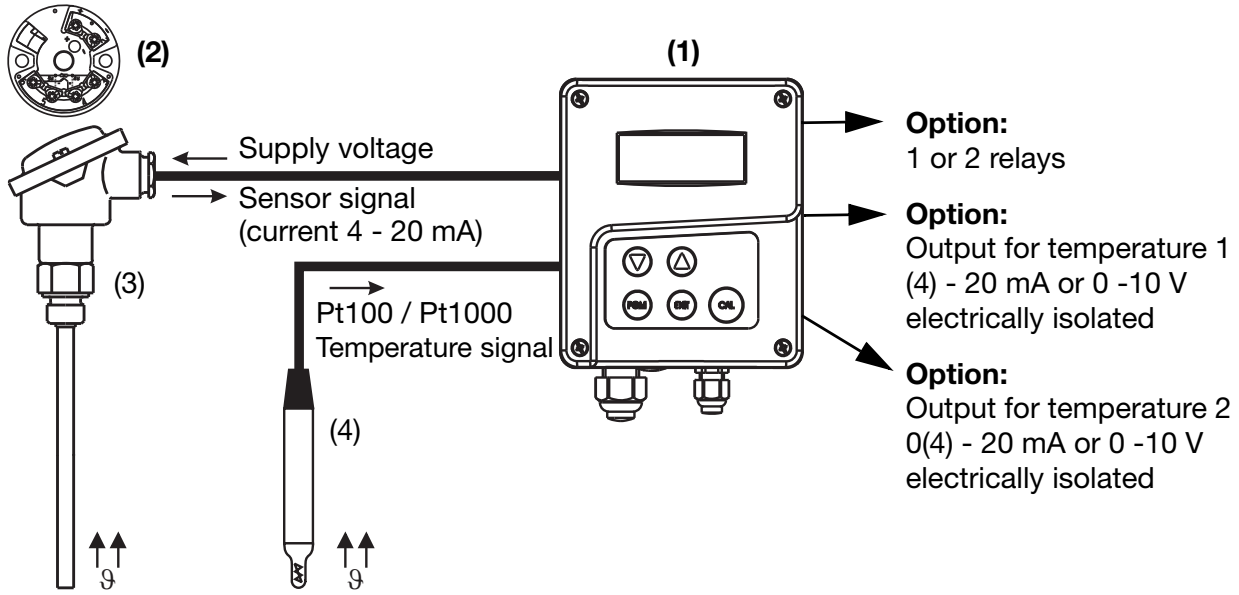
7.2.4 Measuring two temperatures

For temperature sensors, see data sheets 707010, 707030 and 909722.

Task

Measuring range 1:	0 - 100°C
Output signal:	0 - 20 mA
Temperature measurement:	With Pt100
Control function:	Input 1: PID controller
	Input 2: Simple limit switch
Limit value 1:	80°C
Limit value 2:	50°C

Measuring setup

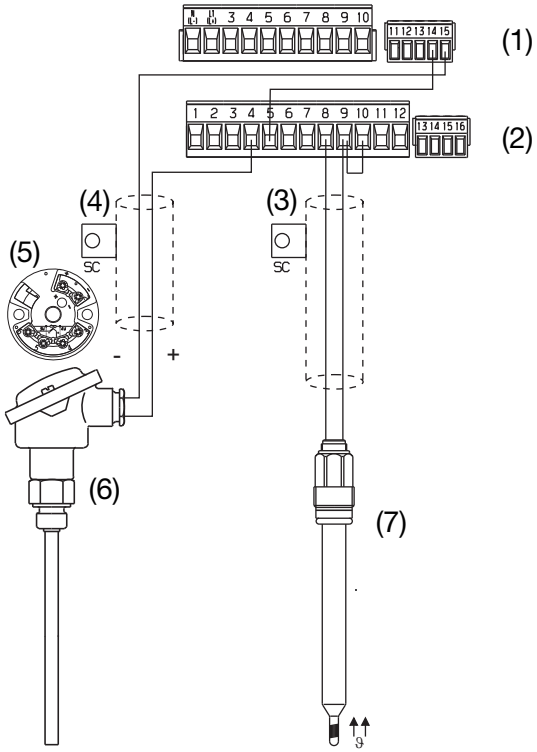


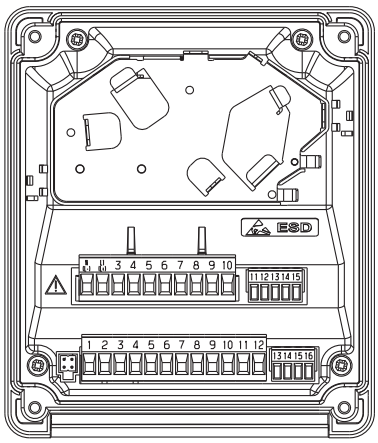
(1) Type 202568
(2) 2-wire transmitter for temperature
(3) Fitting for temperature sensor and 2-wire transmitter
(4) Compensation thermometer

Input 1 can only be changed from °C to °F (customized unit) by means of the setup program!
Input 2 can be changed directly on the device in the "Temperature input / Unit" menu.

7 Commissioning

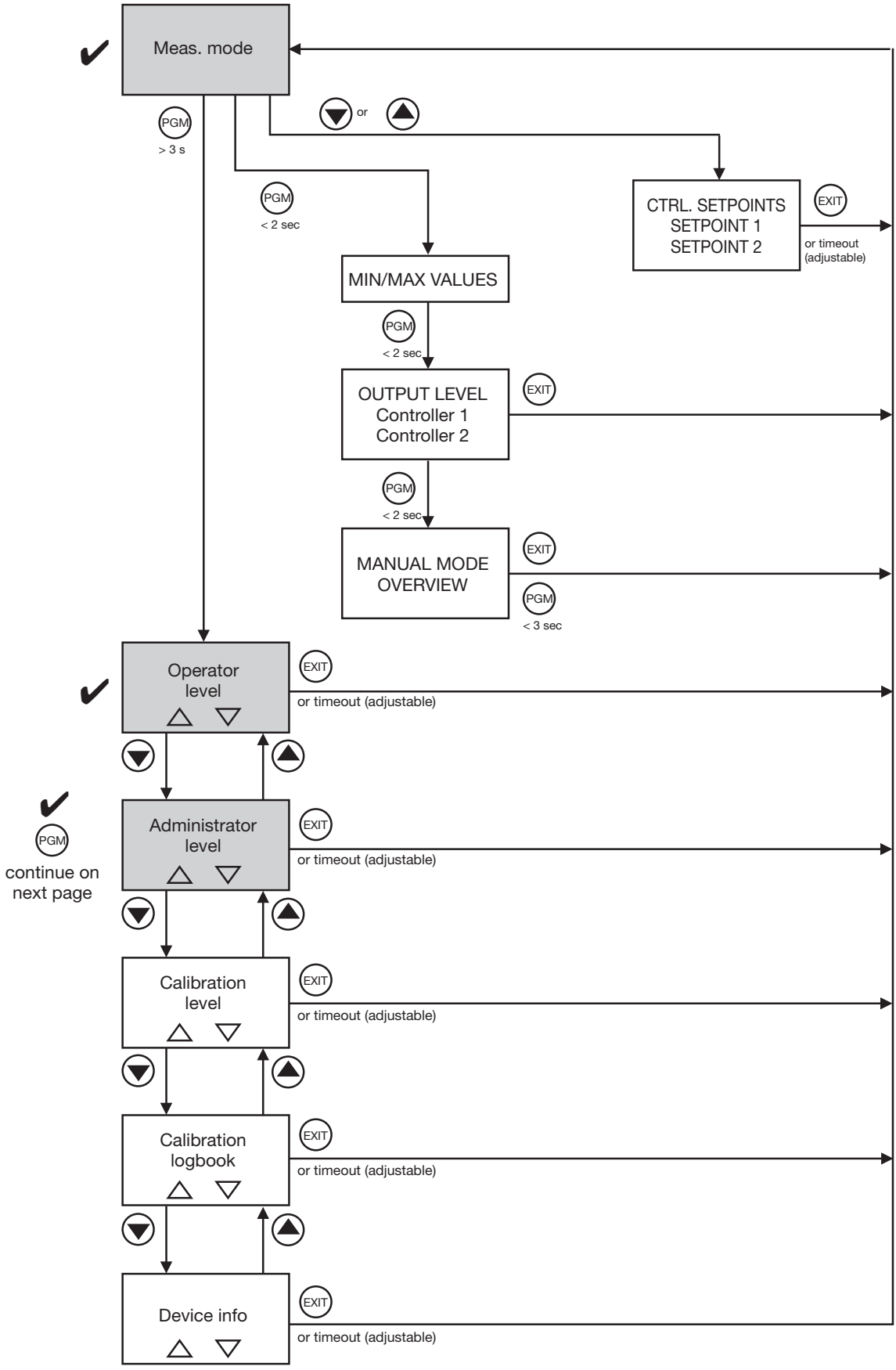
Electrical connection





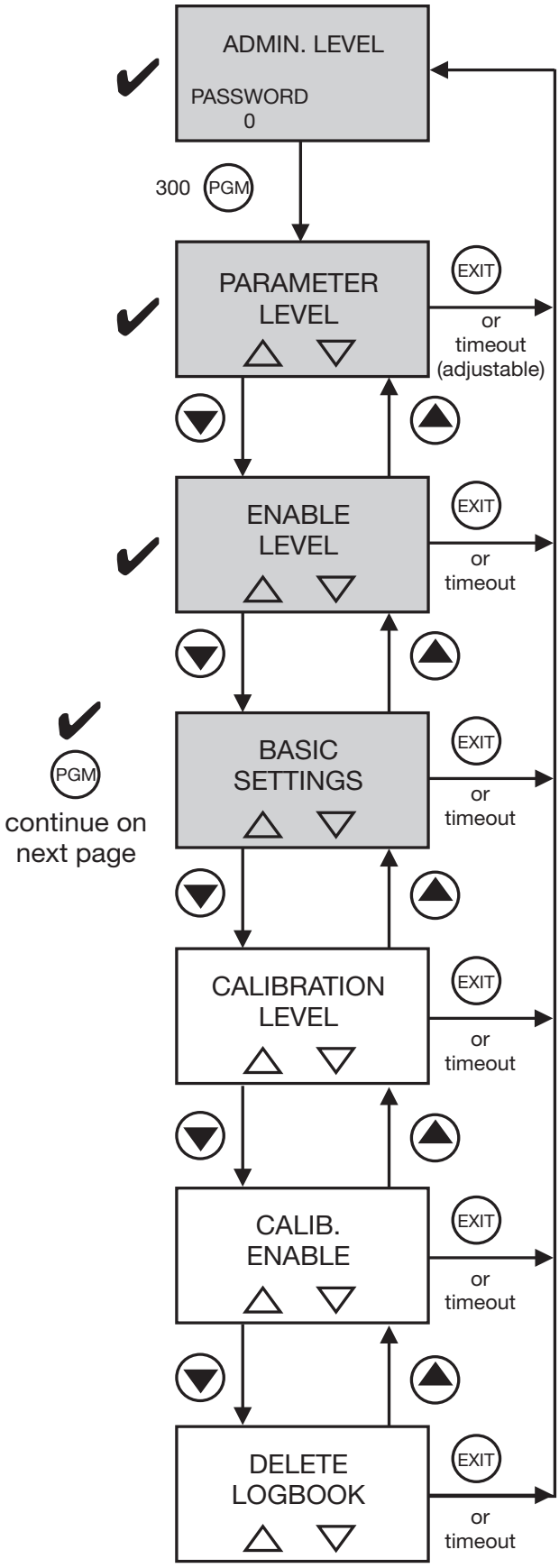
(1) Terminal block 1
(2) Terminal block 2
(3) Temperature signal 2 connection
(4) Temperature signal 1 connection
(5) 2-wire transmitter for temperature
(6) Fitting for temperature sensor and 2-wire transmitter
(7) Compensation thermometer

Calling up Administrator level

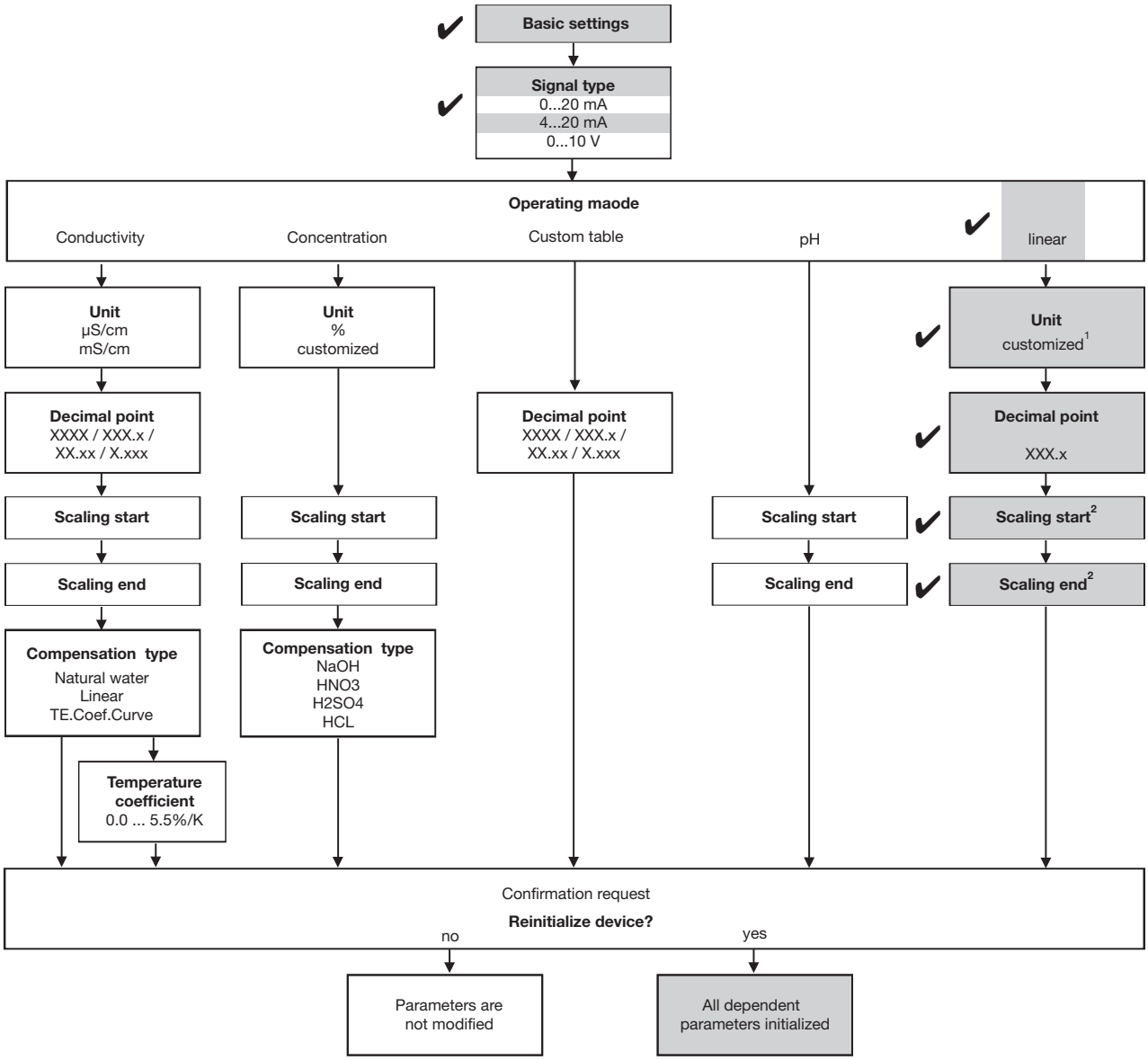


7 Commissioning

Calling up the basic settings



Make the basic settings for the main input

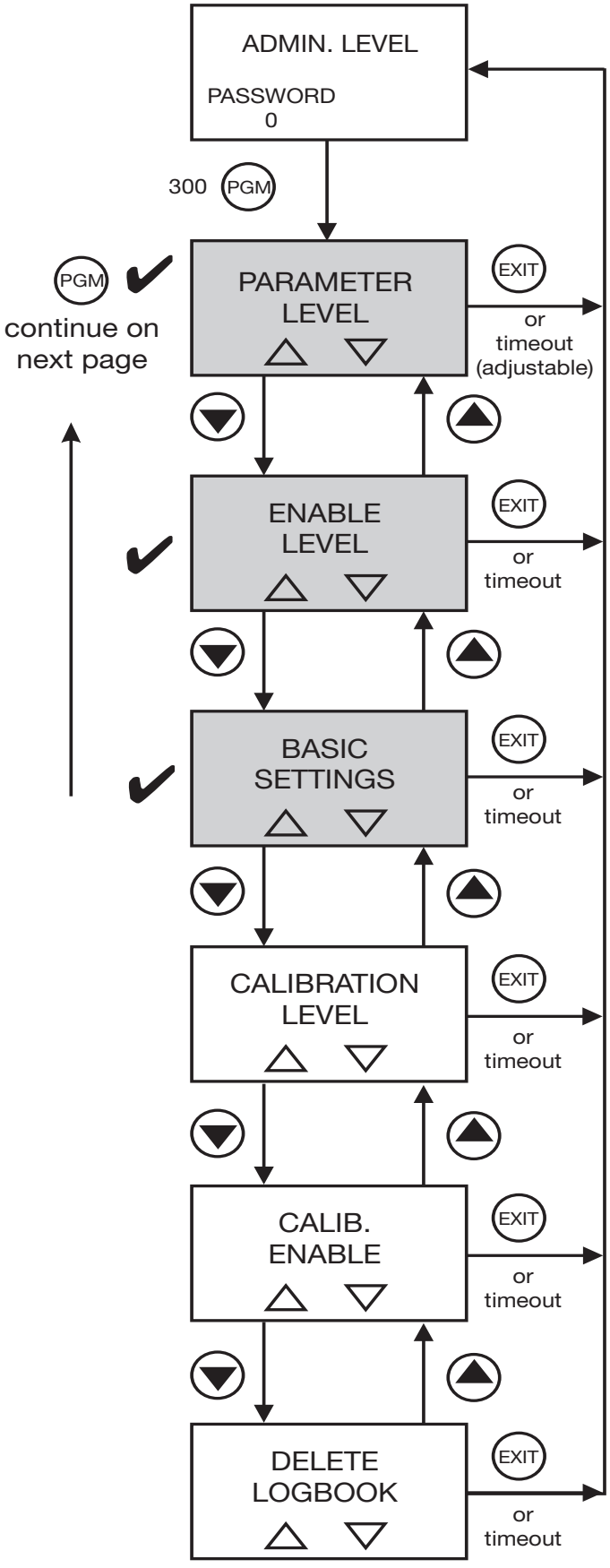


1 It is essential to have the setup program to set the customized unit of measurement!

2 Value relevant to the 2-wire transmitter of temperature sensor 1.

7 Commissioning

Calling up Parameter level



Concluding device settings / checks

Input for temperature[1]	Sensor type:	Pt100/Pt1000
	Unit:	°C
	Filter time constant:	2 s
	Offset:	0.0°C
Controller channel 1[2]	Controller type:	Pulse width controller
	Setpoint:	80.0°C
	Min./Max. contact:	Max. contact
	Proportional band:	As required
	Reset time:	As required
	Derivative time:	As required
	Pulse period:	As required
	Minimum ON time:	As required
	Output level limit:	As required
	Controller alarm:	As required
	Alarm tolerance:	As required
	Alarm delay:	As required
	In Hold mode:	As required
	Hold output level:	As required
	On error:	As required
	Max. setpoint:	As required
	Min. setpoint:	As required
Controller channel 2	Controller type:	Off
Switching output 1[2]	Function:	Controller 1
Switching output 2[1]	Function:	⎍ Temperature
	Switching point:	50.0°C
	Hysteresis:	As required
	Switch-on delay:	As required
	Switch-off delay:	As required
	Pulse time:	As required
	During calibration:	As required
	On error:	As required
	In Hold mode:	As required
	Manual mode:	As required
Analog output 1	Signal selector:	Main variable
	Signal type:	0 - 20 mA
	Scaling start:	0.0°C

	Scaling end:	100.0°C
	During calibration:	As required
	On error:	As required
	In Hold mode:	As required
	Safe value:	As required
	Simulation:	As required
	Simulation value:	As required
Display	Language:	As required
	Lighting:	As required
	Inverse LCD:	As required
	Meas. display type:	As required
	Lower display:	Temperature
	Upper display:	Compensated
	Max./Min. reset:	As required
	Op. timeout:	As required
	Contrast:	As required

[1] The sensor of "Temperature 2" is configured here.

[2] The sensor of "Temperature 1" is configured here.

8 Calibrating a sensor with a standard signal

8.1 Notes

During calibration, relays and analog output signals adopt their configured states!

The sensors connected to the device should be cleaned and the device itself calibrated, at regular intervals (subject to the measuring material).

8.2 General

The device provides three calibration options for adapting the type 202568 to a sensor with a standard signal (e.g. a sensor for free chlorine):

- With one-point offset calibration, the zero point of the sensor is calibrated, see section 8.3 "One-point offset calibration (zero point calibration)", page 76.
- With two-point calibration, the zero point and slope of the sensor are calibrated, see section 8.4 "Two-point calibration", page 78. This is the recommended calibration for most sensors.
- With one-point final value calibration, the slope of the sensor is calibrated, see section 8.5 "Final value calibration", page 80. This is the recommended calibration for chlorine sensors, for example.

Start calibration

Calibration can be started as follows:

- By pressing the CAL key,
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.
- Via ADMINISTR. LEVEL / PASSWORD / CALIB. LEVEL
- Via CALIB. LEVEL in the main menu,
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.

The way in which the outputs respond depends on their configuration.

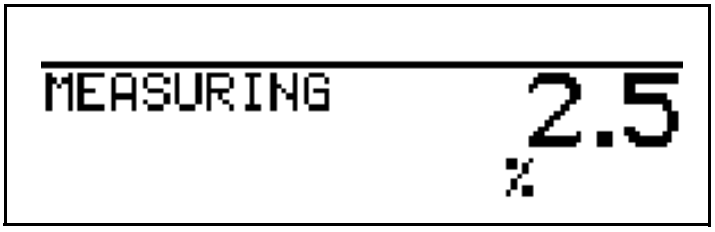
[1] Relevant to the connected 2-wire transmitter.

8 Calibrating a sensor with a standard signal

8.3 One-point offset calibration (zero point calibration)

Requirement

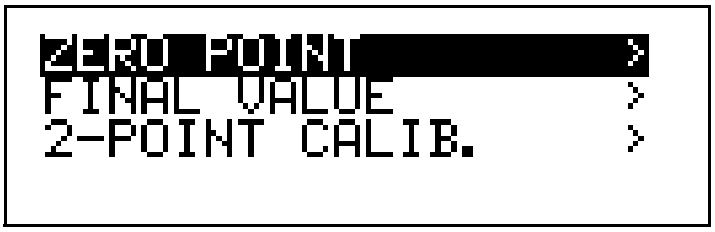
- The type 202568 must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A sensor must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected 2-wire transmitter
  OPERATING MODE "LINEAR"
  UNIT "% or Customized"
  DECIMAL POINT as required
  SCALING START [1]
  SCALING END [1]
  .
- Calibration must be enabled,
  see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



✱ Now bring the system to a defined state (e.g. when measuring liquid level: empty the container).

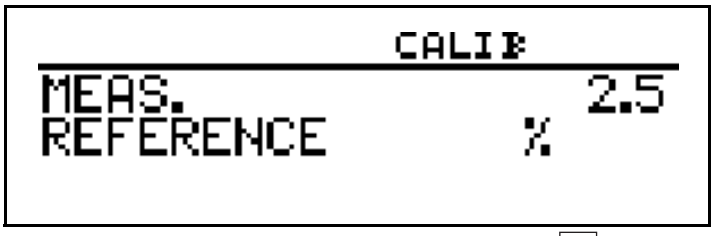
The way in which the outputs respond depends on their configuration.

✱ Start calibration (by pressing the CAL key or via Administrator level).

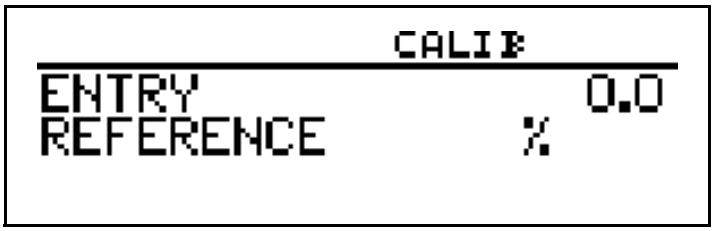


✱ Start the zero point calibration with the PGM key.

[1] Relevant to the connected 2-wire transmitter.



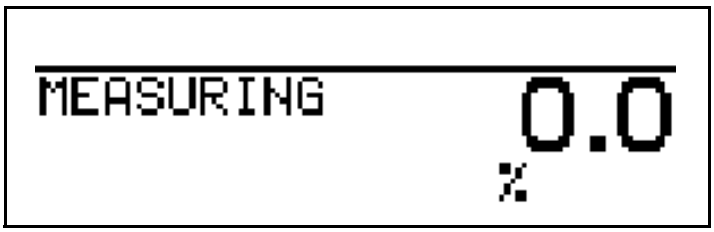
Wait until the display value has stabilized; then press PGM to continue.



✱ Set the displayed value to the required value (usually 0%) with keys ▼ or ▲ ; then press PGM to continue.

The zero point determined by the device is displayed.

✱ Use the PGM key to accept the value or the EXIT key to reject it.



The device returns to measuring mode.

8 Calibrating a sensor with a standard signal

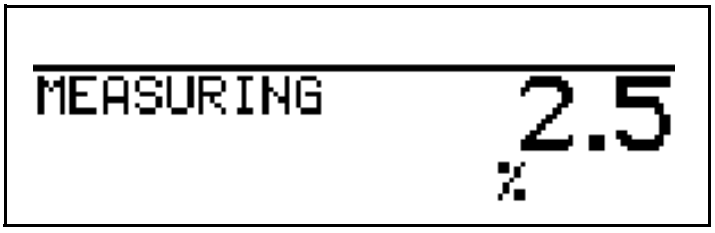
8.4 Two-point calibration

The values determined during calibration (zero point and slope) work out as follows:

$$\text{display} = \frac{\text{input value}}{\text{slope}} + \text{zero point}$$

Requirement

- The device must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A sensor must be connected.
- The configuration of the basic settings must be as follows:
  INPUT "STANDARD SIGNAL"
  SIGNAL TYPE relevant to the connected 2-wire transmitter
  OPERATING MODE "LINEAR"
  UNIT "% or customized"
  DECIMAL POINT as required
  SCALING START [1]
  SCALING END [1]
- Calibration must be enabled,
  see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".

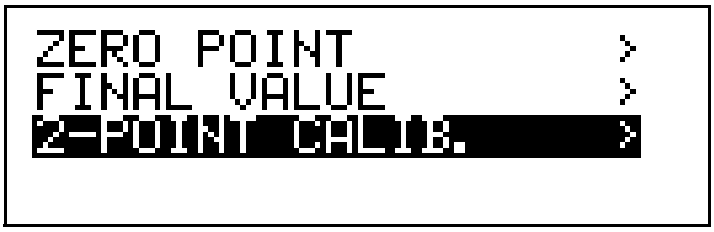


✱ Now bring the system to a defined state (e.g. when measuring liquid level: empty the container).

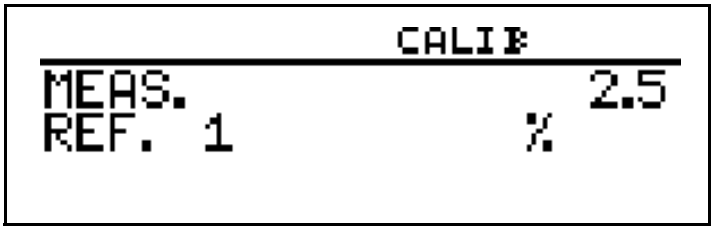
The way in which the outputs respond depends on their configuration.

✱ Start calibration (by pressing the CAL key or via Administrator level).

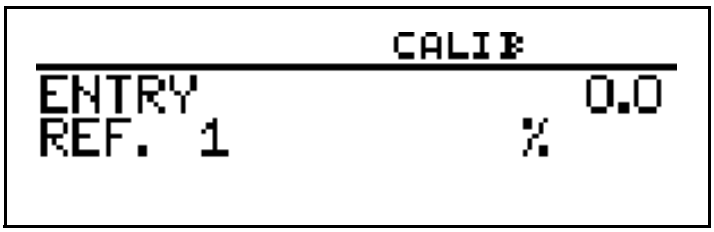
[1] Relevant to the connected 2-wire transmitter.



✱ Start the 2-point calibration with the PGM key.

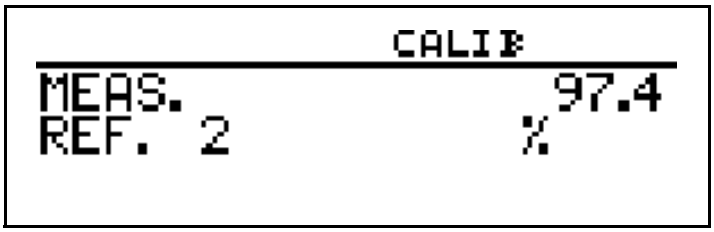


✱ Wait until the display value has stabilized; then press PGM to continue.

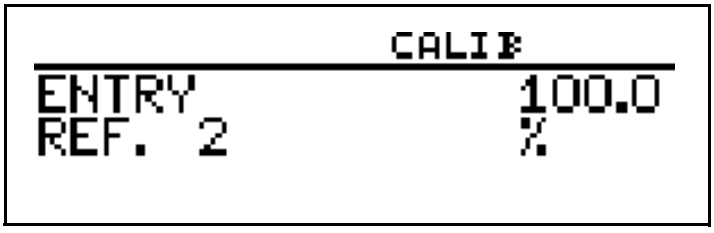


✱ Set the displayed value to the required value (usually 0) with keys ▼ or ▲ ; then press PGM to continue.

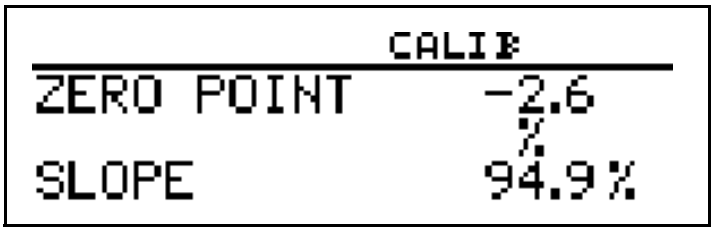
✱ Now bring the system to a second defined state (e.g. when measuring liquid level: container full).



✱ Wait until the display value has stabilized; then press PGM to continue.

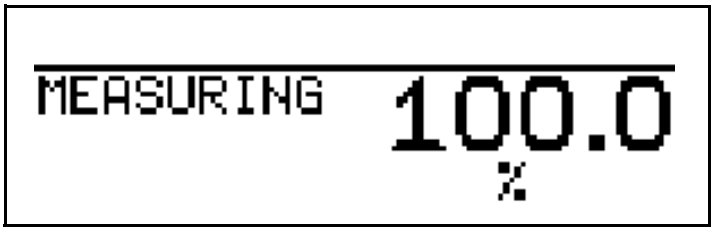


✱ Set the displayed value to "Maximum" (usually 100%) with keys ▼ or ▲ ; then press PGM to continue.



The zero point and slope determined by the device are displayed.

✱ Use the PGM key to accept the calibrated values or reject them with the EXIT key.



The device returns to measuring mode.

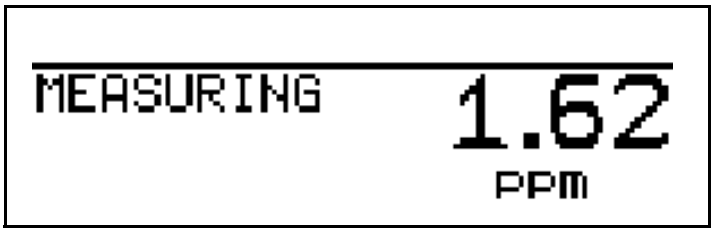
8.5 Final value calibration

Requirement

- The type 202568 must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A sensor must be connected.
- The configuration of the basic settings must be as follows:
  INPUT "STANDARD SIGNAL"
  SIGNAL TYPE relevant to the connected 2-wire transmitter
  OPERATING MODE "LINEAR"
  UNIT "ppm or customized"
  DECIMAL POINT as required
  SCALING START[1]
  SCALING END[1]
  .
- Calibration must be enabled, see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".

For a configuration example see section 7.2.2 "Measuring the concentration of free chlorine", page 53.

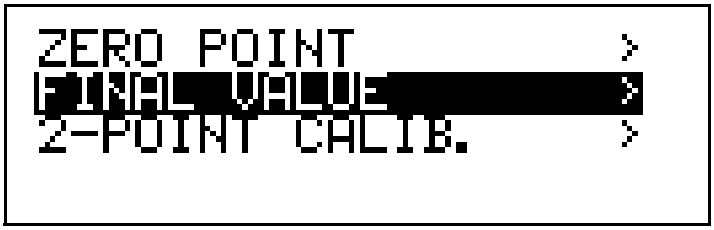
[1] Relevant to the connected 2-wire transmitter.



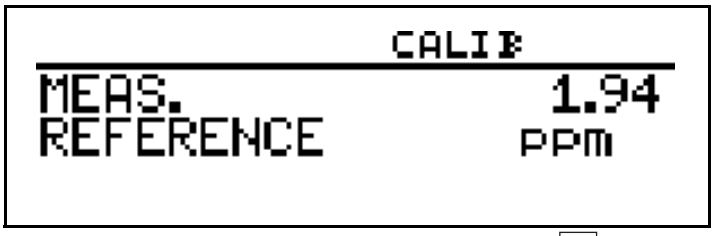
✱ The process must now be brought to the state that is as relevant as possible to the final value (e.g. when measuring chlorine, the required concentration).

The way in which the outputs respond depends on their configuration.

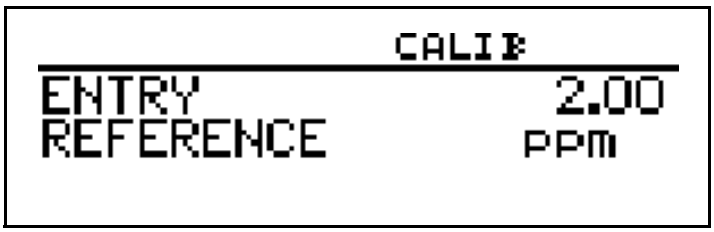
✱ Start calibration (by pressing the CAL key or via Administrator level).



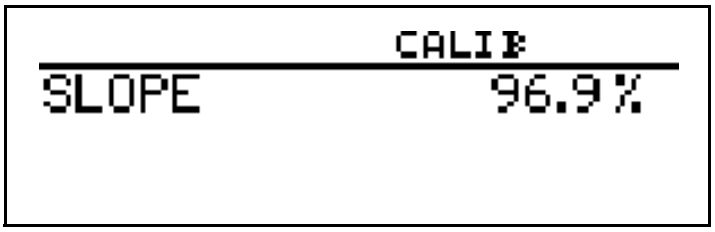
✱ Start the zero point calibration with the PGM key.



Wait until the display value has stabilized; then press PGM to continue.

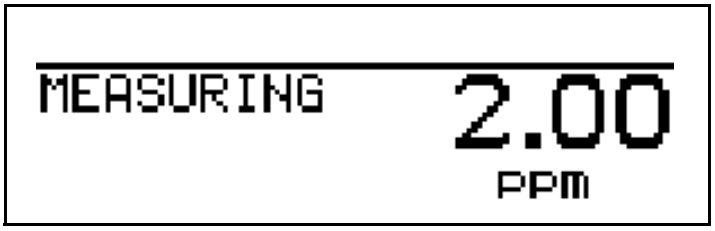


✱ Set the displayed value to the required final value with keys ▼ or ▲ ; then press PGM to continue.



The slope determined by the device is displayed.

✱ Use the PGM key to accept the value or the EXIT key to reject it.



The device returns to measuring mode.

9 Calibrating a pH combination electrode

9.1 Notes

During calibration, relays and analog output signals adopt their configured states!

The sensors connected to the device should be cleaned and the device itself calibrated, at regular intervals (subject to the measuring material).

9.2 General

The device provides two calibration options for adapting the type 202568 to a pH combination electrode:

- With one-point offset calibration, the zero point of the pH combination electrode is calculated, See section 9.3 "One-point offset calibration (zero point calibration)", page 84.
  Recommended only for special applications, such as ultra-pure water.
- With two-point calibration, the zero point and slope of the combination electrode are calibrated, See section 9.4 "Two-point calibration", page 86.
  This is the recommended calibration for most sensors.

Start calibration

The device must be configured for pH measurement!

For a configuration example See section 7.2.1 "Measuring the pH value with a pH combination electrode and a 2-wire transmitter", page 45.

Calibration can be started as follows:

- By pressing the CAL key,
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.
- Via ADMINISTR. LEVEL / PASSWORD / CALIB. LEVEL.
- Via CALIB. LEVEL
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.

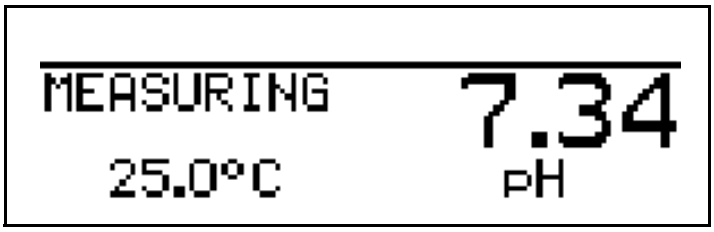
The way in which the outputs respond depends on their configuration.

9 Calibrating a pH combination electrode

9.3 One-point offset calibration (zero point calibration)

Requirement

- The type 202568 must be supplied with voltage.
  See section 5 "Electrical connection", page 16 ff.
- A combination electrode with a 2-wire transmitter must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE [1]
  OPERATING MODE "pH"
  SCALING START [1]
  SCALING END [1]
  .
- Calibration must be enabled,
  See section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



The buffer solution must maintain a constant temperature during calibration!

✱ Start calibration (by pressing the CAL key or via Administrator level).

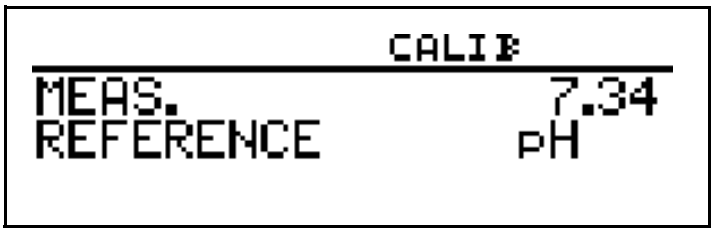
.

✱ Start the zero point calibration with the PGM key.

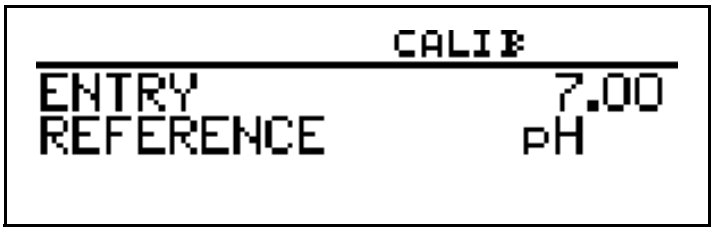
✱ Immerse the combination electrode in a buffer solution with a known pH value (usually around pH 7).

[1] Relevant to the connected 2-wire transmitter.

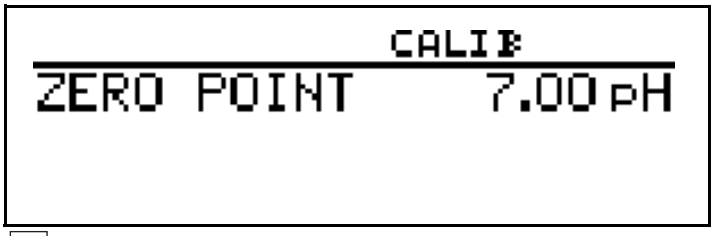
✱ With manual temperature entry, use the ▼ or ▲ keys to set the calibration solution temperature and confirm your entry with the PGM key.



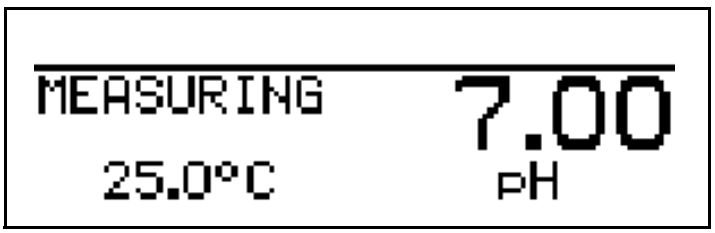
✱ Wait until the display value has stabilized; then press PGM to continue.



✱ Set the displayed value to the buffer solution value with the ▼ or ▲ keys; then press PGM to continue.



✱ Use the PGM key to accept the zero point or the EXIT key to reject it.



The device returns to measuring mode.

Calibration is complete

After rinsing, the combination electrode can again be used to take measurements.

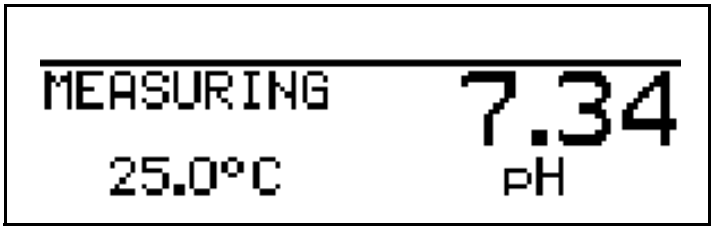
9 Calibrating a pH combination electrode

9.4 Two-point calibration

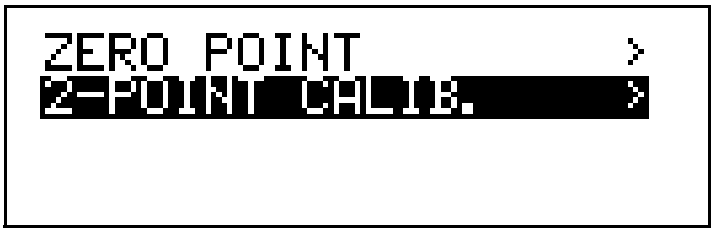
The buffer solutions (reference solutions) used for calibration must differ by at least 2 pH!
During the calibration, the temperature of the two buffer solutions must be identical and remain constant!

Requirement

- The type 202568 must be supplied with voltage.
  See section 5 "Electrical connection", page 16 ff.
- A combination electrode with a 2-wire transmitter must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE [1]
  OPERATING MODE "pH"
  SCALING START [1]
  SCALING END [1]
  .
- Calibration must be enabled,
  See section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



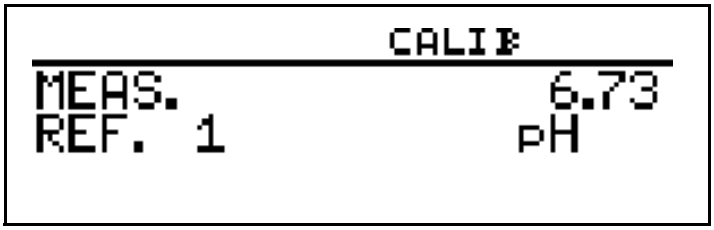
✱ Start calibration (by pressing the CAL key order or via Administrator level).



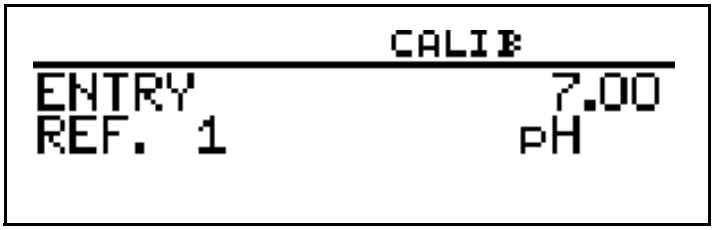
✱ Start the 2-point calibration with the PGM key.

✱ Immerse the combination electrode in the first buffer solution with the known pH value.

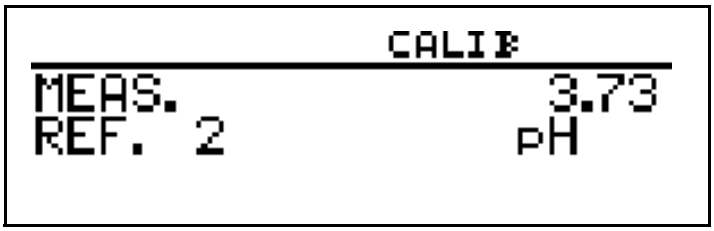
* With manual temperature entry, use the ▼ or ▲ keys to set the buffer solution temperature and confirm your entry with the PGM key.



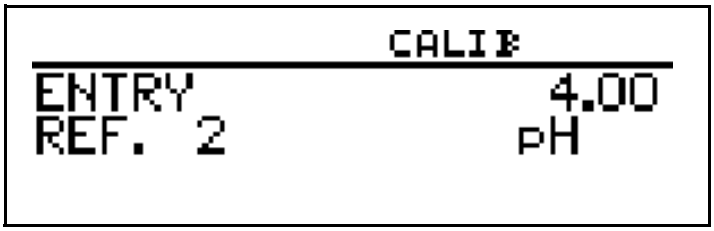
* Wait until the display value has stabilized; then press PGM to continue.



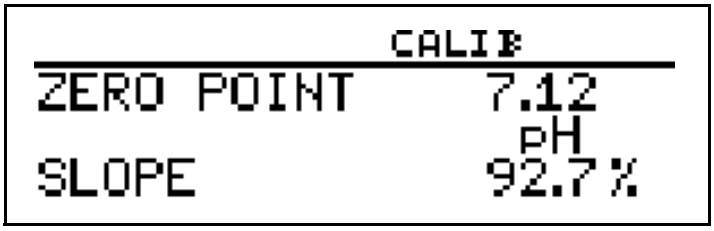
* Set the displayed value to the value of the first buffer solution with the ▼ or ▲ keys; then press PGM to continue.



* Rinse the pH combination electrode.
* Immerse the pH combination electrode in the second buffer solution.
* Wait until the display value has stabilized; then press PGM to continue.

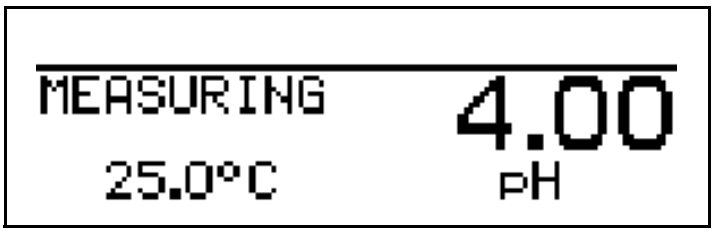


* Set the displayed value to the value of the second buffer solution with the ▼ or ▲ keys; then press PGM to continue.



The zero point and slope determined by the device are displayed.

✱ Use the PGM key to accept the calibrated values or reject them with the EXIT key.



The device returns to measuring mode.

Calibration is complete

After rinsing, the combination electrode can again be used to take measurements.

10 Calibrating a redox combination electrode

10.1 Notes

During calibration, relays and analog output signals adopt their configured states!

The sensors connected to the device should be cleaned and the device itself calibrated, at regular intervals (subject to the measuring material).

10.2 General

The device provides two calibration options for adapting the type 202568 to a redox combination electrode:

- With one-point offset calibration, the zero point of the combination electrode is calibrated, See section 10.3 "One-point offset calibration (zero point calibration)", page 90. This is the recommended method if "mV" has been configured as the UNIT.
- With two-point calibration, the zero point and slope of the combination electrode are calibrated, See section 10.4 "Two-point calibration", page 92. This is the recommended method if "%" or "CUSTOMIZED" has been configured as the UNIT.
- With one-point final value calibration, the slope of the combination electrode is calibrated. This calibration is not recommended for redox measurements!

Start calibration

Calibration can be started as follows:

- By pressing the CAL key,
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.
- Via ADMINISTR. LEVEL / PASSWORD / CALIB. LEVEL
- Via CALIB. LEVEL
  if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.

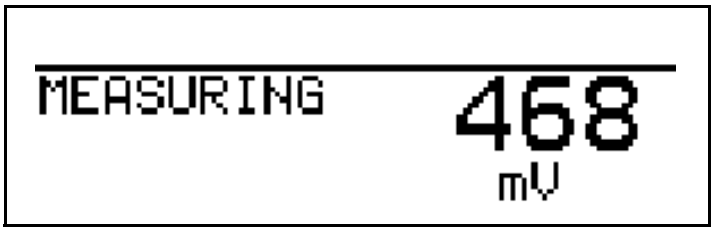
The way in which the outputs respond depends on their configuration.

10 Calibrating a redox combination electrode

10.3 One-point offset calibration (zero point calibration)

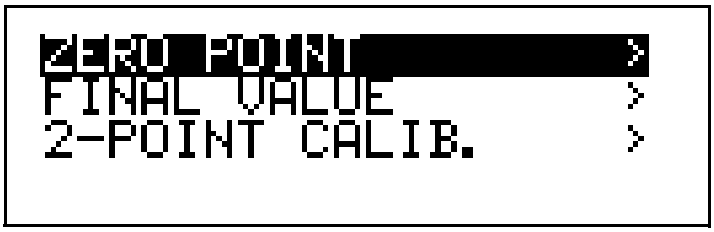
Requirement

- The type 202568 must be supplied with voltage.
  See section 5 "Electrical connection", page 16 ff.
- A combination electrode with a 2-wire transmitter must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected 2-wire transmitter
  OPERATING MODE "LINEAR"
  UNIT "mV"
  DECIMAL POINT as required
  SCALING START [1]
  SCALING END [1]
  .Calibration must be enabled,
  See section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



The redox voltage of a measurement solution is **not** temperature-dependent!

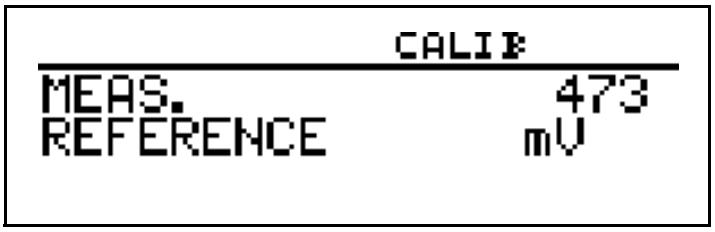
✱ Start calibration (by pressing the CAL key or via Administrator level).



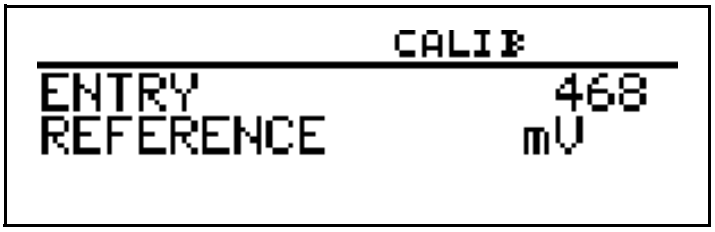
✱ Immerse the combination electrode in a buffer solution with a known redox potential.

✱ Start the zero point calibration with the PGM key.

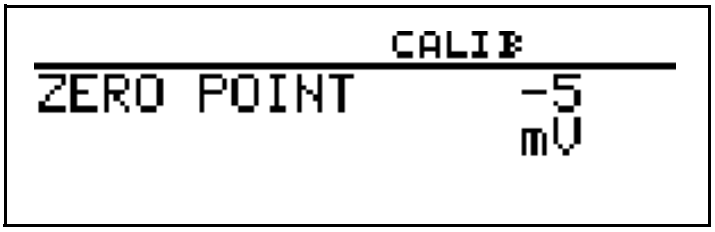
[1] Relevant to the connected 2-wire transmitter.



Wait until the display value has stabilized; then press PGM to continue.

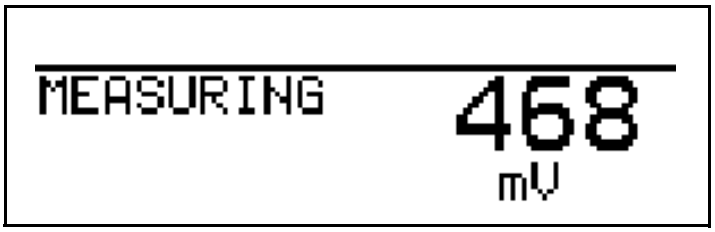


✱ Set the displayed value to the buffer solution value with the ▼ or ▲ keys; then press PGM to continue.



The zero point determined by the device is displayed.

✱ Use the PGM key to accept the value or
the EXIT key to reject it.



The device returns to measuring mode.

Calibration is complete

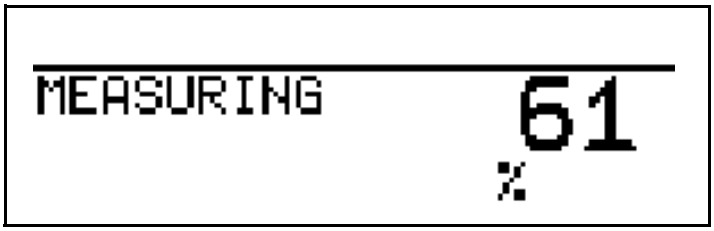
After rinsing, the combination electrode can again be used to take measurements.

10 Calibrating a redox combination electrode

10.4 Two-point calibration

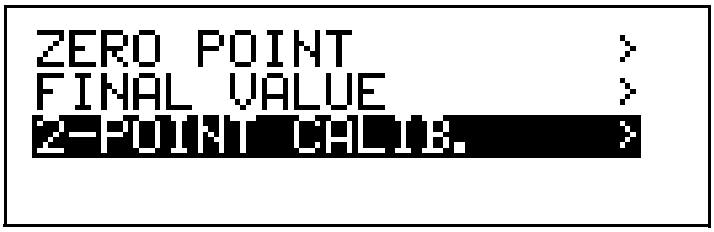
Requirement

- The device must be supplied with voltage.
  See section 5 "Electrical connection", page 16 ff.
- A combination electrode must be connected to the transmitter.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected 2-wire transmitter
  OPERATING MODE "LINEAR"
  UNIT "%"
  DECIMAL POINT as required
  SCALING START[1]
  SCALING END[1].
- Calibration must be enabled,
  See section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



The redox potential of a measurement solution is **not** temperature-dependent!

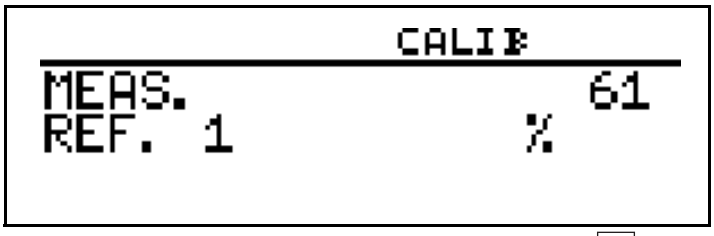
✱ Start calibration (by pressing the CAL key or via Administrator level).



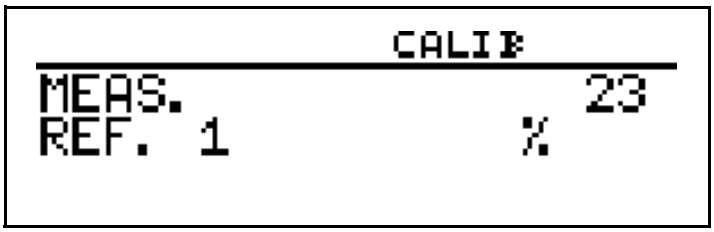
✱ Start the 2-point calibration with the PGM key.

✱ Immerse the combination electrode in a solution with a known redox potential.

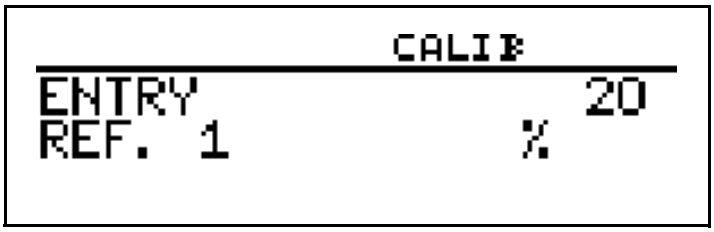
[1] Relevant to the connected 2-wire transmitter.



✱ Wait until the display value has stabilized; then press PGM to continue.

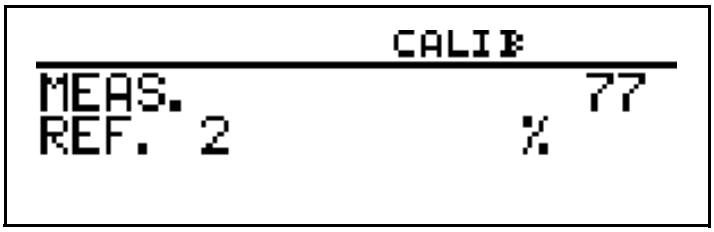


✱ Set the displayed value to the required value of the first solution with the ▼ or ▲ keys; then press PGM to continue.

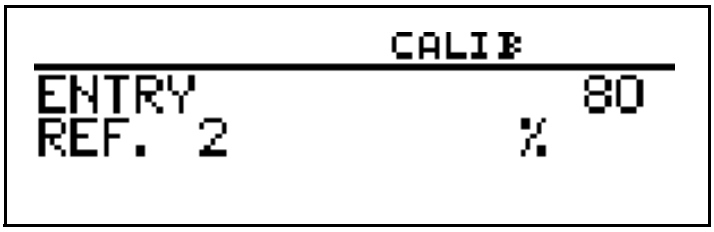


✱ Rinse the redox combination electrode.

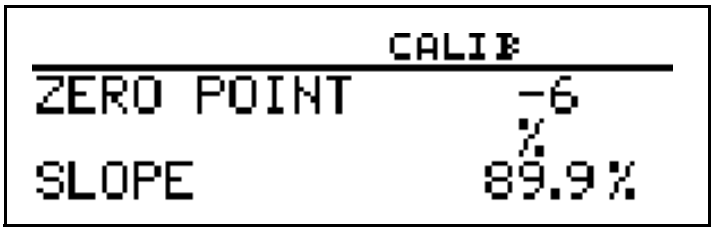
✱ Immerse the redox combination electrode in the second solution.



✱ Wait until the display value has stabilized; then press PGM to continue.

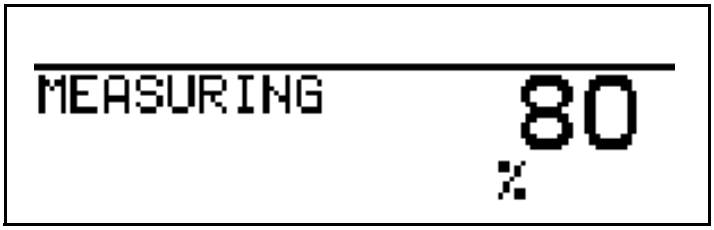


✱ Set the displayed value to the value of the second buffer solution with the ▼ or ▲ keys; then press PGM to continue.



The zero point and slope determined by the device are displayed.

✱ Use the PGM key to accept the calibrated values or reject them with the EXIT key.



The device returns to measuring mode.

Calibration is complete

After rinsing, the combination electrode can again be used to take measurements.

11 Calibrating conductive conductivity cells

11.1 Notes

During calibration, relays and analog output signals adopt their configured states!

The sensors connected to the device should be cleaned and the device itself calibrated, at regular intervals (subject to the measuring material).

11.2 General

Requirement

A conductive conductivity cell delivers a standard signal to the type 202568 either via an external transmitter provided by the customer or via a transmitter integrated in the measuring cell.
If the signal is not yet temperature compensated, or if there are measurement errors because of cell constant deviations, the type 202568 can take on the task of temperature compensation and/or cell calibration.

The device provides two calibration options for adapting the type 202568 to conductive conductivity cells:

- Calibration of the relative cell constants; this is a one-point calibration, see section 11.3 "Calibrating the relative cell constant", page 96.
- Calibration of a linear temperature coefficient; this is a two-point calibration, see section 11.4 "Calibrating the temperature coefficient of the measurement solution", page 98.
- Calibration of a non-linear temperature coefficient. Here the temperature coefficient is calibrated at six points, see section 11.4 "Calibrating the temperature coefficient of the measurement solution", page 98.

Start calibration

Calibration can be started as follows:

- By pressing the CAL key, if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.
- Via ADMINISTR. LEVEL / PASSWORD / CALIB. LEVEL
- Via CALIB. LEVEL if this has been enabled in ADMINISTR. LEVEL / PASSWORD / CALIB. ENABLE.

The way in which the outputs respond depends on their configuration.

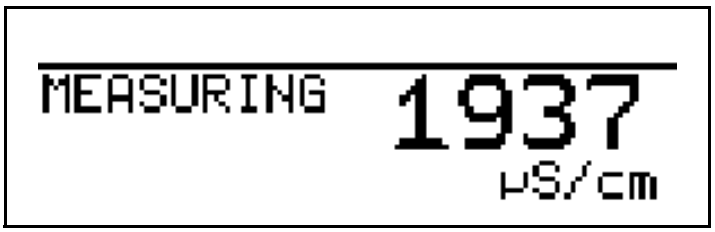
11 Calibrating conductive conductivity cells

11.3 Calibrating the relative cell constant

When there is an increased demand for accuracy, the cell constant first has to be calibrated.

Requirement

- The type 202568 must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A sensor must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected transmitter
  OPERATING MODE "CONDUCTIVITY"
  UNIT mS/cm or µS/cm
  DECIMAL POINT as required
  SCALING START[1]
  SCALING END[1]
  .
- Calibration must be enabled,
  see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".

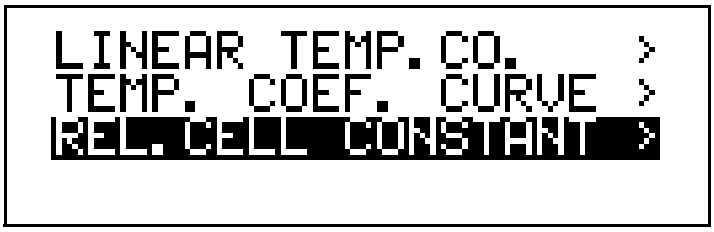


The measurement solution must maintain a constant temperature during calibration!

✱ Press the CAL key or
select the calibration level (CALIBR. LEVEL) or
at Administrator level (password required), select the calibration level.

✱ Immerse the conductivity sensor in a reference solution with a known conductivity.

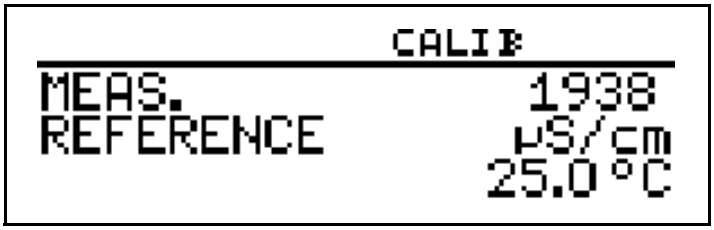
[1] Relevant to the connected transmitter.



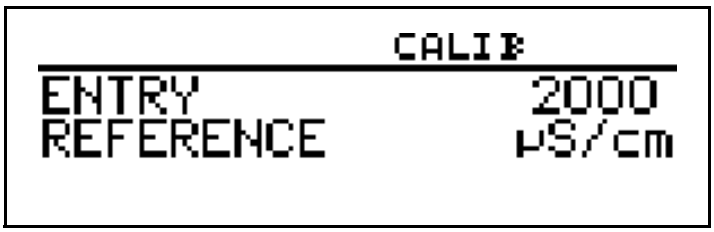
✱ Select REL. CELL CONSTANT;

✱ Press the PGM key.

.

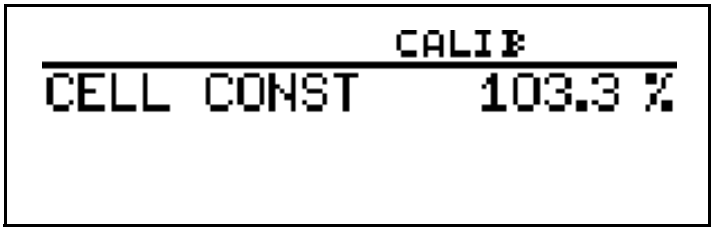


✱ When the measurement value is steady, press the PGM key; the displayed conductivity measurement flashes.

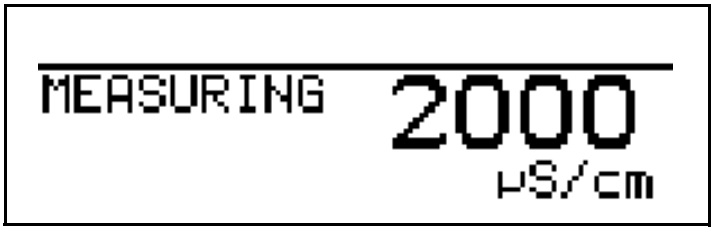


✱ Use the ▼ or ▲ keys to set the value to the actual conductivity.

✱ Press the PGM key; the relative cell constant determined by the device is displayed (as a %).



✱ Use the PGM key to accept the temperature coefficient or the EXIT key to reject it.



The current measurement value and the temperature are displayed.

11 Calibrating conductive conductivity cells

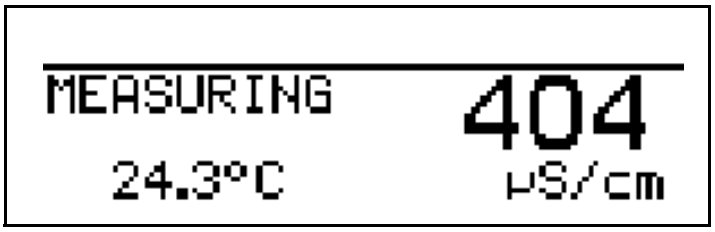
11.4 Calibrating the temperature coefficient of the measurement solution

11.4.1 Linear Temperature coefficient

The conductivity of each measurement solution changes in accordance with its specific temperature coefficient.
We therefore recommend that you run a temperature coefficient calibration.

Requirement

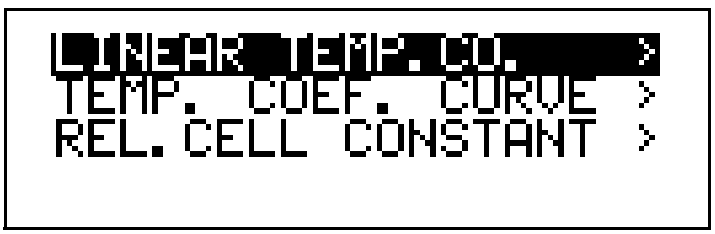
- The type 202568 must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A conductivity transmitter must be connected.
- A temperature sensor must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected transmitter
  OPERATING MODE "CONDUCTIVITY"
  UNIT mS/cm or µS/cm
  DECIMAL POINT as required
  SCALING START[1]
  SCALING END[1]
  .
- Calibration must be enabled,
  see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



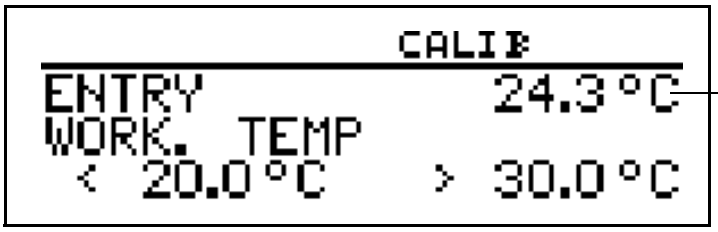
✱ Immerse the conductivity sensor in a sample of the measurement solution.

✱ Press the CAL key or
select the calibration level (CALIBR. LEVEL) or
at Administrator level (password required), select the calibration level.

✱ Select "LINEAR TEMP. CO.".



[1] Relevant to the connected 2-wire transmitter.

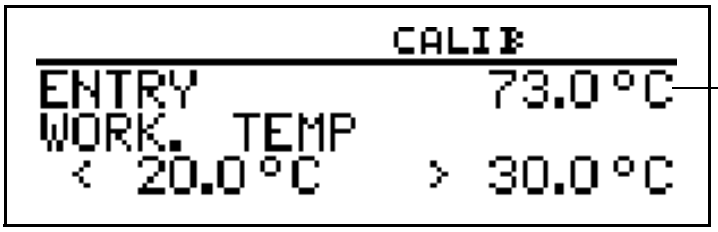


(1)

The displayed current sensor temperature flashes (1).

✱ Enter the required working temperature and confirm your entry.

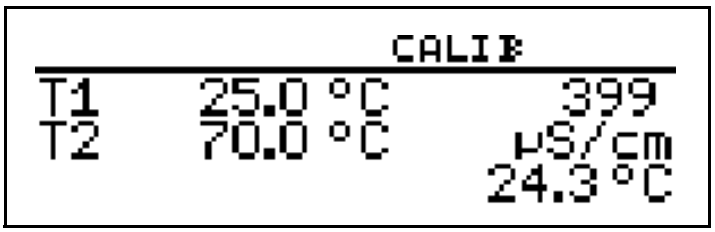
The working temperature must be at least 5°C above or below the reference temperature (25.0°C).



(2)

The LC display now shows the chosen working temperature (flashing) (2).

✱ Press the PGM key.



The conductivity (399 µS/cm) at the current temperature (24.3°C) now appears on the right of the LC display.
The temperatures T1 (25°C) and T2 (70.0°C) that have yet to be triggered are shown on the left.

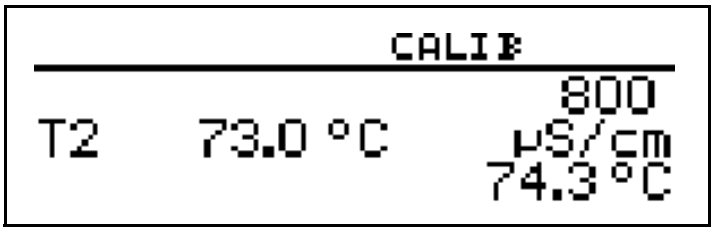
✱ Press the PGM key.

✱ Heat the measuring material until the working temperature is reached.

During calibration, the rate of temperature change in the measurement solution must not exceed 10 °C/min.

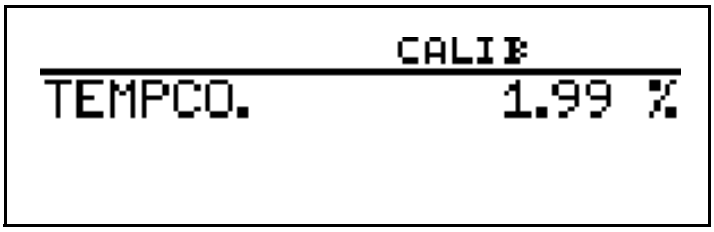
Calibration is also possible in the cooling process (with a falling temperature). It starts above the working temperature and ends below the working temperature.

As soon as the temperature of the measuring material exceeds T1 (25°C), this is hidden on the display. The uncompensated conductivity at the current temperature is displayed on the right.

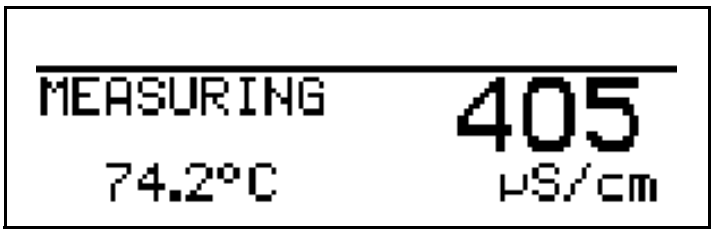


If the temperature of the medium exceeded T2 (73.0°C), the device determines the temperature coefficient.

The LC display now shows the determined temperature coefficient as %/°C.



✱ Use the PGM key to accept the temperature coefficient or the EXIT key to reject it.



The transmitter is in "measuring mode" and displays the compensated conductivity of the solution.

11.4.2 Non- linear temperature coefficient (TEMP. COEF. CURVE)

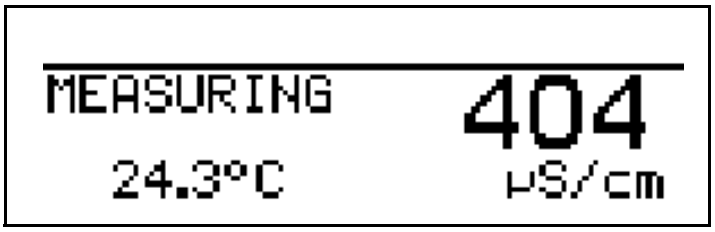
The non-linear temperature coefficient can **only** be calibrated with a rising temperature!
The start temperature **must be below** the configured reference temperature (usually 25°C)!

The "Temp. coef. curve" menu item is only displayed when a temperature sensor is connected: "TEMPERATURE INPUT/ Pt100/Pt1000".

The conductivity of each measurement solution changes in accordance with its specific temperature coefficient.
We therefore recommend that you run a temperature coefficient calibration.

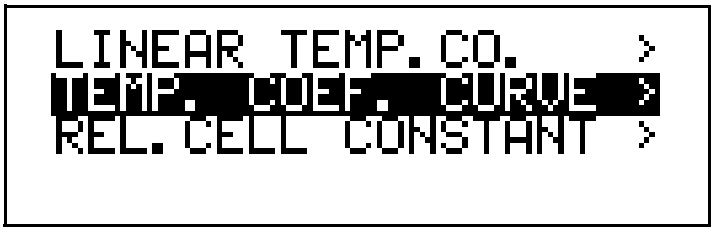
Requirement

- The type 202568 must be supplied with voltage.
  see section 5 "Electrical connection", page 16 ff.
- A conductivity transmitter must be connected.
- A temperature sensor must be connected.
- The configuration of the basic settings must be as follows:
  SIGNAL TYPE relevant to the connected transmitter
  OPERATING MODE "CONDUCTIVITY"
  UNIT mS/cm or µS/cm
  DECIMAL POINT as required
  SCALING START[1]
  SCALING END[1]
  .
- Calibration must be enabled,
  see section 6.10 "Administrator level", page 35.
- The transmitter is in "measuring mode".



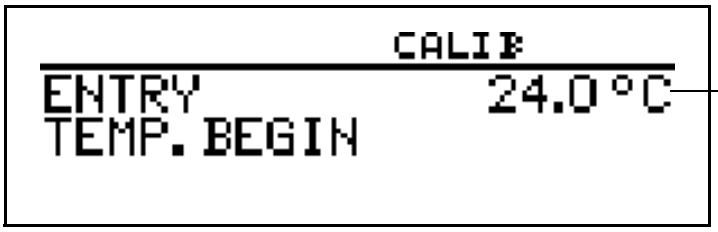
✱ Immerse the conductivity sensor in a sample of the measurement solution.

✱ Press the CAL key or
select the calibration level (CALIBR. LEVEL) or
at Administrator level (password required), select the calibration level.

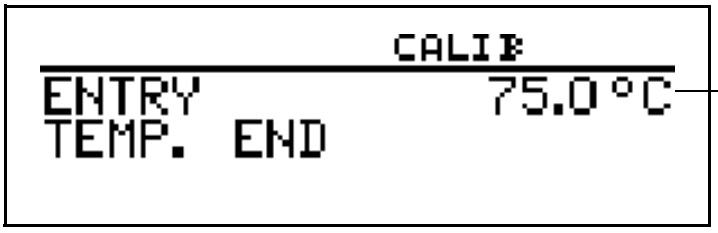


[1] Relevant to the connected 2-wire transmitter.

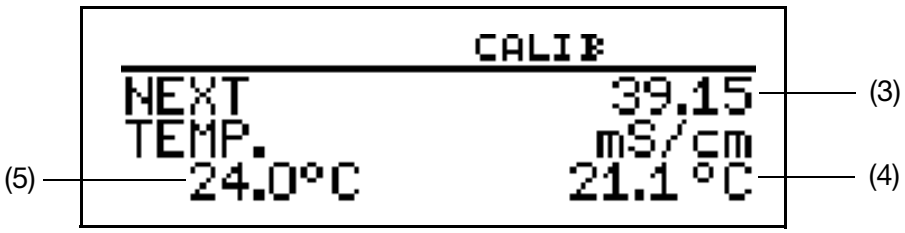
✱ Select "TEMP. COEF. CURVE " and press the PGM key.



Enter the required start temperature (1) for the temp. coef. curve.



✱ Enter the required end temperature (2) for the temp. coef. curve.



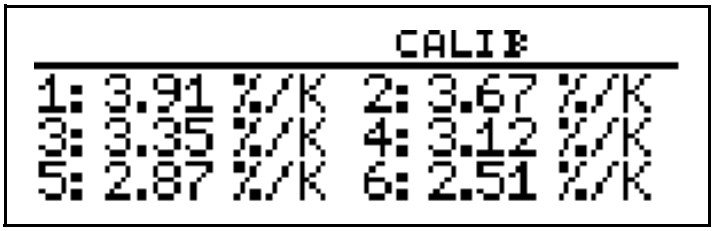
✱ Heat the measuring material continuously
(3) die current uncompensated conductivity
(4) the current temperature of the measuring material
(5) the first target temperature

During calibration, the rate of temperature change in the measurement solution must not exceed 10 °C/min.

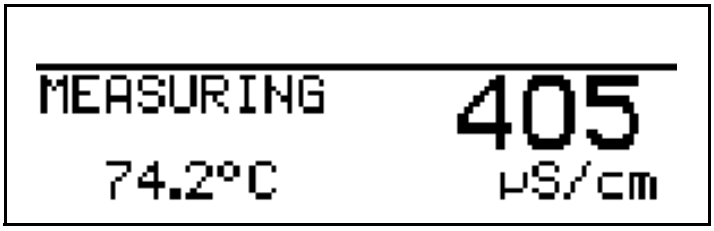
During the calibration process, the device displays values for the following five temperature interpolation points.

The end temperature has been reached

The LC display now shows the determined temperature coefficients as %/°C.



✱ Use the PGM key to accept the temperature coefficients or the EXIT key to reject the calibration result.



The transmitter is in "measuring mode" and displays the compensated conductivity of the solution.

12.1 Function

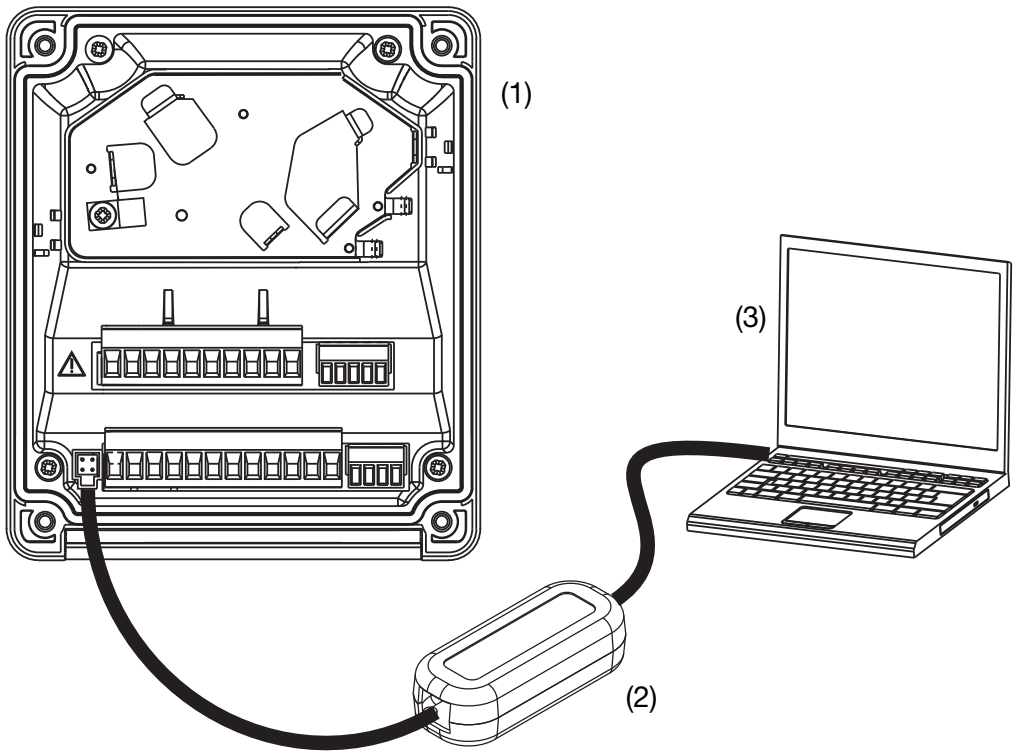
Configurable parameters

Both the setup program and the PC interface cable with USB/TTL converter (70/00456352) are available as options,,,, and provide a convenient way to adapt the transmitter to meet requirements:

- Setting the measuring range.
- Setting the response of the outputs to an overrange signal.
- Setting the functions of switching outputs K1 and K2.
- Setting the functions of binary input E1.
- Setting special functions (e.g. operating mode, controller).
- Setting a customized characteristic
- etc.

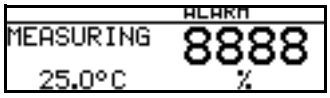
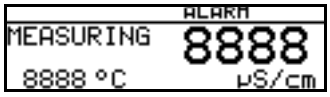
Data can only be transferred from or to the transmitter if it is supplied with voltage, See section 5 "Electrical connection", page 16ff.

Connection



(1) Type 202568
(2) PC interface cable with USB/TTL converter, item no.: 00456352
(3) PC or Notebook

13 Eliminating errors and faults

Problem	Possible cause	Measure
No measurement display or current output	There is no supply voltage	Check the power supply
Measurement display 0000 or current output 4 mA	Sensor not immersed in medium; level in container too low	Top up the container
	Flow-through fitting is blocked	Clean the flow-through fitting
	Sensor measurement variable is unsuitable or sensor is faulty	Replace the sensor
Incorrect or fluctuating measurement display	Sensor measurement variable is unsuitable	Replace the sensor
	Sensor positioning incorrect	Choose another installation location
	No mixing	Ensure proper mixing. Make sure sensor is washed all-round
	Air bubbles	Optimize the mounting
Measurement display 8888, temperature display "ok", flashing 	Overrange	Choose a suitable measuring range
	External transmitter is faulty	Replace the external transmitter
Measurement display 8888, temperature display 8888 flashing 	Temperature is overrange or underrange	Temperature of measuring material must be within the permitted range. Replace the sensor. Send the device away for repair.
	Temperature probe short-circuit or interruption	Replace sensor and/or cable. Send the device away for repair.
	Broken lead	Replace sensor and/or cable
	No sensor connected	Connect a sensor. Configure the sensor on the device.
	Short-circuit - cable - sensor - terminals	Check cable and connections. Replace sensor.
Problem	**Possible cause**	**Measure**

13 Eliminating errors and faults

TEMPERATURE INPUT: OVERRANGE	Temperature is too high	Keep to the permitted range
TEMPERATURE INPUT: UNDERRANGE	Temperature is too low	Keep to the permitted range
MAIN VAR. INPUT: UNDERRANGE	Input signal is too low (e.g. at less than 3.6 mA at 4 - 20 mA)	Check the current loop. Check the connected transmitter.
MAIN VAR. INPUT: OUT OF RANGE	Concentration is outside the permitted range	Check the concentration
MAIN VAR. INPUT: OVERRANGE	Input signal is too high (e.g. at more than 20 mA at 4 - 20 mA)	Check the current loop. Check the connected transmitter.
COMPENSATION RANGE LEFT	Temperature is lower or higher than the compensation range (e.g. greater than 36°C for natural water)	Check the temperature
PARAMETER LOCKED	Parameter is not enabled	Enable the parameter at Enable level
WRONG PASSWORD	Incorrect password	The correct password can be read out with the setup program
KEYS LOCKED	Key inhibit has been activated through binary input	Override binary input activation

14 Technical data

14.1 Analog inputs

Main input	Display range	Accuracy	Temperature error
0(4) - 20 mA 0 - 10 V	0.000 - 9.999 00.00 - 99.99 000.0 - 999.9 0000 - 9999	≤ 0.6% of range	0.2%/10°C

Secondary input	Measuring range	Accuracy	Temperature error
Temperature Pt100 (automatic detection)	-50 to 250°C[1]	± 0,5_K (up to 100 °C) ± 0,8_K (as of 100 °C)	0.05%/10°C
Temperature Pt1000 (automatic detection)		± 0,5_K (up to 100 °C) ± 1,0_K (as of 100 °C)	
Temperature NTC/PTC	max. 4 k ohms, Input via table with 20 value pairs through setup program	≤ 0.3%[2]	0.05%/10°C

14.2 Temperature compensation

	Compensation	Range[3]
in pH function mode	linear	-10 to 150°C
in conductivity function mode	linear, 0 - 5.5%/°C	-10 to 100°C
	natural water (ISO 7888)	0 - 36°C (warning when leaving the range)
Reference temperature is adjustable from 15 - 30°C; preset to 25°C (default)		

14.3 Measuring circuit monitoring

Inputs	Overrange/underrange	Short-circuit	Broken lead
Main variable	yes	dependent on signal type	dependent on signal type
Temperature	yes	yes	yes

14.4 Binary input

Activation	by floating contact
Function	key lock HOLD alarm suppression

14.5 Controller

Controller type	limit controller, pulse width controller, pulse frequency controller, modulating controller, continuous controller
Controller structure	P/PI/PD/PID
A/D converter	dynamic resolution up to 14 bits
Sampling time	500 ms

14.6 Analog outputs (max. 2)

Output type	Signal range	Accuracy	Temperature error	Permissible load resistance
Current signal	0(4) - 20 mA	≤ 0.25%	0.08%/10 °C	≤ 500 Ω
Voltage signal	0 - 10 V	≤ 0.25%	0.08%/10 °C	≥ 500 Ω
The analog outputs respond in accordance with NAMUR recommendation NE43. They are electrically isolated, 30 V AC / 50 V DC.				

14.7 Switching outputs (max. two (SPDT) changeovers)

Rated load	3 A/250 VAC (resistive load)
Contact life	>2x10^5 operations at rated load

1 Selectable in °F.

2 Depending on supporting points.

3 Note the sensor operating temperature range!

14 Technical data

14.8 Supply voltage for sensors

Supply voltage for 2-wire transmitter	24 V DC; -15/+20% max. 30 mA
Voltage supply for inductive proximity switch[1]	12 V DC (10 - 20 V) max. 10 mA

14.9 Setup interface

Interface for configuring the device with the available setup program option (for device configuration only).

14.10 Electrical data

Supply voltage	110 - 240 V AC; -15/+10%; 48 - 63 Hz 20 - 30 V AC/DC; 48 - 63 Hz 12 - 24 V DC; +/-15% (permissible only for connection to SELV/PELV circuits)
Power consumption	approx. 14 VA
Electrical safety	DIN EN 61 010, Part 1 overvoltage category III[2], pollution degree 2
Data backup	EEPROM
Electrical connection	pluggable screw terminals conductor cross-section max. 2.5 mm^2 (supply voltage, relay outputs, sensor inputs) conductor cross-section max. 1.5 mm^2 (analog outputs, supply voltage for sensors)

14.11 Display

Graphic LC display	120 x 32 pixels
Background lighting	Programmable: - off - on for 60 seconds during operation

14.12 Housing

Material	ABS
Cable entry	Cable glands, max. 3 x M16 and 2 x M12
Feature	ventilation to prevent condensation
Ambient temperature range	-10 to 50°C (the specified accuracy is adhered to in this range)
Operating temperature range	-15 to 65°C (device operational)
Storage temperature range	-30 to 70°C
Climatic rating	rel. humidity ≤ 90% annual mean, no condensation (based on EN 60721 3-3 3K3)
Enclosure protection to EN 60529	surface-mounted housing:IP67 panel mounting: at front IP65, at rear IP20 With the panel mounting, the panel must be of sufficient thickness!
Vibration resistant	to EN 60068-2-6
Weight	surface-mounted housing:approx. 900 g panel mounting: approx. 480 g
Dimensions	See section 4.2 "Surface mounting", page 12.

14.13 Standard accessories

Cable glands
Internal mounting material
Operating instructions

14.14 Approvals/marks of conformity

Mark of conformity	Testing laboratory	Certificates/certification numbers	Test basis	valid for
c UL us	Underwriters Laboratories	E 201387	UL 61010-1	all types

[1] e.g. type EI1808 NPOSS.

[2] Not valid for SELV/PELV of power supply variant 12 - 24 V DC.

15.1 Operator level parameters

When there are numerous device parameters to configure, it is advisable to make a note in the table below of all the parameters to be changed and to work through these parameters in the given order.

The following list shows the maximum number of parameters that can be modified.

Some of these parameters will not be visible (and therefore not editable) for your particular device, depending on the configuration.

Parameter	Selection / value range **Factory setting**	New setting
Standard signal		
Temperature coefficient	0 - **2.2** - 5.5%/°C	
Relative cell constant	80 - **100** - 120%	
Zero point	Conductivity: -20 to **0** to +20% of range Custom table: -20 to **0** to +20% of range pH: 5 - **7** - 9 pH Linear: -20 to **0** to +20% of range	
Slope	pH: 75 - **100.0** - 110% of range Linear: -999.9 to **100.0** to +999.9% of range	
Signal type	0 - 20 mA 4 - 20 mA 0 - 10 V	
Scaling start	-9999 to +9999	
Scaling end	-9999 to +9999	
Operating mode (via basic setting only)	Conductivity measurement Concentration measurement Customized table pH measurement Linear	
Unit (via basic setting only)	Conductivity operating mode: - µS/cm - mS/cm Concentration operating mode: - customized unit - % Linear operating mode: - µS/cm - mS/cm - customized unit - % - mV - pH - ppm	

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Parameter	Selection / value range **Factory setting**	New setting
Decimal point (via basic setting only)	XXXX **XXX.x** XX.xx X.xxx	
Compensation type	Conductivity measurement operating mode **- Linear** - Temp. coef. curve - Natural water Concentration measurement operating mode **-** NaOH range 1 - NaOH range 2 - HNO3 range 1 - HNO3 range 2 - H2SO4 range 1 - H2SO4 range 2 - H2SO4 range 3 - HCl range 1 - HCl range 2	
Reference temperature	15.0 - **25.0** - 30.0°C	
Filter time constant	**0** - 25 s	
Calibration interval	**0** - 999 days (0 = off)	
Temperature input		
Sensor type	**Pt100/Pt1000** Customized Manual temperature entry	
Unit	**°C** °F	
Filter time constant	0 - **2** - 25 s	
Manual temperature entry	-50.0 - **25.0** - 250.0°C	
Offset	-20.0 - **0.0** - +20.0°C	
Binary input		
Function	**No function** Key lock Hold mode Alarm stop (for controller only)	
Controller channel 1		
Controller type	No function Limit controller Pulse frequency output Pulse width output Continuous controller Modulating controller	
Setpoint	According to device variant	
Second setpoint (modulating controller at controller 1 only)	According to device variant	

Parameter	Selection / value range **Factory setting**	New setting
Min. / max. contact (increasing / decreasing characteristic)	**Min. contact** Max. contact	
Proportional band	**0** - 9999 (configurable decimal places)	
Reset time	**0** - 9999	
Derivative time	**0** - 9999	
Pulse period	2.5 - **20** - 999.5	
Actuator stroke time (modulating controller at controller 1 only)	15 - **60** - 3000 s	
Hysteresis (of limit controller)	0 - **200** - 9999 (configurable decimal places)	
Minimum ON time	**0.5** - 999.5	
Maximum pulse frequency	0 - **60** 1/min.	
Output level limit	0 - **100**%	
Pull-in delay	**0.00** - 999.5 s	
Drop-out delay	**0.00** - 999.5 s	
Limit controller monitoring	**Off** On	
Alarm tolerance	0 - end of range	
Alarm delay	**0** - 9999 s	
Response during Hold	0% 100 **Frozen** Hold value	
Hold value	**0** - 100%	
Response on error	**0%** 100% Frozen Hold value	
Min. setpoint limit	**0** - 9999 (configurable decimal places)	
Max. setpoint limit	0 - **9999** (configurable decimal places)	
Controller channel 2		
Controller type	No function Limit controller Pulse frequency output Pulse width output Continuous controller	
Setpoint	According to device variant	
Second setpoint (modulating controller at controller 1 only)	According to device variant	
Min. / max. contact (increasing / decreasing characteristic)	Min. contact **Max. contact**	
Proportional band	**0** - 9999 (configurable decimal places)	
Reset time	**0** - 9999	

15 Appendix

Parameter	Selection / value range **Factory setting**	New setting
Derivative time	**0** - 9999	
Pulse period	2.5 - **20** - 999.5	
Actuator stroke time (modulating controller at controller 1 only)	15 - **60** - 3000 s	
Hysteresis (of limit controller)	0 - **200** - 9999 (configurable decimal places)	
Minimum ON time	**0.5** - 999.5	
Maximum pulse frequency	0 - **60** 1/min.	
Output level limit	0 - **100**%	
Pull-in delay	**0.00** - 999.5 s	
Drop-out delay	**0.00** - 999.5 s	
Limit controller monitoring	**Off** On	
Alarm tolerance	0 - end of range	
Alarm delay	**0** - 9999 s	
Response during Hold	0% 100 **Frozen** Hold value	
Hold value	**0** - 100%	
Response on error	**0%** 100% Frozen Hold value	
Min. setpoint limit	**0** - 9999 (configurable decimal places)	
Max. setpoint limit	0 - **9999** (configurable decimal places)	
Controller special functions		
Manual mode	**Manual mode not allowed** Pulsed Switched	
Separate controllers	**Off** On	
I-component switch-off	Yes **No**	

Parameter	Selection / value range **Factory setting**	New setting
Switching output 1		
Function	No function Controller output 1 Controller output 2 Controller alarm 1 Controller alarm 2  AF1 main variable  AF2 main variable  AF7 main variable  AF8 main variable  AF1 temperature  AF2 temperature  AF7 temperature  AF8 temperature Range or sensor error Calibration timer expired	
Switching point	**0** - 9999	
Spacing to switching point Window width at AF1 / AF2	0 - 50% of range or 0 to 150°C	
Hysteresis	0 - 100% of range or -50 to +250°C	
Switch-on delay	**00:00:00** - 01:00:00 H:M:S	
Switch-off delay	**00:00:00** - 01:00:00 H:M:S	
Pulse time[1]	**00:00:00** - 01:00:00 H:M:S	
During calibration	**Inactive** Active Status maintained	
On error	**Inactive** Active Status maintained	
In Hold mode	**Inactive** Active Status maintained	
Manual mode	**No simulation** Inactive Active	

[1] Drop-out delay is automatically deactivated when pulse times are greater than 0 seconds.

15 Appendix

Parameter	Selection / value range **Factory setting**	New setting
Switching output 2		
Function	No function Controller output 1 Controller output 2 Controller alarm 1 Controller alarm 2  AF1 main variable  AF2 main variable  AF7 main variable  AF8 main variable  AF1 temperature  AF2 temperature  AF7 temperature  AF8 temperature Range or sensor error Calibration timer expired	
Switching point	**0** - 9999	
Interval to switching point Window width at LC1 / LC2	0 - 50% of range or 0 to 150°C	
Hysteresis	0 - 100% of range or -50 to +250°C	
Switch-on delay	**00:00:00** - 01:00:00 H:M:S	
Switch-off delay	**00:00:00** - 01:00:00 H:M:S	
Pulse time[1]	**00:00:00** - 01:00:00 H:M:S	
During calibration	**Inactive** Active Status maintained	
On error	**Inactive** Active Status maintained	
In Hold mode	**Inactive** Active Status maintained	
Manual mode	**No simulation** Inactive Active	

[1] Drop-out delay is automatically deactivated when pulse times are greater than 0 seconds.

Parameter	Selection / value range **Factory setting**	New setting
Analog output 1		
Signal selector	**Actual value of main variable / temperature** Continuous controller output 1 Continuous controller output 2	
Signal type	0 - 10 V 0 - 20 mA **4 - 20 mA** 10 - 0 V 20 - 0 mA 20 - 4 mA	
Scaling start of main variable	Dependent on measurement variable and measuring range	
Scaling end of main variable	Dependent on measurement variable and measuring range	
Response during calibration	**Moving** Frozen Safe value	
Response on error	**Low (0 V / 0 mA / 3.4 mA)** High (10.7 V / 22 mA) Frozen Safe value	
Response in Hold mode	**Low (0 V / 0 mA / 3.4 mA)** High (10.7 V / 22 mA) Frozen Safe value Moving	
Safe value	**0** - 10.7 V **0** - 22 mA	
Simulation	**Off** On	
Simulation value	**0** - 10.7 V **0** - 22 mA	
Analog output 2		
Signal selector	**Actual value of main variable / temperature** Continuous controller output 1 Continuous controller output 2	
Signal type	0 - 10 V 0 - 20 mA **4 - 20 mA** 10 - 0 V 20 - 0 mA 20 - 4 mA	
Scaling start of main variable	Dependent on measurement variable/range	
Scaling end of main variable	Dependent on measurement variable/range	
Response during calibration	**Moving** Frozen Safe value	

15 Appendix

Parameter	Selection / value range **Factory setting**	New setting
Response on error	**Low (0 V / 0 mA / 3.4 mA)** High (10.7 V / 22 mA) Frozen Safe value	
Response in Hold mode	**Low (0 V / 0 mA / 3.4 mA)** High (10.7 V / 22 mA) Frozen Safe value Moving	
Safe value	**0** - 10.7 V **0** - 22 mA	
Simulation	**Off** On	
Simulation value	**0** - 10.7 V **0** - 22 mA	
Display		
Language	**German** English French Customized	
Lighting	**When operated** Off	
LCD inverse	**Off** On	
Meas. display type	**Normal** Trend Bar graph	
Lower display	**Temperature** Output level 1 Output level 2 Setpoint 1 Setpoint 2 None Compensated Uncompensated	
Upper display	**Compensated** Uncompensated Temperature Output level 1 Output level 2 Setpoint 1 Setpoint 2 None	
Max. / min. reset	**No** Yes	
Operator timeout	0 - **1** - 10 min	
Contrast	0 - **5** - 20	

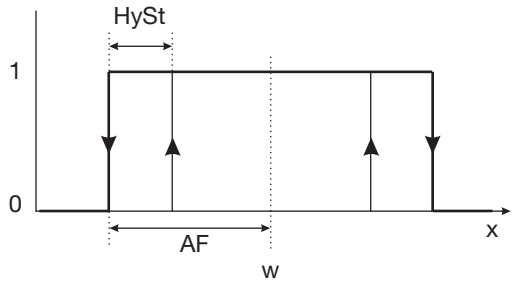
15.2 Parameter explanations

TEMP. COMPENSATION

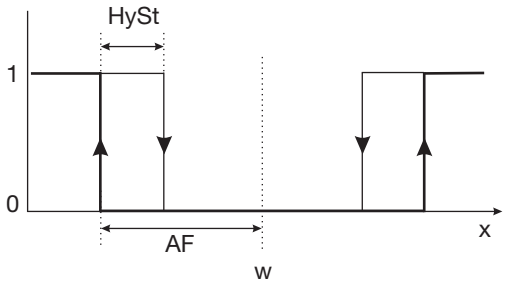
LINEAR
TEMP. COEF CURVE (non-linear)
NAT. WATER (permissible temperature range 0 - 36°C as per EN 27 888)

FUNCTION

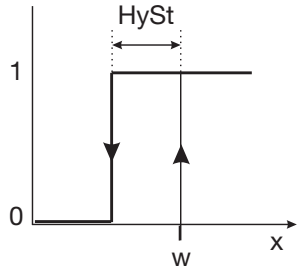
NO FUNCTION
Alarm window AF1 MAIN VAR.
Alarm window AF2 MAIN VAR.
Limit function AF7 MAIN VAR.
Limit function AF8 MAIN VAR.
Alarm window AF1 TEMP.
Alarm window AF2 TEMP.
Limit function AF7 TEMP.
Limit function AF8 TEMP.
SENSOR ERROR
CALIB. TIMER



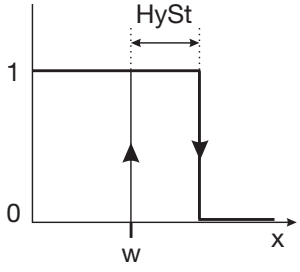
Alarm window AF1



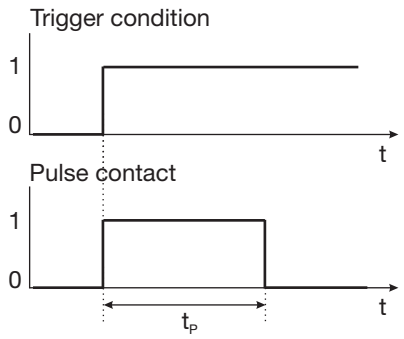
Alarm window AF2



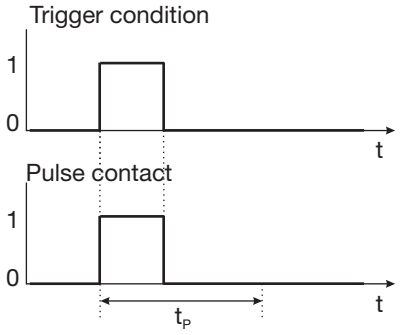
Limit function AF7



Limit function AF8



Pulse contact
Triggering condition longer than pulse duration



Pulse contact
Triggering condition shorter than pulse duration

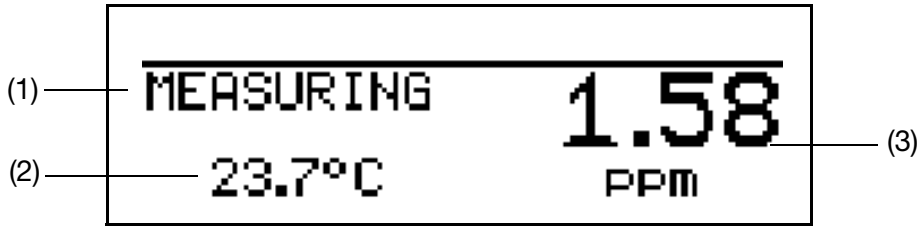
0	Off	t	Time
1	On	t_P	Pulse duration
AL	Spacing	w	Setpoint / Limit
HySt	Hysteresis	x	Actual value / Measurement value

MEAS. DISPLAY TYPE

NORMAL
TREND
BAR GRAPH

NORMAL

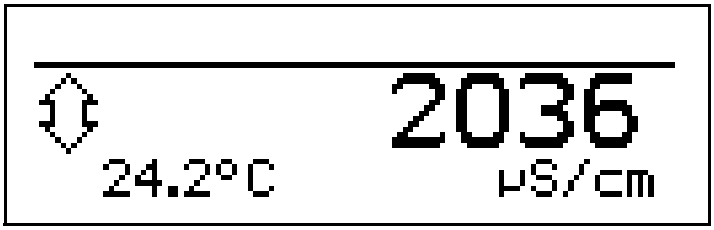
The measurement value, measurement variable and temperature of the measuring material are shown in normal display.

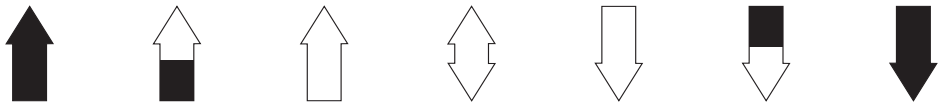


(1) Operating mode
(2) Lower display (temperature input)
(3) Upper display (analog input measurement value)

TREND

The operator can quickly see the direction in which the measurement is changing.



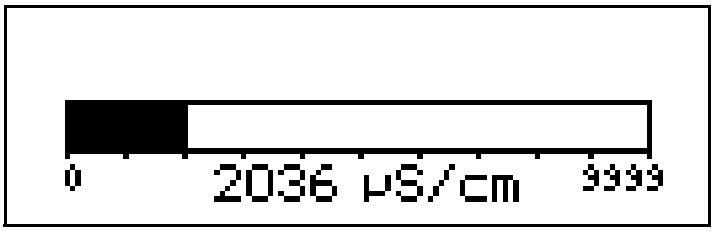


rising			steady	falling		
greatly	medium	slightly		slightly	medium	greatly

The measurement trend is calculated over the last 10 measurement values. So with a sampling interval of 500 ms, the last 5 seconds are considered.

BAR GRAPH

- The analog input measurement value (main input variable) is displayed as a variable bar.
- The temperature is no longer displayed.
- Setpoints are marked with arrows above the bar graph for devices with configured control contact(s).



Scaling the bar

✱ Activate "BAR GRAPH" as the measurement display type.

✱ Use ▼ to select "BARGR. SCALE START".

✱ Confirm the selection with PGM.

✱ Use ▼ or ▲ to enter the lower limit of the range to be displayed.

✱ Confirm the selection with PGM.

✱ Use ▼ to select "BARGR. SCALE END".

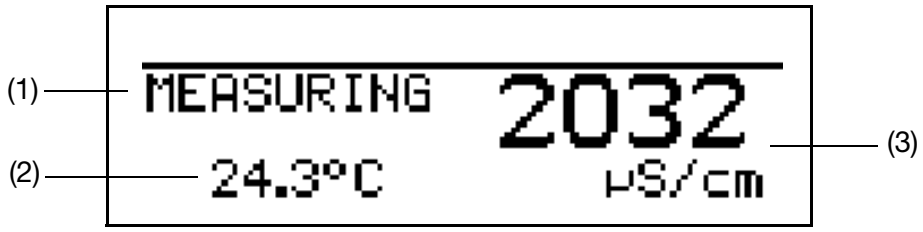
✱ Use ▼ or ▲ to enter the upper limit of the range to be displayed.

✱ Confirm the selection with PGM.

To return to measuring mode:
press the EXIT key repeatedly or wait for a "timeout".

LOWER DISPLAY

.



(1) Operating mode
(2) Lower display
(3) Upper display

The following values can be assigned to the "lower" display:

This parameter is only available for the "NORMAL" and "TREND" measurement display types.

TEMPERATURE
OUTPUT LEVEL 1
OUTPUT LEVEL 2
SETPOINT 1
SETPOINT 2
NONE
COMPENSATED
UNCOMPENSATED

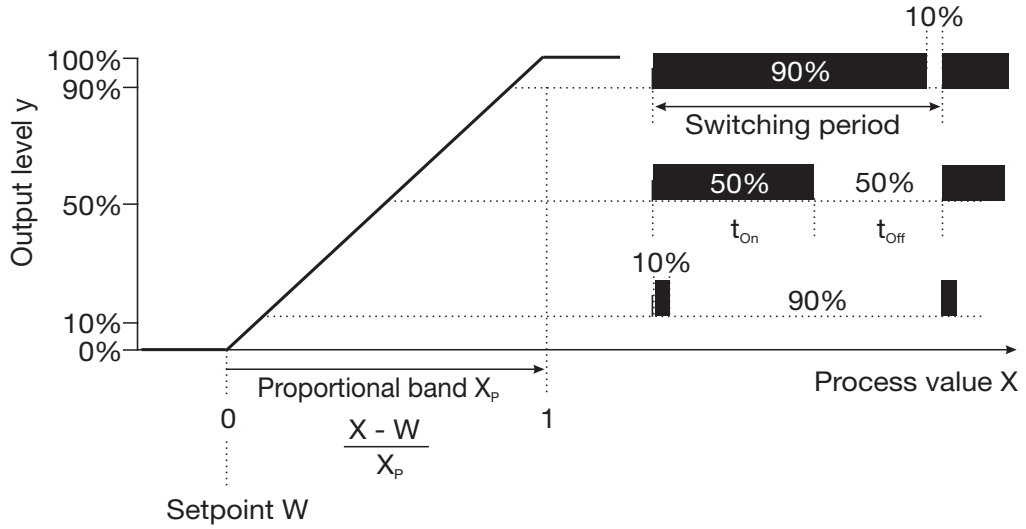
UPPER DISPLAY

The following values can be assigned to the "upper" display:

COMPENSATED
UNCOMPENSATED
TEMPERATURE
OUTPUT LEVEL 1
OUTPUT LEVEL 2
SETPOINT 1
SETPOINT 2
NONE

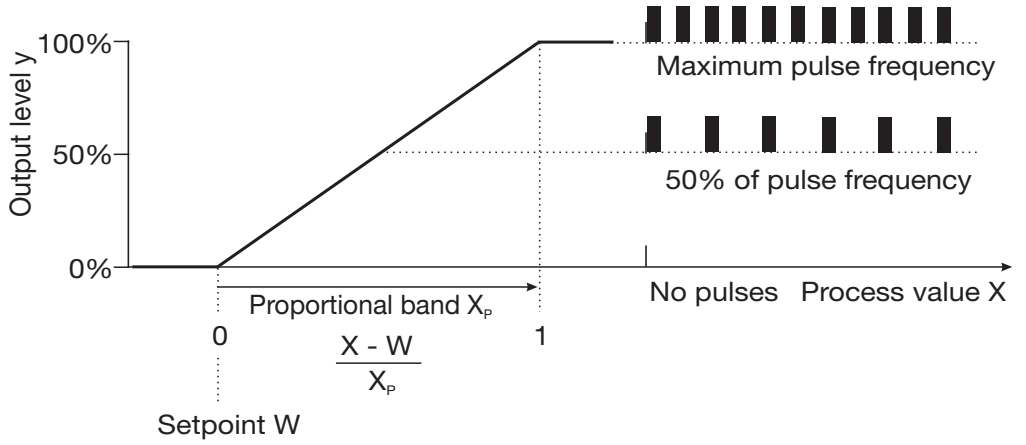
15.3 Glossary

Pulse width controller (output active with x > w and P control structure)



If actual value x exceeds setpoint W, the P controller will control in proportion to the control deviation. When the proportional band is exceeded, the controller operates with an output level of 100% (100% clock ratio).

Pulse frequency controller (output active with x > w and P control structure)



If actual value x exceeds setpoint W, the P controller will control in proportion to the control deviation. When the proportional band is exceeded, the controller operates with an output level of 100% (maximum switching frequency).

Calibration timer

The calibration timer indicates (on request) a required routine calibration. The calibration timer is activated by entering the number of days that must expire before there is a scheduled re-calibration (specified by the system or the operator).

Customized table

In this mode, the input value can be displayed in accordance with a table (max. 20 value pairs). With this function, non-linear input variables can be displayed and linearized. Values can only be entered in the table using the optional setup program.

Max./min. value memory

This memory records the minimum and maximum input quantities that occur. This information can be used, for example, to assess whether the design of the connected sensor is suitable for the values that actually occur.

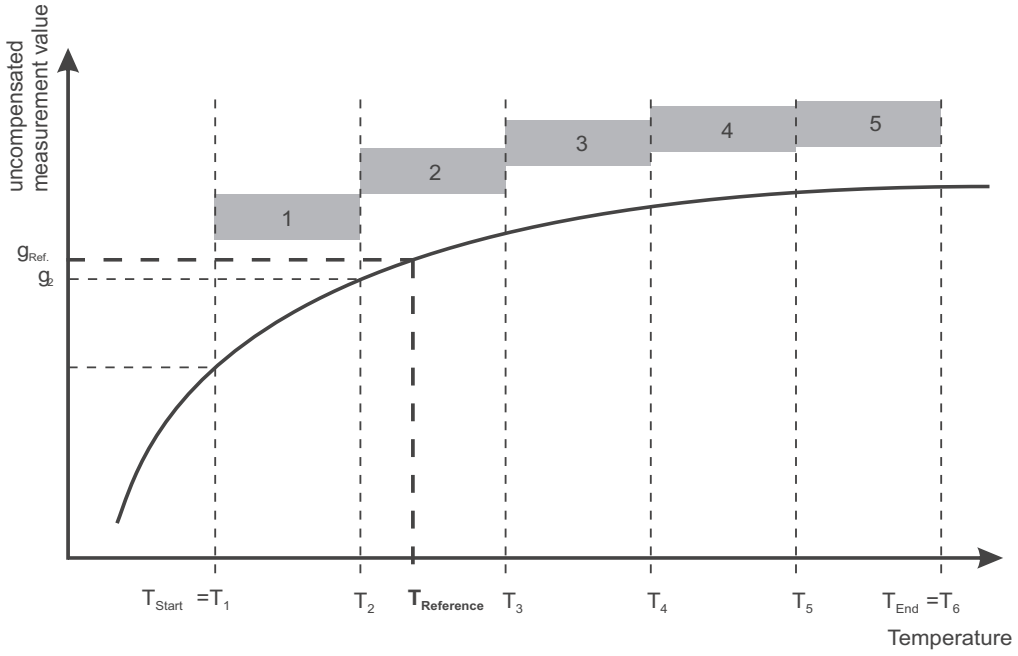
The max./min. value memory can be reset: Operator level / Display / Max./min. value memory / Yes,
See "Operator level parameters" page 109ff.

Conductivity temperature compensation

The conductivity of a measurement solution is temperature-dependent (the conductivity of a solution rises as the temperature increases). The dependency of conductivity and temperature describes the **temperature coefficient** of the measurement solution. As conductivity is not always measured for the reference temperature, automatic temperature compensation is integrated in this device. The transmitter uses the temperature coefficient to calculate the conductivity that would exist for a reference temperature from the current conductivity and the current temperature. This is then displayed. This process is called temperature compensation. Modern transmitters offer different ways to perform this temperature compensation.

- Linear compensation (constant temperature coefficient).
  This type of compensation can be applied to many kinds of normal water, with acceptable accuracy. The temperature coefficient used is then approx. 2.2%/°C
- See below for non-linear compensation.
- Natural water (EN27888 or ISO 7888).
  In this case, so-called non-linear temperature compensation is used. According to the standard cited above, the relevant type of compensation can be applied to natural groundwater, spring water and surface water. The definition range for the water temperature looks like this $0°C \leq T < 36°C$.

Determining the temp. coef. curve



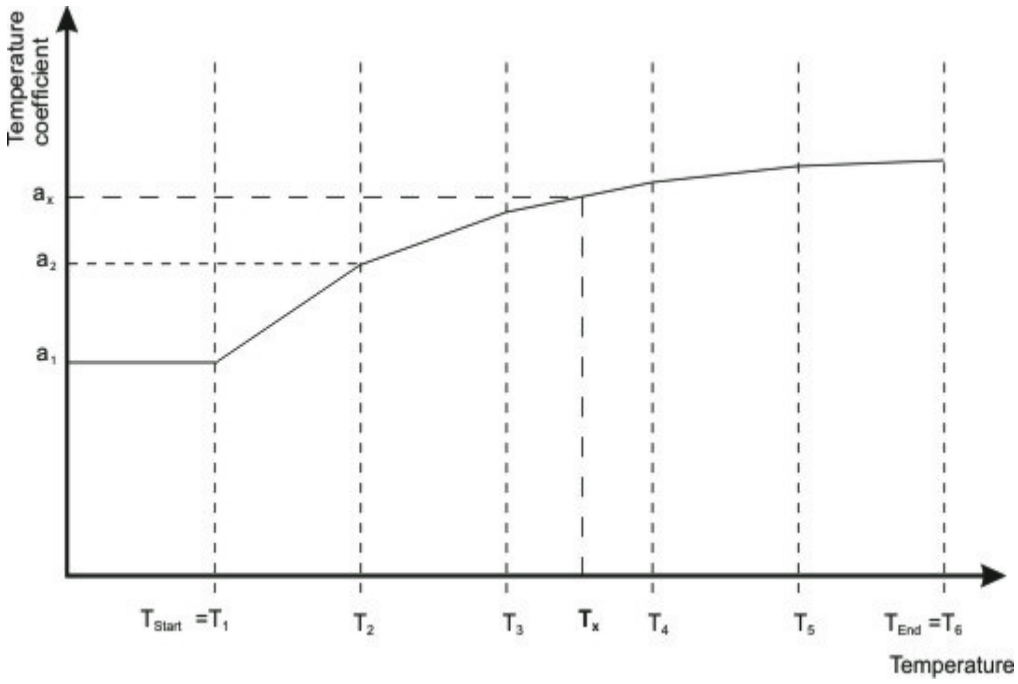
Calculating a temperature coefficient

$$\alpha_1 = \frac{\left(\frac{\gamma_1}{\gamma_{Reference}} - 1\right) \times 100}{T_1 - T_{Reference}}$$

α = temperature coefficient (TC)

γ = uncompensated measurement value

Temp. coef. curve



15 Appendix

Temperature compensation with the temp. coef. curve

The relevant temperature coefficient is determined from the temp. coef. curve by means of the current temperature of the medium.

Intermediate values, such as (α_x at T_x) between the two ascertained values (α_3 at T_3) and (α_4 at T_4) are linearly approximated.

As with linear temperature compensation, the compensated measurement value is calculated with the ascertained TC.

If the measured temperature is lower than the temperature at the beginning, the first TC is used for compensation.
If the measured temperature is higher than the temperature at the end, the last TC is used for compensation.

$$\gamma_{(komp)} = \frac{\gamma_{(mess)}}{\left(1 + \frac{\alpha_x}{100} * (T_x - T_{Ref.})\right)}$$

Sequence of automatic calibration

The temp. coef. curve is automatically applied in a temperature range specified by the user. The temperature range from beginning to end is divided into 5 segments of equal size.

The temperature range must be greater than 20 Kelvin and must overlap the reference temperature.
Example: Reference temperature 25°C, temperature at beginning 18°C and temperature at end 50°C.

Concentration measurement

The device can calculate the concentration of different measuring materials from the current measurement values of uncompensated conductivity and temperature.

Choice of concentration calculations:

NaOH (caustic soda)

- Range 1: 0 - 15 wt.%
- Range 2: 25 - 50 wt.%

HNO_3 (nitric acid)

- Range 1: 0 - 25 wt.%
- Range 2: 36 - 82 wt.%

H_2SO_4 (sulphuric acid)

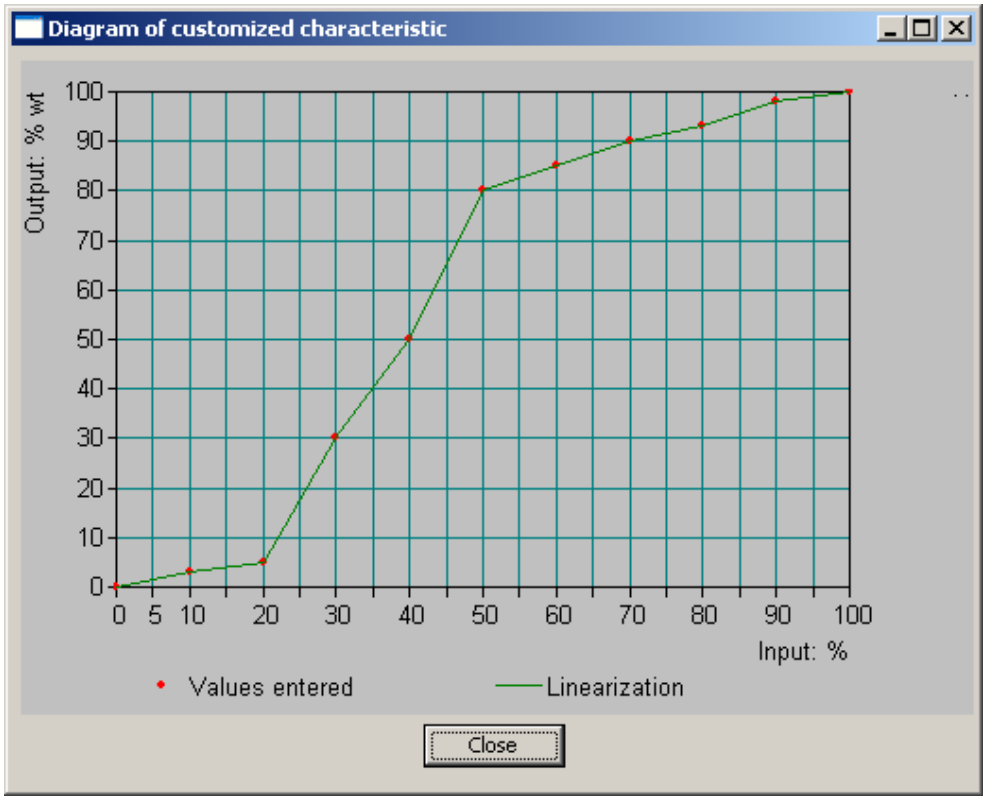
- Range 1: 0 - 28 wt.%
- Range 2: 36 - 85 wt.%
- Range 3: 92 - 99 wt.%

HCl (hydrochloric acid)

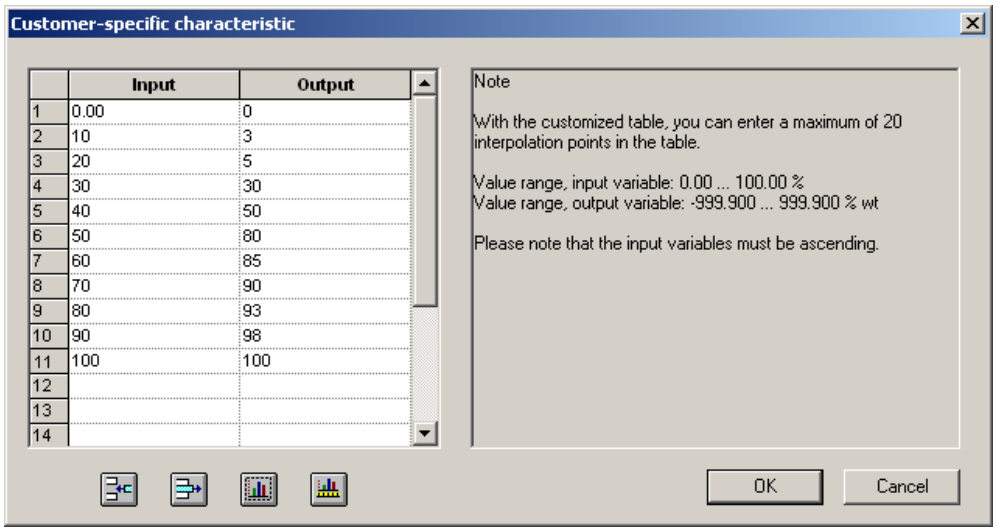
- Range 1: 0 - 18 wt.%
- Range 2: 22 - 44 wt.%

Customized characteristic

In this mode, the device can model a monotonically increasing input variable to any output value.



The optional setup program is used to enter the requisite value table.



Controller special functions:

The following functions can be activated in this menu

- Manual mode (activate controller outputs manually), see section 6.13 "Manual mode", page 43
- Separate controllers (see below)
- I-component switch-off (see below)

Separate controllers

This function is normally deactivated (factory setting or "No" selection).

In the deactivated state, the software stops the two controller outputs being able to work "against each other". So, for example, it is not possible to dose acid and lye at the same time.

If the controllers are separate ("yes" selection), each controller can be freely configured.

I-component switch-off

This function is normally deactivated (factory setting or "No" selection).

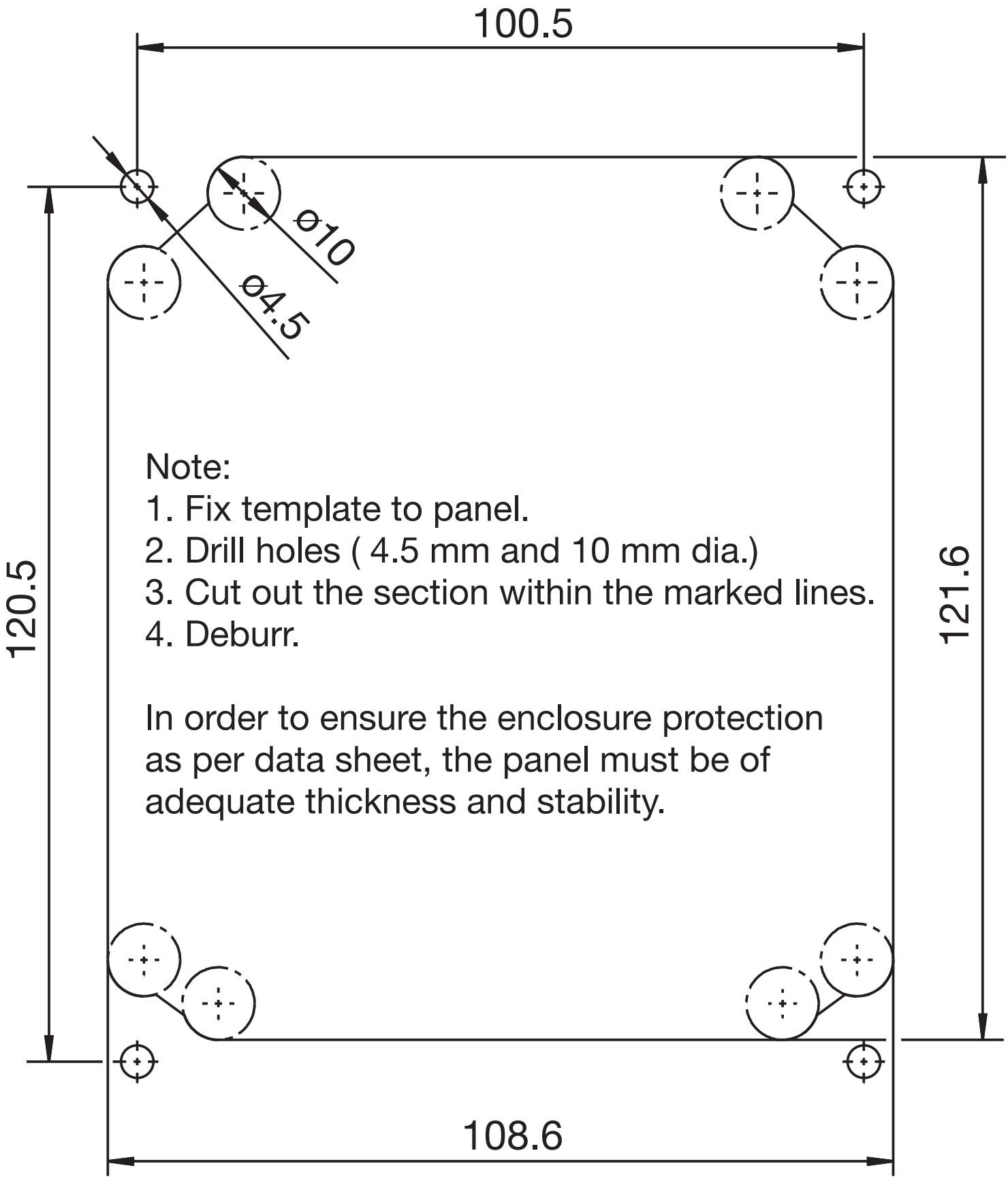
In the deactivated state, the controller works in accordance with general controller theory.

When I-component switch-off is activated ("yes" selection), the part of the output level that can be traced back to the I-component is set to zero when the setpoint is reached.

This can be beneficial with mutual neutralization (acid and lye dosing both possible) in one medication tank.

15 Appendix

15.4 Panel cut-out



产品组别 Product group: 202568 部件名称 Component Name	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （Cr(VI)）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
外壳 Housing (Gehäuse)	X	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	X	○	○	○	○	○
螺栓 Screw (Schraube)	X	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

17 Index

Note:
This index is not intended to be exhaustive! Please read the operating instructions before starting up the device!