Instruction manual

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Measuring set Profi

Measurement technology

Incl. 2-point Calibration according to VDI 2035

Conductivity measuring device „Profi“

1. Display explanations	Page 4
2. Operation	Page 4
3. Setup	Page 5
3.1 Setting the temperature values (P1.0)	Page 5
3.1.1 Change temperature unit	Page 5
3.2 Setting TDS factor (P2.0)	Page 6
3.3 Overview calibration information (P4.0)	Page 6
3.4 Overview cell constant	Page 6
4 Calibration	Page 6
4.1 Calibration fluid	Page 6
4.2 When to calibrate?	Page 7
4.3 Calibration of conductivity	Page 7
5. Error diagnosis	Page 8
6. Care/maintenance	Page 10
7. Battery instructions	Page 10
8. Technical data	Page 11

pH measuring device „Profi“

1. Display explanation	Page 12
2. Operation	Page 12
3. Automatic temperature compensation (ATC) and temperature settings	Page 13
4. Calibration	Page 13
5. Error diagnosis	Page 14
6. Care/maintenance	Page 14
7. Battery instructions	Page 15
8. Technical data	Page 15

IMPORTANT NOTES BEFORE USE

1. pH measuring strips are not suitable for use with fully demineralised water.
2. In the case of softened water, the hardness drops must be used.
3. Only regular calibration can ensure a correct measurement result.
4. The probes are sensitive and should be treated accordingly. Rinse briefly with distilled water after use.
5. The measuring devices as well as the calibration liquid must be stored frost-proof and at < 50 °C.
6. When taking the water sample, please ensure that the oxygen input is kept as low as possible.

ONLY REGULARLY CALIBRATED MEASURING DEVICES PROVIDE REAL MEASURED VALUES!

Regular calibration of measuring devices is essential for accurate readings.

Significant deviations can occur if measuring devices are not calibrated.

Calibrate your measuring devices every 10 measurements, but at least once a month!

Calibration liquids

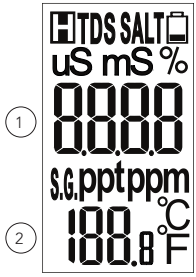
Calibration liquid pH 7	25 Bags 230 ml Bottle 500 ml Bottle	Art. no.: 100030-1 Art. no.: 100030-35 Art. no.: 100030-15
Calibration liquid pH 10	25 Bags 230 ml Bottle 500 ml Bottle	Art. no.: 100030-7 Art. no.: 100030-75 Art. no.: 100030-70
Calibration liquid Conductivity 1413 µS	25 Bags 230 ml Bottle 500 ml Bottle	Art. no.: 100030-2 Art. no.: 100030-45 Art. no.: 100030-25
Storage liquid for pH-Measuring device	230 ml Bottle 500 ml Bottle	Art. no.: 100145 Art. no.: 100135
Cleaning liquid	230 ml Bottle 500 ml Bottle	Art. no.: 100146 Art. no.: 100136

1 Display explanations

LCD display

The display first shows the full display (see picture) for a few seconds. Then the normal display appears.

- The 1st row of numbers shows the measured value.
- The 2nd row of numbers shows the measured temperature.
- µS or mS: Unit of conductivity
- ppt, ppm or S.G.: unit of TDS and salinity
- °C or °F: temperature unit of the liquid
- Low battery symbol



Tastatur

- SET (On/Off)
- HLD (Hold) /
- CAL (Calibration)
- Changeover unit

NOTE

Low battery symbol

The low battery symbol always appears in the start-up display. But only if the battery symbol is lit in the measuring mode, the battery is low.

2 Operation

1. Press „SET“ to switch on the meter.
2. The meter is in the automatic display after it is switched on. The automatic selection determines and selects the display that gives you the greatest resolution and accuracy.
3. Before use, rinse the probe with distilled water to remove any impurities adhering to the electrode. If the meter has not been used for a long time, soak the probe in distilled water for 30 minutes beforehand.

4. When taking the sample, make sure to keep the oxygen input as low as possible. This is possible by connecting a short tube to the sample tap and leading it into the measuring vessel in an s-shape (see picture 1). Please note that, depending on the size of the system, the flow (approx. 1-2 litres) is not suitable as a sample. Calibrated measuring instruments should be washed out of calibration liquids in the preliminary flow.

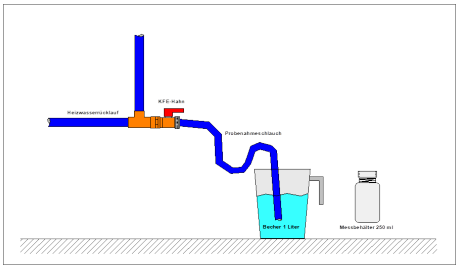


Fig. 1

5. Immerse the measuring probe so far into the water sample that the temperature sensor is also in the water (see Fig. 2). Make sure that there are no air bubbles on the measuring probe. To remove any air bubbles, immerse the probe in the liquid and then shake off the water. Repeat this procedure until there are no more air bubbles on the probe.
6. Stir the probe carefully in the sample to obtain a homogeneous liquid and leave the meter in the liquid for a moment. After approx. 5 minutes you will get stable readings.
7. Press „SET“ to switch off the meter.

Fig. 2

NOTE

Accuracy and air bubbles:

Air bubbles can quickly adhere to the electrode, greatly affecting accuracy. Immerse the probe in water and then wave it in the air to remove the air bubbles. Repeat this procedure about five times.

3 Setup

To enter the setting menu P3.0, press „SET“ for at least 3 seconds while the meter is in measuring mode. CAL P3.0“ appears.

3.1 Setting the temperature units (P7.0)

3.1.1 Changing the temperature unit

- While the meter is in the measuring mode, press „SET“ for at least 3 seconds to switch to the setup mode. CAL P3.0“ appears.
- Press „HLD/CAL“ or „MODE“ to select P7.0.
- Then briefly press „SET“ again to enter the unit setting.
- Press „MODE“ to select C (Celsius) or F (Fahrenheit).

- Press „SET“ briefly to confirm the unit or press „SET“ for at least 3 seconds to return to the measuring mode without saving.

3.2 Setting TDS factor (P5.0)

- In P3.0, press „MODE“ repeatedly until you reach P5.0.
- In P5.0: Press „SET“ for a moment to change to P5.1. The size flashes in the display. Press „MODE“ or „HLD/CAL“ to change the size between 0.30 and 1.00.
- Briefly press „SET“ to confirm the value. The meter returns to P5.0. Press „SET“ for longer than 3 sec. to return to the measuring mode without saving the value.

3.3 Calibration Information Overview (P4.0)

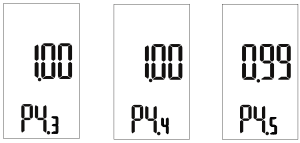
- Press „SET“ for longer than 3 seconds to select P3.0. Now press „SET“ again briefly to get to P3.3. There you can see the last calibration value.
- Press „SET“ for longer than 3 sec. to return to P3.0. When calibrating again, the previous calibration value is replaced.

P3.3 only shows you the last calibration value, but is not used for calibration.

3.4 Overview cell constant

In P4.0 you can see the current cell constant in three different displays. This value should be between 0.8 and 1.2. This is to remind you to buy a new meter if necessary.

1. Press „SET“ to enter P4.0. Here you will find three displays (P4.3 to P4.5). Press „SET“ to enter P4.3.
2. Press „SET“ to enter P4.4 and P4.5 and check the respective cell constant. Press „SET“ again to return to P4.0.



4 Calibration

4.1 Calibration fluid

Use the enclosed „1413 µS“ solution for calibration.

Use the calibration solution only once.

Contamination/foreign matter in the solution will affect calibration and accuracy.

4.2 When to calibrate?

Calibration is necessary and should be carried out regularly. If you measure in the normal measuring range, calibrate the measuring device at least once a month. If you immerse the measuring probe for 15 minutes before calibration or measurement, the measuring probe surface can be impregnated and the deviation minimised. For frequent measurements with extreme temperatures, calibrate the meter at least 1x per week to maintain accuracy.

It is strongly recommended to perform the calibration every working day and at room temperature!

4.3 Calibration conductivity

Please follow the steps below for conductivity calibration. Calibration should be carried out at room temperature.

1. Clean the probe and soak it in distilled water for approx. 30 minutes.
2. Fill the 1413µS calibration solution into a measuring cup or similar until the temperature sensor is completely covered (see picture).
3. Switch on the meter.
4. Immerse the measuring probe in the measuring cup. Stir the measuring probe slightly. Please make sure that no air bubbles adhere to the probe. By gently swinging the probe in the air, you can easily remove the air bubbles (repeat the „immerse shake off" procedure approx. 5 times).

5. Stir the probe gently in the liquid so that it can adjust to the solution temperature.
6. Press „HLD/CAL" for longer than 3 sec. to start calibration. The conductivity value of the solution flashes in the display.
7. Press „MODE" or „HLD/CAL" to change the value or to adjust it to the standard. You can adjust the conductivity value up to +/- 20 % of the detected value. If your detected value and the standard value differ by more than +/- 30 %, you must repeat the procedure.
8. If the detected conductivity value is stable enough, the meter automatically saves the calibration data in 15 seconds. You can also confirm the value by pressing „SET". If the calibration was successful, „SA" appears on the display.

To exit the conductivity calibration mode without saving the calibration, press „SET" (after step 9) for more than 3 sec.

5 Error diagnosis

Switched on but no display

1. Make sure you hold down the power button long enough.
2. Check that the batteries are seated correctly and that the polarity is correct.
3. Insert new batteries and try again.
4. Remove the batteries for 10 minutes and insert them again.

Low battery symbol

Remove all old batteries and then insert new batteries. Make sure the batteries are seated correctly and the polarity is correct. Please be sure to remove all old batteries to avoid electrolyte leakage.

Unstable display

1. Air bubbles quickly adhere between the electrode and the meter. If this happens, it will give very inaccurate and poor results. To reduce the air bubbles, shake the electrode gently. Repeat this procedure about 5 times. If air bubbles still remain on the electrode, remove it from the solution and blow gently to remove the air bubbles.
2. The probe may not be immersed deep enough in the liquid. Make sure that both the electrode and the temperature probe are immersed in the fluid.
3. The probe is too dirty and needs cleaning.
4. The probe is damaged.
5. If the temperature of the liquid is low, this may increase the measurement time.

Error codes

Error code E02

1. E02 means that the measured value is below the display limit.

Solution:

1. Place the probe in tap water at room temperature for approx. 30 minutes to clear error code E02 from the display.
2. If this does not work, calibrate the measuring device.

Error code E03

1. E03 means that the measured value is above the display limit.

Solution:

1. Place the probe in tap water at room temperature for approx. 30 minutes to clear error code E03 from the display.
2. If this does not work, calibrate the measuring device.

Error code E04

1. E04 means that there is a memory problem.

Solution:

1. Check whether the measured temperature is above the display limit. If so, place the probe in tap water at room temperature for approx. 30 minutes to clear error code E04 from the display.

Error code E16

1. E16 means that the cell constant of the conductivity probe is outside the display limit.

Solution:

1. Switch the meter on and off several times to clear the error code.
2. If this does not work, calibrate the conductivity probe.

Error code E31

1. E31 means that the measuring circuit has a hardware error.

Solution:

1. Switch the device on and off several times to clear the error code.

As a rule, thorough cleaning of the measuring device in distilled water (30 minutes) followed by calibration helps with all error codes.

6 Care instructions/maintenance

1. Make sure that the electrode is clean.
2. Rinse the electrode with tap or distilled water before and after each measurement.
3. Please also ensure that the measuring device and the electrode are carefully cleaned with a cloth at regular intervals.
4. Carefully clean the electrode with distilled water before storage and then store the measuring device dry at 0 - 50 °C.
5. Maintenance of the electrode: Always ensure that the electrode is clean.

7 Battery instructions

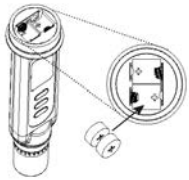
The measuring device is powered by 4 LR44 batteries.

Check the batteries

1. when using for the first time,

2. when the battery symbol appears on the display in measuring mode,

3. if the meter cannot be switched on.



Insert the batteries:

1. Switch off the measuring device.
2. Unscrew the battery cover anti-clockwise.
3. Replace the old batteries with 4 new LR44 battery cells.
4. Ensure that the batteries are seated correctly and that the polarity is correct.
5. Replace the battery cover and turn it firmly clockwise.

1. Please recalibrate the measuring device after you have changed the batteries.
2. Remove the batteries from the device if you do not use it for more than one month.

8 Technical data

Accuracy +/-	2 % original size +/- 1 digit
Automatic switch-off	•
Measuring range	0 - 1999 µS/ppm or 0 - 19.99 mS/ppt
Temperature accuracy	+/- 0.5 °C
Temperature resolution	0.1 °C / °F
Temperature resolution	1 µS/ppm or 0.01 mS/0.01 ppt
Record measured values	•
Units °C / °F switchable	•
Automatic temperature adjustment (0-50 °C)	•
View calibration information	•
Waterproof (IP65)	•
Size (mm)	165 (L) x 35 (H) x 32 (D)
TDS factor/size	0.4 - 1.00
Temperature coefficient	0 - 4.0 % / °C
Temperature normalisation	20 °C or 25 °C
Operating temperature	0 °C - 50 °C (32 °F - 122 °F)
Battery life	> 80 hours of continuous use

1 Display explanations

LCD Display

The display initially shows the full display for a few seconds (see illustration). The normal display then appears.

- The display shows the measured pH value
- The display shows the temperature
- CAL = calibration mode
- ATC = automatic temperature calibration
- Hold = measured value fixation

Keyboard

- HLD (Hold)
- CAL (Calibration)
- SET (On / Off)

Low battery symbol:

The low battery symbol always appears in the start display. However, the battery is only low if the battery symbol lights up in measurement mode.

Important note

After 12 months, a pH probe, or the entire measuring device in the case of compact devices, is no longer suitable for use. In this case, please replace the meter.

Reorder number pH meter „Profi“: 100037

2 Operation

1. Remove the bottom cover (Fig. 1) by turning the cap slightly anti-clockwise and then pulling the cover off the meter. It is normal if there are white crystals on the cover cap or on the electrode.
2. Immerse the electrode in the test solution. Press „SET“ to switch on the meter.
3. When taking the sample, ensure that the oxygen input is kept as low as possible. This is possible by connecting a short tube to the sample tap and feeding it into the measuring vessel in an S-shape (see Fig. 1). Please note that, depending on the size of the system, the flow (approx. 1-2 litres) is not suitable as a sample. However, the calibrated measuring devices should be washed out of calibration liquids in the flow.

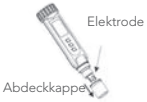


Fig. 1

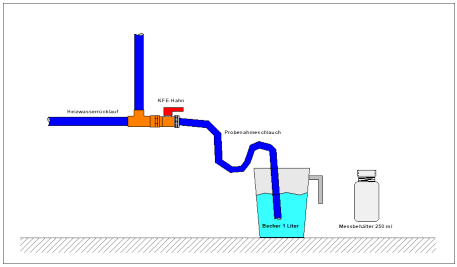


Fig. 2

4. A small dot „•“ flashes while the measuring device is in measuring mode. The display not only shows the measured pH value, but also the temperature (Fig. 3).
5. When the value has stabilised (approx. 3-5 min), press „HLD“ to fix the current measured values. „Hold“ appears on the display and the dot „•“ does not flash. Press „HLD“ again to exit the recording mode (Fig. 4).

   Note: Please observe the measuring time of 3-5 minutes!
6. Switch off the measuring device by pressing „SET“..
7. When you have finished the measurement, clean the electrode (rinse briefly, do not use a cloth), replace the cover cap and store the measuring device at 0 - 50 °C.

Fig. 3

Fig. 4

3 Automatic temperature calibration (ATC) and temperature settings

These measuring devices are suitable for measurements with automatic temperature calibration. „ATC“ is shown in the centre of the display.

Temperature settings

To select the temperature setting (°C/°F), first switch off the meter. When the meter is switched off, press „SET“ and „ ↵ CAL“ simultaneously until „C“ or „F“ appears in the display. Press „HLD“ to select the preferred unit and then press „CAL“ to save. „SA“ (see picture) appears on the display for one second and the display then switches back automatically.

4 Calibration

Calibration is necessary and should be carried out every working day at room temperature.

1. Switch on the measuring device.
2. For the 2-point calibration, first place the electrode in the pH7 calibration solution.
3. Press „CAL“ to enter the pH calibration mode. „CA“ appears on the display for one second, then the pH value 7 is displayed.

   Note: The meter only displays one digit after the decimal point, e.g. 7.1.
4. If no action is taken within 2 to 4 seconds, the device automatically calibrates itself to the value of the selected calibration liquid. SA“ appears briefly on the display and then „En“ after 2 to 4 seconds (see illustration). The device then returns to measuring mode.
5. If the measuring probe or the solution is faulty: „En“ only appears on the display for one second, then the device switches to normal status.
6. In this case, repeat the calibration. If only „En“ is displayed again (see illustration), the electrode is probably faulty.
7. After successful calibration, rinse the measuring probe, ideally with distilled water.
8. Now repeat steps 1 to 7 with the pH10 calibration solution.

5 Fault diagnosis

Switched on, but no display

1. Check that the batteries are fitted correctly and that the polarity is correct.
2. Insert new batteries and try again.
3. Remove the batteries for a minute and reinsert them.

Slow response
Clean the measuring probe in the cleaning solution (see „Cleaning solution application instructions“ below).

Display shows „---“ (Fig. 1)
Outside the pH range, too acidic or too alkaline.

Display shows „H“ or „L“ (Fig. 2)
Outside the temperature range, too cold or too warm.

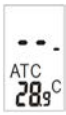


Fig. 1

Fig. 2

pH value changes very quickly
The electrode is not immersed in a solution, but in the air. If this occurs when you have already immersed the electrode, shake the meter gently to release any air bubbles.

6 Care instructions/maintenance

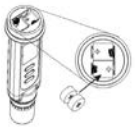
1. Please note that the protective cap must always be placed on the measuring device after use in order to protect the electrode and store it correctly..
2. The protective cap must always be at least 2/3 full with the storage solution (500 ml bottle art. no. 100135, 230 ml bottle art. no. 100145). Replace the solution regularly.
3. Please also ensure that the measuring device is regularly cleaned in the cleaning solution. (500 ml bottle, item no. 100136)
4. Rinse the pH electrode with tap or distilled water before and after each measurement.
5. **The electrode (glass sphere) must not be touched.**

Instructions for use Rinse solution

- Soak the electrode in 50-75 ml rinse solution for approx. 5-30 minutes, stirring the solution gently several times.
- Rinse the electrode thoroughly with distilled water.
- After cleaning, store the electrode in the storage solution for approx. 1 hour.
- Rinse the electrode thoroughly with distilled water before starting the measurements.
- Repeat the cleaning process if necessary.

If the electrode has been exposed to a solvent that is not miscible with water, clean it with a solvent that is miscible with water, e.g. ethanol or acetone. Then rinse the electrode carefully and thoroughly with water. Then proceed as described in „Cleaning solution application instructions“.

7 Battery instructions



The measuring device is powered by 4 LR44 batteries. Check the batteries
1. the first time you use it,
2. when the battery symbol appears on the display,
3. if the meter cannot be switched on.

Insert the batteries:
1. Switch off the meter and unscrew the battery cover anti-clockwise.
2. Replace the old batteries with 4 new LR44 battery cells.
3. Ensure that the batteries are seated correctly and that the polarity is correct.
4. Replace the battery cover and turn it firmly clockwise.

1. Please recalibrate the measuring device after you have changed the batteries.
2. Remove the batteries from the device if you do not use it for more than one month.

8 Technical data

Accuracy +/-	0.2 pH
Automatic switch-off	•
Measuring range	0.0 - 14.0
Temperature accuracy	+/- 1 °C
Temperature scale	0.5 °C/°F
Value scale	0.1 pH
Fix measured values (Hold)	•
Units °C / °F switchable	•
Self-calibration	•
Size (mm)	165 (L) x 35 (H) x 32 (T)
Operating temperature	0 °C - 50 °C (32 °F - 122 °F)
Battery life	> 80 hours of continuous use

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