

GB Photometer Total Hardness

● Operation



Switch the unit on using the ON/OFF switch.

tH

The display shows the following:

Pour 1 ml of the water sample into a clean vial and fill to the 10 ml mark with deionised water. Close the vial using the vial lid, and place in the sample chamber with ▽ and Δ alignment.



Press the ZERO/TEST key.



The method symbol flashes for approx. 3 seconds.

0.0.0

The display shows the following:

After zero calibration is completed, remove the vial from the sample chamber.

Add the appropriate reagent tablet; a colour will develop in the sample.

Screw the cap back on and place the vial in the sample chamber with the Δ and ▽ marks aligned.



Press the ZERO/TEST key.



The method symbol flashes for approx. 3 seconds.

RESULT

The result appears in the display.

Repeating the analysis:

Press the ZERO/TEST key again.

New zero calibration:

Press the MODE key until the desired method symbol appears in the display again.

● User messages

EOI

Light absorption too great. Reasons: zero calibration not carried out or, possibly, dirty optics.

+Err

Measuring range exceeded or excessive turbidity.

-Err

Result below the lowest limit of the measuring range.

LO BAT

Replace 9 V battery, no further analysis possible.

● Technical data

Light source: LED: $\lambda = 528 \text{ nm}$ (filter)

Battery: 9 V block battery (life = approx. 600 tests)

Auto-OFF: Automatic switch off 10 minutes after last keypress

Ambient conditions: 5-40°C
30-90% rel. humidity (non-condensing).

CE: DIN EN 55 022, 61 000-4-2, 61 000-4-8,
50 082-2, 50 081-1, DIN V ENV 50 140, 50 204

● Total Hardness 50 - 500 mg/l CaCO₃

0.0.0

Perform zero calibration (see "Operation").

Add one HARDCHECK P1-tablet straight from the foil to the water sample, and crush using a clean stirring rod. Screw the cap on and replace the vial in the sample chamber making sure the Δ and ▽ marks are aligned.



Press the ZERO/TEST key.

tH

The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l CaCO₃.

Measuring tolerance: ± 10 % full scale

● Note

Strongly alkaline or acidic water must be brought within the pH values of 4 and 10 before the tablet is added.

● Conversions

	Alkaline Earth ions mmol/l	Alkaline Earth ions mval/l	ppm CaCO ₃	German degrees °d	English degrees °e	French degrees °f
1 mg/l CaCO ₃	0.01	0.020	1.00	0.056	0.07	0.10

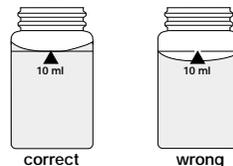
● Method notes

Observe application options, analysis regulations and matrix effects of methods. Reagent tablets are designed for use in chemical analysis only and should be kept well out of the reach of children.

If necessary, request safety data sheets.

Ensure proper disposal of reagent solutions.

● Correct filling of the vial



● Troubleshooting: Guidelines for photometric measurements

1. Vials, stoppers and stirring rods should be cleaned thoroughly **after each analysis** to prevent errors being carried over. Even minor reagent residues can cause errors in the test results. Use the brush provided for cleaning.
2. The outside of the vial must be clean and dry before starting the analysis. Fingerprints or droplets of water on the sides of the vial can result in errors.
3. Zero calibration and test must be carried out with the same vial as there may be slight differences in optical performance between vials.
4. The vials must be positioned in the sample chamber for zero calibration and test with the graduations facing toward the housing mark.
5. Zero calibration and test must be carried out with the sample chamber lid closed.
6. Bubbles on the inside of the vial may also lead to errors. In this case, fit the vial with a clean stopper and remove bubbles by swirling the contents before starting test.
7. Avoid spillage of water in the sample chamber. If water should leak into the photometer housing, it can damage electronic components and cause corrosion.
8. Contamination of the windows over the light source and photo sensor in the sample chamber can result in errors. If this is suspected check the condition of the windows.
9. The reagent tablets should be added to the water sample without being handled.
10. Large temperature differentials between the photometer and the operating environment can lead to incorrect measurement due to, for example, the formation of condensate in the area of the lens or on the vial.
11. To avoid errors caused by stray-light do not use the instrument in bright sunlight.

● Calibration mode



Press MODE key and **keep it depressed**.



Switch unit on using ON/OFF key.
Release MODE key after approx. 1 second.

CAL

tH

The display shows the following in alternating mode:



Perform zero calibration (see "Operation").
Press the ZERO/TEST key.



The method symbol flashes for approx. 3 seconds.

0.0.0

CAL

The display shows the following in alternating mode:



Place the calibration standard to be used in the sample chamber with the Δ and ∇ marks aligned.
Press the ZERO/TEST key.



The method symbol flashes for approx. 3 seconds.

RESULT

CAL

The result is shown in the display, alternating with CAL.

If the result displayed corresponds with the value of the calibration standard (within the tolerance quoted), exit calibration mode by pressing the ON/OFF key.



Otherwise, pressing the MODE key once increases the displayed value by 1 digit.



Pressing the ZERO/TEST key once decreases the displayed value by 1 digit.

CAL

RESULT + x

Pressing the relevant key until the displayed value equals the value of the calibration standard.



By pressing the ON/OFF key, the new correction factor is calculated and stored in the user calibration software.

: :

Confirmation of calibration (3 seconds).

● Note

CAL

Factory calibration active.

cAL

Calibration has been set by the user.

● Recommended calibration value

Total Hardness: between 150 and 250 mg/l CaCO₃

● User calibration : cAL

Manufacturing calibration : CAL

To reset the calibration to the factory setting:



Press both the MODE and ZERO/TEST and **keep them depressed**.



Switch the unit on using the ON/OFF key. Release the MODE and ZERO/TEST keys after approx. 1 second.

The following messages will appear in turn on the display:

SEL

The calibration is reset to the factory setting.

CAL

(SEL stands for Select)

or:

SEL

Calibration has been set by the user. (If the user calibration is to be retained, switch the unit off using the ON/OFF key.)

cAL



Calibration is reset to the factory setting by pressing the MODE key. The following messages will appear in turn on the display:

SEL

CAL



Switch the unit off using the ON/OFF key.

● User notes

E 10

Calibration factor "out of range"

E 70

Manufacturing calibration incorrect / erase

E 71

User calibration incorrect / erase