

GB 6 in 1 Photometer : Cl, Br, pH, Cys, TA, CAH

● Operation



Switch the unit on using the ON/OFF switch.

Cl

The display shows the following:



Select the test required using the MODE key:
Cl → Br → pH → Cys → TA → CA.H → Cl → (Scroll)

METHOD

The display shows the following:

Fill a clean vial with the water sample up to the 10 ml mark, replace the cap tightly and place the vial in the sample chamber with the Δ-mark on the vial aligned with the ∇-mark on the instrument.



Press the ZERO/TEST key.

METHOD

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.

Replace the cap tightly and place the vial in the sample chamber with the Δ and ∇ marks aligned.



Press the ZERO/TEST key.

METHOD

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

E0I

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

+Err or HI

Measuring range exceeded or excessive turbidity.

-Err or LO

Result below the lowest limit of the measuring range.

LO BAT

Replace 9 V battery, no further analysis possible.

● Technical data

Light source: 2 LED: $\lambda_1 = 528 \text{ nm}$ (filter) ; $\lambda_2 = 605 \text{ nm}$
Battery: 9 V-block battery (Life 600 tests).
Auto-OFF: Automatic switch off 5 minutes after last keypress
Ambient conditions: 5-40°C
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

● Chlorine 0.05 - 6.0 mg/l

(a) Free Chlorine

Perform zero calibration (see "Operation").

Empty the vial and then add a DPD No. 1 tablet. Crush the tablet with a clean stirring rod then add the water sample to the 10 ml mark. Mix well with the stirring rod to dissolve the tablet. Replace the cap tightly and place the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Press the ZERO/TEST key.



Cl

The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l free chlorine.

(b) Total Chlorine

Remove the vial and add one DPD No. 3 tablet to the coloured test solution. Mix to dissolve with the stirring rod. Replace the cap tightly and place the vial in the sample chamber, making sure the Δ and ∇ marks are aligned.

Wait for a colour reaction time of two minutes.

Press the ZERO/TEST key.



Cl

The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l total chlorine. Rinse the vial and cap thoroughly after each test.

(c) Combined Chlorine

Combined Chlorine = Total Chlorine - Free Chlorine

Tolerance: 0-1 mg/l: $\pm 0.05 \text{ mg/l}$ > 3-4 mg/l: $\pm 0.30 \text{ mg/l}$
> 1-2 mg/l: $\pm 0.10 \text{ mg/l}$ > 4-6 mg/l: $\pm 0.40 \text{ mg/l}$
> 2-3 mg/l: $\pm 0.20 \text{ mg/l}$

● Bromine 0.1-13.5 mg/l

Total Bromine (free and combined)

Perform zero calibration (see "Operation"). Empty the vial and then add a DPD No. 1 tablet. Crush the tablet with a clean stirring rod then add the water sample to the 10 ml mark. Mix well with the stirring rod to dissolve the tablet. Replace the cap tightly and place the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Press the ZERO/TEST key.



Br

The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l total bromine.

Tolerance in mg/l: 0 - 2,3 : $\pm 0,12$ > 6,8 - 9 : $\pm 0,68$
> 2,3 - 4,5 : $\pm 0,25$ > 9 - 13 : $\pm 0,90$
> 4,5 - 6,8 : $\pm 0,45$

● pH-value 6.5 - 8.4

0.0.0

Perform zero calibration (see "Operation"). Remove the vial from the sample chamber. Add a PHENOLRED/PHOTOMETER tablet and mix to dissolve using a clean stirring rod. Replace the cap tightly and place the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Press the ZERO/TEST key.



pH

The method symbol flashes for approx. 3 seconds.

RESULT

The pH value is shown in the display. Rinse the vial and cap thoroughly after each test.

Tolerance: $\pm 0.1 \text{ pH}$

● Cyanuric Acid 2 - 160 mg/l

Cys

The display shows the following:



Cys

The method symbol flashes for approx. 3 seconds.

0.0.0

The display shows the following:

Add a CYANURIC ACID tablet and mix well to dissolve the tablet using a clean stirring rod. The presence of cyanuric acid will cause the solution to take on a milky appearance. Replace the cap tightly and invert the vial several times for about 20 seconds. Replace the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Press the ZERO/TEST key.



Cys

The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l cyanuric acid.

Tolerance: $\pm 10 \text{ mg/l}$

● Total Alkalinity 5 - 200 mg/l CaCO₃

0.0.0

Perform zero calibration (see "Operation"). Remove the vial from the sample chamber. Add a ALKA-M-PHOTOMETER tablet and mix to dissolve using a clean stirring rod. Replace the cap tightly and place the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Press the ZERO/TEST key.



tA

The method symbol flashes for approx. 3 seconds.

RESULT

The mg/l CaCO₃ value is shown in the display. Rinse the vial and cap thoroughly after each test.

Tolerance: $\pm 5 \%$ Full Scale

● Calcium-Hardness 50 - 500 mg/l CaCO₃

Use the adapter for 16 mm vial. Fill a clean 16 mm vial with 8 ml distilled water (Calcium-ion free). Add a CALCHECK-tablet and mix well to dissolve the tablet using a clean stirring rod. Replace the cap tightly and place the vial in the adapter/sample chamber making sure that | and Δ marks are aligned.

Press the ZERO/TEST key.



CA.H

The method symbol flashes for approx. 3 seconds.

0.0.0

The display shows the following:

Remove the vial from the sample chamber. Add 2 ml of the water sample. Replace the cap tightly and place the vial in the sample chamber making sure the | and Δ marks are aligned.

Wait for a colour reaction time of two minutes!

Press the ZERO/TEST key.



CA.H

The method symbol flashes for approx. 3 seconds.

RESULT

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

Tolerance: $\pm 5 \%$ Full Scale

● Calibration Mode



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



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

CAL

Select the test required using the MODE key:
CAL Cl → CAL pH → CAL Cys → CAL TA → CAL CA.H ... (Scroll)



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

≡ **METHOD** ≡

The method symbol flashes for approx. 3 seconds.

0.0.0

The display shows the following in alternating mode:

CAL



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

≡ **METHOD** ≡

The method symbol flashes for approx. 3 seconds.

RESULT

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

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

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

RESULT + x



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

A calibration for the bromine test is not necessary. Bromine readings are calculated out of the chlorine calibration using a factor of 2,25.

CAL

Factory calibration active.

cAL

Calibration has been set by the user.

● Recommended calibration values

Chlorine: between 0,5 and 1,5 mg/l*
pH: between 7,6 and 8,0*
Cyanuric acid: between 30 and 60 mg/l
Total Alkalinity: between 50 and 150 mg/l CaCO₃
Calcium Hardness: between 100 and 200 mg/l CaCO₃

* or rather values mentioned in the reference standard kits

● 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

Cl: Manufacturing calibration incorrect / erase

E 72

pH: Manufacturing calibration incorrect / erase

E 74

Cys: Manufacturing calibration incorrect / erase

E 76

tA: Manufacturing calibration incorrect / erase

E 78

CA.H: Manufacturing calibration incorrect / erase

E 71

Cl: User calibration incorrect / erase

E 73

pH: User calibration incorrect / erase

E 75

Cys: User calibration incorrect / erase

E 77

tA: User calibration incorrect / erase

E 79

CA.H: User calibration incorrect / erase

● Troubleshooting: Guidelines for photometric measurements

1. Vials, caps 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. Clean the outside of the vials with a towel. Fingerprints or other marks will be removed.
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 Δ-mark on the vial aligned with the ▽-mark on the instrument.
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. When using reagent tablets, use only tablets in black printed foil. For pH value determination, the PHENOLRED-tablet foil should also be marked PHOTOMETER.
10. The reagent tablets should be added to the water sample without being handled.
11. 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.
12. To avoid errors caused by stray-light do not use the instrument in bright sunlight.

● Correct filling of the vial

