

GB Photometer Chlorine LR

with liquid reagents

● Operation



Switch the unit on using the ON/OFF switch

CI

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 ▽ vial marking aligned with the Δ housing marking.



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.

The characteristic coloration starts to appear after the addition of the liquid reagent(s).

Replace the cap tightly and place the vial in the sample chamber with the ▽ and Δ 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 once again.

New zero calibration:

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

● User messages

EOL

Light absorption too great. Reason - e.g. soiled lens.

+Err or HI

Measuring range exceeded or excessive turbidity.

-Err or LO

Result outside bottom measuring range limit.

LO BAT

Replace 9 V battery immediately; no further analysis possible.

● Technical data

Optics:	LED: $\lambda = 528 \text{ nm}$
Battery:	9 V block battery (life = approx. 600 tests)
Auto-OFF:	auto unit switch-off approx. 5 minutes after a key was last pressed
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

● Chlorine 0,05 - 4,0 mg/l with liquid reagent

0.0.0

(a) Free Chlorine

Perform zero calibration (see "Operation").

Empty the vial. Hold the drip bottle vertically and add evenly sized drops to the vial by pressing slowly (6 drops of DPD 1 buffer solution, 2 drops of DPD 1 reagent solution). Add the water sample to the 10 ml mark, replace the cap tightly, swirl to mix, and place the vial in the sample chamber making sure the ▽ and Δ marks are aligned.



Press the ZERO/TEST key.



The method symbol flashes for approx. 3 seconds.

RESULT

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

(b) Total Chlorine

Immediately after measurement, add 3 drops of DPD 3 solution to the coloured test solution. Replace the cap tightly, swirl to mix, 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.



The method symbol flashes for approx. 3 seconds.

RESULT

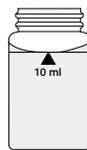
The result is shown in the display in mg/l total chlorine.

(c) Combined Chlorine

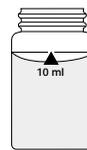
Combined Chlorine = Total Chlorine - Free Chlorine

Tolerance: 0-1 mg/l: $\pm 0,05 \text{ mg/l}$
> 1-2 mg/l: $\pm 0,10 \text{ mg/l}$
> 2-3 mg/l: $\pm 0,20 \text{ mg/l}$
> 3-4 mg/l: $\pm 0,30 \text{ mg/l}$

● Correct filling of the vial



correct



wrong

● Method notes

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

Material Safety Data Sheets: www.tintometer.de

Ensure proper disposal of reagent solutions.

● 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. Place the cover on the sample chamber for zero calibration and test.
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 or reagent solution 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. Large temperature differentials between the photometer and the operating environment can lead to incorrect measurement due to the formation of condensate in the area of the lens or on the vial (e.g).
10. To avoid errors caused by stray-light do not use the instrument in bright sunlight.

● **Calibration mode**



Press MODE key and **hold depressed**.



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

CAL
Cl

The following messages appear in the display in alternating mode:



Perform zero calibration as described.
Press the ZERO/TEST key.

METHOD

The method symbol flashes for approx. 3 seconds.

0.0.0
CAL

The following messages appear in the display in alternating mode:



Place the standard to be used in the sample chamber with ▽ and △ alignment. Press the ZERO/TEST key.

METHOD

The method symbol flashes for approx. 3 seconds.

RESULT

CAL

The result is shown in alternating mode with CAL.

If the result corresponds to the value of the standard used (within the allowed tolerance), exit calibration mode by pressing the ON/OFF key.



Pressing the MODE key once increases the displayed result by 1 digit.



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

CAL

RESULT + x

Continue pressing the keys until the displayed result corresponds to the value of the standard used.



If you press the ON/OFF key, the new correction factor is calculated and stored on the user calibration level.

: **:** Confirmation of calibration (3 seconds).

● **Note**

CAL

Factory calibration active.

cAL

Calibration has been effected by the user.

● **Recommended calibration value**

Chlorine: between 0,5 and 1,5 mg/l Cl*

* or rather values mentioned in the reference standard kits

● **User calibration** : cAL

Factory calibration : CAL

The unit can be reset to delivery condition (factory calibration) as follows:



Press MODE and ZERO/TEST together and **hold depressed**.



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

The following messages appear in the display in alternating mode:

SEL

The unit is in delivery condition.

CAL

(SEL stands for Select)

or:

SEL

The unit operates with a calibration performed by the user. (If the user calibration is to be retained, switch the unit off using the ON/OFF key.)

cAL



Factory calibration is activated by pressing the MODE key. The following messages appear in alternating mode in the display:

SEL

CAL



Switch the unit off using the ON/OFF key.

● **User notes**

E 10

Calibration factor "out of range"

E 70

Factory calibration not OK / deleted

E 71

User calibration not OK / deleted