

GB Photometer Copper / Zinc LR

● Operation



Switch the unit on using the "ON/OFF" switch.

Cu/Zn

This display shows the method. Press the "MODE" key until the desired method is displayed.



For zeroing the instrument refer to "Method Preparation".

Press the "ZERO/TEST" key.



The method symbol flashes for approx. 3 seconds.

0.0.0

Confirms zero calibration.

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

Add the appropriate reagent tablet; a color will develop in the sample (see "Method Preparation").

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.

Repeat 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

Measuring range exceeded or excessive turbidity.

- Err

Result below the measuring range limit.

LO BAT

Replace 9 V battery, no further analysis are possible.

E20

Too much light; with Zn possibly due to overrange.

E22

Light absorption too high or excessive light at detector.

● Technical data

Light source:

LED: $\lambda = 580 \text{ nm}$

Battery:

9 V-block battery (Life 600 tests).

Auto-OFF:

Automatic switch-off occurs approx. 15 minutes after last keypress.

Ambient conditions:

5-40°C

rel. humidity (non-condensing).

Compliance:

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
FCC Part 15 Class A
ICES – 003 Issue 2

● Copper LR 0.02 - 1.0 mg/l Method Preparation

0.0.0

Fill a clean vial with the sample up to the 10 ml mark, screw the cap on, and place in the sample chamber with the ∇ vial mark aligned with the Δ housing mark.



Press the "ZERO/TEST" key.



The method symbol flashes for approx. 3 seconds.

0.0.0

Confirms zero calibration.

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

Add one COPPER / ZINC LR-tablet straight from the foil to the 10 ml sample, and crush using a clean stir rod, allow to dissolve completely, cap the vial.

Wait for a color reaction time of 5 minutes!

Add one EDTA-tablet straight from the foil to the same sample and crush using a clean stir rod. Allow to dissolve completely, cap the vial, and align the ∇ and Δ marks.



Press the "ZERO/TEST" key.



The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display in mg/l Cu²⁺

Measuring tolerance: $\pm 0.05 \text{ mg/l Cu}^{2+}$

● Zinc LR 0.02 - 1.0 mg/l Method Preparation

Zn

The display shows the following:

Add one COPPER / ZINC LR-tablet straight from the foil to the 10 ml sample, and crush using a clean stir rod. Allow to dissolve completely, cap the vial, and align the ∇ and Δ marks.

Wait for a color reaction time of 5 minutes!

Press the "ZERO/TEST" key.



The method symbol flashes for approx. 3 seconds.

0.0.0

This display confirms the first reaction.

To the already colored sample add one EDTA-tablet straight from the foil and crush using a clean stir rod. Allow to dissolve completely, close the vial, and position with ∇ and Δ 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 Zn.

Measuring tolerance: $\pm 0.05 \text{ mg/l}$

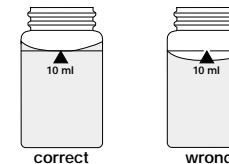
● Calibration Standards

Standards for calibration should be prepared similar to samples.

● Notes

The tablets must be added in the correct sequence.

● Correct filling of the vial



● 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.

Material Safety Data Sheets: www.tintometer.de

Ensure proper disposal of reagent solutions.

● Avoiding errors in photometric measurements

1. Thoroughly clean vials, caps and stir rod **after each analysis** in order to prevent carry-over errors. Even minute reagent residues lead to incorrect measurements. Use the supplied brush for cleaning.
2. Ensure that the outer walls of the vials are dry and clean before performing the analysis. Fingerprints or water droplets on the light entry surfaces of the vials lead to incorrect measurements.
3. "Zero calibration" and "Test" must be performed using the same vial, since different vials can possess slightly different tolerances.
4. For "Zero calibration" and "Test", ensure that the vial is always positioned in the sample chamber in such a way that the graduation with the white triangle points toward the marking on the housing.
5. Always perform "Zero calibration" and "Test" with capped vials.
6. Bubbles on the inside walls of the vial can lead to incorrect measurements. To prevent this, cap the vial and remove the bubbles by swirling the vial before performing the test.
7. You must prevent water from penetrating into the sample chamber. The entry of water into the housing of the photometer can destroy electronic components and lead to corrosion damage.
8. Soiling of the lens (LED and photosensor) in the sample chamber leads to incorrect measurements. Check - and if necessary clean - the light entry surfaces of the sample chamber at regular intervals. Clean using a moist cloth and cotton balls.
9. Always add the reagent tablets to the sample straight from the foil without touching them with your fingers.
10. Major temperature differentials between the photometer and the environment can lead to incorrect measurements - e.g. due to the formation of condensate in the area of the lens or on the vial. Specified tolerances at T = 20 °C.
11. For best results pipette samples.
12. To avoid errors caused by stray-light do not use the instrument in bright sunlight.

● Calibration mode



Press and hold "MODE" key.



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

CAL

These messages will alternate in the display.
If necessary, press "MODE" key until the desired method alternates with CAL.

Cu/Zn



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



The method symbol flashes for approx. 3 seconds.

0.0.0

These messages will alternate in the display.

CAL



Place the standard to be used in the sample chamber with the ▽ and ▲ marks aligned (see "Method Preparation"). Press the "ZERO/TEST" key.



The method symbol flashes for approx. 3 seconds.

RESULT

The result is shown in the display alternating with CAL.

CAL

If the result corresponds to the value of the standard used (within the allowed tolerance), exit calibration mode by pressing the "power" 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

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

RESULT + x



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

: :

Confirms calibration (3 seconds).

● Note

CAL

Factory calibration active.

cAL

Calibration has been set by the user.

● Recommended calibration values

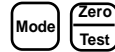
Copper: between 0.2 and 0.4 mg/l Cu²⁺

Zinc: between 0.2 and 0.4 mg/l Zn²⁺

● User calibration : cAL

Factory calibration : CAL

The unit can be reset to the factory calibration as follows:



Press and hold both "MODE" and "ZERO/TEST" together.



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

The following messages will alternate in the display.

SEL

The unit is reset to factory settings.

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 will alternate 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

Cu Factory calibration incorrect / deleted

E 71

Cu User calibration incorrect / deleted

E 72

Zn Factory calibration incorrect / deleted

E 73

Zn User calibration incorrect / deleted