

● **Operation**



Switch the unit on using the "power" switch

**Cu**

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

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. The characteristic color starts to appear after the addition of the reagent tablet(s) (see "Method Preparation"). Cap the vial again and place 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.

**Repeat 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**

**EOI**

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

**+Err**

Measuring range exceeded or excessive turbidity.

**-Err**

Result below measuring range limit.

**LO BAT**

Replace 9 V battery immediately; no further analysis possible.

● **Technical data**

Optics:	LED: λ = 528 nm (filter)
Battery:	9 V block battery (life = approx. 600 tests)
Auto-OFF:	Auto unit switch-off occurs approx. 5 minutes after a key was last pressed.
Ambient conditions:	5-40°C 30-90% 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 0.05 - 5.0 mg/l Method Preparation**

**(a) free copper**

**0.0.0**

Perform zero calibration (see "Operation"). Add one COPPER No. 1 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.



Press the "zero/test" key.

**Cu**

The method symbol flashes for approx. 3 seconds.

**RESULT**

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

**(b) total copper**

Add one COPPER No. 2 direct from the foil to the already colored sample immediately after measurement, 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.

**Cu**

The method symbol flashes for approx. 3 seconds.

**RESULT**

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

**(c) combined copper**

combined copper = total copper - free copper

**Tolerance:** 0.05-1.00 mg/l: ± 0.05 mg/l  
1.00-5.00 mg/l: ± 0.10 mg/l

● **Calibration Standards**

Standards for calibration should be prepared similar to samples.

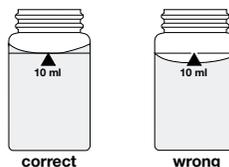
● **Method notes**

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 material safety data sheets.

Ensure proper disposal of reagent solutions.

● **Correct filling of the vial**



● **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.

## ● Calibration mode



Press and hold "mode" key.



Switch unit on using "power" 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**



Perform zero calibration as described.  
Press the "zero/test" key.

**METHOD**

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.

**METHOD**

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 "power" 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 0.5 and 1.5 mg/l Cu<sup>2+</sup>

## ● 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 "power" 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.  
(SEL stands for Select)

**CAL**

**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 "power" 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 "power" key.

## ● User notes

**E 10**

Calibration factor "out of range"

**E 70**

Factory calibration incorrect / erased

**E 71**

User calibration incorrect / erased

Technical changes without notice.  
Printed in Germany.