

GB Photometer COD vario (Order code 20 92 50)

● Preparing the Sample

Use the vial for the appropriate range:

Lr-Range: 0 - 150 mg/l, Order code 420720

Mr-Range: 0 - 1500 mg/l, Order code 420721

Hr-Range: 0 - 15000 mg/l, Order code 420722

Open a vial with a white cap and add the specified volume (Appropriate protection equipment required).

Lr-/Mr: 2 ml water sample

Hr: 0.2 ml water sample

Prepare a **blank**¹⁾ by using deionized water instead of the sample (Lr/Mr: 2 ml deionized water, Hr: 0.2 ml deionized water) (Note 1).

Replace the cap **tightly**. Invert the vial gently several times to mix the contents (**The vial will become hot during mixing!**) and heat the vials for two hours in the reactor at a temperature of 150 °C. Remove the tubes from the reactor and allow them to cool to 60 °C or less. Mix the contents by inverting each vial several times while still warm. Then allow the tubes to cool to ambient temperature before measuring (Note 2).

● Technical Data

Optics:	Lr-Range: LED, filter ($\lambda = 430 \text{ nm}$) Mr-/Hr-Range: LED, ($\lambda = 605 \text{ nm}$)
Battery:	9 V-block-battery (Life approx. 600 tests).
Auto-OFF:	Automatic switch off 5 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

● 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 tests possible.

● Operation



Lr

Fix the adaptor for 16 mm vials on the sample chamber.

Switch the unit on, using the ON/OFF key.



RANGE

Use the MODE key to select the range required:
Lr → Mr → Hr → Lr → (Scroll)

The display will show:

Place the **blank** in the adaptor (Note 3) making sure that the I mark on the vial is aligned with the Δ mark on the instrument. Place the cover on the adaptor.
Blanks are specially prepared for each individual test range.



RANGE

Press the ZERO/TEST key.

The "Range" symbol will flash for about 3 seconds.

0.0.0

The display will show:

After zeroing, remove the vial from the adaptor and store it with its test-set.

Place the sample vial in the adaptor (Note 3) making sure that the I mark on the vial is aligned with the Δ mark on the instrument. Place the cover on the adaptor.



RANGE

Press the ZERO/TEST key.

The "Range" symbol will flash for about 3 seconds.

RESULT

The display will show the result:

Lr-/Mr-range: direct in mg/l
Hr-range: direct in g/l
(this is shown by an alternating display of the reading and g : L)

Tolerance: $\pm 3.5 \%$

Repeating the analysis:

Press the ZERO/TEST key again.

New zero calibration:

Press the MODE key until the desired range symbol appears in the display.

● Notes

- Run samples and blanks with the same batch of vials. The blank is stable when stored in the dark and can be used for further measurements with vials of the same batch.
- Don't place hot vials in the adaptor. Cool the vials to room temperature for final measurement.
- Suspended solids in the vial lead to incorrect measurements. For this reason it is important to place the vials carefully in the adaptor. The precipitant at the bottom of the sample should not be suspended.
- Clean the outside of the vials with a towel. Finger-prints or other marks will be removed.
- Vials must always be positioned in the sample chamber so that graduation on the vials lines up with the mark on the housing.
- Avoid spillage of water in the sample chamber. If water should leak into the photometer housing, it can damage electronic components and cause corrosion.
- Contamination of the optics (LED and photo-sensor) in the sample chamber will result in incorrect measurements. The windows in of the sample chamber must be checked at regular intervals and cleaned as necessary. Use a moistened cloth and cotton buds for cleaning purposes.
- Large temperature differences between the photometer and ambient conditions can lead to incorrect measurements, or build-up of condensate around the optics of the vial.
- To avoid errors caused by stray-light do not use the instrument in bright sunlight.

● Chemical method:

Method:

The organic material present in the sample is oxidised by a standard amount of a potassium dichromate oxidising mixture. The excess of this reagent, after oxidation is complete, is measured photometrically.

Application:

Samples can be measured where the chloride content does not exceed 1.000 mg/l (LR/MR) or 10.000 mg/l (HR).

In exceptional cases, compounds contained in the water cannot be oxidized adequately, what results in minimum findings, compared with the reference method.

Different methods of sampling, the preparation of the sample itself and the time elapsed between taking the sample and analysis, can all affect the results obtained.

Material Safety Data Sheets: www.tintometer.de

Reagent solutions must be disposed properly.

● Calibration Mode



Press MODE key and **hold**.



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

CAL

Select the range using the MODE key:

Lr

CAL Lr → CAL Mr → (Scroll)



Zero the instrument as described above.
Press the ZERO/TEST key.



The "Range" symbol flashes for approx. 3 seconds.

0.0.0

The display will show alternately:

CAL



Place the calibration standard in the adaptor Δ . Place the cover on the adaptor. Press the ZERO/TEST key.



The "Range" symbol flashes for approx. 3 seconds.

RESULT

The result will appear on the display, alternating with CAL.

CAL

If the result agrees with the value of the standard which is being used (within normal tolerances) push the ON/OFF key to quit the calibration mode.



Pressing the MODE key once will raise the displayed value by one digit.



Pressing the ZERO/TEST key once will reduce the displayed value by one digit.

CAL

Press the keys repeatedly until the displayed value agrees with the value of the standard which is being used.

RESULT+ x



Pressing the ON/OFF key will cause the new correction factor to be calculated and stored in the user calibration software (there is no automatic switch-off after 5 minutes).

: :

Confirmation of calibration (3 seconds).

Separate calibration of the measuring range for HR is not possible. The unit uses the calibration for the MR measuring range.

● Note

CAL

The factory calibration is active.

cAL

Calibration has been set by the user.

● Recommended calibration values

Lr: 100 mg/l

Mr: 900 mg/l

● User calibration : cAL

Manufacturing calibration : CAL

The unit can be returned to the "as-delivered" condition (factory calibration).



Press both the MODE and the ZERO/TEST key and **hold**.



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

The display will show alternately:

SEL

The unit is in the "as-delivered" condition

CAL

(SEL = Select)

or:

SEL

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

cAL



Calibration is reset to the factory setting by pressing the MODE key. The display will show alternately.

SEL

CAL



Switch the unit off using the ON/OFF key (no automatic switch-off after 5 minutes).

● User Information

E 10

Calibration factor "out of range"

E 70

Lr: Manufacturing calibration incorrect / erase

E 72

Mr: Manufacturing calibration incorrect / erase

E 71

Lr: User calibration incorrect / erase

E 73

Mr: User calibration incorrect / erase