(GB) Photometer Cl, pH, TA, Urea

● Operation

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

Cl — The display shows the following:

Mode — Select the test required using the MODE key:
Cl → pH → tA → Ur → Cl → ..... (Scroll)

METHOD — The display shows the following:

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

Zero/Test — Press the ZERO/TEST key.

METHOD (flashing) — 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.
Screw the cap back on and place the vial in the sample chamber with the Δ and ∇ marks aligned.

Zero/Test — Press the ZERO/TEST key.

METHOD (flashing) — 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

EOI	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 lowest limit of the measuring range.
LO BAT	Replace 9 V battery, no further analysis possible.

● Technical data

Light source:	2 LED: λ_1 = 528 nm (filter) ; λ_2 = 605 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

0.0.0 — 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. Screw the cap on and replace the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Zero/Test — Press the ZERO/TEST key.

Cl (flashing) — 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 and put the vial back into the sample chamber, repositioning the Δ and ∇ marks.
Wait for a colour reaction time of two minutes.

Zero/Test — Press the ZERO/TEST key.

Cl (flashing) — 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: ± 0.05 mg/l > 3-4 mg/l: ± 0.30 mg/l
> 1-2 mg/l: ± 0.10 mg/l > 4-6 mg/l: ± 0.40 mg/l
> 2-3 mg/l: ± 0.20 mg/l

● 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. Screw the cap on and replace the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Zero/Test — Press the ZERO/TEST key.

pH (flashing) — 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: ± 0.1 pH

● Total Alkalinity 5 - 200 mg/l $CaCO_3$

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. Screw the cap on and replace the vial in the sample chamber making sure the Δ and ∇ marks are aligned.

Zero/Test — Press the ZERO/TEST key.

tA (flashing) — The method symbol flashes for approx. 3 seconds.

RESULT — The mg/l $CaCO_3$ value is shown in the display.
Rinse the vial and cap thoroughly after each test.

Tolerance: ± 5 % Full Scale

● Urea 0,1 - 3 mg/l

0.0.0 — Perform zero calibration (see "Operation").
Add 2 drops of Urea reagent 1 to the 10 ml sample. Screw the cap on and swirl to mix. Open the vial, ass 1 drop of reagent (Urease), screw the cap on and swirl to mix.

Wait for a colour reaction time of 5 minutes!

Add an AMMONIA No. 1 tablet to the vial straight from the foil and mix to dissolve using a clean stirring rod. Add an AMMONIA No. 2 tablet to the same sample straight from the foil and mix to dissolve using a clean stirring rod. Allow the tablet to dissolve completely. Screw the cap on and replace the vial in the sample chamber making sure that the Δ and ∇ marks are aligned.

Wait for a colour reaction time of 10 minutes!

Zero/Test — Press the ZERO/TEST key.

U.1 (flashing) — The method symbol flashes for approx. 3 seconds.

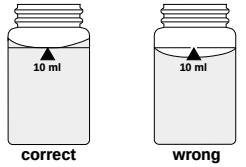
RESULT — The result is shown in the display in mg/l urea.

Tolerance: ± 0,2 mg/l

● Notes

1. The sample temperature should be between 20 and 30°C; determination at the latest one hour after sample taking.
2. Store reagent 2 (Urease) in the refrigerator at a temperature of 4 - 8°C.
3. Ammonium and chloramines are also measured during urea measurement.
4. Always adhere to the sequence of tablet addition.
5. The AMMONIA No. 1 tablet does not dissolve fully until the AMMONIA No. 2 tablet has been added.
6. Before analysing seawater samples, a measuring spoon of "Ammonia Conditioning Powder" must be added to the sample and swirled to dissolve before the AMMONIA No. 1 tablet is added.

● 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.

● Calibration Mode

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

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

CAL / Cl — Select the test required using the MODE key:
CAL Cl → CAL pH → CAL tA → CAL Ur..... (Scroll)

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

METHOD — The method symbol flashes for approx. 3 seconds.

0.0.0 / CAL — The display shows the following in alternating mode:

Zero/Test — 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 / CAL — The result is shown in the display, alternating with 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.

Mode — Otherwise, pressing the MODE key once increases the displayed value by 1 digit.

Zero/Test — Pressing the ZERO/TEST key once decreases the displayed value by 1 digit.

CAL / RESULT + x — Pressing the relevant key until the displayed value equals the value of the calibration standard.

On/Off — 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

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*
Total Alkalinity:	between 50 and 150 mg/l $CaCO_3$
Urea:	between 1 and 2 mg/l CH_4N_2O

* or rather values mentioned in the reference standard kits

● User calibration : cAL
Manufacturing calibration : CAL

To reset the calibration to the factory setting:

Mode + Zero/Test — Press both the MODE and ZERO/TEST and **keep them depressed**.

On/Off — 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 / CAL — The calibration is reset to the factory setting.
(SEL stands for Select)

or:

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

Mode — Calibration is reset to the factory setting by pressing the MODE key. The following messages will appear in turn on the display:

SEL / CAL

On/Off — 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	tA:	Manufacturing calibration incorrect / erase
E 76	Ur:	Manufacturing calibration incorrect / erase
E 71	Cl:	User calibration incorrect / erase
E 73	pH:	User calibration incorrect / erase
E 75	tA:	User calibration incorrect / erase
E 77	Ur:	User calibration incorrect / erase

● Troubleshooting: Guidelines for photometric measurements

1. Vials, stoppers 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. Fingerprints or droplets of water on the sides of the vial can result in errors.
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 graduations facing toward the housing mark.
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.

Technical changes without notice
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