

● **Operation**



Switch the unit on using the "power" switch.

**Cld**

The 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 Δ-mark on the vial aligned with the ∇-mark on the instrument.



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**

**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 measuring range limit.

**LO BAT**

Replace 9 V battery, no further analysis are possible.

● **Technical data**

Light source: LED, filter (λ = 528 nm)  
 Battery: 9 V-block battery (Life 600 tests).  
 Auto-OFF: Automatic switch-off occurs 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

● **Chlorine Dioxide 0.04 - 2.8 mg/l Method Preparation**

**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 stir rod then add the sample to the 10 ml mark. Mix well with the stir rod to dissolve the tablet completely. Screw the cap on and replace the vial in the sample chamber making sure the Δ and ∇ marks are aligned.



Press the "zero/test" key.



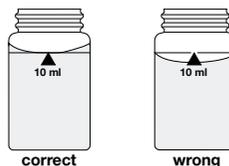
The method symbol flashes for approx. 3 seconds.

**RESULT**

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

**Tolerance:** 0.1 - 1.9 mg/l: ± 0.1 mg/l  
 > 1.9 - 2.8 mg/l: ± 0.2 mg/l

● **Correct filling of the vial**



correct

wrong

● **Calibration Standards**

Use chlorine calibration standards, Orion AC 2073, if needed.

● **Chemical methods notes**

● **Chlorine dioxide**

1. Vial cleaning

Many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of oxidation agents (e.g. chlorine) may show lower results.

In order to rule out this measurements error, we refer users to ISO 7393 / Part 1 and Part 2:

"The glass appliances should be free of chlorine consumption and used exclusively for this process (determination of free chlorine and total chlorine). Chlorine consumption-free glass appliances are obtained by placing them in a sodium hypochlorite solution (0.1 g/l) for 1 hour and then rinsing thoroughly with water."

N.B.: As an alternative to the sodium hypochlorite solution, the vial may also be placed in chlorinated swimming pool water and then thoroughly rinsed with water before use.

2. Preparing the sample

When preparing the sample, the escape of chlorine, e.g. by pipetting or shaking, must be avoided. The analysis must take place immediately after taking the sample. The DPD color development is carried out with a pH value of 6.3 - 6.5. The reagent tablets therefore contain a buffer for the pH value adjustment. Strongly alkaline or acidic water must, however, be neutralized before the analysis.

3. Exceeding the measuring range

Concentrations above 2.8 mg/l of chlorine dioxide can produce results within the measuring range up to 0 mg/l. In this event, the sample must be diluted and the measurement repeated.

4. Interferences

Any oxidizers such as chlorine, ozone, bromine interfere.

● **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. Ensure proper disposal of reagent solutions.

If necessary, request material safety data sheets.

Ensure proper disposal of reagent solution.

## ● Calibration Mode

It is not necessary to make a calibration since the software refers to the calibration of the chlorine range.

Calibrate using the Cl method display if no previous calibration was performed.

To check for proper operation, the 1 mg/l Cl<sub>2</sub> standard, part of Orion AC 2073, should read about 1.9 mg/l ± 0.1 mg/l in the Chlorine Dioxide mode.

## ● Note

**CAL** Factory calibration active.

**cAL** Calibration has been set by the user.

## ● Avoiding errors in photometric measurements

1. Vials, caps and stir rods should be cleaned thoroughly **after each analysis** to prevent carry over errors. 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 since there may be slight differences in optical performance between vials.
4. The vials must be positioned in the vial compartment for zero calibration and test with the graduations aligned with the housing mark.
5. Zero calibration and test must be carried out with capped vials.
6. Bubbles on the inside of the vial may also lead to errors. In this case, cap the vial and remove bubbles by swirling the contents before starting test.
7. Avoid spilling water into the vial compartment. 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 vial compartment can result in errors. If this is suspected check the condition of the windows.
9. The reagent tablets should be added to the sample without being handled.
10. 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.  
Specified tolerances at T = 20 °C.
11. For best results pipette samples.

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