

## Instruction Manual

# HI 3810 Dissolved Oxygen Test Kit

**HANNA**  
instruments

www.hannainst.com

Dear Customer,

Thank you for choosing a Hanna Product. Please read the instructions carefully before using the chemical test kit. It will provide you with the necessary information for correct use of the kit.

Remove the chemical test kit from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any noticeable damage, notify your Dealer or the nearest Hanna office immediately.

Each kit is supplied with:

- Reagent 1, 1 bottle with dropper (30 mL);
- Reagent 2, 1 bottle with dropper (30 mL);
- Reagent 3, 2 bottles with dropper (60 mL);
- Reagent 4, 1 bottle with dropper (10 mL);
- Reagent 5, 1 bottle (120 mL);
- 1 glass stoppered bottle;
- 1 calibrated vessel (10 mL);
- 1 calibrated syringe.

Note: Any damaged or defective item must be returned in its original packing materials.

## SPECIFICATIONS

Range	0 to 10 mg/L (ppm) O <sub>2</sub>
Smallest Increment	0.1 mg/L (ppm) O <sub>2</sub>
Analysis Method	Azide Modification Titration
Sample Size	5 mL
Number of Tests	110 (average)
Case Dimensions	260x120x60 mm (10.2x4.7x2.4")
Shipping Weight	910 g (34.0 oz.)

ISTR3810RT 10/99 PRINTED IN ITALY

## SIGNIFICANCE AND USE

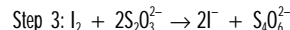
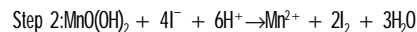
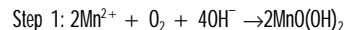
The concentration of dissolved oxygen in water is extremely important in nature as well in man's environment. In the oceans, lakes, rivers, and other surface water bodies, dissolved oxygen is essential to the growth and development of aquatic life. Without oxygen, the water can become toxic due to the anaerobic decaying of organic matter. In man's environment, water must contain at least 2 mg/L of oxygen to protect water pipes from corrosion. However, boiler system water, in many cases, cannot contain greater than 10 mg/L oxygen.

The Hanna Dissolved Oxygen Test Kit can determine the oxygen concentration in water quickly and easily. The kit is portable and can be used in the field as well in the laboratory. The design makes the kit easy to handle and, except for Reagent 5, practically prevents accidental injury or damage due to spills.

Note: mg/L is equivalent to ppm (parts per million).

## CHEMICAL REACTION

A modified Winkler method is used. Manganous ions react with oxygen in the presence of potassium hydroxide to form a manganese oxide precipitate (Step 1). An azide is present to prevent any nitrite ions from interfering with the test. On addition of acid, manganese oxide hydroxide oxidizes the iodide to iodine (Step 2). Since the amount of iodine generated is equivalent to the oxygen in the sample, the concentration of iodine is calculated by titration of thiosulfate ions that reduce the iodine back to iodide ions.



## INSTRUCTIONS

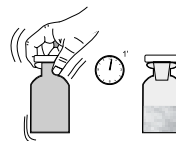
READ ALL THE INSTRUCTIONS BEFORE USING THE TEST KIT  
LOOK AT THE BACK PAGE FOR THE ILLUSTRATED PROCEDURE

Note: Push and twist pipet tip onto tapered end of syringe ensuring an air tight-fit.

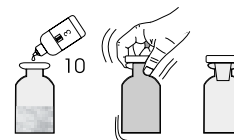
- Rinse the glass bottle 3 times with water sample and fill to overflow. Insert stopper carefully so as to avoid trapping of air bubbles in the bottle.



- Remove the stopper and add 5 drops each of reagent 1 and 2. Carefully stopper the bottle, shake vigorously and allow to stand for 1 minute. A flocculent precipitate will form.



- Remove the stopper, add 10 drops of Reagent 3, again stopper the bottle and shake vigorously until all particulate material is dissolved.



Note: If oxygen is present, the flocculent precipitate will disappear and the solution will turn a yellow color.

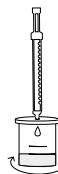
- Remove the cap from the plastic vessel. Rinse the plastic vessel with the solution in the bottle, fill to the 5 mL mark and replace the cap.
- Add 1 drop of Reagent 4 through the cap port and mix by carefully swirling the vessel in tight circles. The solution will turn a violet to blue color.



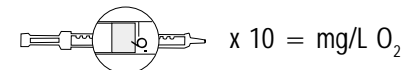
- Take the titration syringe and push the plunger completely into the syringe. Insert tip into Reagent 5 solution and pull the plunger out until the lower edge of the plunger seal is on the 0 mL mark of the syringe.



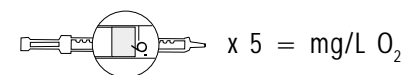
- Place the syringe tip into the cap port of the plastic vessel and slowly add the titration solution dropwise, swirling to mix after each drop. Continue adding titration solution until the solution in the plastic vessel changes from blue to colorless.



- Read off the milliliters of titration solution from the syringe scale and multiply by 10 to obtain mg/L (ppm) oxygen.



- If results are lower than 5 mg/L, the precision of the test can be improved as follows. Add an amount of unused sample in the glass bottle to the 10 mL mark of the plastic vessel. Proceed with the test as described before and multiply the values on the syringe scale by 5 to obtain mg/L oxygen in the sample.



## REFERENCES

1987 Annual Book of ASTM Standard, Volume 11.01 Water (1), pages 629-638.

Official Methods of Analysis, A.O.A.C., 14<sup>th</sup> Edition, 1984, pages 620-621.

Standard Methods for the Examination of Water and Wastewater, 16<sup>th</sup> Edition, 1985.

## HEALTH & SAFETY DATA

The chemicals contained in this test kit may be hazardous if improperly handled. Read Health and Safety Data Sheets before performing the test.

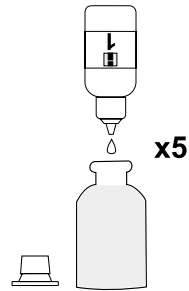
**HI 3810 DISSOLVED OXYGEN TEST KIT**

**1**

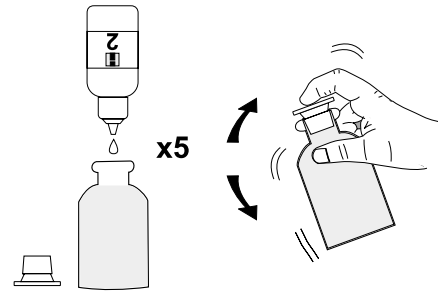
**Rinse x 3**



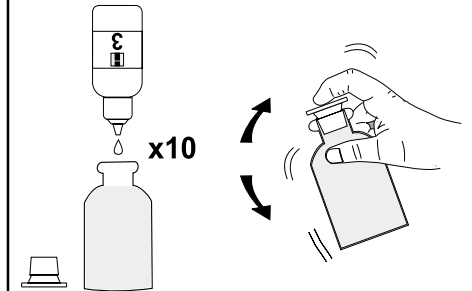
**2**



**3**

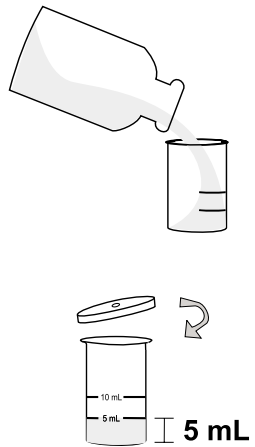


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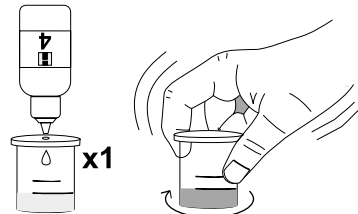


**5 mL sample**

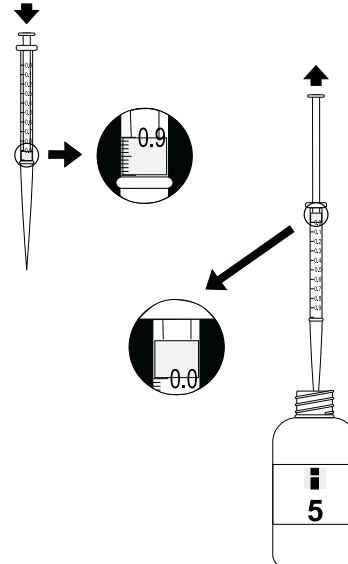
**5**



**6**



**7**



**8**

