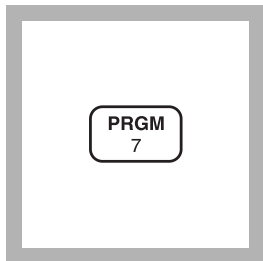


# OXYGEN, DISSOLVED, High Range (0 to 15.0 mg/L O<sub>2</sub>)

## HRDO Method

For water and wastewater

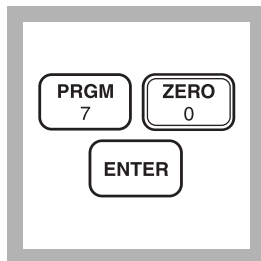


1. Enter the stored program number for dissolved oxygen, high range.

Press: **PRGM**

The display will show:

**PRGM ?**

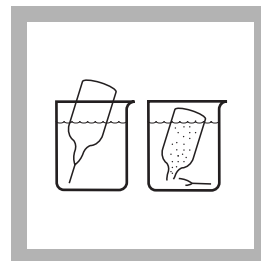


2. Press: **70 ENTER**

The display will show **mg/L, O<sub>2</sub>** and the **ZERO** icon.

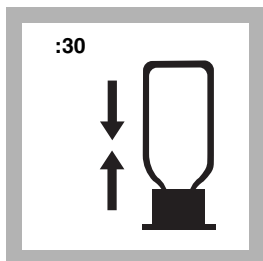


3. Fill a sample cell (the blank) with at least 10 mL of sample. Fill a blue ampul cap with sample. Collect at least 40 mL of sample in a 50-mL beaker.



4. Fill a High Range Dissolved Oxygen AccuVac Ampul with sample.

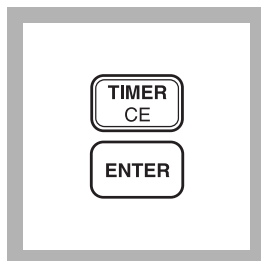
*Note: Keep the tip immersed while the ampul fills completely.*



5. Without inverting the ampul, immediately place the ampul cap that has been filled with sample securely over the tip of the ampul. Shake for about 30 seconds.

*Note: Accuracy is not affected by undissolved powder.*

*Note: The cap prevents contamination with atmospheric oxygen.*

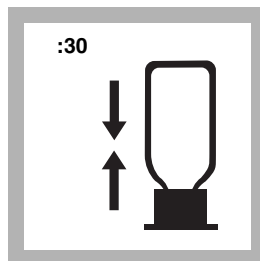


6. Press:

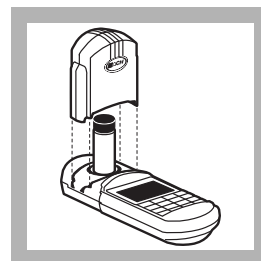
**TIMER ENTER**

A 2-minute reaction period will begin.

*Note: The two-minute period allows oxygen which was degassed during aspiration to redissolve in the sample and react.*



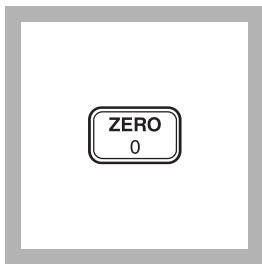
7. When the timer beeps, shake the ampul for 30 seconds.



8. Place the blank into the cell holder. Tightly cover the sample cell with the instrument cap.

## OXYGEN, DISSOLVED, High Range, continued

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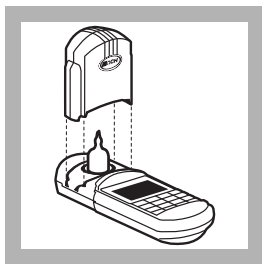


**9. Press: ZERO**

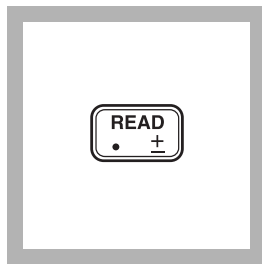
The cursor will move to the right, then the display will show:

**0.0 mg/L O<sub>2</sub>**

*Note: If Reagent Blank Correction is on, the display may flash "limit". See Section 1.*



**10. Place the AccuVac ampul into the cell holder. Tightly cover the ampul with the instrument cap. Wait approximately 30 seconds for the air bubbles to disperse from the light path.**



**11. Press: READ**

The cursor will move to the right, then the result in mg/L O<sub>2</sub> will be displayed.

*Note: Standard Adjust may be performed using a prepared standard (see Section 1).*

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### Sampling and Storage

The main consideration in sampling with the High Range Dissolved Oxygen AccuVac Ampul is to prevent the sample from becoming contaminated with atmospheric oxygen. This is accomplished by capping the ampul with an ampul cap in the interval between breaking open the ampul and reading the absorbance. If the ampul is securely capped, it should be safe from contamination for several hours. The absorbance will decrease by approximately 3% during the first hour and will not change significantly afterwards.

Sampling and sample handling are important considerations in obtaining meaningful results. The dissolved oxygen content of the water being tested can be expected to change with depth, turbulence, temperature, sludge deposits, light, microbial action, mixing, travel time and other factors. A single dissolved oxygen test rarely reflects the accurate over-all condition of a body of water. Several samples taken at different times, locations and depths are recommended for most reliable results. Samples must be tested immediately upon collection although only a small error results if the absorbance reading is taken several hours later.

# OXYGEN, DISSOLVED, High Range, continued

## Accuracy Check

The results of this procedure may be compared with the results of a dissolved oxygen meter (Cat. No. 51815-01).

## Method Performance

### Precision

In a single laboratory, using a standard solution of 8.0 mg/L O<sub>2</sub> determined by the Winkler method and two representative lots of reagent with the instrument, a single operator obtained a standard deviation of ±0.41 mg/L O<sub>2</sub>.

### Estimated Detection Limit

The estimated detection limit for program 70 is 0.10 mg/L O<sub>2</sub>. For more information on the estimated detection limit, see *Section 1*.

## Interferences

Interfering Substance	Interference Levels and Treatments
Cr <sup>3+</sup>	Greater than 10 mg/L
Cu <sup>2+</sup>	Greater than 10 mg/L
Fe <sup>2+</sup>	Greater than 10 mg/L
Mg <sup>2+</sup>	Magnesium is commonly present in seawater and causes a negative interference. If the sample contains more than 50% seawater, the oxygen concentration obtained by this method will be 25% less than the true oxygen concentration. If the sample contains less than 50% seawater, the interference will be less than 5%.
Mn <sup>2+</sup>	Greater than 10 mg/L
Ni <sup>2+</sup>	Greater than 10 mg/L
NO <sub>2</sub> <sup>-</sup>	Greater than 10 mg/L

## Summary of Method

The High Range Dissolved Oxygen AccuVac Ampul contains reagent vacuum sealed in a 12-mL ampul. When the AccuVac ampul is broken open in a sample containing dissolved oxygen, a yellow color forms, which turns purple as the oxygen reacts with the reagent. The color developed is proportional to the concentration of dissolved oxygen.

# OXYGEN, DISSOLVED, High Range, continued

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## REQUIRED REAGENTS

Description	Quantity Required		Unit	Cat. No.
	Per Test			
High Range Dissolved Oxygen AccuVac Ampuls, with 2 reusable ampul caps .....	1 ampul .....	25/pkg.....	25150-25	

## REQUIRED APPARATUS

Beaker, 50 mL.....	1 .....	each.....	500-41H
Caps, ampul, blue.....	varies .....	25/pkg.....	1731-25
Sample Cell, 10-20-25 mL, w/ cap.....	1 .....	6/pkg.....	24019-06

## OPTIONAL REAGENTS AND APPARATUS

AccuVac Dissolved Oxygen Sampler .....	each.....	24051-00
AccuVac Snapper Kit.....	each.....	24052-00
AccuVac Drainer.....	each.....	41036-00
BOD bottle and stopper, 300 mL.....	each.....	621-00
Dissolved Oxygen Meter, Portable HQ 10 .....	each.....	51815-01
Dissolved Oxygen Reagent Set (Buret Method).....	100 tests.....	23514-00
Dissolved Oxygen Reagent Set (Digital Titrator Method) .....	50 tests.....	22722-00

Dissolved oxygen may also be determined by titrimetric methods.  
Request Publication 8042 for additional information.

### *For Technical Assistance, Price and Ordering*

In the U.S.A.—Call 800-227-4224

Outside the U.S.A.—Contact the Hach office or distributor serving you.