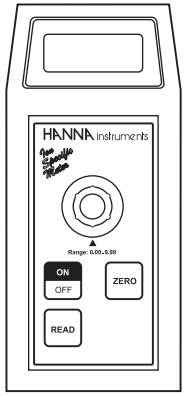
Instruction Manual

# HI 93732N
# Dissolved Oxygen ISM




HANNA instruments
www.hannainst.com

CE
This Instrument is in Compliance with the CE Directives

## WARRANTY

HI 93732N is warranted for two years against defects in workmanship and materials when used for its intended purpose and maintained according to instructions.

This warranty is limited to repair or replacement free of charge.

Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. If the repair is not covered by the warranty, you will be notified of the charges incurred.

If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization Number from the Customer Service department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

To validate your warranty, fill out and return the enclosed warranty card within 14 days from the date of purchase.



Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

Dear Customer,

Thank you for choosing a Hanna product. This manual will provide you with the necessary information for the correct operation of the meter. Please read it carefully before using the meter. If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com.

This instrument is in compliance with CE directives.

## PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If there is any damage, notify your Dealer.

Each Ion Specific Meter is supplied complete with

- Two Sample Cuvets and Caps
- One Transport Cap
- One 60 mL glass Bottle with Stopper
- 9V Battery

Note: Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing with the supplied accessories.

## GENERAL DESCRIPTION

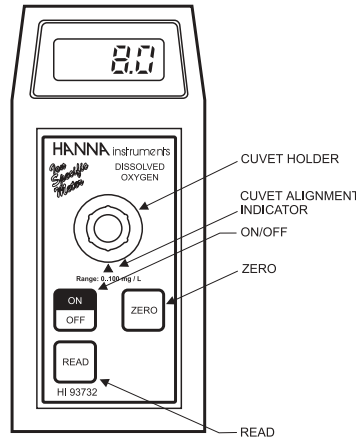
The HI 93732N meter measures the content of dissolved oxygen ($O_2$) in surface, feed, natural and waste waters in the 0.0 to 10.0 mg/L (ppm) range.

The meter uses an exclusive positive-locking system to ensure that the cuvet is in the same place every time it is placed into the measurement cell.

The reagents are in liquid form and are supplied in bottles. The amount of reagent is precisely dosed to ensure maximum repeatability.

Display codes aid the user in routine operations. The meter has an auto-shut off feature that will turn itself off after 10 minutes of non-use.

## SPECIFICATIONS




SPECIFICATIONS

| | |
|---|---|
| Range | 0.0 to 10.0 mg/L (ppm) |
| Resolution | 0.1 mg/L |
| Accuracy | ±0.2 mg/L ± 3% of reading |
| Typical EMC Deviation | ±0.1 mg/L |
| Light Source | Light Emitting Diode @ 470 nm |
| Method | Adaptation of the *Standard Methods for the Examination of Water and Wastewater (18th edition)*, azide modified Winkler method. The reaction between dissolved oxygen and the reagent causes a yellow tint in the sample. |
| Light Life | Life of the instrument |
| Light Detector | Silicon Photocell |
| Environment | 0 to 50°C (32 to 122°F); max 95% RH non-condensing |
| Battery Type/Life | 1 x 9 volt/40 hours |
| Auto-Shut off | After 10' of non-use |
| Dimensions | 180 x 83 x 46 mm (7.1 x 3.3 x 1.8") |
| Weight | 290 g (10 oz.). |

REQUIRED REAGENTS

| Code | Description | Quantity |
|---|---|---|
| HI 93732A-0 | Reagent A | 5 drops |
| HI 93732B-0 | Reagent B | 5 drops |
| HI 93732C-0 | Reagent C | 10 drops |

REAGENT SETS

| | |
|---|---|
| HI 93732-01 | Reagents for 100 tests |
| HI 93732-03 | Reagents for 300 tests |

## DISPLAY CODE GUIDE

| | |
|---|---|
| ---  | This indicates that the meter is in a ready state and zeroing can be performed. |
| SIP | Sampling in Progress. This prompt appears each time the meter is performing a measurement. |
| -0.0- | This indicates that the meter is in a zeroed state and measurement can be performed. |
| ZERO | A zero reading was not taken. Insert a sample before adding reagent and press ZERO. |
| 0.00 | Under range. A blinking "0.00" indicates that the sample absorbs less light than the zero reference. Check the procedure and make sure you use the same cuvet for reference (zero) and measurement. |
| 11.0 | Over range. A flashing value higher than the maximum concentration readable (see specifications) indicates that the sample absorbs too much light, meaning that the concentration is too high. |
| CAP | Light over range. The cuvet is not inserted correctly and an excess ambient light is reaching the detector. If the cover is properly installed, then contact your dealer or the nearest Hanna Customer Service Center. |
| LO | Light under range. The zero sample is too dark for proper zeroing. If this is not the case, contact your dealer or the nearest Hanna Customer Service Center. |
| V 8.2 | The "V" indicates that the battery voltage is getting low and the battery needs to be replaced. |
| -BA- | This indicates that the battery is dead and must be replaced. |

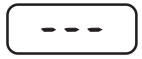
Note: once this indication is displayed, the meter will lockup. Change the battery to restart.

# OPERATIONAL GUIDE

## MEASUREMENT PROCEDURE

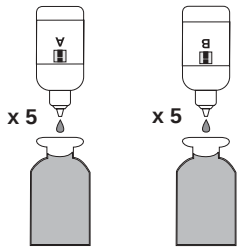
- Turn the meter on by pressing ON/OFF.


- When the LCD displays "- - -", it is ready.

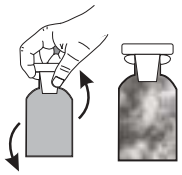


- Fill one 60 mL glass bottle completely with the unreacted sample.

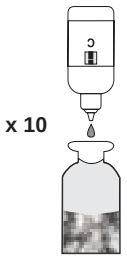
- Replace the cap and ensure that a small part of the sample spills over.



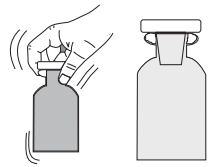

- Remove the cap and add 5 drops of HI 93732A and 5 drops of HI 93732B.
- Add some more sample, to fill the bottle completely. Replace the cap again and ensure that a part of the sample spills over. This is to make sure that no air bubbles have been trapped inside, which would corrupt the reading.
- Invert several times the bottle. The sample becomes orange-yellow and a flocculant agent will appear.



- Let the sample stand and the flocculant agent will start to settle.
- After approximately 2 minutes, when the upper half of the bottle becomes limpid, add 10 drops of HI 93732C.

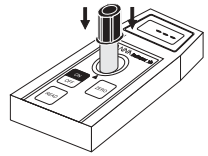



- Replace the cap and invert the bottle until dissolution of the settled flocculant is complete. The sample is ready for measurement when it is yellow and completely limpid.



- Fill the cuvet up to the mark with 10 mL of the unreacted (original) sample, and replace the cap. This is the blank.

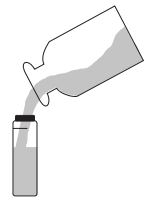

- Place the cuvet into the older and ensure that the notch on the cap is positioned securely into the groove.



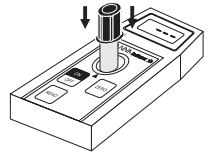
- Press ZERO and "SIP" will appear on the display.


- Wait for a few seconds and the display will show "-0.0-". Now the meter is zeroed and ready for measurement.

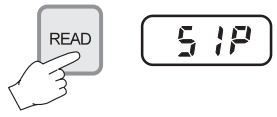

- Remove the cuvet.
- Fill another cuvet up to the mark with 10 mL of the reacted sample and replace the cap.



- Reinsert the cuvet into the instrument.



- Press READ and "SIP" will appear during measurement.




- The instrument directly displays the concentration of dissolved oxygen in mg/L on the Liquid Crystal Display.

## INTERFERENCES

Interferences may be caused by reducing and oxidizing materials.

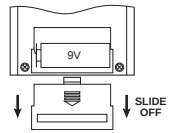
# TIPS FOR AN ACCURATE MEASUREMENT

The instruction listed below should be carefully followed during testing to ensure best accuracy.

- It is important that the sample does not contain any debris. This would corrupt the readings.
- Each time the cuvet is used, the cap must be tightened to the same degree.
- Whenever the cuvet is placed into the measurement cell, it must be dry outside and completely free of fingerprints, oil or dirt. Wipe it thoroughly with HI 731318 or a lint-free cloth prior to insertion.
- Shaking the cuvet can generate bubbles in the sample, causing higher readings. To obtain accurate measurements, remove such bubbles by swirling or by gently tapping the cuvet.
- Do not let the reacted sample stand too long after reagent is added or accuracy will be lost.
- It is possible to take multiple readings in a row, but it is recommended to take a new zero reading for each sample and to use the same cuvet is used for zeroing and measurement.
- After the reading it is important to discard immediately the sample, otherwise the glass might become permanently stained.
- All the reaction times reported in this manual are referred to 20°C (68°F). As a general rule of thumb, they should be doubled at 10°C (50°F) and halved at 30°C (86°F).

# BATTERY REPLACEMENT

Battery replacement must only take place in a non-hazardous area using a 9V alkaline battery.
Simply slide off the battery cover on the back of the meter. Detach the battery from the terminals and attach a fresh 9V battery while paying attention to the correct polarity. Replace the battery and the cover.




# ACCESSORIES

## REAGENT SETS

HI 93732-01 Reagents for 100 tests
HI 93732-03 Reagents for 300 tests

## OTHER ACCESSORIES

| | |
|---|---|
| HI 710009 | Blue rubber boot |
| HI 710010 | Orange rubber boot |
| HI 721310 | 9V battery (10 pcs) |
| HI 731318 | Tissue for wiping cuvets (4 pcs) |
| HI 731321 | Glass cuvets (4 pcs) |
| HI 731325 | Caps for cuvets (4 pcs) |
| HI 93703-50 | Cuvets cleaning solution (230 mL) |
| HI 740038 | 60 mL glass bottle with stopper |

# CE DECLARATION OF CONFORMITY

HANNA instruments

CE

*DECLARATION OF CONFORMITY*

We

Hanna Instruments Italia Srl
Viale Delle Industrie, 12/A
35010 Villafranca Padovana- PD
ITALY

herewith certify that the meter:

**HI 93732N**

Has been tested and found to be in compliance with EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC according to the following applicable normatives:

**EN 50082-1**: Electromagnetic Compatibility - Generic Immunity Standard
**IEC 61000-4-2** Electrostatic Discharge
**IEC 61000-4-3** RF Radiated

**EN 50081-1**: Electromagnetic Compatibility - Generic Emission Standard
**EN 55022** Radiated, Class B

**EN61010-1**: Safety requirements for electrical equipment for measurement, control and laboratory us

Date of Issue: 30-05-1997

D. Volpato - Engineering Manager
On behalf of
Hanna Instruments Italia S.r.l.

Recommendations for Users

Before using these products, make sure that they are entirely suitable for the environment in which they are used.

Operation of these instruments in residential area could cause unacceptable interferences to radio and TV equipments, requiring the operator to take all necessary steps to correct interferences.

Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance.

To avoid damages or burns, do not perform any measurement in microwave ovens.

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