# **INSTRUCTION MANUAL**





HI97757

# Ozone Photometer

# Dear Customer,

Thank you for choosing a Hanna Instruments® product.

Please read this instruction manual carefully before using this instrument as it provides the necessary information for correct use of this instrument, and a precise idea of its versatility.

If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com. Visit www.hannainst.com for more information about Hanna Instruments and our products.

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

#### 1. PRELIMINARY EXAMINATION

Remove the instrument and accessories from the packaging and examine it carefully. For further assistance, please contact your local Hanna Instruments<sup>®</sup> office or email us at tech@hannainst.com.

Each H197757C is delivered in a rugged carrying case and is supplied with:

- Sample cuvette (2 pcs.)
- Sample cuvette cap (2 pcs.)
- Plastic stopper (2 pcs.)
- A 7FRO CAI Check™ Cuvette A
- HI97757B CAI Check Cuvette B for Ozone
- Cloth for wiping cuvettes
- Scissors
- 1.5V AA Alkaline battery (3 pcs.)
- CAL Check standard certificate
- · Battery safety insert
- · Quick reference guide with instructions for manual download and instrument quality certificate

Each H197757 is delivered in a cardboard box and is supplied with:

- Sample cuvette (2 pcs.)
- Sample cuvette cap (2 pcs.)
- Plastic stopper (2 pcs.)
- 1.5V AA Alkaline battery (3 pcs.)
- Battery safety insert
- · Quick reference guide with instructions for manual download and instrument quality certificate

**Note**: Save all packing material until you are sure that the instrument works correctly. Any damaged or defective item must be returned in its original packing material with the supplied accessories.

# 2. SAFETY MEASURES



- The chemicals contained in the reagent kits may be hazardous if improperly handled.
- Read the Safety Data Sheets (SDS) before performing tests.
- Safety equipment: Wear suitable eye protection and clothing when required, and follow instructions carefully.
- Reagent spills: If a reagent spill occurs, wipe up immediately and rinse with plenty of water.
   If reagent contacts skin, rinse the affected area thoroughly with water. Avoid breathing released vapors.
- Waste disposal: For proper disposal of reagent kits and reacted samples, contact a licensed waste disposal provider.

4 Abbreviations

# Coin-cell Battery Safety

The coin-cell battery is replaceable by a professional service center only.

# ♠ WARNING

- INGESTION HAZARD: This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if digested.
- A swallowed button cell or coin battery can cause Internal Chemical Burns in as little as 2 hours.



- KEEP new and used batteries OUT OF REACH OF CHILDREN.
- Seek immediate medical attention if a battery is suspected to be swallowed or inserted inside any part of the body.
- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children.
  - Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Coin-cell battery type CR2032
- Nominal voltage 3.0 V
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above 85 °C (185 °F) or incinerate. Doing so may
  result in injury due to venting, leakage or explosion resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period
  of time according to local regulations.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

# 3. ABBREVIATIONS

mg/L milligrams per liter (ppm)

mL milliliter °C degree Celsius

°F degree Fahrenheit

DPD N,N-diethyl-p-phenylenediamine

GLP Good Laboratory Practice
HDPE High Density Polyethylene
LED Light Emitting Diode

NIST National Institute of Standards and Technology

Specifications 5

# 4. SPECIFICATIONS

# Ozone

Range	0.00 to 2.00 mg/L (as 0 <sub>3</sub> )
Resolution	0.01 mg/L
Accuracy	$\pm 0.02$ mg/L $\pm 3\%$ of reading at 25 °C
Method	DPD Colorimetric Method

# **Measurement System**

Light source	Light Emitting Diode
Bandpass filter	525 nm
Bandpass filter bandwidth	8 nm
Bandpass filter wavelength accuracy	$\pm$ 1.0 nm
Light detector	Silicon photocell
Cuvette type	Round 24.6 mm diameter (22 mm inside)

# **Additional Specifications**

Auto logging	50 readings
Display	$128 \times 64$ pixel B/W LCD with backlight
Auto-off	After 15 minutes of inactivity (30 minutes before a Read measurement)
Battery type	1.5 V AA Alkaline (3 pcs.)
Battery life	>800 measurements (without backlight)
Environment	0 to 50 °C (32 to 122 °F); 0 to 100% RH, non-serviceable
Dimensions	142.5×102.5×50.5 mm (5.6×4.0×2.0")
Weight (with batteries)	380 g (13.4 oz.)
Case ingress protection rating	IP67, floating case

6 Description

# 5. DESCRIPTION

# 5.1. GENERAL DESCRIPTION & INTENDED USE

The H197757 is an auto-diagnostic portable photometer that benefits from Hanna's ears of experience as a manufacturer of analytical instruments. It has an advanced optical system that uses a Light Emitting Diode (LED) and a narrow band interference filter that allows for accurate and repeatable readings.

The optical system is sealed from outside dust, dirt and water. The meter uses an exclusive positive-locking system to ensure that the cuvettes are placed into the holder in the same position every time.

With the CAL Check  $^{\text{TM}}$  functionality, users are able to validate the performance of the instrument at any time and apply a user calibration (if necessary). Hanna Instruments  $^{\text{(B)}}$  CAL Check cuvettes are made with NIST traceable standards.

The built-in tutorial mode guides users step-by-step through the measurement process. It includes all steps required for sample preparation, the required reagents and quantities.

The H197757 meter measures ozone in water samples from 0.00 to 2.00 mg/L (ppm). The method is the DPD Colorimetric Method.

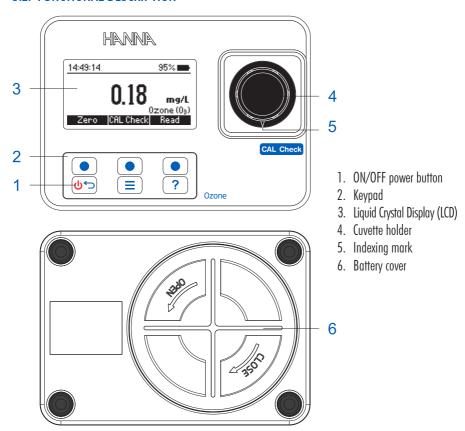
Ozone is a widely used disinfectant in the treatment of drinking water, wastewater and swimming pools.

The H197757 photometer is a compact and versatile meter suitable for field or bench measurements, featuring a:

- Sophisticated optical system
- Meter validation using certified CAL Check cuvettes
- Tutorial mode guides the user step-by-step
- Auto logging
- Waterproof IP67, floating case
- GLP features

Description 7

# 5.2. FUNCTIONAL DESCRIPTION



# **Keypad Description**

The keypad contains 3 direct keys and 3 functional keys with the following functions:



Press the functional key to perform the function displayed above it on the LCD.



Press and hold to power off/on. Press briefly to return to the previous screen.



Press to access the menu screen.



Press to display the context-sensitive help menu.

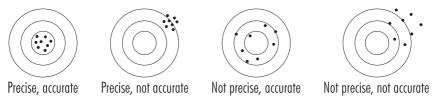
8 Description

#### 5.3. PRECISION & ACCURACY

Precision is how closely repeated measurements are to one another. Precision is usually expressed as standard deviation (SD).

Accuracy is defined as the closeness of a test result to the true value.

Although good precision suggests good accuracy, precise results can be inaccurate. The figure explains these definitions



#### 5.4. PRINCIPLE OF OPERATION

Absorption of light is a typical phenomenon of interaction between electromagnetic radiation and matter. When a light beam crosses a substance, some of the radiation may be absorbed by atoms, molecules or crystal lattices. Photometric chemical analysis is based on specific chemical reactions between a sample and reagent to produce a light-absorbing compound.

If pure absorption occurs, the fraction of light absorbed depends both on the optical path length through the matter and on the physical-chemical characteristics of the substance according to the Lambert-Beer Law. If all other factors are constant, the concentration "c" can be calculated form the absorbance of the substance.

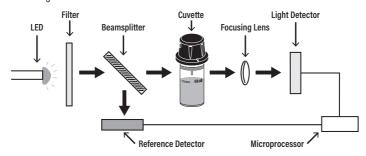
# 5.5. OPTICAL SYSTEM

The internal reference system (reference detector) of the HI97757 photometer compensates for any drifts due to power fluctuations or ambient temperature changes, providing a stable source of light for your blank (zero) measurement and sample measurement.

LED light sources offer superior performance compared to tungsten lamps. LEDs have a much higher luminous efficiency, providing more light while using less power. They also produce little heat, which could otherwise affect electronic stability. LEDs are available in a wide array of wavelengths, whereas tungsten lamps have poor blue/violet light output.

Improved optical filters ensure greater wavelength accuracy and allow a brighter, stronger signal to be received. The end result is higher measurement stability and less wavelength error.

A focusing lens collects all of the light that exits the cuvette, eliminating errors from cuvette imperfections and scratches, eliminating the need to index the cuvette.



Instrument Block Diagram

#### 6. GENERAL OPERATIONS

#### 6.1. METER VALIDATION: CAL CHECK™ & CALIBRATION

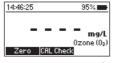
Validation of the H197757 involves verifying the concentration of the certified CAL Check standards. The CAL Check screen guides the user step-by-step through the validation process and user calibration (if necessary).

**WARNING**: Do not use any solutions or standards other than the Hanna Instruments<sup>®</sup> CAL Check Standards. For accurate validation and calibration results, please perform these at room temperature, 18 to 25 °C (64.5 to 77.0 °F).

**Note:** CAL Check Standards will not read the specified value in measurement mode. Protect the CAL Check cuvettes from direct sunlight by keeping them in the original packing. Store between 5 and 30 °C (41 to 86 °F), do not freeze.

To perform a CAL Check:

1. Press CAL Check from measurement mode.



The "Not Available" message or the date, time and status of the last CAL Check will be displayed on the screen.



 Use the functional keys to enter the certificate value of the calibration standard found on the CAL Check™
 Standard Certificate. Press Next to continue.



**Note**: This value will be saved in the instrument for future validation. If a new set of calibration standards is obtained please update the certificate value.

 Insert the A ZERO CAL Check Cuvette A then press Next to continue. The "Please wait..." message will be displayed during the measurement.





Insert the H197757B CAL Check Cuvette B then press Next to continue. The "Please wait..." message will be displayed during the measurement.

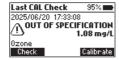




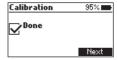
- 6. When the CAL Check is complete, the display will show one of the following messages and the value obtained during the measurement:
  - "PASSED": The measured value is within the accuracy specification, no user calibration is required.



"OUT OF SPECIFICATION" and Calibrate is available: The measured value is near the expected
value. To update the user calibration press Calibrate. Press Accept to confirm or Cancel to return
to the previous screen.







 "OUT OF SPECIFICATION": A user calibration is not allowed, the measured value is outside of the tolerance window. Check the certified value, expiration date and clean the outside of the cuvette. Repeat the CAL Check procedure. If this error continues contact your nearest Hanna Instruments<sup>®</sup> Customer Service Center.



# 6.2. GLP

Press the  $\bigcirc$  key to enter the menu. Use the functional keys to select *GLP* and press **Select**. Good Laboratory Practice (GLP) shows the date and time of the last user calibration (if available) or factory calibration. To erase the last user calibration and to clear the CAL Check  $^{\text{TM}}$  press **Clear** and follow the prompts. Press **Yes** to erase and return to the factory calibration data or **No** to exit the clear procedure.



#### 6.3. LOGGING DATA & LOG RECALL

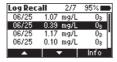
The instrument features a data autolog function to help users keep track of all measurements. Every time a measurement is made the data is automatically saved. The data log can hold 50 individual measurements. When the data log is full (50 data points) the meter will rewrite the oldest data point.

Viewing and deleting the data is possible using the Log Recall menu.

Press the 📃 key to enter the menu. Use the functional keys to select *Log Recall* and press **Select**.

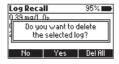


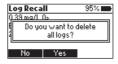
Use the functional keys to highlight a log and press **Info** to view additional information about the log. From this screen **Next** and **Previous** can be used to view other logs.





Press Delete to erase logged data. After pressing Delete a prompt on display is asking for confirmation.





Press **No** or the **b** key to return to the previous screen.

Press Yes to delete selected log.

Press **Del All** to erase all the logged data. If **Del All** is pressed follow the prompt to confirm. Press **Yes** to delete all logged data, **No** or the beginning to return to the log recall.

#### 6.4. GENERAL SETUP

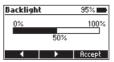
Press the \( \equiv \) key to enter the menu. Use the functional keys to select *Setup* and press **Select**. Use the functional keys to highlight desired option.

# **Backlight**

Option: 0 to 100 %

Press **Modify** to access the backlight intensity. Use the functional keys to increase or decrease the value. Press **Accept** to confirm or the beyon to return to the **Setup** menu without saving the new value.

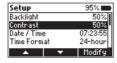


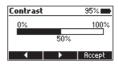


#### Contrast

Option: 0 to 100 %

Press **Modify** to change the display's contrast. Use the functional keys to increase or decrease the value. Press **Accept** to confirm the value or the beyon to return to the Setup menu without saving the new value.

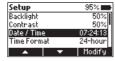




#### Date & Time

Press **Modify** to change the date and time. Press the functional keys to highlight the value to be modified (year, month, day, hour, minute or second). Press **Edit** to modify the highlighted value. Use the functional keys to change the value.

Press **Accept** to confirm or the **b** key to return to the previous screen.







#### Time Format

Option: AM/PM or 24-hour

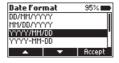
Press the functional key to select the desired time format.



#### **Date Format**

Press **Modify** to change the date format. Use the functional keys to select the desired format. Press **Accept** to confirm or the beyond to return to the **Setup** menu without saving the new format.





#### **Decimal Separator**

# Option: Comma (,) or Period (.)

Press the functional key to select the desired decimal separator.

The decimal separator is used on the measurement screen.

# Setup 95% Time Format 24-hour Date Format YYYY/MM/DD Decimal Separator Language English

# Language

Press **Modify** to change the language. Use the functional keys to select the desired language. Press **Accept** to choose one of the languages installed.



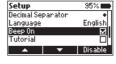


#### Beeper

#### Option: Enable or Disable

When enabled, a short beep is heard every time a key is pressed.

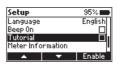
A long beep alert sounds when the pressed key is not active or an error is detected. Press the functional key to enable or disable the beeper.



#### **Tutorial**

# Option: Enable or Disable

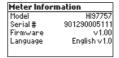
When enabled, the user will be guided step-by-step through the measurement procedure.



#### Meter Information

Press **Select** to view the model, serial number, firmware version and selected language. Press the version to the **Setup** menu.





# **Restore Factory Settings**

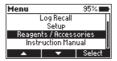
Press **Select** to reset to factory settings. Press **Accept** to confirm or **Cancel** to exit without restoring the factory settings.





#### 6.5. REAGENTS & ACCESSORIES

Press the key to enter the menu. Use the functional keys to select *Reagents / Accessories* and press **Select** to access a list of reagents and accessories. To exit press the key.





#### 6.6. INSTRUCTION MANUAL

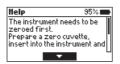
Press the key to enter the menu. Use the functional keys to select *Instruction Manual* and press **Select** to access (and scan) the QR code or use link to download the manual. To exit press the key.

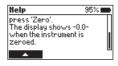




# 6.7. CONTEXTUAL HELP

The H197757 offers an interactive contextual help mode that assists the user at any time. To access the help screen press the ? key.



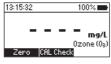


The instrument will display additional information related to the current screen. To read all the available information, scroll the text using the functional keys.

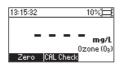
To exit help mode press the  $({}^{\bullet}{}^{\bullet})$  or the  $({}^{\circ}{})$  key and the meter will return to the previous screen.

#### 6.8. BATTERY MANAGEMENT

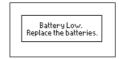
The meter will perform an auto-diagnostic test when it is powered on. During this test, the Hanna Instruments<sup>®</sup> logo will appear on the LCD. If the auto-diagnostic test was successful, the meter is ready for use. The battery icon on the LCD will indicate the battery status:



Battery is full.



Battery is below 10%.
Replace the batteries soon.



Battery is low.

Replace the batteries with new ones.

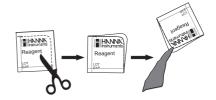
To conserve battery, the meter will turn off automatically after 15 minutes of inactivity. If a zero reading has been done but not a read, auto-off time is increased to 30 minutes.

Photometer 15

# 7. PHOTOMETER

# 7.1. PROPER USE OF POWDER PACKET

- 1. Use scissors to open the powder packet.
- 2. Push the edges of the packet to form a spout.
- 3. Pour out the content of the packet.



#### 7.2. CUVETTE PREPARATION

Proper mixing is very important for reproducibility of the measurements. The proper mixing technique is listed in the method procedure.

The mixing method is indicated with "shake gently" using one of the following icons:





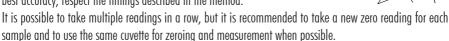
In order to avoid reagent leaking and to obtain more accurate measurements, close the cuvette first with the supplied HDPE plastic stopper and then the black cap.



Whenever the cuvette is placed into the measurement holder, it must be dry outside and free of fingerprints, oil or dirt. Wipe it thoroughly with HI731318 microfiber cleaning cloth or a lint-free wipe prior to insertion.

Shaking the cuvette can generate bubbles in the sample, causing higher readings. To obtain accurate measurements, remove such bubbles by swirling or by gently tapping the cuvette.

Do not let the reacted sample stand too long after reagent has been added. For best accuracy, respect the timings described in the method.



Discard the sample immediately after the reading has been taken, or the glass might become permanently stained. All the reaction times reported in this manual are at  $25 \,^{\circ}$ C (77  $^{\circ}$ F). In general, the reaction time should be increased for temperatures lower than  $20 \,^{\circ}$ C (68  $^{\circ}$ F), and decreased for temperatures higher than  $25 \,^{\circ}$ C (77  $^{\circ}$ F).



# 8. METHOD PROCEDURE

#### REQUIRED REAGENTS

Code	Description	Quantity
HI93757-0	Ozone Reagent	1 packet
HI93703-52-0	Glycine Powder (optional)	1 packet

#### REAGENT SETS

HI93757-01	Ozone Reagent - 100 tests
HI93757-03	Ozone Reagent - 300 tests

HI93703-52 Glycine Powder Reagent for 100 tests (optional)

For other accessories see Accessories section.

#### STANDARD MEASUREMENT PROCEDURE

**Note**: If tutorial mode is disabled follow the measurement procedure below. If the tutorial mode is enabled, press **Measure** and follow the messages on the screen.

# Chlorine-free samples

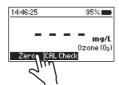
Fill the cuvette with 10 mL of unreacted sample (up to the mark).
 Replace the plastic stopper and the cap.

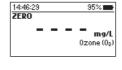


• Insert the cuvette into the holder and ensure that the notch on the cap is positioned securely in the groove.



• Press Zero. The display will show "-0.0-" when the meter is zeroed and ready for measurement.







- Remove the cuvette.
- Add one packet of HI93757-0 Ozone Reagent. Replace the plastic stopper and the cap. Shake gently for about 20 seconds.

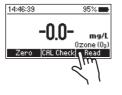


Method Procedure 17

• Insert the cuvette into the holder and ensure that the notch on the cap is positioned securely in the groove.

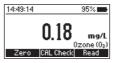


Press Read and the display will show a countdown of 2 minutes prior to the measurement. Alternatively, wait 2 minutes then press Read twice. When the timer ends the meter will perform the reading. The instrument displays the results in mg/L of Ozone (O<sub>3</sub>) (chlorine-free sample only).
 For samples containing chlorine, record this value as A.





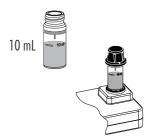




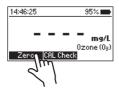
#### ADDITIONAL MEASUREMENT PROCEDURE

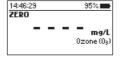
# Samples containing chlorine

Fill the cuvette with 10 mL of unreacted sample (up to the mark).
 Replace the plastic stopper and the cap.



- Insert the cuvette into the holder and ensure that the notch on the cap is positioned securely in the groove.
- Press **Zero**. The display will show "-0.0-" when the meter is zeroed and ready for measurement.







- · Remove the cuvette.
- Add one packet of HI93703-52-0 Glycine powder. Replace the plastic stopper and the cap. Shake gently until the powder is completely dissolved.



18 Method Procedure

 Add one packet of HI93757-0 Ozone Reagent. Replace the plastic stopper and the cap. Shake gently for 20 seconds.



• Insert the cuvette into the holder and ensure that the notch on the cap is positioned securely in the groove.

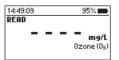


Press Read and the display will show a countdown of 2 minutes prior to the measurement. Alternatively,
wait 2 minutes then press Read twice. When the timer ends the meter will perform the reading.
Record this value as B.









 To determine the mg/L ozone (0<sub>3</sub>) concentration in sample containing chlorine, subtract value B (additional measurement procedure) from value A (standard measurement procedure).

#### INTERFERENCES

Interference may be caused by:

- Bromine, Chlorine Dioxide, Iodine
- Hardness greater than 500 mg/L CaCO<sub>3</sub>
   Shake the sample for approximately 2 minutes after adding the powder reagent.
- Alkalinity above 250 mg/L CaCO<sub>3</sub> will not reliably develop the full amount of color or it may rapidly fade Neutralize the sample with diluted HCl.
- Chlorine is a strong interferent. If the sample is suspected to contain chlorine residue (free or total chlorine), follow the alternative measurement procedure described below:
  - 1. Perform the Standard Measurement Procedure, Record the result as Value A.
  - 2. Perform Additional Measurement Procedure. Record the result as Value B.
  - 3. To determine the ozone concentration in mg/L, subtract Value B from Value A.

$$mg/L$$
 ozone  $(0_3) = Value A - Value B$ 

#### 9. WARNING & ERROR DESCRIPTIONS

The instrument shows clear warning messages when erroneous conditions appear and when measured values are outside the expected range.

The information below provides an explanation of the errors and warnings, and recommended action to be taken.



Check cuvette cap.
If issue persists
contact technical support.

#### Continue

There is an excess amount of ambient light reaching the detector. Ensure that the notch on the cap is positioned securely in the groove before performing any measurements. If the issue persists, please contact Hanna Instruments technical support.

# ∕∕ Warning

Inverted cuvettes. Repeat measurement.

#### Continue

The sample and the zero cuvettes are inverted. Swap the cuvettes and repeat the measurement.

# /\ Warning

Check the Zero cuvette

#### Continue

There is either too much light or the instrument can not adjust the light level. Please check the preparation of the zero cuvette and that the sample does not contain any debris.

#### N Warning

Meter temperature over limit. Wait for meter to cool down.

#### Continue



Meter temperature under limit. Put the meter in a warm place.

#### Continue

The meter is either overheating or its temperature has dropped too low to operate within published accuracy specifications. The meter must be between 0 and 50  $^{\circ}$ C (32 and 122  $^{\circ}$ F) to perform any measurements.

#### **⚠** Warning

Meter temperature changing too fast. Redo Zero.

#### Continue



Meter temperature has changed significantly since the zero measurement has been performed. The zero measurement must be performed again.

The measured value is outside the limits of the method. Verify that the sample does not contain any debris. Check the sample preparation and the measurement preparation.

# (1) Warning

Set Date/Time. If issue persists contact technical support.

#### Continue

Date and time settings have been lost. Please reset the values. If the issue persists, please contact Hanna Instruments technical support.

# **⚠** Warning

Language not available. Contact technical support.

#### Continue

English is the only available language. Help function is not available. Restart the meter. If the issue persists, please contact Hanna Instruments technical support.

Battery Low. Replace the batteries. Battery level is too low for the meter to function properly. Replace the batteries with new ones.

Tutorial Mode is Enabled.

Tutorial mode has been enabled in the Setup menu. Press **Continue** and follow the prompt on the screen. Tutorial mode can be disabled in the Setup menu.

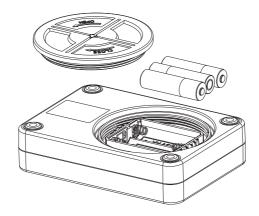


A critical error has occurred. Restart the meter. If the issue persists, please contact Hanna Instruments® technical support.

# 10. BATTERY REPLACEMENT

To replace the instrument's batteries, follow these steps:

- Turn the instrument off by pressing and holding the 😊 key.
- Remove the battery cover by turning it counterclockwise.
- Remove the old batteries, replace them with three new 1.5V AA batteries.
- Replace the battery cover, turn it clockwise to close.



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# 11. ACCESSORIES

# 11.1. REAGENT SETS

Ordering Information	Description
HI93757-01	Ozone Reagent - 100 tests
HI93757-03	Ozone Reagent - 300 tests
HI93703-52	Glycine Powder Reagent - 100 tests

# 11.2. OTHER ACCESSORIES

Description
HI97 series blue carrying case with 2 cuvette slots
Cloth for wiping cuvettes (4 pcs.)
Glass cuvette (4 pcs.)
Cap for glass cuvette (4 pcs.)
Glass cuvette with cap (2 pcs.)
Cuvette cleaning solution (250 mL)
CAL Check™ standards for Ozone - cuvette kit

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# **CERTIFICATION**

All Hanna® instruments conform to the **CE European Directives**.





**Disposal of Electrical & Electronic Equipment.** The product should not be treated as household waste. Instead, hand it over to the appropriate collection point for the recycling of electrical and electronic equipment, which will conserve natural resources.

**Disposal of waste batteries.** This product contains batteries, do not dispose of them with other household waste. Hand them over to the appropriate collection point for recycling.

Ensuring proper product and battery disposal prevents potential negative consequences for the environment and human health. For more information, contact your city, your local household waste disposal service, or the place of purchase.

#### RECOMMENDATIONS FOR USERS

Before using this product, make sure it is entirely suitable for your specific application and for the environment in which it is used. Any variation introduced by the user to the supplied equipment may degrade the meter's performance. For your and the meter's safety do not use or store the meter in hazardous environments.

# WARRANTY

The H197757 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. Damage due to accidents, misuse, tampering, or lack of prescribed maintenance is not covered. If service is required, contact your local Hanna Instruments® office. If under warranty, report the model number, date of purchase, serial number (engraved on the bottom of the meter), and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the meter is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization (RGA) number from the Technical Service department and then send it with shipping costs prepaid. When shipping any meter, make sure it is properly packed for complete protection.