Calibration

Calibrate the electrode before using.
For best results, calibrate frequently.
Additionally, the instrument must be calibrated:

- When high accuracy is required.
- At least once a month with regular use.

Procedure

With **High** or **Low** range mode manually configured in Setup, the tester supports one-point calibration.
Factory default **Auto** range mode allows one-point calibration in 35.00 ppt or in 5.00 ppt.

1. Press the **CAL** button to enter calibration mode.
   The tester prompts "35.00 PPt USE" (High or Auto) or "5.00 PPt USE" (Low), with CAL tag blinking.
2. Cut the sachet(s) open at the top.
   Push the edges of the sachet to form a spout.
   Do not squeeze the sachet or heat the solution by handling.
   It is suggested to empty the contents into a calibration beaker.
3. Place the Salinity tester into the calibration solution.
   Ensure the electrodes are fully immersed in solution.
4. Tap the beaker to dislodge entrapped bubbles.
   The tester automatically recognizes the solution.
   "REC" is displayed until the reading is stable and the calibration is accepted.
   The tester displays "Stor" while saving the calibration point, then returns to measurement mode.

Note: *To exit calibration without saving, press the CAL button.*

Clear Calibration

Enter calibration mode and press the **ON/OFF** button. "CLR" is displayed. The tester will now be at default calibration.

Measurement

To ensure accuracy of measurements:

- Use a fresh calibration standard for each calibration.
- Rinse the tester with purified water before calibration and dry completely.

Procedure

1. Immerse the tester 1.5" (38 mm) into the sample to be tested.
2. Swirl the tester in sample to dislodge entrapped air bubbles and wait for the stability tag to disappear.
   The tester automatically compensates for temperature variations.
3. The salinity reading is displayed with the last selected measurement unit (ppt, PSU or S.G.) and as per configured range mode.
   The measured temperature is displayed on the second LCD line.
4. After use, rinse the probe with purified water and dry off.
   Always replace the protective cap after each use.

Error Messages

"**--- Err**" displayed during user calibration indicates that the reading is out of the accepted range.

"**10.00**" or "**70.0**" (varies, depending on selected range) value displayed blinking during measurement indicates that the reading is out of range in PPt.

0.0 °C or **50.0 °C** value displayed blinking during measurement indicates that the measured temperature is lower than 0.0 °C or higher than 50.0 °C.

Care & Maintenance

To ensure accuracy of measurements:

- Use fresh calibration standards for each calibration.
- Rinse the tester with purified water and dry off with a soft tissue before calibrating or taking measurements.
- Calibrate monthly with regular use or more often with frequent use.
- Inspect the tester to see if foreign material is detected in the openings housing the electrodes. A more thorough cleaning may be made using a non-abrasive detergent, and a soft material such as cardboard, to dislodge the material.
- Rinse thoroughly with a stream of running tap water and jetting the stream through the opening. Shake excess water and rinse with purified water. Dry off and recalibrate the tester before using.
- Store with the protective cap on.

Battery Replacement

The tester features a battery life-percentage indicator. If the battery level drops below 10 %, the battery indicator is displayed blinking.
When the battery is discharged, "dEAd bAtt" is displayed for 2 seconds before the tester turns off.

To replace the CR2032 Lithium-ion battery, turn the tester off, remove the battery cover by turning it counterclockwise, remove the old battery and replace with a new 3V battery, "+" sign facing up.

Note: *Only use the battery type specified in this instruction manual.*

Accessories

Code	Description
HI70023P	5.00 ppt salinity calibration solution, 20 mL sachet (25 pcs.)
HI70024P	35.00 ppt salinity calibration solution, 20 mL sachet (25 pcs.)
HI70024M	35.00 ppt salinity calibration solution, 230 mL
HI70024L	35.00 ppt salinity calibration solution, 500 mL

Certification

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

CE RoHS compliant

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 battery, do not dispose of it with other household waste. Hand it 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 Hanna products, make sure that they are entirely suitable for your specific application and for the environment in which they are used. Any variation introduced by the user to the supplied equipment may degrade the instrument's performance. For your and the instrument's safety do not use or store it in hazardous environments.

Warranty

HI98319 is warranted for a period of one year against defects in workmanship and materials when used for their 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, 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 instrument is to be returned to Hanna Instruments office, first obtain a Returned Goods Authorization (RGA) number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

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

IST98319 01/25

INSTRUCTION MANUAL

HI98319
Waterproof Salinity Tester

Marine Line

HANNA® instruments

Dear Customer,

Thank you for choosing a Hanna Instruments® product. Please read this instruction manual carefully before using the tester.

For more information about Hanna Instruments and our products, visit www.hannainst.com or e-mail us at sales@hannainst.com.

For technical support, contact your local Hanna Instruments office or e-mail us at tech@hannainst.com.

Preliminary Examination

Remove the tester and accessories from the packing material and examine them carefully. For further assistance, please contact your local Hanna Instruments office or email us at tech@hannainst.com.

Each HI98319 is supplied with:

- 5.00 ppt salinity calibration standard, 20 mL (2 pcs.)
- 35.00 ppt salinity calibration standard, 20 mL (2 pcs.)
- 3V Lithium battery - CR2032, installed (1 pc.)
- Storage / Protection sleeve
- Instrument quality certificate
- Instruction manual

Note: *Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packaging with the supplied accessories.*

General Description & Intended Use

The HI98319 is a compact, pocket-sized marine Salinity tester designed for the measurement of salinity in salt water aquariums, aquaculture, brackish water, or other salt-water bodies.

HI98319 features an exposed temperature sensor for faster response times and amperometric graphite electrodes for improved measurement repeatability (pins do not oxidize).

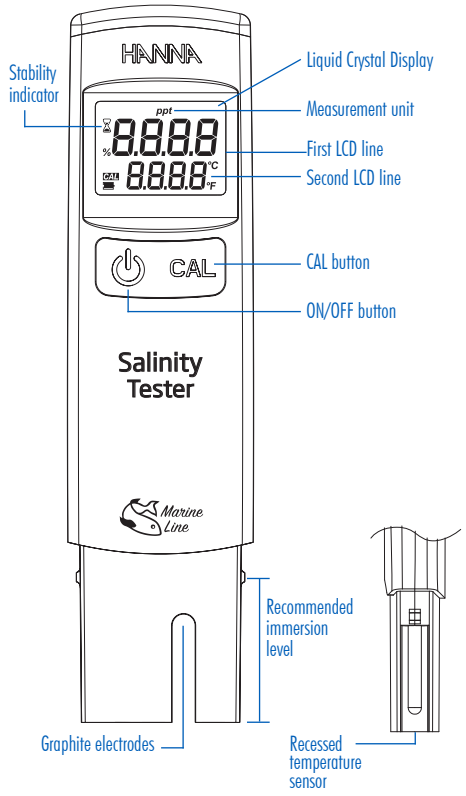
To provide the best resolution and accuracy for each measured sample, the tester defaults to the Auto range mode where High or Low range is automatically selected. Additionally, users can opt to manually configure High or Low reading mode in Setup.

Results are displayed in **parts per thousand** (ppt), **Practical Salinity Units** (PSU), or **Specific Gravity** (S.G.).

Specifications

	Low Range	High Range	Auto (Default)
ppt (g/L)			
Range	0.00 to 10.00	0.0 to 70.0	0.00 to 9.99 10.0 to 70.0
Resolution	0.01	0.1	0.01 / 0.1
Accuracy	±0.20	±1.0 (0.0 to 40.0) ±2.0 (40.0 to 70.0)	±0.20 (0.00 to 9.99) ±1.0 (10.0 to 40.0) ±2.0 (40.0 to 70.0)
PSU			
Range	0.00 to 10.00	0.0 to 70.0	0.00 to 9.99 10.0 to 70.0
Resolution	0.01	0.1	0.01 / 0.1
Accuracy	±0.20	±1.0 (0.0 to 40.0) ±2.0 (40.0 to 70.0)	±0.20 (0.00 to 9.99) ±1.0 (10.0 to 40.0) ±2.0 (40.0 to 70.0)
S.G.			
Range	1.000 to 1.007	1.000 to 1.041	1.000 to 1.041
Resolution	0.001	0.001	0.001
Accuracy	±0.001	±0.001	±0.001
Temperature			
Range	0.0 to 50.0 °C (32.0 to 122.0 °F)		
Resolution	0.1 °C / 0.1 °F		
Accuracy	±0.5 °C / ±1.0 °F		
Method	ppt International Oceanographic Tables, 1966 PSU Standard Methods for the Examination of Water and Wastewater, 2520 B, Electrical Conductivity Method S.G. Standard Methods for the Examination of Water and Wastewater, 2520 C, Density Method		
Calibration solution	HI70023 (5.00 ppt) HI70024 (35.00 ppt)		
Calibration	Automatic, one-point calibration at 5.00 ppt or 35.00 ppt		
Temperature compensation	Automatic from 5.0 to 50.0 °C (41.0 to 122.0 °F)		
Battery type	CR2032 3V Lithium-ion		
Battery life	Approximately 100 hours of continuous use		
Auto-off	User selectable: after 8 min., 60 min., or disabled		
Environment	0 to 50 °C (32 °C to 122 °F); RH max. 100%		
Dimensions	160×40×17 mm (6.3×1.6×0.7")		
Weight	68 g (2.4 oz.), without battery		

Functional Description & LCD Display



Preparation

The probe is shipped dry. Remove the protective cap and follow with the calibration procedure.

- Press the **ON/OFF** button to turn the tester on.
- Immerse the tip of the probe in the sample to be tested.
- Stir gently and wait for the stability indicator to disappear.
- The tester enters measurement mode with data displayed in last selected unit.
- The electrode automatically compensates for temperature variations.

Operational Guide

Turn the Tester On & Check the Battery Status

Press the **ON/OFF** button to turn the tester on. At start-up, all the LCD segments are displayed followed by the battery percent level alerting user to the remaining battery life. The tester then enters measuring mode using the last selected unit displayed on the second LCD line for 3 seconds.

Note: *Keeping the ON/OFF button pressed while turning the tester on keeps all LCD segments displayed for as long as the button is pressed.*

Enter Calibration Mode

Press the **CAL** button. "CAL" is displayed in the first LCD line.

Enter Setup Mode

Remove the battery cover and press the **Setup** button located on the side of the battery.

Setup

Change Settings

1. While in measurement mode, remove the battery cover on the back of the tester.
2. Press the **Setup** button located on the side of the battery.
   - Press the **ON/OFF** button to move through the setup parameters.
   - Press **CAL** button to change parameter options.

Setup Configuration

Range

Option: Auto (default), **Low, High**

When "rnG" is displayed, press the **CAL** button to cycle between "Auto", "Lo", and "Hi".

Salinity Unit

Option: PPt (default), **PSU, S.G.**

When "Unit" is displayed, press the **CAL** button to cycle between options. Press **ON/OFF** to store selected value.

Temperature Unit

Option: °C (default), **°F**

When "SET t" is displayed, press the **CAL** button to change between °C or °F. Press **ON/OFF** to move to last set of options.

Auto-Off Time

Option: 8 minutes (default), **60 minutes, ---**

When "AOFF" is displayed, press the **CAL** button to cycle between 8 min, 60 min, and "---" (disabled).

Return to Measurement Mode

Press the **ON/OFF** button. The second LCD line shows the previous selected unit for three seconds before switching to measurement mode.