

Instruction Manual

HI 931100 • HI 931101

**Waterproof Instruments
for Salinity and Sodium
Content Measurements**



HANNA[®]
instruments

www.hannainst.com

Dear Customer,
 Thank you for choosing a HANNA instruments® product.
 Please read this instruction manual carefully before using the instrument.
 If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com
 These instruments are in compliance with the CE directives.

TABLE OF CONTENTS

| | |
|--|----|
| Preliminary Examination | 3 |
| General Description | 3 |
| Functional Description HI931100 | 4 |
| Specifications HI931100 | 5 |
| Functional Description HI931101 | 6 |
| Specifications HI 931101 | 7 |
| Operational Guide | 8 |
| Na Calibration (HI 931101) | 12 |
| NaCl Calibration (HI 931100) | 15 |
| Special Applications & Additional Info | 18 |
| Temperature Calibration | 21 |
| FC 300B Conditioning & Maintenance | 23 |
| Battery Replacement | 26 |
| Accessories | 27 |
| Warranty | 29 |
| CE declaration of conformity | 30 |

PRELIMINARY EXAMINATION

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

Each meter is supplied with batteries, rugged carrying case and instructions

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

GENERAL DESCRIPTION

HANNA instruments® has designed these two rugged waterproof salinity and sodium meters for regular use in the lab, as well as in harsh processing environments.

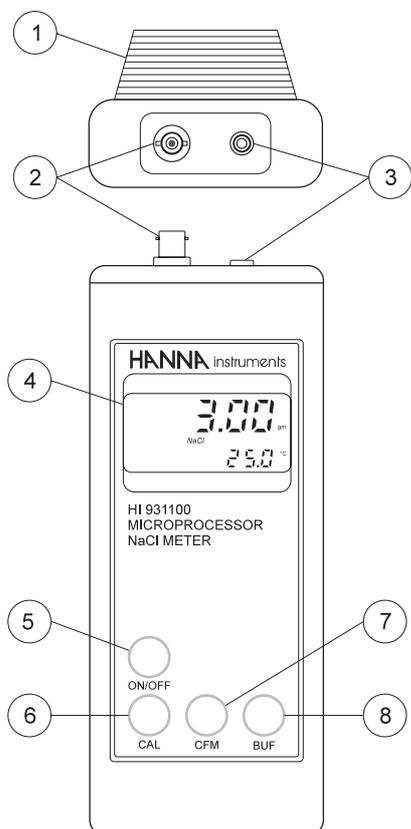
HI 931100 is an ion-selective meter that uses a sodium electrode to read the salt (NaCl) content of a solution. **HI 931100** autoranges (4 scales available) from sample to sample allowing an extremely wide range of measurements without recalibration.

HI 931101 employs the **FC 300B** combination sodium electrode to provide sodium readings from 15.0 mg/L to 60 g/L.

The calibration is automatic at 2 points, the first is at 2.3 g/L while the second can be either at 0.23 g/L (low range) or at 23.0 g/L (high range).

A separate temperature probe, **HI 7662**, provides temperature readings from 0 to 80°C.

FUNCTIONAL DESCRIPTION HI 931100

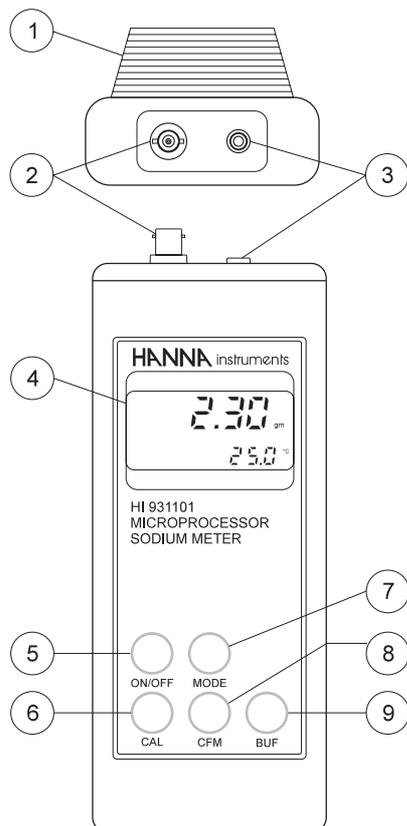


1. Battery compartment
2. BNC connector for electrode
3. Temperature probe socket
4. LCD (Liquid Crystal Display)
5. **ON/OFF** key, to turn the meter on or off
6. **CAL** key, to enter/exit calibration mode
7. **CFM** key, to confirm calibration
8. **BUF** key, to select calibration buffer value

SPECIFICATIONS HI 931100

| | |
|---------------------------------|---|
| Range | 0.150 to 1.500 / 1.50 to 15.00 / 15.0 to 150.0 150 to 300 g/L NaCl 0.0 to 80.0°C |
| Resolution | 0.001 / 0.01 / 0.1 / 1 g/L NaCl 0.1°C |
| Accuracy (@20°C) | ±5% of reading (NaCl) ±0.5°C |
| Typical EMC Deviation | ±2% FS (NaCl) / ±0.5°C |
| Calibration | Automatic, 1 or 2 point at 3.00 g/L (HI 7083) and 0.30 g/L (HI 7085) or 30.0 g/L (HI 7081) |
| Temperature Compensation | 25°C (77°F) |
| Electrode | FC300B sodium electrode with BNC and 1 m (3.3) cable (not included) |
| Temperature Probe | HI 7662 (not included) |
| Input Impedance | 10 ¹² Ohm |
| Battery Type / Life | 4 x 1.5V AA / approx. 200 hours of use |
| Environment | 0 to 50°C (32 to 122°F); RH max 100% |
| Dimensions | 196 x 80 x 60 mm (7.7 x 3.1 x 2.4") |
| Weight | 500 g (1.1 lb.) |

FUNCTIONAL DESCRIPTION HI 931101



1. Battery compartment
2. BNC connector for electrode
3. Temperature probe socket
4. LCD (Liquid Crystal Display)
5. **ON/OFF** key, to turn the meter on or off
6. **CAL** key, to enter/exit calibration mode
7. **MODE** key, to select Na or pNa range
8. **CFM** key, to confirm calibration
9. **BUF** key, to select calibration buffer value

SPECIFICATIONS HI 931101

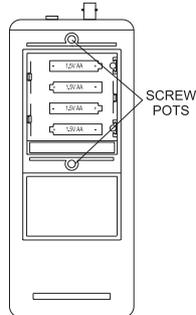
| | |
|---------------------------------|--|
| Range | 0.00 to 3.00 pNa 15.0 to 150.0 mg/L Na 0.150 to 1.500 / 1.50 to 15.00 / 15.0 to 60.0 g/L Na 0.0 to 80.0°C |
| Resolution | 0.01 pNa / 0.1 mg/L Na 0.001 / 0.01 / 0.1 / 1 g/L Na 0.1°C |
| Accuracy (@20°C) | ±0.05 pNa ±5% of reading (Na) ±0.5°C |
| Typical EMC Deviation | ±2% FS (pNa and Na) / ±0.5°C |
| Calibration | Automatic, 1 or 2 point at 2.3 g/L (HI 7080) and 0.23 g/L (HI 7087) or 23.0 g/L (HI 7086) |
| Temperature Compensation | 25°C (77°F) |
| Electrode | FC300B sodium electrode with BNC an 1 m (3.3) cable (not included) |
| Temperature Probe | HI 7662 (not included) |
| Input Impedance | 10 ¹² Ohm |
| Battery Type / Life | 4 x 1.5V AA / approx. 200 hours of use |
| Environment | 0 to 50°C (32 to 122°F); RH max 100% |
| Dimensions | 196 x 80 x 60 mm (7.7 x 3.1 x 2.4") |
| Weight | 500 g (1.1 lb.) |

OPERATIONAL GUIDE

INITIAL PREPARATION

Each meter is supplied complete with four 1.5V AA batteries.

Remove the back cover, unwrap the batteries and install them while paying attention to their polarity.



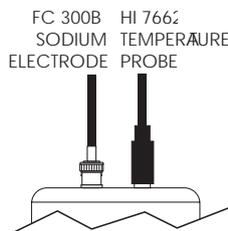
PROBE CONNECTION

Connect the **FC 300B** sodium electrode to the BNC socket on the top of the instrument.

Connect the **HI 7662** temperature probe to the RCA socket.

The temperature probe can be used independently to take temperature measurements.

If the probe is not plugged in, the secondary display shows "25°C" with the "°C" indicator blinking.



To switch the instrument on, press and hold the ON/OFF key for a fraction of a second.



These meters have a built-in protection against electromagnetic interferences and the holding of the keys is to ensure that the commands are not mistaken for erroneous signals.

In order to take accurate measurements, make sure the instrument is calibrated before use (see "Calibration" sections for details).

For accurate readings, calibration should be performed (or verified) every day if measuring the same type of samples (e.g. cheese), or every time the sample type is changed (e.g. cheese, meat, sea water, etc.).

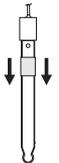
The recommended working temperature is around 20-25°C (68-77°F). For greater accuracy, perform the calibration with standard solutions at a temperature as close as possible to the temperature of the sample.

TAKING SODIUM MEASUREMENTS

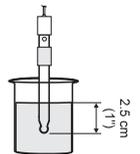
Remove the protective cap from the **FC 300B** sodium electrode and, if possible, rinse it with some of the sample to be measured.



Shift downwards the rubber sleeve (see picture) to have a properly working junction.

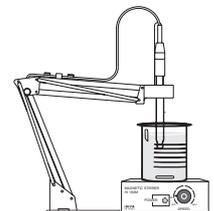


Immerse the tip of the **FC 300B** electrode (at least 2.5 cm/1") into the sample to be tested while making sure that the electrode junction is completely immersed, and without touching the bottom of the beaker.



Wait for approximately 10 to 15 minutes to allow for the electrode to adjust and stabilize, i.e. until no drifting is observed for at least a couple of minutes.

During measurement, if possible, the sample should be gently stirred (100 rpm).

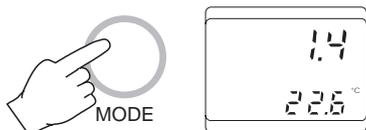


TAKING pNa MEASUREMENTS (HI 931101 only)

Press the MODE key during measurement to convert the value displayed by the **HI 931101** to pNa. Note that

$$pNa = -\log a_{Na}$$

where a_{Na} is the activity of ion Na.



Press the MODE key again to return to g/L measurements.

TEMPERATURE MEASUREMENTS

Connect the temperature probe to the meter and turn on.

Dip the **HI 7662** temperature probe into the sample. Allow the reading to stabilize.



Note: The temperature is always displayed on the secondary LCD.



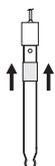
AFTER USE

Turn the meter off by pressing the ON/OFF key again.



For faster and accurate measurements, the electrode should be stored in a solution with a Na/NaCl concentration similar to the sample to be measured.

After use, shift back upwards the rubber sleeve (see picture).



If the electrode is used rarely (once a month or less), store it dry. Before using it again, let it condition overnight in **HI 7081** (30.0 g/L NaCl) or **HI 7086** (23 g/L Na 1M)

To avoid very long response time, do not store or rinse the electrode with deionized water. Do not rub the electrode.

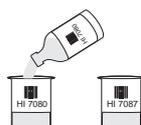
Na CALIBRATION (HI 931101)

Calibration can be performed at 1 (offset only) or 2 points.

For best accuracy, a 2 point procedure is recommended.

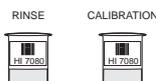
PREPARATION

- Pour small quantities of **HI7080** (2.3 g/L Na) solution and **HI 7087** (0.23 g/L Na) or **HI 7086** (23 g/L Na) into two beakers.



For accurate readings, use for the second point the **HI 7087** solution if you are going to measure samples with low sodium content (below 2.3 g/L), or the **HI 7086** standard if you are going to measure samples with high sodium content (over 2.3 g/L).

- For accurate calibration use two beakers for each solution, the first one for rinsing the electrode, the second one for calibration.



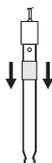
If possible, use plastic beakers to minimize any EMC interferences.

- Turn the meter on by pressing the ON/OFF key.



- Remove the protective cap and rinse the electrode with some of the calibration solution you are going to use first.

- Shift downwards the rubber sleeve for a properly working junction (see picture).

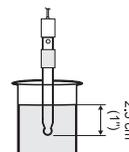


SINGLE POINT CALIBRATION (OFFSET)

- Dip the **FC 300B** sodium electrode into the **HI 7080** (2.3 g/L Na) solution.



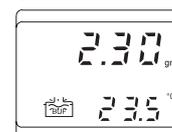
Note: Immerse the electrode approximately 2.5 cm (1") into the solution.



- Press the CAL key. The "CAL" and "BUF" indicators will be displayed with the "BUF" and the "—" symbols blinking.



- As soon as the standard solution is recognized, only the "—" symbol continues blinking to indicate that the electrode is stabilizing. The required standard solution being value is displayed on the primary LCD.



- As soon as the electrode stabilized, the "CON" symbol appears on the display.



Press the CFM key to save the calibration point. For best results, wait for a couple of minutes before confirming.



- HI 931101** will display "0.230 gm".



- For exiting the calibration mode and save the single point calibration, press the CAL key. For better accuracy however, it is recommended to perform a 2 point calibration.

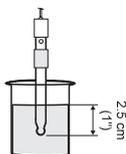


TWO POINT CALIBRATION

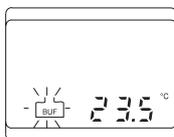
- After the first point is confirmed, immerse the **FC 300B** electrode into the second standard solution: **HI 7087** at 0.23 g/L Na or **HI 7086** at 23 g/L Na.



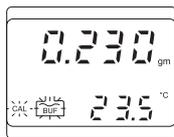
Note: The electrode should be immersed approximately 2.5 cm (1") into the solution.



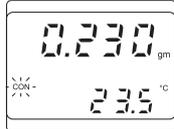
- Select the calibration value by pressing the BUF key. Make sure that the selected value corresponds to the solution being used for the second calibration point.
- If the reading is not close to the selected calibration standard, the "BUF" indicator will continue to blink.



Otherwise, if the reading is close to the selected calibration value, the meter will recognize the standard solution and only the "CON" symbol will blink, to indicate that the reading is stabilizing.



- Once stabilized "CON" symbol will appear on the display.



Wait for a couple of minutes and then press the CFM key.



- The two point calibration procedure is now completed and the meter automatically returns to the normal measurement mode.

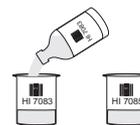
NaCl CALIBRATION (HI 931100)

Calibration can be performed at 1 (offset only) or 2 points.

For best accuracy, a two point procedure is recommended.

PREPARATION

- Pour small quantities of **HI 7083** (3.00 g/L NaCl) solution and **HI 7085** (0.30 g/L) or **HI 7081** (30 g/L) into two clean beakers.



For more accurate readings use for the second point the **HI 7085** solution if you are going to measure samples with low sodium chloride content (< 3 g/L), or the **HI 7081** solution for samples with high sodium chloride content (> 3 g/L).

- For an accurate calibration, use two beakers for each solution, the first one for rinsing the electrode, the second one for calibration.

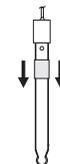


If possible use plastic beakers to minimize any EMC interferences.

- Turn the meter on by pressing the ON/OFF key.



- Remove the protective cap and rinse the electrode with some of the calibration solution you are going to use first.
- Shift downwards the rubber sleeve for a properly working junction (see picture).

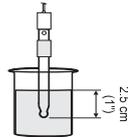


SINGLE POINT CALIBRATION (OFFSET)

- Dip the **FC 300B** sodium electrode into the **HI 7083** (3.00 g/L NaCl) solution.



Note: Immerse the electrode approx. 2.5 cm (1") into the solution.



- Press the CAL key. The "CAL" and "BUF" indicators will be displayed with the "BUF" and the "~~~~" symbols blinking.



- As soon as the standard solution is recognized, only the "~~~~" symbol will continue blinking to indicate that the electrode is stabilizing.

The value of the standard solution being used will be displayed on the primary LCD.



- As soon as the electrode is stabilized, "CON" symbol lights up.

For best results, wait for a couple of minutes before pressing the CFM key.



- **HI 931100** will then display "30.0 gm".



- To quit the calibration and save the first point, press the CAL key.



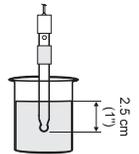
For better accuracy however, it is recommended that a two-point calibration is performed.

TWO POINT CALIBRATION

- After the first point is confirmed, immerse the **FC 300B** electrode into the second solution: **HI 7085** at 0.3 g/L NaCl or **HI 7081** at 30 g/L NaCl.



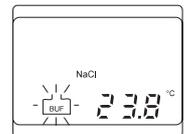
Note: The electrode should be immersed approximately 2.5 cm (1") into the solution.



- Select the second point value by pressing the BUF key. Make sure that the selected value corresponds to the one being used for the second calibration point.



- If the reading is not close to the selected value, the "BUF" symbol will blink.



Otherwise, if the reading is close to the selected value, the meter will recognize the standard solution. Only the "~~~~" symbol will blink, to indicate that the reading is stabilizing.



- Once stabilized "CON" symbol will appear on the display.

For best results, wait for a couple of minutes and press the CFM key.



- The two point calibration is now completed and the meter returns to the normal mode.



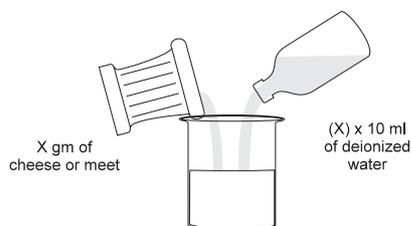
SPECIAL APPLICATIONS & ADDITIONAL INFORMATION

HOW TO MEASURE SODIUM CHLORIDE IN CHEESE AND MEAT (HI 931100)

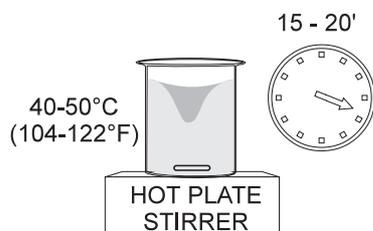
1. Grind a sample of cheese or meat.



2. Pour a quantity (X g) in a glass beaker. Add (X)x 10 mL of deionized water (**note**: ignoring water content of cheese and meat).

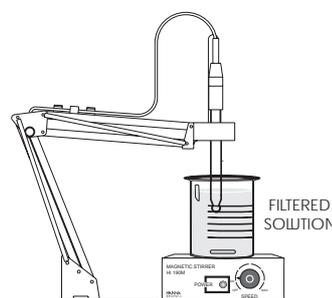


3. Cover the beaker to prevent any spilling during stirring, place the beaker on a hot plate stirrer and agitate the sample at 40-50°C (104-122°F) for 15-20 minutes.



4. Let the sample cool to the ambient temperature, then filter it.

5. Dip the **FC 300B** sodium electrode into the filtered sample. The tip of the electrode should be immersed for approximately 2.5 cm/1" (i.e. the electrode junction must be completely immersed) without touching the bottom of the beaker. During measurement, the sample should be gently stirred (100 rpm).



6. Wait for the reading to stabilize, i.e. no drift should be observed for at least a couple of minutes. Note the measured value.

7. Since the dilution rate is 1/10, the reading in the g/L range has to be divided by 100 to get the actual reading of NaCl (per gram of cheese or meat), or the value can be considered directly expressed in % of NaCl.

Note: A response time of 10 to 15 minutes for the first measurement of cheese or meat, is the correct expected time for the electrode to stabilize. Next measurements of cheese or meat samples will require shorter response time (less than 2 minutes). Do not rinse the sodium electrode between subsequent measurements since contamination is negligible.

IONIC STRENGTH ADJUSTER (ISA)

When the NaCl concentration of the sample is lower than 5 g/L, it is recommended to use the **HI 7090** ISA solution. In such case, calibration should be performed with standard solution containing 2% of ISA.

ISA (Ionic Strength Adjuster) = 50% of NH_4Cl 4M + 50% of NH_4OH 4M (use 2 mL of ISA every 100 mL of sample).

TEMPERATURE

The best working temperature is around 20-25°C (68-77°F).

For greatest accuracy, it is recommended to calibrate the meter with standard solution at a temperature as close as possible to the temperature of the sample ($\pm 1^\circ\text{C}/\pm 2^\circ\text{F}$).

Na CONCENTRATION WITH HI 931100

It is always possible to determine the Na concentration by using the formula:

$$X_{\text{Na}} = X_{\text{NaCl}} \cdot (23 / 58.4)$$

where

X_{Na} = concentration of Na

and

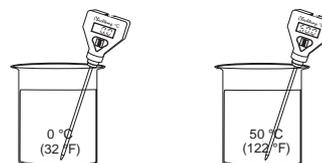
X_{NaCl} = concentration of NaCl

TEMPERATURE CALIBRATION (for Technical Personnel only)

INITIAL PREPARATION

Prepare a 0°C/32°F bath with ice and water and another one at 50°C/122°F using hot water at a known temperature. Place insulation material around the containers to minimize temperature changes.

Use a **Checktemp** or another accurate thermometer with a resolution of 0.1° as reference.



Note: A blinking "°C" indicates that the temperature probe is not connected.

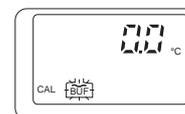


PROCEDURE

- Connect the **HI 7662** temperature probe to the RCA socket on the top of the instrument.
- Turn the instrument off.
- To enter the temperature calibration mode, press the CAL and ON/OFF keys simultaneously.
- Immerse the temperature probe into the 0°C/32°F bath together with the reference thermometer.



- When the reading stabilizes, press the CAL key. The "0.0°C", "CAL" and "BUF" symbols will be displayed. The "—" symbol will blink for a few seconds.



- When the input value becomes stable, the "⎯" symbol disappears and "CON" will start blinking.

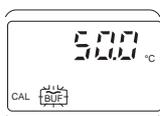


Press the CFM key to confirm the calibration value.

- Immerse the temperature probe into the 50°C (122°F) bath.



- Press the CAL key to display the "0.0°C" and then press the BUF key to select "50.0°C". "CAL" and "BUF" symbols. "⎯" symbol will blink for a few seconds.



- When the input value becomes stable, the "⎯" symbol disappears and "CON" will start blinking.



- Press the CFM key to confirm the calibration value.
- The calibration is now complete.
- Turn the meter off and on again to return to the normal mode.

FC300B CONDITIONING & MAINTENANCE

PREPARATION

Remove the protective cap.

DO NOT BE ALARMED IF ANY SALT DEPOSITS ARE PRESENT. This is normal with sodium electrodes and they will disappear when rinsed with water.

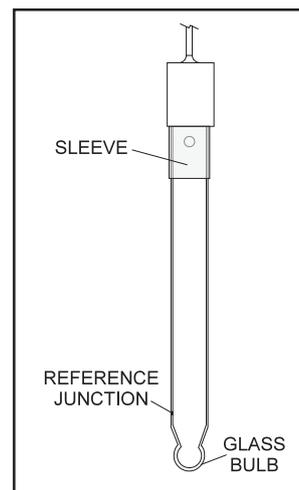
During transport tiny bubbles of air may have formed inside the glass bulb. The electrode cannot function properly under these conditions. These bubbles can be removed by "shaking down" the electrode as you would do with a glass thermometer.



If the bulb and/or junction are dry, soak the electrode in **HI 7081** (NaCl 30.0 g/L) solution overnight before use with **HI931100**. Soak it in **HI7086** (Na 23 g/L) solution overnight before use with **HI931101**.

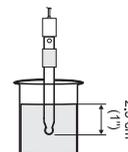
If the electrolyte solution is more than 1 cm (1/2") below the filling hole, add **HI8093** 1M KCl+AgCl electrolyte solution.

Shift downwards the rubber sleeve during measurements and calibration.



SODIUM MEASUREMENT

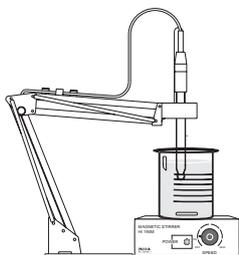
Rinse the sodium electrode tip with some of the sample to be tested, then immerse the tip (approx. 2.5 cm / 1") in the sample and stir gently.



The sensitive bulb should not touch the bottom of the beaker.

The Hanna **HI 76405** electrode holder can be used for this purpose.

During measurement, the sample should be gently stirred (approx. 100 rpm). The Hanna **HI190M** stirrer can be used for this purpose.



STORAGE

When used frequently, the electrode should be stored in a solution with a Na or NaCl concentration similar to the sample to be measured. For longer periods of storage, the electrode should be stored with a few drops of appropriate solution in the protective cap.

For frequent use in different samples (1 or 2 times per week), store the electrode in **HI7081** (30.0 g/L NaCl) solution if used for NaCl measurements with **HI 931100**.

Store the electrode in **HI 7080** (2.3 g/L Na) solution if used for Na measurements with **HI931101**.

For occasional use (once a month or less) store the electrode dry and let it conditioning overnight in **HI7081** (30.0 g/L NaCl) or **HI7086** (23 g/L Na) solution before use.

Note: NEVER STORE OR RINSE THE ELECTRODE IN DISTILLED OR DEIONIZED WATER.

PERIODIC MAINTENANCE

Inspect electrode and cable. The cable used for connection to the meter must be intact and there must be no points of broken insulation on the cable or cracks on the electrode stem or bulb. Connectors must be perfectly clean and dry.

If any scratches or cracks are present, replace the electrode.

Rinse off any salt deposits with water.

Refill the electrode with fresh electrolyte (**HI 8093**) and let it stand upright for 1 hour.

Follow the Storage Procedure above.

CLEANING PROCEDURE

General Soak in Hanna **HI 7061** general cleaning solution for approximately 1 hour.

Removal of films, dirt or deposits on the membrane/junction:

- *Protein* Soak in Hanna **HI 7073** protein cleaning solution for 15 minutes.
- *Inorganic* Soak in Hanna **HI 7074** inorganic cleaning solution for 15 minutes.
- *Oil/grease* Rinse with Hanna **HI 7077** or Oil & Fat cleaning solution.

IMPORTANT: After performing any of the cleaning procedures rinse the electrode thoroughly with a solution containing 2% ISA, refill (if necessary) the reference chamber with fresh electrolyte (**HI8093**) and soak the electrode in **a solution very close to the next sample to be measured** for at least 1 hour before taking measurements.

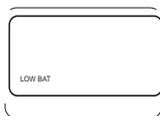
TROUBLESHOOTING

Evaluate the performance of your electrode based on the following.

- **Noise** (readings fluctuate up and down) could be due to:
 - **Clogged/Dirty Junction:** refer to the Cleaning Procedure above.
 - **Loss of shielding** due to low electrolyte level: refill with **HI 8093** solution
- **Dry Membrane/Junction:** soak it overnight in **HI7081** (30.0 g/L NaCl) or **HI7086** (23 g/L Na) solution before use.
- **Drifting:** soak the electrode tip in warm **HI 8093** solution for one hour. Refill with fresh **HI 8093** electrolyte solution.
- **Low Slope:** refer to the Cleaning Procedure.
- **No Slope:** check the electrode for cracks in glass stem or bulb and, if necessary, replace the electrode.
- **Slow Response/Excessive Drift:** soak the tip in **HI 7061** solution for 30 minutes, rinse thoroughly in a solution with 2% of ISA, and then follow the Cleaning Procedure.

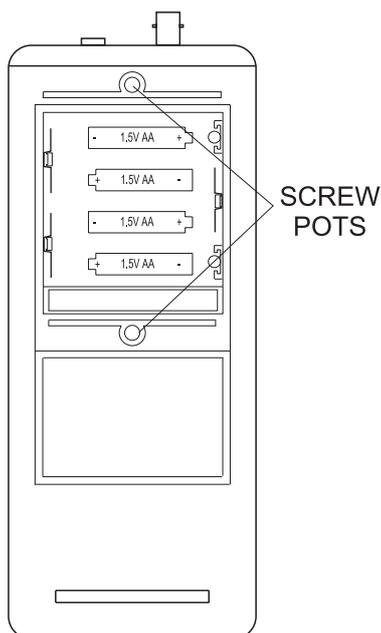
BATTERY REPLACEMENT

If the batteries become weak the LCD will display the "LOW BAT" indication.



Battery replacement must only take place in a safe area and using the battery type specified in this instruction manual.

To replace batteries, remove the two screws on the rear cover and replace all four 1.5V AA batteries with new ones, while paying attention to the correct polarity. Replace the cover and tighten the two screws.



ACCESSORIES

Na SOLUTIONS FOR HI931101

| | |
|-----------------|--|
| HI 7080M | 2.3 g/L Na solution, 230 mL bottle |
| HI 8080M | 2.3 g/L Na solution, 230 mL FDA bottle |
| HI 7080L | 2.3 g/L Na solution, 500 mL bottle |
| HI 8080L | 2.3 g/L Na solution, 500 mL FDA bottle |
| HI 7086M | 23 g/L Na solution, 230 mL bottle |
| HI 8086M | 23 g/L Na solution, 230 mL FDA bottle |
| HI 7086L | 23 g/L Na solution, 500 mL bottle |
| HI 8086L | 23 g/L Na solution, 500 mL FDA bottle |
| HI 7087M | 0.230 g/L Na solution, 230 mL bottle |
| HI 8087M | 0.230 g/L Na solution, 230 mL FDA bottle |
| HI 7087L | 0.230 g/L Na solution, 500 mL bottle |
| HI 8087L | 0.230 g/L Na solution, 500 mL FDA bottle |

NaCl SOLUTIONS FOR HI 931100

| | |
|-----------------|--|
| HI 7081M | 30 g/L NaCl solution, 230 mL bottle |
| HI 8081M | 30 g/L NaCl solution, 230 mL FDA bottle |
| HI 7081L | 30 g/L NaCl solution, 500 mL bottle |
| HI 8081L | 30 g/L NaCl solution, 500 mL FDA bottle |
| HI 7083M | 3.0 g/L NaCl solution, 230 mL bottle |
| HI 8083M | 3.0 g/L NaCl solution, 230 mL FDA bottle |
| HI 7083L | 3.0 g/L NaCl solution, 500 mL bottle |
| HI 8083L | 3.0 g/L NaCl solution, 500 mL FDA bottle |
| HI 7085M | 0.3 g/L NaCl solution, 230 mL bottle |
| HI 8085M | 0.3 g/L NaCl solution, 230 mL FDA bottle |
| HI 7085L | 0.3 g/L NaCl solution, 500 mL bottle |
| HI 8085L | 0.3 g/L NaCl solution, 500 mL FDA bottle |
| HI 7090M | ISA solution, 230 mL bottle |
| HI 8090M | ISA solution, 230 mL FDA bottle |
| HI 7090L | ISA solution, 500 mL bottle |
| HI 8090L | ISA solution, 500 mL FDA bottle |

ELECTRODE MAINTENANCE SOLUTIONS

| | |
|-----------------|--|
| HI 7061M | General cleaning solution, 230 mL bottle |
| HI 8061M | General cleaning solution, 230 mL FDA bottle |
| HI 7061L | General cleaning solution, 500 mL bottle |

- HI 8061L General cleaning solution, 500 mL FDA bottle
- HI 7073M Protein cleaning solution, 230 mL bottle
- HI 8073M Protein cleaning solution, 230 mL FDA bottle
- HI 7073L Protein cleaning solution, 500 mL bottle
- HI 8073L Protein cleaning solution, 500 mL FDA bottle
- HI 7074M Inorganic cleaning solution, 230 mL bottle
- HI 7074L Inorganic cleaning solution, 500 mL bottle
- HI 7077M Oil & Fat cleaning solution, 230 mL bottle
- HI 8077M Oil & Fat cleaning solution, 230 mL FDA bottle
- HI 7077L Oil & Fat cleaning solution, 500 mL bottle
- HI 8077L Oil & Fat cleaning solution, 500 mL FDA bottle
- HI 8093 1M KCl + AgCl electrolyte solution, 4 x 50 mL bottle

OTHER ACCESSORIES

- HI 98501 **ChecktempC** electronic thermometer with penetration, stainless steel probe and 0.1°C resolution (range: -50.0 to 150.0°C)
- FC 300B Sodium electrode, glass body, single junction, refillable, with BNC connector and 1 m (3.3') cable
- HI 190M/D Mini-stirrer 230 V (1 liter max stirring capacity, speed range from 100 to max 1000 rpm)
- HI 190M/U Mini-stirrer 115 V (1 liter max stirring capacity, speed range from 100 to max 1000 rpm)
- HI 710031 Rugged carrying case
- HI 7662 Stainless steel temperature probe with 1 m (3.3') cable
- HI 76405 Electrode holder

WARRANTY

All Hanna Instruments **meters are warranted for two years** against defects in workmanship and materials when used for their intended purpose and maintained according to instructions.

Electrodes and probes are warranted for six months.

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.

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

CE DECLARATION OF CONFORMITY

| |
|--|
|   DECLARATION OF CONFORMITY We Hanna Instruments Italia Srl via E.Fermi, 10 35030 Sarneola di Rubano - PD ITALY herewith certify that the meters HI 931100 HI 931101 HI 931102 have 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 801-2 Electrostatic Discharge IEC 801-3 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 use Date of Issue: <u>11-11-1998</u>  P. Cesa - Technical Director On behalf of Hanna Instruments 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 electrical shock, do not use these instruments when voltages at the measurement surface exceed 24 Vac or 60 Vdc.

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

SALES & TECHNICAL SERVICE CONTACTS

Australia:

Tel. (03) 9769.0666 • Fax (03) 9769.0699

China:

Tel. (10) 88570068 • Fax (10) 88570060

Egypt:

Tel. & Fax (02) 2758.683

Germany:

Tel. (07851) 9129-0 • Fax (07851) 9129-99

Greece:

Tel. (210) 823.5192 • Fax (210) 884.0210

Indonesia:

Tel. (21) 4584.2941 • Fax (21) 4584.2942

Japan:

Tel. (03) 3258.9565 • Fax (03) 3258.9567

Korea:

Tel. (02) 2278.5147 • Fax (02) 2264.1729

Malaysia:

Tel. (603) 5638.9940 • Fax (603) 5638.9829

Singapore:

Tel. 6296.7118 • Fax 6291.6906

South Africa:

Tel. (011) 615.6076 • Fax (011) 615.8582

Taiwan:

Tel. 886.2.2739.3014 • Fax 886.2.2739.2983

Thailand:

Tel. 66.2619.0708 • Fax 66.2619.0061

United Kingdom:

Tel. (01525) 850.855 • Fax (01525) 853.668

USA:

Tel. (401) 765.7500 • Fax (401) 765.7575

For e-mail contacts and complete list of Sales and Technical offices, please see www.hannainst.com