INSTRUCTION MANUAL



HI2210
HI2211

Microprocessor-based Bench Meters

pH / mV / °C

Hanna Instruments Inc., 584 Park East Drive, Woonsocket, RI 02895 USA
www.hannainst.com

Dear Customer,

Thank you for choosing a Hanna Instruments® product.

Please read this instruction manual carefully before using this instrument. This manual will provide you with the necessary information for correct use of this instrument, as well as 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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1. PRELIMINARY EXAMINATION

Remove the instrument and accessories from the packaging and examine it carefully.
For further assistance, please contact your local Hanna Instruments office or e-mail us at tech@hannainst.com.

Each instrument is supplied with:

- HI1131B glass body pH electrode with BNC connector and 1 m (3.3') cable
- HI7662 temperature probe
- HI76404N electrode holder
- pH 4.01 and 7.01 buffer solutions, 20 mL each
- HI7082 electrolyte solution
- HI700661 cleaning solution, 20 mL (2 pcs.)
- Pipette
- 12 Vdc power adapter
- Electrode quality certificate and quick reference guide
- Instrument quality certificate with quick reference guide

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

2. SPECIFICATIONS

Range	–2.00 to 16.00 pH ±399.9 mV; ±2000 mV (**HI2211** only) –20.0 to 120.0 °C
Resolution	0.01 pH 0.1 mV; 1 mV (**HI2211** only) 0.1 °C
Accuracy @ 20 °C / 68 °F	±0.01 pH ±0.2 mV; ±1 mV (**HI2211** only) ±0.4 °C (excluding probe error)
pH Calibration	Automatic, 1 or 2 point with 5 memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01)
Temperature compensation	Automatic (with **HI7662** probe) Manual from: –20.0 to 120.0 °C
pH Electrode	**HI1131B** glass body pH electrode with BNC connector and 1 m (3.3') cable (included)
Temperature probe	**HI7662** (included)
Power supply	12 Vdc adapter (included)
Environment	0 to 50 °C (32 to 122 °F), max. 95 % RH non-condensing
Dimensions	235 x 222 x 109 mm (9.2 x 8.7 x 4.3")
Weight	1.3 Kg (2.9 lbs)

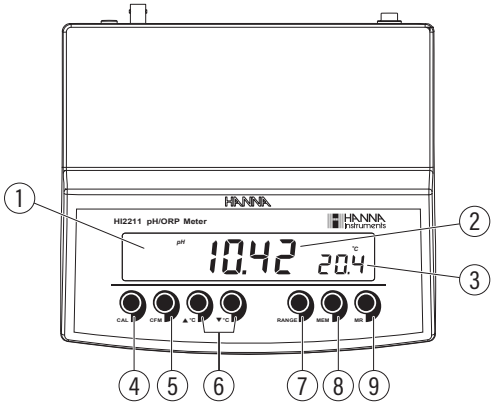
3. GENERAL DESCRIPTION

The Hanna Instruments HI2210 and HI2211 are microprocessor based pH and temperature bench meters. HI2211 can also be used for ion concentration (ISE) and Oxidation Reduction Potential (ORP) in the mV range. pH measurements are compensated for temperature effect manually or automatically with the HI7662 temperature probe.

The instrument is equipped with a large easy-to-read LCD which shows the pH (or mV) and temperature simultaneously, together with graphic symbols. A stability indicator makes the calibration procedure error free.

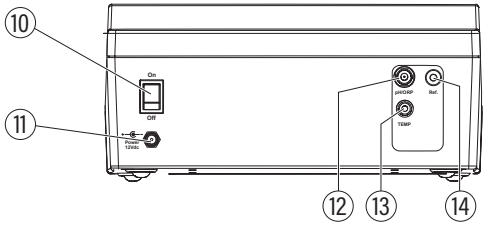
4. FUNCTIONAL DESCRIPTION

4.1. Front Panel



1. Liquid Crystal Display (LCD)
2. Secondary LCD
3. Primary LCD
4. **CAL** key, to enter and exit calibration mode
5. **CFM** key, to confirm different values
6. **ARROW** keys (▲°C / ▼°C), to manually increase/decrease temperature or select pH buffer
7. **RANGE** key, to select measurement range (HI2211 only)
8. **MEM** key, to store a value into memory
9. **MR** key, memory recall

4.2. Rear Panel



10. ON/OFF switch
11. Power adapter socket
12. BNC electrode connector
13. Temperature probe socket
14. Electrode reference socket

5. OPERATIONAL GUIDE

5.1. Power Connection

Plug the 12 Vdc adapter into the power supply socket.

Notes: *These instruments use non volatile memory to retain the pH, mV, temperature calibrations and all other settings, even when unplugged. Make sure a fuse protects the main line.*

5.2. Electrode And Probe Connections

For pH or ORP combination electrode connect to the BNC connector on the back of the instrument.
For electrodes with a separate reference connect the electrode's BNC to the BNC connector and the reference electrode plug to the reference socket.
For temperature measurements and automatic temperature compensation connect the temperature probe to the appropriate socket.

5.3. Instrument Start-Up

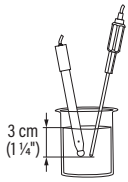
- Turn the instrument on by pressing the ON/OFF switch located on the rear panel.
- All LCD segments are displayed while the instrument performs a self test.



5.4. pH Measurements

Make sure the electrode and the instrument have been calibrated together before taking pH measurements.

- Submerse the electrode and the temperature probe approximately 3 cm (1 ¼") into the sample to be tested and stir gently. Allow time for the electrode to stabilize.
- The pH is displayed on the primary LCD and the temperature on the secondary LCD.
- If the pH reading is out of range, the closest full scale value will be displayed blinking on the LCD.

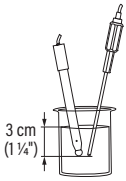




If measurements are taken successively in different samples, it is recommended to rinse the electrode thoroughly with deionized water or tap water and then with some of the next sample in order to prevent cross-contamination.
The pH reading is affected by temperature. In order to measure the pH accurately, the temperature effect must be compensated for. To use the **Automatic Temperature Compensation** feature, connect and submerse the HI7662 temperature probe into the sample as close as possible to the electrode and wait for a few seconds.
If the temperature of the sample is known, manual temperature compensation can be used by disconnecting the temperature probe.
The display will show the last recorded temperature reading with the " °C " tag blinking.
The temperature can now be adjusted with the **ARROW** keys (from -20.0 °C to 120.0 °C).



5.5. ORP Measurements (HI2211 only)



An optional ORP electrode must be used to perform ORP measurements (see Accessories). Oxidation-reduction potential (REDOX) measurements provide the quantification of the oxidizing or reducing power of the tested sample. The surface of the ORP electrode must be clean and smooth in order to obtain an accurate measurement.

- Press **RANGE** key to enter mV range.
- Submerse the tip of the ORP electrode 3 cm (1 ¼") into the sample to be tested and allow a few seconds for the reading to stabilize.
- The instrument displays the mV reading on the primary LCD and the temperature on the secondary LCD.
- If the reading is out of range, the closest full scale value will be displayed blinking on the LCD.





5.6. Temperature Measurements



Connect the HI7662 temperature probe to the TEMP socket and turn the instrument on. Submerse the temperature probe into the sample and allow the reading on the secondary LCD to stabilize.

5.7. Memory Function

To store the last reading:

- Press and hold down **MEM** key to store the last reading in the meter's memory. "MEM" tag is displayed.

To display the memorized reading:

- Press **MR** key to display the memorized reading. "MEM" tag is displayed.







6. pH CALIBRATION

Calibrate the instrument often, especially if high accuracy is required. The instrument should be recalibrated:

- Whenever the pH electrode is replaced.
- At least once a week.
- After testing aggressive chemicals.

6.1. Preparation

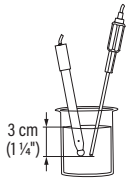
Pour small quantities of the buffer solutions into clean beakers. If possible use plastic or glass beakers to minimize any EMC interferences. For accurate calibration and to minimize cross-contamination, use two beakers for each buffer solution: one for rinsing the electrode and one for calibration.

- If you are measuring in the acidic range, use pH 7.01 or pH 6.86 as first buffer and pH 4.01 as second buffer.
- If you are measuring in the alkaline range, use pH 7.01 or pH 6.86 as first buffer and pH 10.01 or pH 9.18 as second buffer.

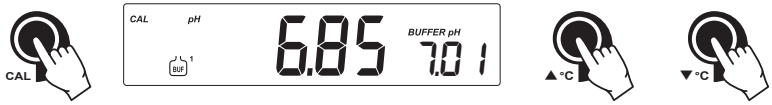
6.2. Procedure

A two-point calibration is recommended however a one-point calibration will be permitted.
Calibration can be performed using the five memorized buffers: **pH 4.01**, **6.86**, **7.01**, **9.18** and **10.01**.

6.3. Two-Point Calibration

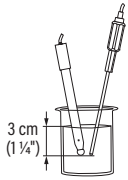


- Submerse the pH electrode and the temperature probe approximately 3 cm (1 ¼") into a buffer solution and stir gently. The temperature probe should be close to the pH electrode.
- Press CAL. The "CAL" and (BUF1) messages will appear and "**7.01**" buffer will be displayed on the secondary LCD.
- If necessary, press the **ARROW** keys to select a different buffer value.



- The (⧖) symbol will blink on the LCD until the reading is stable. When the reading is stable and close to the selected buffer, "READY" message will appear and "CFM" message will blink.
- Press **CFM** key to confirm calibration. The calibrated value is then displayed on the primary LCD and the secondary LCD will display the second expected buffer value.





- After the first calibration point is confirmed, submerse the pH electrode and the temperature probe approximately 3 cm (1 ¼") into the second buffer solution and stir gently. The temperature probe should be close to the pH electrode.
- If necessary, press the **ARROW** keys to select a different buffer value.

Note: *The instruments will automatically skip the buffer used for the first point. It also skips 6.86 if 7.01 buffer was used and vice versa. Likewise, it will skip 9.18 if 10.01 buffer was used and vice versa.*



- The (⧖) symbol will blink on the LCD until the reading is stable.
- When the reading is stable, "READY" message will appear and "CFM" message will blink.
- Press **CFM** key to confirm calibration. The instrument will return to measurement mode.

6.4. Notes:

- To clear previous calibration data enter calibration mode, press and hold down **CFM** key, then press **CAL** key. The display will show "CLR" and then return to measurement mode.
- If the value measured by the meter is not close to the selected buffer, "WRONG BUF" and "WRONG !" messages will blink alternately. In this case check if the correct buffer has been used, or regenerate the electrode by following the cleaning procedure. If necessary, change the buffer or the electrode.
- The "WRONG" message and temperature value are displayed blinking if the temperature reading is out of the defined temperature range of the buffer. Calibration cannot be confirmed in this situation.
- Press **RANGE** key to display the temperature reading during calibration (HI2211 only).



6.5. One-Point Calibration

- Proceed as described in "Two-point calibration" section.
- Press **CAL** key after the first calibration point was confirmed. The instrument will return to measurement mode and will memorize the one-point calibration data (new offset).



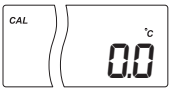
The instrument will use the slope from the previous calibration. The default slope will be used if there is no previous calibration.

7. TEMPERATURE CALIBRATION

Note: *for technical personnel only.*

All the instruments are factory calibrated for temperature. Hanna Instruments' temperature probes are interchangeable and no temperature calibration is needed when they are replaced.
If the temperature measurements are inaccurate, temperature recalibration should be performed.
For an accurate recalibration, contact your local Hanna Instruments Office.

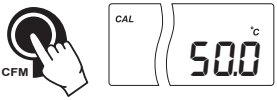
- Prepare a vessel containing ice and water and another one containing hot water (around 50 °C). Place insulation material around the vessels to minimize temperature changes.
- Use a calibrated thermometer with a resolution of 0.1 °C as a reference thermometer.
- With the instrument off, press and hold down the **CAL** key & **MEM** key, then power on the instrument. The "CAL" message will appear and the secondary LCD will show "**0.0** °C".



- Submerse the temperature probe in the vessel with ice and water as near as possible to the reference thermometer. Allow a few seconds for the probe to stabilize.
- Use the **ARROW** keys to set the reading on the secondary LCD to that of ice and water, measured by the reference thermometer.



- When the reading is stable and close to the selected calibration point, "READY" message will appear and "CFM" message will blink.
- To confirm press **CFM** key. The secondary LCD will show "**50.0** °C".



- Submerse the temperature probe in the second vessel as near as possible to the reference thermometer. Allow a few seconds for the probe to stabilize.
- Use the **ARROW** keys to set the reading on the secondary LCD to that of the hot water.



- When the reading is stable and close to the selected calibration point, "READY" tag will appear and "CFM" tag will blink.
- Press **CFM** key to confirm. The instrument returns to measurement mode.



Note: *If the reading is not close to the selected calibration point, "WRONG" tag will blink. Change the temperature probe and restart calibration.*

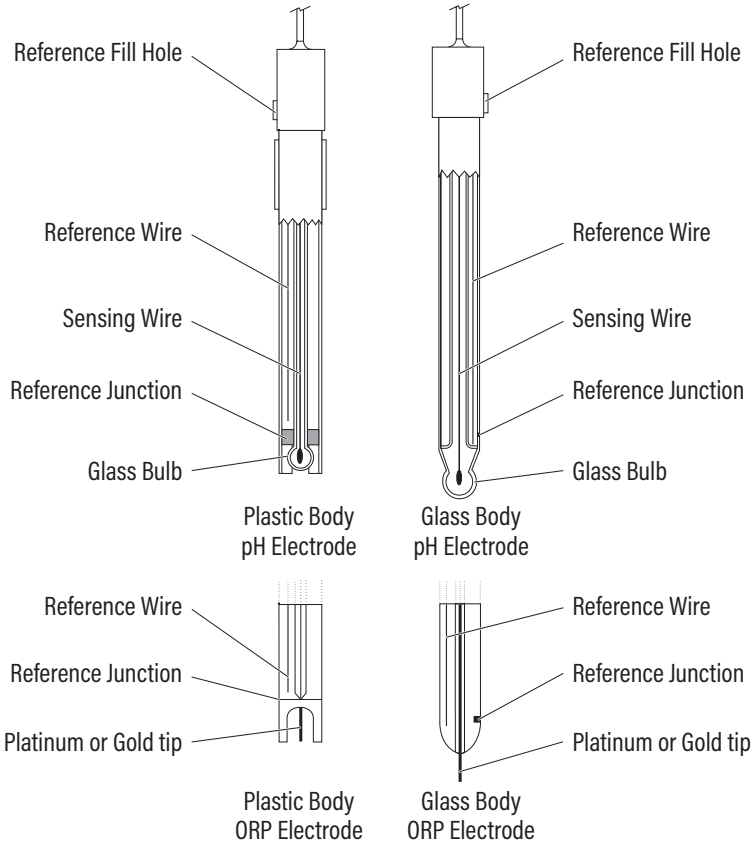
8. pH BUFFER TEMPERATURE DEPENDENCE

The temperature has an effect on pH. The calibration buffer solutions are affected by temperature changes to a lesser degree than normal solutions. During calibration the instrument will automatically calibrate to the pH value corresponding to the measured or set temperature.

Temperature		pH values				
°C	°F	4.01	6.86	7.01	9.18	10.01
0	32	4.01	6.98	7.13	9.46	10.32
5	41	4.00	6.95	7.10	9.39	10.24
10	50	4.00	6.92	7.07	9.33	10.18
15	59	4.00	6.90	7.05	9.27	10.12
20	68	4.00	6.88	7.03	9.22	10.06
25	77	4.01	6.86	7.01	9.18	10.01
30	86	4.02	6.85	7.00	9.14	9.96
35	95	4.03	6.84	6.99	9.11	9.92
40	104	4.04	6.84	6.98	9.07	9.88
45	113	4.05	6.83	6.98	9.04	9.85
50	122	4.06	6.83	6.98	9.01	9.82
55	131	4.08	6.84	6.98	8.99	9.79
60	140	4.09	6.84	6.98	8.97	9.77
65	149	4.11	6.84	6.99	8.95	9.76
70	158	4.12	6.85	6.99	8.93	9.75

During calibration the instrument will display the pH buffer value at 25 °C.

9. ELECTRODE CONDITIONING AND MAINTENANCE



9.1. Preparation Procedure

Remove the protective cap of the pH electrode.

Note: *Do not be alarmed if salt deposits are present. This is normal with electrodes. They will disappear when rinsed with water.*

During transport, tiny bubbles of air may form inside the glass bulb affecting proper functioning of the electrode. These bubbles can be removed by "shaking down" the electrode as you would do with a glass thermometer. If the bulb and/or junction is dry, soak the electrode in HI70300 or HI80300 Storage Solution for at least one hour.

9.1.1. For refillable electrodes:

If the filling solution (electrolyte) is more than 2 cm (1") below the fill hole, add HI7082 or HI8082 3.5M KCl Electrolyte Solution for double junction or HI7071 or HI8071 3.5M KCl+AgCl Electrolyte Solution for single junction electrodes. Unscrew the fill hole screw during measurements.

9.1.2. For AmpHel electrodes:

If the electrode does not respond to pH changes, the battery is dead and the electrode should be replaced.

9.2. Measurement

Rinse the electrode tip with distilled water. Submerse the tip 3 cm (1 ¼") into the sample and stir gently for a few seconds.
For a faster response and to avoid cross-contamination of the samples, rinse the electrode tip with a few drops of the solution to be tested, before taking measurements.

9.3. Storage Procedure

To minimize clogging and assure a quick response time, the glass bulb and the junction should be kept moist and not allowed to dry out.
Replace the solution in the protective cap with a few drops of HI70300 or HI80300 Storage Solution or, in its absence, Fill Solution (HI7071 or HI8071 for single junction and HI7082 or HI8082 for double junction electrodes). Follow the Preparation Procedure before taking measurements.

Note: *Never store the electrode in distilled or deionized water.*

9.4. Periodic Maintenance

Inspect the electrode and the cable. The cable must be intact and well connected. No cracks should be seen 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.

9.4.1. For refillable electrodes:

Refill the reference chamber with fresh electrolyte (HI7071 or HI8071 for single junction or HI7082 or HI8082 for double junction electrodes). Allow the electrode to stand upright for 1 hour. Follow the Storage Procedure.

9.5. Cleaning Procedure

- General: Soak in Hanna Instruments HI7061 or HI8061 General Cleaning Solution for approximately ½ hour.
- Protein: Soak in Hanna Instruments HI7073 or HI8073 Protein Cleaning Solution for 15 minutes.
- Inorganic: Soak in Hanna Instruments HI7074 Inorganic Cleaning Solution for 15 minutes.
- Oil/grease: Rinse with Hanna Instruments HI7077 or HI8077 Oil and Fat Cleaning Solution.

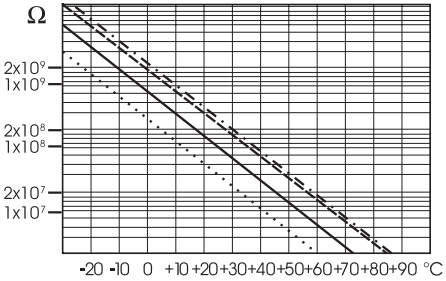
Important: *After performing any of the cleaning procedures, rinse the electrode thoroughly with distilled water, refill the reference chamber with fresh electrolyte (not necessary for gel-filled electrodes) and soak the electrode in HI70300 or HI80300 Storage Solution for at least 1 hour before taking measurements.*

10. TROUBLESHOOTING GUIDE

Symptoms	Problem	Solution
Slow response/excessive drift.	Dirty pH electrode.	Clean the electrode and then soak the tip in **HI7061** or **HI8061** for 30 minutes.
Readings fluctuate up and down (noise).	Clogged/dirty junction. Low electrolyte level (refillable electrodes only).	Clean the electrode. Refill with fresh solution (for refillable electrodes only). Check cable and connector.
The meter does not accept the buffer solution for calibration.	Dirty electrode or contaminated buffer.	Follow the cleaning procedure. If still no results, replace the electrode. Replace Buffer.
If the display shows "**pH**" and "**-2.00**" or "**16.00**" blinking.	Out of range in the pH scale.	Verify that the electrode is connected. Verify that the shipping cap has been removed. Recalibrate the meter. Make sure the pH sample is in the specified range. Check the electrolyte level and the general state of the electrode.
The display shows "**mV**" and "**-2000**" or "**2000**" blinking.	Out of range in the mV scale.	Verify that the electrode is connected.
The meter does not work with the temperature probe.	Broken temperature probe. Wrong temperature probe used.	Replace the temperature probe.
The meter fails to calibrate or gives faulty readings.	Broken pH electrode.	Replace the electrode.
At startup the meter displays all LCD tags permanently.	One of the keys is stuck.	Check the keyboard or contact the vendor.
"**Err xx**" error message displayed.	Internal error.	Power off the meter and then power it on. If the error persists, contact the vendor.

11. TEMPERATURE CORRELATION FOR pH SENSITIVE GLASS

The resistance of glass electrodes partially depends on the temperature. The lower the temperature, the higher the resistance. It takes more time for the reading to stabilize if the resistance is higher. In addition, the response time will suffer to a greater degree at temperatures below 25 °C.



Since the resistance of the pH electrode is in the range of 50-200 Mohms, the current across the membrane is in the pico Ampere range. Large currents can disturb the calibration of the electrode for many hours.
For these reasons high humidity environments, short circuits and static discharges are detrimental to a stable pH reading.
The pH electrode's life also depends on the temperature. If constantly used at high temperatures, the electrode life is drastically reduced.

11.1. Typical Electrode Life

Ambient Temperature	1- 3 years
90 °C	Less than 4 months
120 °C	Less than 1 month

11.2. Alkaline Error

High concentrations of sodium ions interfere with readings in alkaline solutions. The pH at which the interference starts to be significant depends upon the composition of the glass. This interference is called alkaline error and causes the pH to be underestimated.
Hanna Instruments' glass formulations have the indicated characteristics.

Sodium Ion Correction for Glass at 20-25 °C

Concentration	pH	Error
0.1 Mol L^{-1} Na^{+}	13.00	0.10
	13.50	0.14
	14.00	0.20
1.0 Mol L^{-1} Na^{+}	12.50	0.10
	13.00	0.18
	13.50	0.29
	14.00	0.40

12. ACCESSORIES

12.1. pH Buffer Solutions

HI70004P	pH 4.01 buffer sachets, 20 mL, 25 pcs.
HI70007P	pH 7.01 buffer sachets, 20 mL, 25 pcs.
HI70010P	pH 10.01 buffer sachets, 20 mL, 25 pcs.
HI7004L	pH 4.01 buffer solution, 500 mL
HI7006L	pH 6.86 buffer solution, 500 mL
HI7007L	pH 7.01 buffer solution, 500 mL
HI7009L	pH 9.18 buffer solution, 500 mL
HI7010L	pH 10.01 buffer solution, 500 mL
HI8004L	pH 4.01 buffer solution in FDA approved bottle, 500 mL
HI8006L	pH 6.86 buffer solution in FDA approved bottle, 500 mL
HI8007L	pH 7.01 buffer solution in FDA approved bottle, 500 mL
HI8009L	pH 9.18 buffer solution in FDA approved bottle, 500 mL
HI8010L	pH 10.01 buffer solution in FDA approved bottle, 500 mL

12.2. Electrode Storage Solutions

HI70300L	Storage solution, 500 mL
HI80300L	Storage solution in FDA approved bottle, 500 mL

12.3. Electrode Cleaning Solutions

HI70000P	Electrode rinse sachets, 20 mL, 25 pcs.
HI7061L	General cleaning solution, 500 mL
HI7073L	Protein cleaning solution, 500 mL
HI7074L	Inorganic cleaning solution, 500 mL
HI7077L	Oil & fat cleaning solution, 500 mL
HI8061L	General cleaning solution in FDA approved bottle, 500 mL
HI8073L	Protein cleaning solution in FDA approved bottle, 500 mL
HI8077L	Oil & fat cleaning solution in FDA approved bottle, 500 mL

12.4. Electrode Refill Electrolyte Solutions

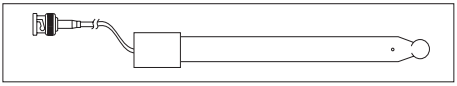
HI7071	3.5M KCl + AgCl electrolyte, 4 × 30 mL, for single junction electrodes
HI7072	1M KNO_3 electrolyte, 4 × 30 mL
HI7082	3.5M KCl electrolyte, 4 × 30 mL, for double junction electrodes
HI8071	3.5M KCl + AgCl electrolyte in FDA approved bottle, 4x30 mL, for single junction electrodes
HI8072	1M KNO_3 electrolyte in FDA approved bottle, 4x30 mL

12.5. ORP Pretreatment Solutions

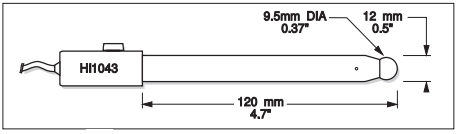
HI7091L	Reducing pretreatment solution, 500 mL + 14 g
HI7092L	Oxidizing pretreatment solution, 500 mL

12.6. Electrodes

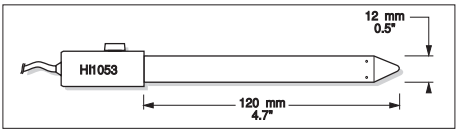
All electrodes part numbers ending in **B** are supplied with BNC connectors and 1 m (3.3') cable, as shown below:



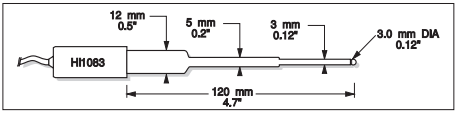
HI1043B Glass-body, double junction, refillable, combination pH electrode. Use: strong acid/alkali.



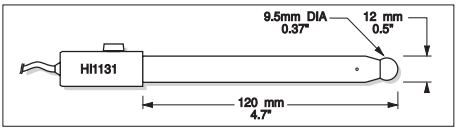
HI1053B Glass-body, triple ceramic, conic shape, refillable, combination pH electrode. Use: emulsions.



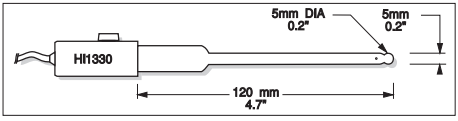
HI1083B Glass-body, micro, Viscolene, non-refillable, combination pH electrode.
Use: biotechnology, micro titration.



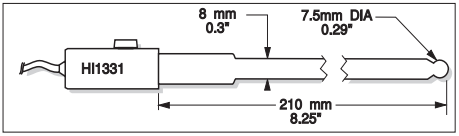
HI1131B Glass-body, double junction, refillable, combination pH electrode. Use: general purpose.



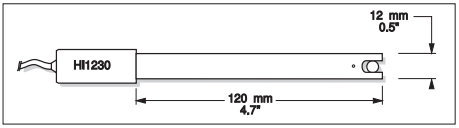
HI1330B Glass-body, semimicro, single junction, refillable, combination pH electrode.
Use: laboratory, vials.



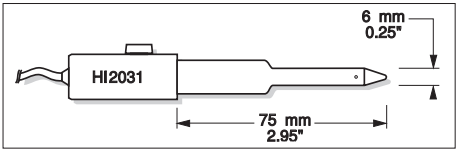
HI1331B Glass-body, semimicro, single junction, refillable, combination pH electrode. Use: flasks.



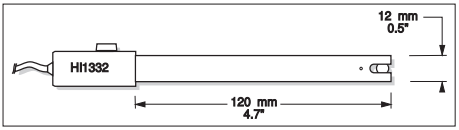
HI1230B Plastic-body (PES), double junction, gel-filled, combination pH electrode. Use: general, field.



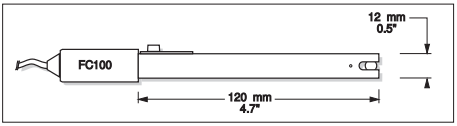
HI2031B Glass-body, semimicro, conic, refillable, combination pH electrode. Use: semisolid products.



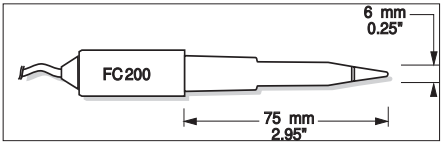
HI1332B Plastic-body (PES), double junction, refillable, combination pH electrode. Use: general purpose.



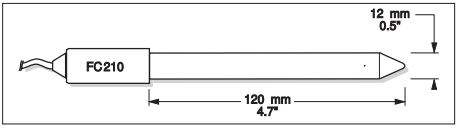
FC100B Plastic-body (PVDF), double junction, refillable, combination pH electrode.
Use: general purpose for food industry.



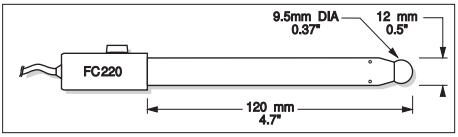
FC200B Plastic-body (PVDF), open junction, conic, Viscolene, non-refillable, combination pH electrode.
Use: meat & cheese.



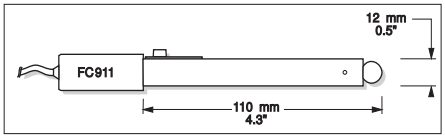
FC210B Glass-body, double junction, conic, Viscolene, non-refillable, combination pH electrode.
Use: milk, yogurt.



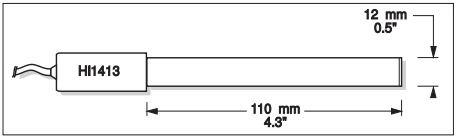
FC220B Glass-body, triple-ceramic, single junction, refillable, combination pH electrode.
Use: food processing.



FC911B Plastic-body (PVDF), double junction, refillable with built-in amplifier, combination pH electrode.
Use: very high humidity.

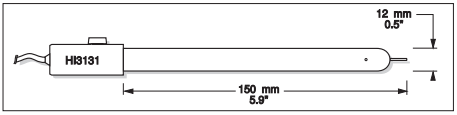


HI1413B Glass-body, single junction, flat tip, Viscolene, non-refillable, combination pH electrode.
Use: surface measurement.

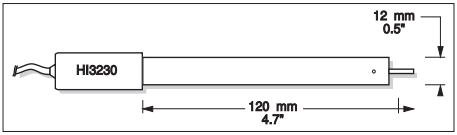


12.6.1. ORP Electrodes

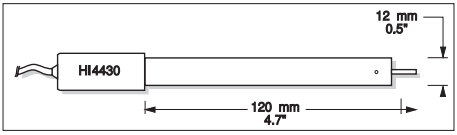
HI3131B Glass-body, refillable, combination platinum ORP electrode. Use: titration.



HI3230B Plastic-body (PES), gel-filled, combination platinum ORP electrode. Use: general purpose.

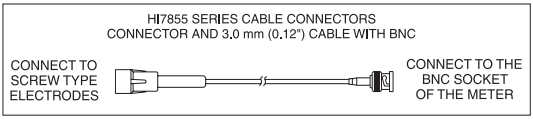


HI4430B Plastic-body (PES), gel-filled, combination gold ORP electrode. Use: general purpose.



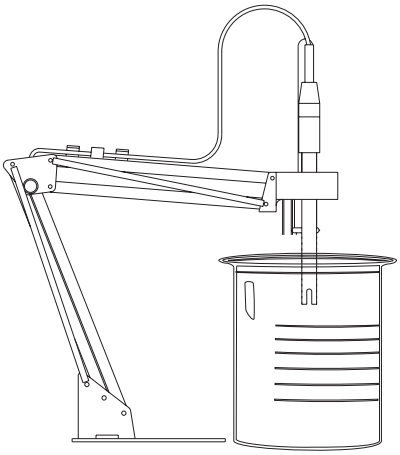
12.6.2. Extension Cables for Screw-Type Electrodes (Screw To BNC Adapter)

HI7855/1	Extension cable 1m (3.3') long
HI7855/3	Extension cable 3m (9.9') long
HI7855/5	Extension cable 5m (16.5') long
HI7855/10	Extension cable 10m (33') long
HI7855/15	Extension cable 15m (49.5') long



12.6.3. Other Accessories

HI710005	Voltage adapter from 115 Vac to 12 Vdc
HI710006	Voltage adapter from 230 Vac to 12 Vdc
HI98501	Pocket-size thermometer (range -50.0 to 150.0 °C)
HI76405	Electrode holder
HI8427	pH and ORP electrode simulator with 1 m (3.3') coaxial cable ending in female BNC connectors
HI931001	pH and ORP electrode simulator with LCD and 1 m (3.3') coaxial cable ending in female BNC connectors



CERTIFICATION

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



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.

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 its performance. For yours and the instrument's safety, do not use or store the product in hazardous environments.

WARRANTY

HI2210 and HI2211 are warranted for two years against defects in workmanship and materials when used for its intended purpose and maintained according to instructions. Electrodes and probes are guaranteed for six months. 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, 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 packed for complete protection.