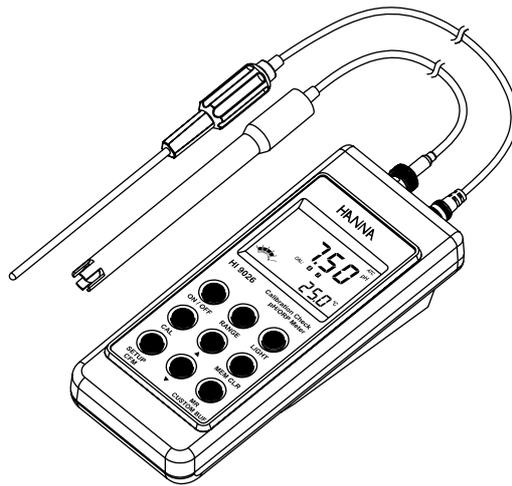


Instruction Manual

HI 9026

Calibration Check Waterproof pH/mV/°C Meter



Dear Customer,
 Thank you for choosing a Hanna Instruments product.
 Please read this instruction manual carefully before using the instrument.
 This manual will provide you with the necessary information for correct use of the 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 or turn to the back cover for our worldwide contact list.
 This instrument is in compliance with **CE** directives.

WARRANTY

HI 9026 is guaranteed 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. 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 the dealer from whom you purchased the instruments. 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 instruments are to be returned to Hanna Instruments, first obtain a Returned Goods Authorization 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.

TABLE OF CONTENTS

WARRANTY	2
PRELIMINARY EXAMINATION	3
GENERAL DESCRIPTION	3
FUNCTIONAL DESCRIPTION	4
SPECIFICATIONS	5
OPERATIONAL GUIDE	6
pH CALIBRATION	9
pH BUFFER TEMPERATURE DEPENDENCE	13
SETUP MENU	14
mV CALIBRATION	15
TEMPERATURE CALIBRATION	15
BATTERY REPLACEMENT	15
LCD MESSAGE GUIDE	16
TEMPERATURE CORRELATION FOR pH SENSITIVE GLASS	17
ELECTRODE CONDITIONING & MAINTENANCE	18
TROUBLESHOOTING GUIDE	20
ACCESSORIES	21

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it to make sure that no damage has occurred during shipping.

If there is any damage, notify your dealer or the nearest Hanna Customer Service Center.

The meter is supplied with:

- **HI 1230B** combination double-junction, gel pH electrode
- **HI 7662** stainless steel temperature probe with 1 m (3.3') cable
- **pH 4.01 & pH 7.01** buffer solutions (20 mL sachet)
- 100 mL plastic beaker
- 1.5V AA alkaline batteries (4 pcs)
- Instruction manual
- Rugged carrying case

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.

GENERAL DESCRIPTION

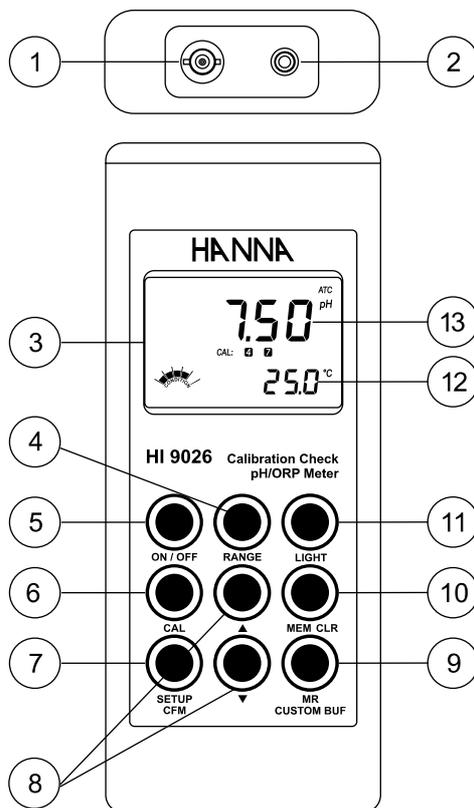
HI 9026 is a state-of-the-art waterproof, heavy-duty pH meter designed to provide laboratory results and accuracy under harsh industrial conditions. This meter is provided with a series of new diagnostic features which add an entirely new dimension to the measurement of pH, by allowing the user to dramatically improve the reliability of the measurement:

- 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45) for calibration
- Custom calibration by entering up to two custom buffers
- Messages on the LCD to make the calibration easy and accurate
- Diagnostic features to alert the user when the electrode needs cleaning
- Monitoring of the electrode aging
- User-selectable "calibration time-out" to remind when a new calibration is necessary

HI 9026 can also measure with ORP electrodes, thanks to its capability to measure mV with a resolution up to 0.1 mV.

Moreover, it offers an extended temperature range from $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$) to $120\text{ }^{\circ}\text{C}$ ($248\text{ }^{\circ}\text{F}$), using **HI 7662** interchangeable probes.

FUNCTIONAL DESCRIPTION



- 1) BNC electrode connector.
- 2) Temperature probe socket.
- 3) Liquid Crystal Display (LCD).
- 4) **RANGE** key, to select pH or mV.
- 5) **ON/OFF** key, to turn the meter ON and OFF.
- 6) **CAL** key, to enter/exit calibration mode.
- 7) **SETUP/CFM** key, to enter setup mode or to confirm calibration.
- 8) **UP** and **DOWN** arrow keys, for manual temperature setting, entering menu parameters or changing buffer values.
- 9) **MR/CUSTOM BUF** key, to recall the stored value from memory or to enter custom buffer values.
- 10) **MEM/CLR** key, to store the reading in memory or to clear calibration.
- 11) **LIGHT** key, to toggle display backlighting.
- 12) Secondary display.
- 13) Primary display.

SPECIFICATIONS

RANGE	–2.00 to 16.00 pH
	± 699.9 mV / ± 1999 mV
	–20.0 to 120.0 °C (–4.0 to 248.0 °F)
RESOLUTION	0.01 pH
	0.1 mV / 1 mV
	0.1 °C (0.1 °F)
ACCURACY @ 20 °C / 68 °F	± 0.01 pH
	± 0.2 mV / ± 1 mV
	± 0.4 °C (± 0.8 °F) (excluding probe error)
	± 0.02 pH
Typical EMC Deviation	± 0.2 mV / ± 1 mV
	± 0.4 °C (± 0.8 °F)
	± 0.02 pH
pH Calibration	1 or 2-point procedure, with 7 memorized buffers and 2 custom buffers
Offset Calibration	± 1 pH
Slope Calibration	From 80 to 108%
Temperature Compensation	Automatic, from –20.0 to 120.0 °C (–4.0 to 248.0 °F) or manual, without temperature probe
pH Electrode	HI 1230B (included)
Temperature Probe	HI 7662 (included)
Input Impedance	10^{12} ohms
Battery Type & Life	4 x 1.5V AA size (alkaline batteries) approx. 500 hours of continuous use
Auto-off	User selectable: 20 minutes or disabled
Dimensions	196x80x60 mm (7.7x3.1x2.4")
Weight (meter only)	425 g (15 oz.)
Environment	0 – 50 °C (32 – 122 °F) max RH 100%
Warranty	2 years

OPERATIONAL GUIDE

INITIAL PREPARATION

The meter is supplied complete with batteries. Remove the back cover, unwrap the batteries and install them while paying attention to their polarity (see page 15).

To prepare the instrument for use, connect the pH electrode and the temperature probe to the BNC and temperature sockets on the top of the instrument. The temperature probe is used in conjunction with the pH electrode to utilize the meter's ATC capability, but it can also be used independently to take temperature measurements. If the probe is disconnected, temperature can be set manually with the UP and DOWN arrow keys (see page 7 for details).

Turn the instrument ON by pressing ON/OFF.

At start-up the display will show all the used segments for a few seconds (or while the button is held), followed by the percentage indication of the remaining battery charge, then enters measurement mode.

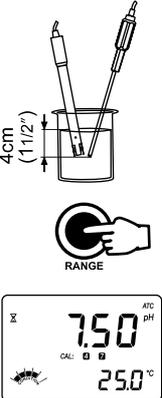


After measurement switch the meter off, clean the electrode and store it with a few drops of HI 70300 storage solution in the protection cap. The auto-off feature turns the meter off after 20 minutes with no button pressed to save battery life. To disable this feature, see "Setup Menu" section on page 9.

pH MEASUREMENTS

To take a pH measurement remove the electrode protective cap and simply submerge the tip (4cm/1 1/2") of the electrode and the temperature probe into the sample to be tested. If necessary, press the RANGE key until the display changes to the pH mode.

Allow for the electrode to adjust and reading to stabilize (hourglass symbol turns off). The LCD will show the pH measurement together with the temperature of the sample.



In order to take more accurate pH measurements, make sure that the instrument is calibrated (see page 9 for details).

It is recommended that the electrode is always kept wet and rinsed thoroughly with the sample to be measured before use.

The pH reading is directly affected by temperature. In order for the meter to measure the pH accurately, temperature must be taken into consideration. If the sample temperature is different from the temperature at which the pH electrode was kept, allow a few minutes to reach thermal equilibrium.

To use the meter's Automatic Temperature Compensation feature, submerge the temperature probe into the sample as close to the electrode as possible and wait for a few minutes.

If manual temperature compensation (MTC) is desired, the temperature probe must be disconnected from the instrument.

The display will show the default temperature of 25 °C or the last temperature set with the "°C" (or "°F") indicator blinking.



The MTC tag and up & down arrows symbols light up on the LCD to indicate that the meter is in MTC mode and the arrow keys can be used to enter the desired temperature value.

Note: When in MTC the user can press and hold the arrow keys, and the meter will start incrementing/decrementing the temperature value. The meter keeps measuring and the display is updated every second.

ORP MEASUREMENTS

To perform ORP measurements, connect an optional ORP electrode (see "Accessories" section) to the meter and turn it ON.

If necessary, enter the "mV" mode by pressing RANGE until the display changes to mV.

Submerge the ORP electrode tip (4cm/1½") into the sample to be tested and wait a few minutes for the reading to stabilize.

Measurements within the ±699.9 mV range are displayed with 0.1 mV resolution, while outside this range the resolution automatically switches to 1 mV.



The ATC (or MTC) tag is turned off because mV readings are not temperature compensated.

For accurate ORP measurements, the surface of the electrode must be clean and smooth. Pretreatment solutions are available to condition the electrode and improve its response time (see "Accessories" section).

Notes:

- When the reading is out of range, the display will flash the closest full-scale value.
- If using pH electrode while in mV mode, the meter will measure the mV generated by the pH electrode.

MEM & MR FUNCTIONS

From normal measurement mode, pressing the MEM key will freeze the readings on the display and store into internal memory the current values (pH and temperature, or mV and temperature) together with "condition" and buffer segments.

The MEM tag blinks and the display remains frozen until the MEM key is pressed again.



Note: While in MEM mode, the user can switch between pH and mV by pressing the RANGE key.

A stored value can be recalled by pressing MR: the display will show the value, together with the RCL & MEM tags, as long as the MR key is pressed.



Note: Pressing MR, only the range that was active at the time MEM was pressed is shown.

BACKLIGHT FEATURE

The meter is provided with a Backlight feature, which can be easily toggled on and off through the keyboard by pressing the LIGHT key.



Note: The backlight automatically shuts off after approximately 1 minute with no buttons pressed.

pH CALIBRATION

It is recommended to calibrate the instrument frequently, especially if high accuracy is required.

The pH range should be recalibrated:

- a) Whenever the pH electrode is replaced.
- b) At least once a week.
- c) After testing aggressive chemicals.
- d) When extreme accuracy is required.
- e) When the calibration time-out is expired (if feature is enabled).

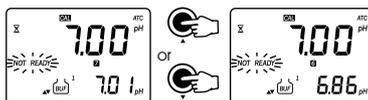
PROCEDURE

The meter offers a choice of 7 memorized buffers (1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45 pH) and also allows the user to enter two more pH values for calibration, C1 and C2 (see "Custom Buffer Selection" section on page 12 for details).

- Pour small quantities of selected buffer solutions into clean beakers. For accurate calibration use two beakers for each buffer solution, the first one for rinsing the electrode and the second one for calibration.
- Remove the protective cap and rinse the electrode with some of the buffer solution to be used for the first calibration point.

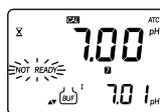
TWO-POINT CALIBRATION

- Press the CAL key. The "CAL" and "Buf" indicators will be displayed. The secondary LCD will display buffer "7.01". If a different calibration buffer is desired (e.g. "6.86"), use the UP and DOWN arrow keys to change the displayed value.



- Submerge the electrode approximately 4 cm (1½") into the solution, place the temperature probe as close as possible to the electrode and stir gently.

- The LCD will flash "NOT READY" for 12 seconds, then:



if the reading is not close to the selected buffer, "WRONG Buf" and "WRONG" will blink alternatively;

if it is close to the selected buffer the meter will advise the user with an acoustic signal (if enabled) when the reading becomes stable and the display will change to "READY" and blinking "CFM".



- Press the CFM key to confirm the calibration: the meter stores the first calibration point; the primary LCD will show the calibrated reading, while the secondary LCD will show the second buffer to be used for calibration (pH 4.01).



If you're going to calibrate with a different buffer, select the desired value by pressing the arrow keys.

- Submerge the electrode approximately 4 cm (1½") into the second buffer solution, place the temperature probe as close as possible to the electrode and stir gently.
- The LCD will flash "NOT READY" for 12 seconds, then: if the reading is not close to the selected buffer, "WRONG" and "WRONG" will blink alternatively;



if it is close to the selected buffer the meter will advise the user with an acoustic signal (if enabled) when the reading becomes stable and the display will change to "READY" and blinking "CFM".

- Press the CFM key: the value is stored in memory and the meter returns to normal mode. The tags corresponding to the buffers used for calibration will light up together with the "condition" bargraph (if enabled).



Note: The meter automatically skips the buffer used for the first calibration point to avoid erroneous procedure. A difference of at least 1.5 pH unit is required between the two buffers used for the offset and slope calibration: once calibrated at either pH 7.01 or 6.86, the instrument automatically ignores the other value for the second point (same for pH 10.01 and 9.18).

Note: During calibration, the secondary LCD shows the selected buffer value; press RANGE to display the buffer temperature.

Note: To clear a previous calibration and return to the default values, press CLR at any time after entering the calibration mode. The LCD will show "CLR CAL" for one second, and then will return to normal measurement mode.

The LCD will show an empty bargraph to warn the user that the meter is not calibrated.



ONE-POINT CALIBRATION

For optimum accuracy it is always recommended to perform a two-point calibration, but for a faster operation it is also possible to carry out a single-point procedure.

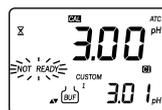
Buffers at pH 7.01 or pH 6.86 (NIST) are normally the most appropriate for this purpose, even though the meter can be calibrated with any of the memorized calibration values.

After calibrating the first point (see above), press the CAL key to end the calibration procedure.

Note: With one-point calibration there is no "Condition" and only the frame is shown. Calibration time-out is active.

CUSTOM BUFFER SELECTION

- The meter also allows the user to calibrate with custom buffers.
- To select a custom buffer press the CUSTOM BUF key while in calibration mode. Use the arrow keys to set the desired value for C1 (the default value is 7.00).



Note: To increase the speed, keep pressed the UP or DOWN key.

- Once the desired value is reached, the meter will continue calibration as with memorized buffers.
- Pressing again CUSTOM BUF, the meter will select the second custom buffer. Pressing CUSTOM BUF once again, the meter will return to the standard buffers mode.



EXPIRED CALIBRATION

The instrument is provided with a real time clock (RTC), in order to monitor the time elapsed since the last pH calibration.

The real time clock is reset every time the meter is calibrated and the "expired calibration" status is triggered when the meter detects a calibration time-out. The CAL tag will start blinking to warn the user that the meter should be recalibrated.

The calibration time-out can be set (see "Setup menu" section on page 14) from 0 (function disabled) to 14 days.

For example, if a 4 days time-out has been selected the meter will issue the alarm exactly 4 days after the last calibration.

However, if at any moment the expiration value is changed (e.g. to 7 days), then the alarm will be immediately recalculated and appear 7 days after the last calibration.

Notes:

- When the meter is not calibrated or calibration is cleared (default values loaded) there is no “expired calibration”, and the display always shows a blinking CAL tag.
- When an abnormal condition in the RTC is detected the meter forces the “expired calibration” status.

CONDITION

The display is provided with a 5-dot bargraph (unless the feature is disabled) which gives an indication of the electrode status after calibration as follows:

Bargraph indication		Condition value
All 5 dots steady		81 to 100% of life
4 dots steady		61 to 80%
3 dots steady		41 to 60%
2 dots steady		21 to 40%
1 dot steady		1 to 20%
1 dot blinking		0%
Only frame is ON		No info available

The “condition” bargraph remains active for 12 hours after calibration, then only the frame is shown.

Note: When an abnormal condition in the RTC is detected, the “condition” is cleared and only the bargraph frame is shown on the display.

CLEAN ELECTRODE

Each time pH calibration is performed, the meter internally compares the new calibration with the one previously stored.

When this comparison indicates a significant difference, the CLEAN message blinks on the LCD to advise the user that the pH electrode may need to be cleaned (see “Electrode Conditioning & Maintenance” section).



After cleaning, perform calibration.

Note: If the calibration data are cleared, the comparison is done with the default values.

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.

TEMP		pH BUFFERS						
°C	°F	1.68	4.01	6.86	7.01	9.18	10.01	12.45
0	32	1.67	4.01	6.98	7.13	9.46	10.32	13.38
5	41	1.67	4.00	6.95	7.10	9.39	10.24	13.18
10	50	1.67	4.00	6.92	7.07	9.33	10.18	12.99
15	59	1.67	4.00	6.90	7.05	9.27	10.12	12.80
20	68	1.68	4.00	6.88	7.03	9.22	10.06	12.62
25	77	1.68	4.01	6.86	7.01	9.18	10.01	12.45
30	86	1.68	4.02	6.85	7.00	9.14	9.96	12.29
35	95	1.69	4.03	6.84	6.99	9.11	9.92	12.13
40	104	1.69	4.04	6.84	6.98	9.07	9.88	11.98
45	113	1.70	4.05	6.83	6.98	9.04	9.85	11.83
50	122	1.71	4.06	6.83	6.98	9.01	9.82	11.70
55	131	1.72	4.08	6.84	6.98	8.99	9.79	11.57
60	140	1.72	4.09	6.84	6.98	8.97	9.77	11.44
65	149	1.73	4.11	6.84	6.99	8.95	9.76	11.32
70	158	1.74	4.12	6.85	6.99	8.93	9.75	11.21
75	167	1.76	4.14	6.86	7.00	8.91	9.74	11.10
80	176	1.77	4.16	6.87	7.01	8.89	9.74	11.00
85	185	1.78	4.17	6.87	7.02	8.87	9.74	10.91
90	194	1.79	4.19	6.88	7.03	8.85	9.75	10.82
95	203	1.81	4.20	6.89	7.04	8.83	9.76	10.73

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

SETUP MENU

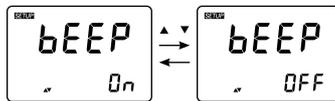
The instrument allows the user to configure several parameters through the Setup Menu.

To enter the Menu mode, while in normal measurement mode, press and hold the SETUP key for about 5 seconds.

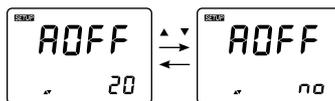
Once the menu is entered, each parameter can be changed by using the arrow keys; then pressing the CFM key will confirm the value and scroll to the next parameter.

The sequence of programmable parameters is as follows:

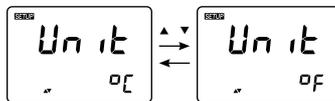
1. Acoustic signal: On (default) or Off



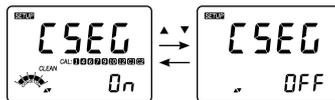
2. Auto-off feature: 20 minutes (default) or disabled



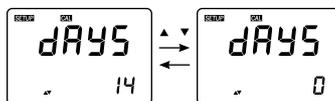
3. Temperature measure unit: °C (default) or °F



4. Calibration segments: On (default) or Off (this enables or disables the bargraph, the CLEAN message and the buffer segments)



5. Calibration time-out: 1 (default) to 14 days or disabled (0 days)



After setting the last parameter, pressing the CFM key will confirm the value and return to normal measurement mode.

mV CALIBRATION

HI 9026 has been accurately precalibrated for mV range at the factory.

For optimum accuracy, it is recommended to recalibrate the meter for mV readings at least once a year.

Contact your Dealer or the nearest Hanna Customer Service Center for more information.

TEMPERATURE CALIBRATION

HI 9026 has been accurately precalibrated for temperature at the factory.

For optimum accuracy, it is recommended to recalibrate the meter for temperature at least once a year.

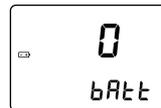
Contact your Dealer or the nearest Hanna Customer Service Center for more information.

BATTERY REPLACEMENT

If the batteries become weak, the display will flash the battery symbol to advise the user that approximately 25 hours of working time is left. It is recommended to replace batteries soon.

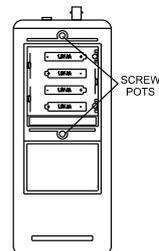


The meter is also provided with the BEPS (Battery Error Prevention System) feature, which automatically turns the instrument off when the battery level is too low to ensure reliable readings. At start-up the display will show "0 bAtt" for a few seconds, then the meter automatically turns off.



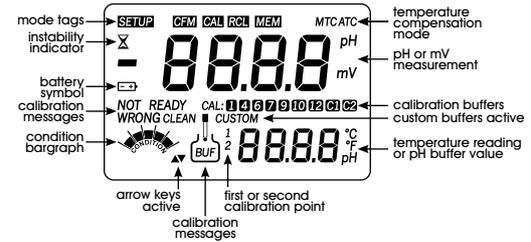
Battery replacement must only take place in a non hazardous area using the battery types specified in this instruction manual.

To replace rundown batteries, remove the rear cover of the instrument and substitute all four 1.5V AA alkaline batteries with new ones, while paying attention to the correct polarity. Reattach the cover and tighten the two screws.



LCD MESSAGE GUIDE

TAGS & SYMBOLS



- Mode tags** light up for indicating the corresponding active mode, and blink for warning the user.

SETUP on: setup menu mode has been entered.

CFM blinking: ask confirmation of calibration value.

CAL on: calibration mode has been entered.

CAL blinking: meter is not calibrated or calibration is expired.

RCL, MEM on: when recalling stored values.

MEM blinking: measurement stored in the internal memory and frozen on the display.
- Indication of **temperature compensation mode:**
 MTC for manual, ATC for automatic compensation.
- Battery symbol blinking:** low battery condition. Batteries should be replaced soon.
- Calibration messages.**

NOT READY blinking: buffer has been recognized, but reading is not stable.

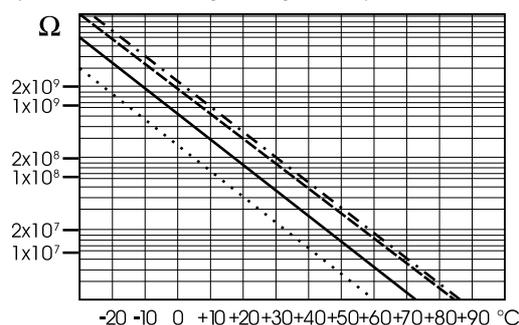
READY on: buffer has been recognized and reading is stable.

WRONG (Σ) and WRONG (⚠) blinking alternatively: wrong buffer, value not recognized.

CLEAN blinking: an abnormal difference between new and previous calibration has been detected. Electrode cleaning is suggested. Follow the cleaning procedure described in the “Electrode conditioning & maintenance” section. If the problem remains, check the buffer solutions.

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 can be 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.

Typical Electrode Life

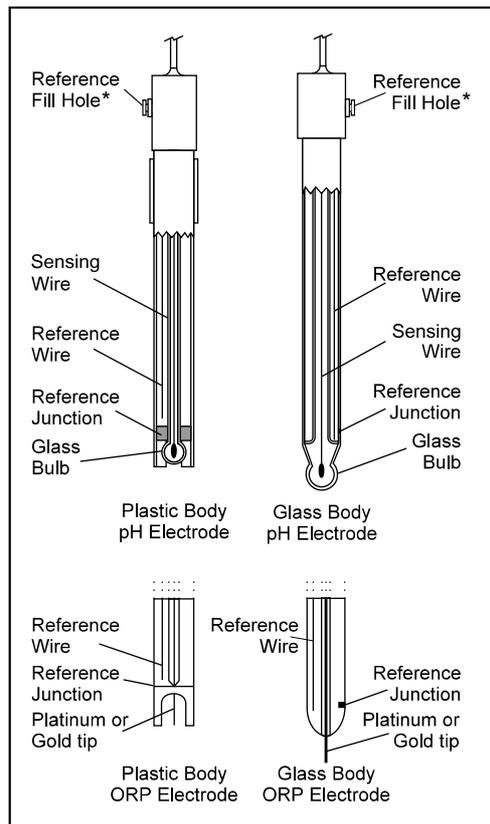
Ambient Temperature	1 – 3 years
90 °C	Less than 4 months
120 °C	Less than 1 month

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's 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

ELECTRODE CONDITIONING & MAINTENANCE



* Not present in gel electrodes.

PREPARATION PROCEDURE

Remove the electrode protective cap.

DO NOT BE ALARMED IF ANY SALT DEPOSITS ARE PRESENT. This is normal with 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 70300 Storage Solution for at least one hour.

For refillable electrodes, if the refill solution (electrolyte) is more than 2½ cm (1") below the fill hole, add the appropriate Electrolyte Solution.

MEASUREMENT

Rinse the electrode tip with distilled water, immerse it (4 cm / 1½") in 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 the solution to be tested, before taking any measurements.

STORAGE PROCEDURE

To minimize clogging and ensure a quick response time, the glass bulb and the junction should always be kept moist.

When not in use, store it with a few drops of **HI 70300** storage solution in the protective cap.

NEVER STORE THE ELECTRODE IN DISTILLED OR DEIONIZED WATER.

PERIODIC MAINTENANCE

Inspect electrode and cable. The cable used for the 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. If any scratches or cracks are present, replace the electrode. Rinse off any salt deposits with water.

Connectors must be perfectly clean and dry.

For refillable electrodes:

Refill the electrode with fresh electrolyte (see the electrode's specifications to select the correct refilling solution). Allow the electrode to stand upright for 1 hour. Follow the Storage Procedure above.

CLEANING PROCEDURE

- *General* Soak in Hanna **HI 7061** General Cleaning Solution for approximately ½ hour.
- *Protein* Soak in Hanna **HI 7073** Protein Cleaning Solution for 15 min.
- *Inorganic* Soak in Hanna **HI 7074** Inorganic Cleaning Solution for 15 min.
- *Oil/grease* Rinse with Hanna **HI 7077** Oil & Fat Cleaning Solution for 1 min.

IMPORTANT: After performing any of the cleaning procedures, rinse the electrode thoroughly with distilled water and soak it in **HI 70300** Storage Solution for at least 1 hour before taking measurements.

TROUBLESHOOTING GUIDE

SYMPTOMS	PROBLEM	SOLUTION
Slow response/excessive drift.	Dirty pH electrode.	Soak the electrode tip in HI 7061 solution for 30 minutes and then follow the Cleaning Procedure.
Reading fluctuates up and down (noise).	Clogged/dirty junction. Low electrolyte level (refillable electrodes only).	Clean the electrode. Refill with fresh electrolyte (refillable electrodes only).
Display shows blinking full scale value.	Reading out of range.	Check that sample is within measurable range; Check electrolyte level and general electrode status.
mV scale out of range.	Dry membrane or dry junction.	Soak electrode in HI 70300 storage solution for at least 30 minutes.
Display shows blinking "°C" or "°F".	Out of order temperature probe.	Replace temperature probe.
Display shows "CLEAN" blinking.	Difference between new and previous calibration has been detected.	Clean electrode and recalibrate. If the problem remains, check the buffer solutions.
Display shows blinking battery symbol.	Low battery level.	Change batteries.
Meter does not work with temperature probe.	Broken temperature probe.	Replace temperature probe.
Meter fails to calibrate or gives faulty readings.	Broken pH electrode.	Replace electrode.
"WRONG CAL" is displayed during pH calibration procedure.	Wrong or contaminated buffer.	Check that buffer solution is correct and fresh.
Meter shuts off.	Dead batteries; Auto-off feature is enabled: in this case, meter shuts off after 20 min of non-use.	Change batteries; Press ON/OFF.
"Er0, Er1, Er2" message at start up.	EEPROM error.	Contact your dealer or any Hanna Service Center.
"Clr" message at start up.	Loaded default pH calibration values.	Perform pH calibration.

ACCESSORIES

pH CALIBRATION SOLUTIONS

HI 70004P	pH 4.01 Buffer Solution, 20 mL sachet, 25 pcs
HI 70006P	pH 6.86 Buffer Solution, 20 mL sachet, 25 pcs
HI 70007P	pH 7.01 Buffer Solution, 20 mL sachet, 25 pcs
HI 70009P	pH 9.18 Buffer Solution, 20 mL sachet, 25 pcs
HI 70010P	pH 10.01 Buffer Solution, 20 mL sachet, 25 pcs
HI 7001L	pH 1.68 Buffer Solution, 500 mL bottle
HI 7001M	pH 1.68 Buffer Solution, 230 mL bottle
HI 7004L	pH 4.01 Buffer Solution, 500 mL bottle
HI 7004M	pH 4.01 Buffer Solution, 230 mL bottle
HI 7006L	pH 6.86 Buffer Solution, 500 mL bottle
HI 7006M	pH 6.86 Buffer Solution, 230 mL bottle
HI 7007M	pH 7.01 Buffer Solution, 500 mL bottle
HI 7007M	pH 7.01 Buffer Solution, 230 mL bottle
HI 7009L	pH 9.18 Buffer Solution, 500 mL bottle
HI 7009M	pH 9.18 Buffer Solution, 230 mL bottle
HI 7010L	pH 10.01 Buffer Solution, 500 mL bottle
HI 7010M	pH 10.01 Buffer Solution, 230 mL bottle

ELECTRODE STORAGE SOLUTION

HI 70300L	Storage Solution, 460 mL bottle
HI 70300M	Storage Solution, 230 mL bottle

ELECTRODE CLEANING SOLUTIONS

HI 70000P	Electrode Rinse Solution, 20 mL sachet, 25 pcs
HI 7061L	General Cleaning Solution, 460 mL bottle
HI 7061M	General Cleaning Solution, 230 mL bottle
HI 7073L	Protein Cleaning Solution, 460 mL bottle
HI 7073M	Protein Cleaning Solution, 230 mL bottle
HI 7074L	Inorganic Cleaning Solution, 460 mL bottle
HI 7074M	Inorganic Cleaning Solution, 230 mL bottle
HI 7077L	Oil & Fat Cleaning Solution, 460 mL bottle
HI 7077M	Oil & Fat Cleaning Solution, 230 mL bottle

REFILLING ELECTROLYTE SOLUTIONS (50 mL, 4 pcs)

HI 7071	3.5M KCl + AgCl Electrolyte for single junction electrodes
HI 7072	1M KNO ₃ Electrolyte
HI 7082	3.5M KCl Electrolyte for double junction electrodes
HI 8093	1M KCl + AgCl Electrolyte

ORP PRETREATMENT SOLUTIONS

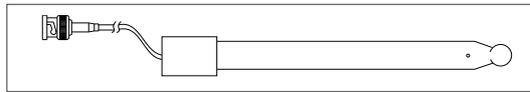
HI 7091L	Reducing Pretreatment Solution, 460 mL bottle
HI 7091M	Reducing Pretreatment Solution, 230 mL bottle
HI 7092L	Oxidizing Pretreatment Solution, 460 mL bottle
HI 7092M	Oxidizing Pretreatment Solution, 230 mL bottle

ORP SOLUTIONS

HI 7020L	Test Solution 200-275 mV, 500 mL bottle
HI 7020M	Test Solution 200-275 mV, 230 mL bottle
HI 7021L	Test Solution 240 mV, 500 mL bottle
HI 7021M	Test Solution 240 mV, 230 mL bottle

pH ELECTRODES

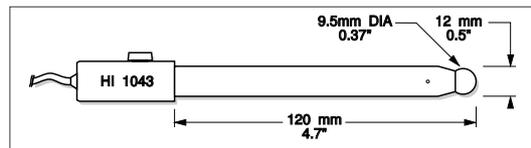
All electrodes part numbers ending in B are supplied with a BNC connector and 1 m (3.3') cable, as shown below:



HI 1043B

Glass-body, double junction, refillable, combination pH electrode.

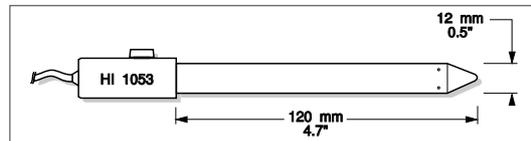
Use: strong acid/alkali.



HI 1053B

Glass-body, triple ceramic, conic shape, refillable, combination pH electrode.

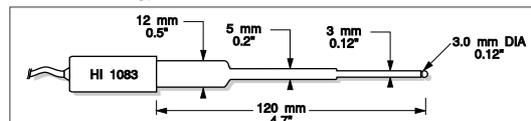
Use: emulsions.



HI 1083B

Glass-body, micro, Viscolene, non-refillable, combination pH electrode.

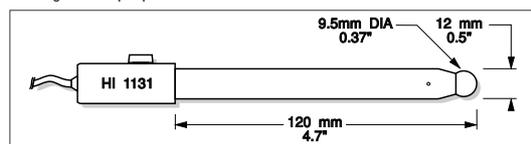
Use: biotechnology, micro titration.



HI 1131B

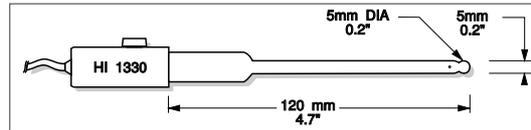
Glass-body, single junction, refillable, combination pH electrode.

Use: general purpose.



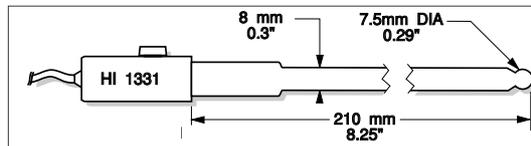
HI 1330B

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



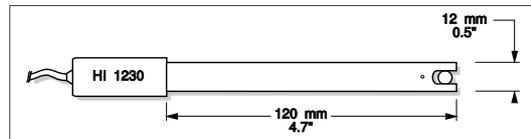
HI 1331B

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



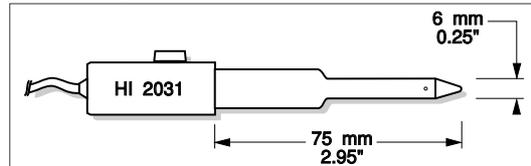
HI 1230B

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



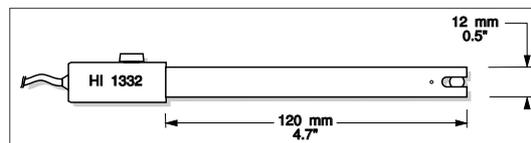
HI 2031B

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



HI 1332B

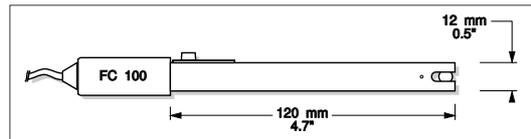
Plastic-body (Ultem®), double junction, refillable, combination pH electrode.
Use: general purpose.



FC 100B

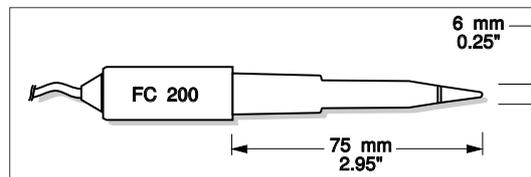
Plastic-body (Kynar®), double junction, refillable, combination pH electrode.

Use: general purpose for food industry.



FC 200B

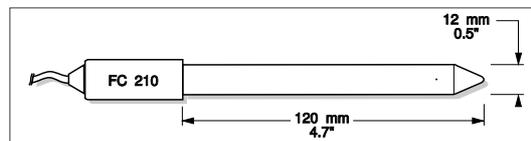
Plastic-body (Kynar®), open junction, conic, Viscolene, non-refillable, combination pH electrode. Use: meat & cheese.



FC 210B

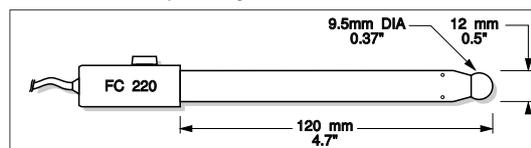
Glass-body, double junction, conic, Viscolene, non-refillable, combination pH electrode.

Use: milk, yogurt.



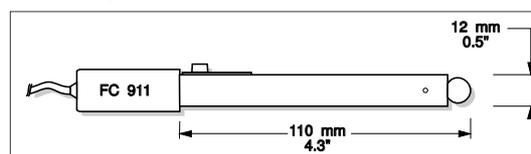
FC 220B

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



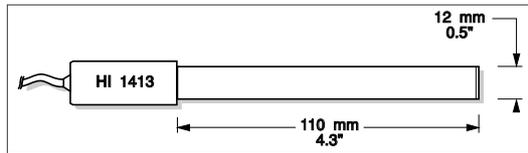
FC 911B

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



HI 1413B

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

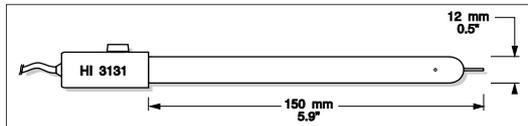


ORP ELECTRODES

HI 3131B

Glass-body, refillable, combination platinum ORP electrode.

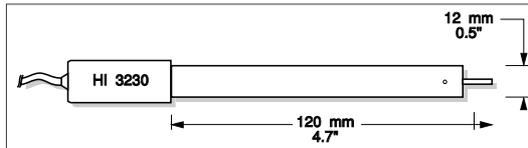
Use: titration.



HI 3230B

Plastic-body (Ultem®), gel-filled, combination platinum ORP electrode.

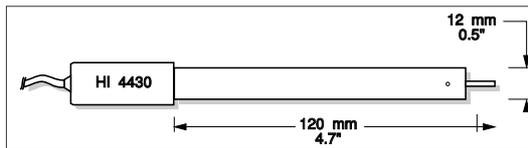
Use: general purpose.



HI 4430B

Plastic-body (Ultem®), gel-filled, combination gold ORP electrode.

Use: general purpose.



Consult the Hanna General Catalog for a complete and wide selection of electrodes.

Ultem® is registered Trademark of "General Electric Co."
Kynar® is registered Trademark of "Pennwalt Corp."

OTHER ACCESSORIES

- HI 721317 Rugged carrying case
- HI 740157 Plastic electrode refilling pipet (20 pcs)
- HI 76405 Electrode holder
- HI 7662 Stainless steel Temperature probe with 1 m (3.3')
screened cable
- HI 8427 pH and ORP electrode simulator with 1 m (3.3')
coaxial cable ending in female BNC connectors
- HI 931001 pH and ORP electrode simulator with LCD and 1 m
(3.3') coaxial cable ending in female BNC connectors

RECOMMENDATIONS FOR USERS

Before using this product, make sure that it is entirely suitable for the environment in which it is used.

Operation of this instrument in residential areas could cause unacceptable interferences to radio and TV equipment, requiring the operator to follow all necessary steps to correct interferences.

The glass bulb at the end of the pH electrode is sensitive to electrostatic discharges. Avoid touching this glass bulb at all times.

During operation, ESD wrist straps should be worn to avoid possible damage to the electrode by electrostatic discharges.

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

To avoid electrical shock, do not use this instrument when voltages at the measurement surface exceed 24 VAC or 60 VDC.

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

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

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