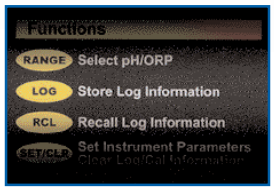
pH Meters with Calibration Check™

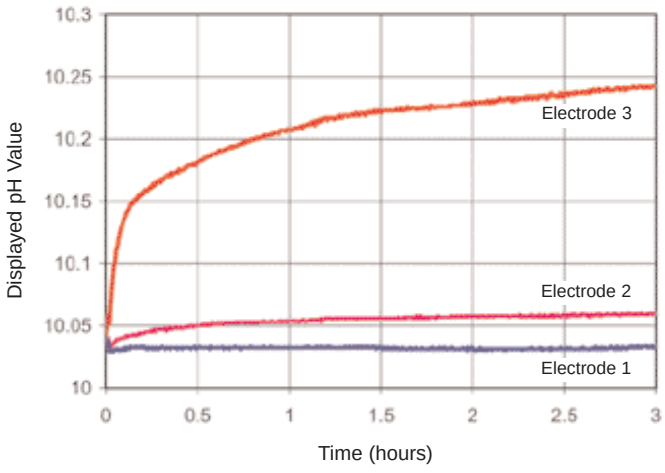
GLP
These instruments can be programmed to give an alarm when a new calibration is required.

Recall
With HI 221 and HI 223, the logged readings can be recalled at a later time.



Log-on-demand
Both models feature a "log-on-demand" function to record up to 100 (HI 221) or 500 (HI 223) readings.

Electrode nr. 1: correct cleaning has been performed before calibration.
Electrodes nr. 2 & 3: correct maintainance not performed.



A pH electrode, when it is properly manufactured and kept clean, will retain its physical characteristics for a long time.

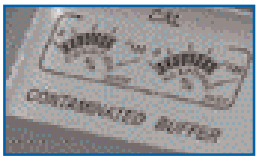
A common problem associated with pH measurements is the use of a pH electrode that hasn't been properly cleaned. This is very important because, during calibration, the instrument assumes that the electrode used is clean and that the standardization curve created during the calibration process will remain the same until the next calibration.
pH meters on the market today will allow an offset of approximately ±60 mV. The deviation from 0 mV is not unusual, in fact it represents the true characteristics of the pH electrode.
The deviation from 0 mV becomes a problem if it is the result of calibrating a dirty electrode.

The figure below shows that the pH measured by a dirty electrode changes over a period of time. This results from the residue on the pH electrode bulb dissolving into the solution and the electrode gradually returning close to its true characteristics. The resulting pH measurements, based upon the calibration of a dirty electrode, will then be incorrect.

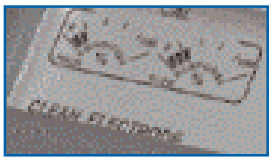
HANNA instruments® HI 221 & HI 223 compare the characteristics of the pH electrode from one calibration to the next. In case of large variances in electrode condition that can only be the result of dirt, these meters alert the user that the electrode needs to be properly cleaned prior to the calibration process.

How does the Calibration Check™ work?

HI 221 and HI 223 are able to detect a contaminated calibration buffer solution.



When a pH electrode is dirty, it has a slow response time and unstable reading. HI 221 and HI 223 warn the user in the event of a dirty electrode.



Calibration Check™ features

- Electrode offset & slope condition
- Electrode response time
- Calibration time-out

During calibration, the user is advised whether one or more parameters are unsuitable to perform the operation.

Ordering Information

HI 221 and HI 223 are supplied complete with HI 1131P refillable pH electrode (glass-body, BNC & Pin with 1 m cable), HI 7669/2W stainless steel temperature probe, HI 76404 electrode holder, pH 4 and pH 7 buffer sachets, electrode refilling solution, 12 Vdc power adapter and instructions.

Specifications

		HI 221	HI 223
Range	pH	-2.00 to 16.00	-2.00 to 16.00; -2.000 to 16.000
	mV	±699.9 mV; ±2000 mV	±999.9 mV; ±2000 mV
	Temperature	-20.0 to 120.0°C	
Resolution	pH	0.01	0.01; 0.001
	mV	0.1 (±699.9 mV); 1 (±2000 mV)	0.1 (±999.9 mV); 1 (±2000 mV)
	Temperature	0.1°C	
Accuracy	pH	±0.01	±0.01; ±0.002
	mV	±0.2 mV; ±1 mV	±0.2 (±699.9 mV); ±0.5 (±999.9 mV); ±1 (±2000mV)
	Temperature	±0.4°C	
Calibration Check		status of electrode condition and response time, status of the buffer solutions during calibration	
pH Calibration		automatic, 1 or 2 point with 7 memorized values (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45)	
Temperature Compensation		manual or automatic, -20.0 to 120.0°C (-4 to 248°F)	
pH Electrode		HI 1131P glass-body, single junction, refillable, BNC + pin (included)	
Temperature Probe		HI 7669/2W stainless steel temperature probe (included)	
PC Connection		RS232 opto-isolated serial port	
Data Logging		100 samples	500 samples
Input Impedance		10^{12} Ohm	
Power Supply		12 Vdc adapter (included)	
Environment		0 to 50°C (32 to 122°F); RH max 95%	
Dimensions / Weight		240 x 182 x 74 mm (9.4 x 7.2 x 2.9") / 1.1 kg (2.4 lb.)	

Accessories

pH Electrodes

All part codes ending with P are provided with BNC & Pin connectors, and 1 m (3.3') cable.

HI 1043P	Use: strong acids and bases. Galss-body, double junction, refillable
HI 1053P	Use: emulsions. Glass-body, triple ceramic junction, refillable
HI 1083P	Use: biotechnology Glass-body, open junction, refillable
HI 1131P	Use: general purpose Glass-body, ceramic junction, refillable
HI 1332P	Use: general purpose Ultem® body, double junction, refillable

Solutions

HI 70004P	pH 4.01 buffer solution, 20 mL sachet, 25 pcs
HI 70007P	pH 7.01 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 7004L	pH 4.01 buffer solution, 500 mL bottle
HI 7004/1L	pH 4.01 buffer solution, 1 L bottle
HI 7004/1G	pH 4.01 buffer solution, 1 gallon (approx. 3.8 L)
HI 7006L	pH 6.86 buffer solution, 500 mL bottle
HI 7006/1L	pH 6.86 buffer solution, 1 L bottle
HI 7006/1G	pH 6.86 buffer solution, 1 gallon (approx. 3.8 L)
HI 7007L	pH 7.01 buffer solution, 500 mL bottle
HI 7007/1L	pH 7.01 buffer solution, 1 L bottle
HI 7007/1G	pH 7.01 buffer solution, 1 gallon (approx. 3.8 L)
HI 7009L	pH 9.18 buffer solution, 500 mL bottle
HI 7009/1L	pH 9.18 buffer solution, 1 L bottle
HI 7009/1G	pH 9.18 buffer solution, 1 gallon (approx. 3.8 L)
HI 7010L	pH 10.01 buffer solution, 500 mL bottle
HI 7010/1L	pH 10.01 buffer solution, 1 L
HI 7010/1G	pH 10.01 buffer solution, 1 gallon (approx. 3.8 L)
HI 70300L	Electrode storage solution, 500 mL
HI 70000P	Electrode rinsing solution, 20 mL sachet, 25 pcs
HI 7061L	Cleaning solution, 500 mL bottle
HI 7073L	Cleaning solution for proteins, 500 mL bottle
HI 7074L	Cleaning solution for inorganic substances, 500 mL bottle
HI 7077L	Cleaning solution for oil and fat, 500 mL bottle
HI 7071	Electrolyte solution 3.5M KCl + AgCl, 30 mL bottle, 4 pcs, for single-junction electrodes
HI 7072	Electrolyte solution 1M KNO_3, 30 mL bottle, 4 pcs.
HI 7082	Electrolyte solution 3.5M KCl, 30 mL bottle, 4 pcs, for double-junction electrodes

PC Connection

HI 920010	Serial cable for PC connection
HI 92000	Windows® compatible software

For a complete range of calibration, cleaning and maintenance solutions, see section F. For pH and ORP electrodes, see section E. For accessories, see section U.