

# pH Meters



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Dante Alighieri, in Canto X of Paradiso, defines the clock as "the glorious wheel," referring to it as the machine which could point to the movement of the sky throughout an entire day.

Many sources indicate Piazza dei Signori in Padova, as the place where the first mechanical clock was placed inside a tower.

Giovanni de Dondi, in 1364, wrote the first treatise about a clock, while his son Jacopo built the first clock tower in Padova in 1344.

The art critic Lewis Mumford (1885-1990) indicated the clock as "the key machine of the modern industrial age". He defined the appearance of this first automatic mechanism as a prophecy which "suggests a perfection to which all machines aspire".

What Dante Alighieri called the "glorious wheel", represents the approach in our time of precision machines and high technology.

**HANNA** instruments® is proud to be located in Padova, a historic city privileged of being the place where the original mechanical clock was built on a tower.

The precision which exemplifies the mechanical clock is also the basic concept that **HANNA** instruments® applies particularly to the design of bench pH meters.

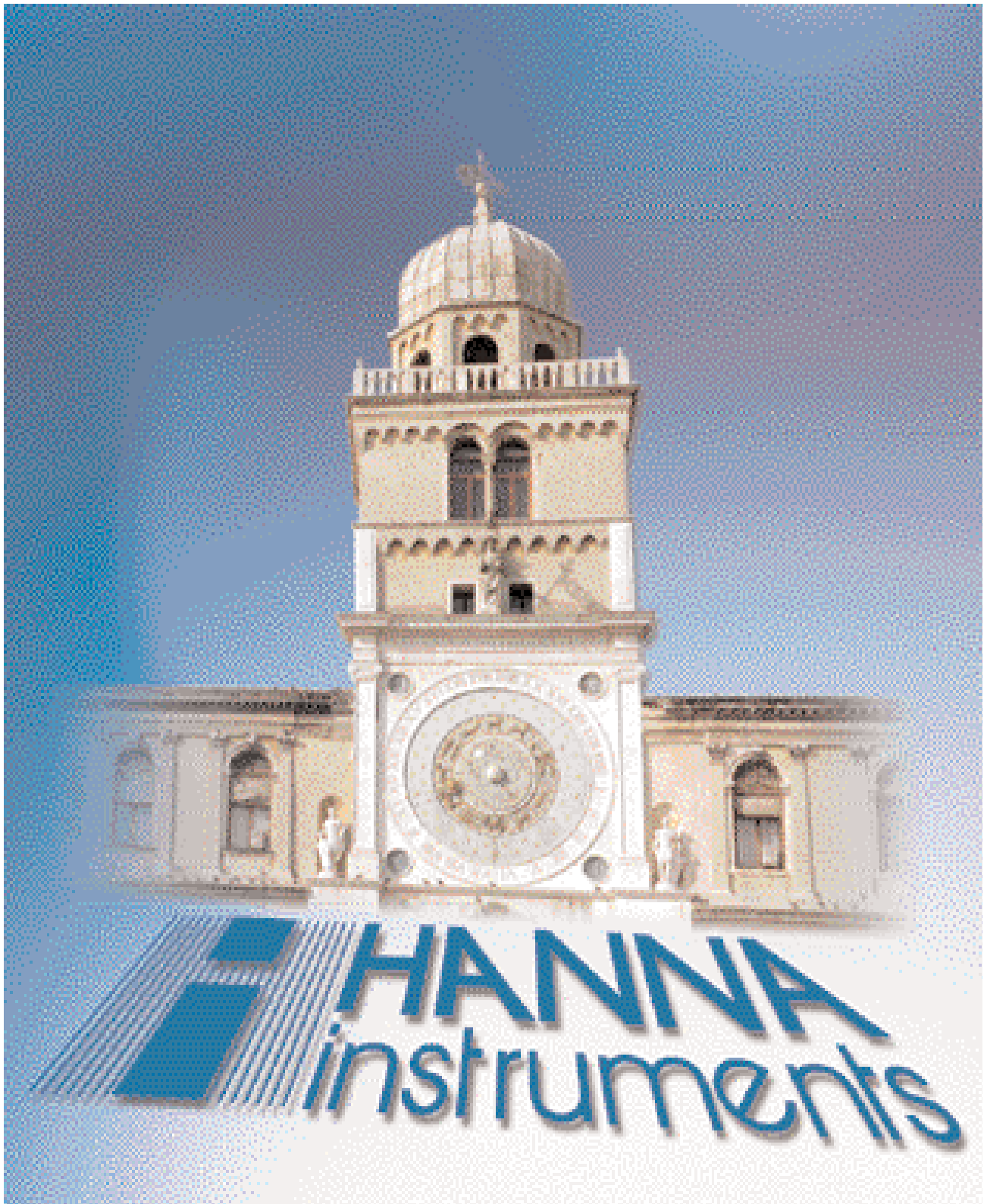
Among the advancements introduced in our latest line of bench pH meters, is a system that monitors the electrode condition during each calibration, and displays the degree of reliability and the response time, using two easy-to-read indicators.

In addition, all calibration phases are monitored, and any anomaly is displayed with clear messages, such as "wrong buffer", "contaminated buffer", and "clean electrode".

The last message is particularly important, because a calibration performed with a dirty electrode will compromise the results.

**HANNA** instruments® continues to be recognized as the leading designer and manufacturer of innovative and technologically advanced products.





## Portable pH Meters

### Comparison Chart

	HI 9214	HI 8010	HI 8014	HI 8314	HI 83141	HI 83140	HI 8915	HI 8424/NEW	HI 991001	HI 991002	HI 991003	HI 9210N	HI 9024	HI 9025	HI 9026	HI 98140	HI 9815	HI 98150	HI 98160	HI 98230	HI 98240	
0 to 14 pH Range		•	•	•	•	•	•					•	•	•								•
-2.00 to 16.00 pH Range		•						•	•	•	•				•							
-4.00 to 19.99 pH Range																•						
0.01 pH Resolution		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mV Range			•	•	•	•	•		•	•				•	•							
Automatic Temperature Compensation		•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Simultaneous Display of pH & Temperature									•	•	•	•	•	•	•	•	•	•	•	•	•	•
Waterproof									•	•	•	•	•	•	•	•	•	•	•	•	•	•
Manual Calibration			•	•	•	•	•				•											
Automatic Calibration		•							•	•	•	•	•	•	•	•	•	•	•	•	•	•
Electrode Status						•					•				•							
Calibration Check														•								
Custom Buffers														•								
Good Laboratory Practice (GLP)																•		•	•	•	•	•
Recorder Output							•															
PC Connection																•	•	•	•	•	•	•
12 Vdc Power Supply																•	•	•	•	•	•	•
Built-in Printer																						•
Log-on-demand																•	•	•	•	•	•	•
Automatic Data Logging																	•					•
Display with Backlight														•	•		•	•	•	•	•	•
Smart Electrode																•						•
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## Bench pH Meters

### Comparison Chart

	HI 4211	HI 4212	pH 20	pH21	pH 209	pH 209R	pH 210	pH 211	pH 211R	pH 212	pH 213	HI 110	HI 111	HI 112	HI 113	HI 221	HI 222	HI 223	HI 250	HI 251	HI 253	HI 254	HI 120	HI 121	HI 122	HI 123	HI 255		
0 to 14 pH Range			•	•	•	•																							
-2.00 to 16.00 pH Range		•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0.01 pH Resolution			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0.001 pH Resolution		•	•						•	•																			
mV Range		•	•		•	•	•	•																					
Ion Range			•								•	•	•																
Automatic Temperature Compensation		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Simultaneous Display of pH & Temperature		•	•																										
2 point Calibration				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3 point Calibration												•	•																
5 point Calibration		•	•											•	•								•	•	•	•	•	•	•
Custom Buffers		•	•									•	•	•	•														
Calibration Check																•	•	•											
Good Laboratory Practice (GLP)		•	•									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Analog Output						•			•																				
PC Connection		•	•							•	•																		
12 Vdc Power Supply		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Built-in Printer																													
Data Logging		•	•																										
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## pH Meters for Specific Applications

### Comparison Chart

	HI 99121	HI 99131	HI 99141	HI 99161	HI 99163	HI 99171	HI 99181	HI 98401	HI 931100	HI 931101
Fluoride (F <sup>-</sup> ) Range								•		
Sodium (Na <sup>+</sup> ) Range										•
NaCl Range									•	
0.00 to 14.00 pH Range				•						
-2.00 to 16.00 pH Range	•	•	•		•	•	•			
0.01 pH Resolution	•	•	•	•	•	•	•			
Automatic Temperature Compensation	•	•	•	•	•	•	•	•	•	•
Simultaneous Display of pH & Temperature	•	•	•	•	•	•	•			
Waterproof	•	•	•	•	•	•	•	•	•	•
Automatic Calibration	•	•	•	•	•	•	•			
Industry	•	•								
Food Processing				•	•				•	•
Agriculture	•									
Cosmetic Industry							•	•		
Specific Electrode										
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## HANNA instruments® pH Meters

Over the past two decades, the measurement and use of pH has grown dramatically. This parameter has come out of the laboratory and is now being monitored in the environment, food industries, agriculture, horticulture, wastewater, pharmaceutical industry, cosmetic industry, fish farming, metal finishing, education and anywhere quality is important. This has meant that every application with its own operating environment and tolerances requires specially designed products suitable to its needs. In addition, each market brings with it people with different backgrounds and technical training. Due to these market realities, HANNA instruments® has developed a complete range of meters, each catering to the specific needs of particular market segments. A few years ago, the biggest requirement in pH measurement was the ability to document results. To answer this need, HANNA instruments® released the World's first line of printing pH meters. Subsequently, to satisfy the next market demand, we presented a complete line of HANNA instruments® G.L.P. Meters (Good Laboratory Practice), where the calibration data is recorded and displayed to avoid errors.

This year, the extensive line of pH meters has been expanded with more products that you have asked us for! Besides a restyling of our popular existing lines, such as HI 8314 and HI 8424NEW, the following pages will present a new line of portable pH meters dedicated to specific applications. The HI 991xx series was designed for application specific measurement; a pH meter for the plating industry is available, one for meat products, one for cosmetics, one for leather tanning industry, one for paper mills and one for agriculture. We have packaged these instruments as part of specific kits, consisting of a water resistant pH meter, a custom electrode with built-in temperature sensor and application engineered cleaning solutions. You will find instruments with log-on-demand, automatic data logging, PC connection and printer.

Also, our bench line of pH meters has been expanded with some exciting new instruments. HI 221, HI 222, HI 223 and the brand new HI 12X series, together with the new portable HI 9026, have our exclusive Calibration Check feature that allows the user to check the probe condition at any time. During calibration this feature analyzes the record of offset and slope data against the current data and notifies the user if the delicate calibration procedure has been successful. In case of failure, the display shows specific help messages. All these instruments have extremely high resolution, ATC, data logging, extended pH and temperature ranges, and a serial port, making them essential for laboratories and universities.

