

HI 901 • HI 902

Automatic Titration Systems

with Clip-Lock™ Exchangeable Burette System and Automatic Burette Recognition

HI 901 and HI 902 Automatic Titrators Feature:

- 320 x 240 pixel LCD w/backlight
- Precise dosing system (accuracy under 0.1% of burette volume)
- Supports up to 10,000 titration methods (standard and user defined)
- Clip Lock™ — change burettes quickly with auto burette recognition
- Dynamic/Linear dosing feature
- Fixed end point potential or pH
- Equivalence point detection (first derivative and second derivative)
- The results are displayed directly in the selected units
- Titration graph can be displayed on-screen and saved
- User customized reports can be printed, saved on floppy disk or transferred to PC via RS232 interface
- Reminders for titrant age and standardization expiration
- Self diagnostic features for peripheral devices including pump, valve, burette and stirrer



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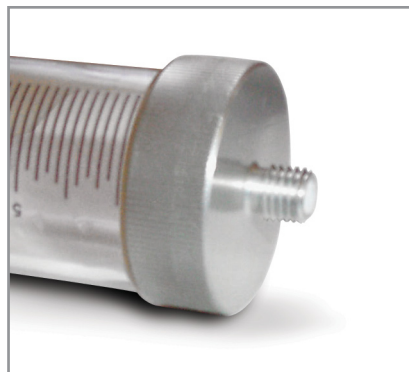
Powerful Customization, Accurate Analysis

HI 901 and HI 902 are automatic titrators from HANNA that compliment our wide range of products dedicated to quick and accurate laboratory analysis. HI 902 also features the addition of back-titration capabilities.

Each unit is provided with a host of numerous features suitable for routine sample analysis. HI 901 and HI 902 perform acid/base, potentiometric and amperometric titrations.

With our exclusive Clip Lock™ system for burette replacement, changing from one titrant to another is done in a flash! Often, preliminary titration operations are very long and arduous. A burette often needs to be adjusted for correct dosing, which extends waiting time for new sample analysis. HANNA has engineered a way to solve this problem.

The innovative Clip Lock™ system allows users to change burettes in two simple steps, passing from one titrant to the next



Automatic Burette Volume Recognition

This feature makes exchanging titrants convenient, safe and fast.

Up to 100 reports of analysis, complete with titration curve graphing is possible. A calibration "time-out" can be set and the user can be advised when the pH electrode needs to be calibrated. The instrument's status can be viewed clearly on the large LCD screen. Contained in the set-up menu, features like language, display brightness, resolution, pH electrode calibration, date and hour can be adjusted. During analysis, the titration is displayed in real-time together with the stored data. Date, hour, temperature (when probe is connected) and warning messages such as a pH electrode calibration message can all be displayed for your convenience.



Stirrer

The optional stirrer ensures an effective mixing with a selectable speed from 100 to 2500 rpm.

These versatile titrators support up to 10,000 methods: standard or user defined. When powered on, the instrument initiates an internal diagnostics check and then readies itself for the first titration of the day. A large LCD screen clearly shows the chosen method, correlated information and also indicates which parameters may be adjusted. A real-time titration curve is shown on the display; this feature is useful when new methods are tested or when a procedure needs to be optimized. At the end of the titration, all data, including the graph, are automatically stored in memory and can be copied to disk via the built-in floppy drive or through direct connection with the serial cable supplied with the titrator. The titrators are equipped with an RS485 serial port.

Burette maintenance is simple and completely automated. The user can decide to purge it or wash it and can select how many washings to perform.

without any problem. Additionally, HI 901 and HI 902 automatically recognizes the volume of the new burette.

Both HI 901 and HI 902 can drive two pumps, with the HI 902 incorporating a more advanced system. While the HI 901 can drive the two pumps separately, HI 902 can also drive them concurrently and perform back titrations. HI 902 can perform more complex functions with the ability to determine more than one equivalence point.

Users can connect pH or ORP electrodes to this unit, as well as create a complete workstation with a PC, monitor, keyboard and printer. This unit complies with GLP specifications, providing validation support for analysis. All GLP information from each sample can be stored, including ID number, date and time of analysis, electrode ID code and last calibration date.

Quick Change

Keep several burettes on hand for a quick change.



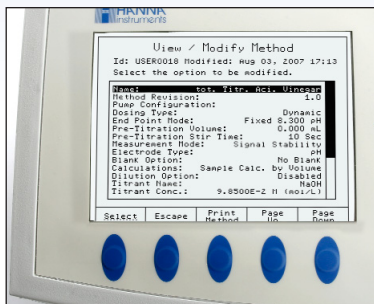
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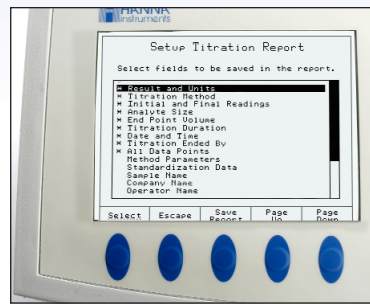
Keep an accurate record of analyses!

HANNA's 900 Series titration systems are easily incorporated into any existing GLP data management program:

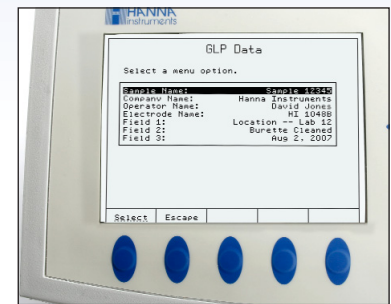
- Users can easily record all necessary GLP information with every sample including sample identification, company and operator name, date, time, electrode ID codes and calibration information.
- Data can also be transferred using the integral floppy disk drive for communication with a PC or even other titration systems. Special memory cards are not required.
- All test results can be transferred directly to a PC.
- Users can print reports of analyses directly from the titrator using a standard parallel printer.
- An external monitor and keyboard can be attached for added versatility.
- RS485 port for future expansion.



Custom methods



Record up to 100 reports



Incorporate HANNA 900 series titrators into any GLP data management program

**View
Store
Print**
with HANNA
PC Connectivity



PC Connectivity

The HI 900 series titrators can be connected to a computer in conjunction with HANNA software.



VGA Display Connectivity

The information shown on the titrator display can be viewed on a standard VGA display via a 15-pin socket.



Printer Connectivity

The HI 900 series titrators accept a variety of parallel printers for printing of data.



PC Keyboard Connectivity

An external PC compatible keyboard can be connected.

A Complete Analysis

These instruments perform a complete analysis comprising of sample preparation, dispensing of titrant solution, stirring, measuring and waiting times, recognition of the end point and storing the results. All the parameters that a titration requires are grouped into a method.

The titrators are already supplied with a set of standard methods or you can create your own. Using a floppy disk or connecting the titrator to the HI 900 PC application, methods (standard and user) can be upgraded, stored or deleted.

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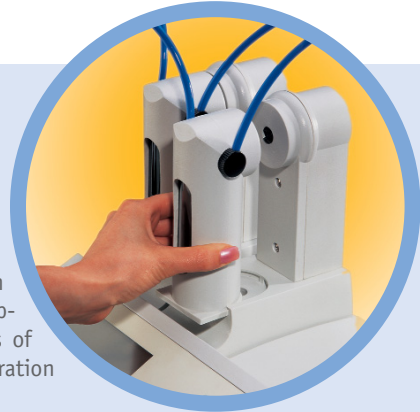
Clip-Lock™ Exchangeable Burette System

With Clip-Lock™, it only takes a couple of seconds to exchange the reagent burettes to perform a different titration.

With conventional titrators, there is the risk of cross contamination of titrants when exchanging reagents. Reconfiguring the titrator for different sample methods consumes time and reagents. Each method may need different reagents and care must be used when purging and cleaning the burette. To avoid these problems, **HANNA** introduces the Clip-Lock™ exchangeable burette system to prevent cross contamination while reducing loss of time and reagents. Burettes simply slide out for quick exchanges and detaching the aspiration and dispensing tubes from the titrant bottles is easy.

Having several prepared burettes on hand will make the **HANNA** 900 series the fastest and most versatile titration systems available. Interrupting an important cycle of analysis due to a malfunctioning burette is a thing of the past. With the **HANNA** Clip-Lock™ system you can simply substitute the burette and complete all your tests with the same titrant!

HANNA's burettes feature a threaded screw connection to prevent leakage problems. Burettes are available in 5 mL, 10 mL & 25 mL sizes and are made of chemically resistant material to ensure many years of trouble-free operation.



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| A. Aspiration Tube (Titrant Inlet) | F. Support Bar | K. Stirrer Propeller | P. Arrow Keys |
| B. Dispensing Tube (Titrant Outlet) | G. Sliding Positioning Collar | L. Stirrer Stand | Q. Option Keys |
| C. Burette Assembly | H. Dispensing Tip | M. Numeric Keys | R. 320 x 240 Pixel Graphic LCD |
| D. Light Shield (in closed state) | I. Temperature Sensor | N. Function Keys | |
| E. Burette Support | J. pH Electrode | O. Help Key | |

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SPECIFICATIONS	mV	pH	TEMPERATURE
Range	-2000.0 to 2000.0 mV	-2.000 to 20.000 pH	-5.0 to 105.0°C/23 to 221°F/268.2 to 378.2 K
Resolution	0.1 mV	0.1/0.01/0.001 pH	0.1°C/0.1°F/0.1K
Accuracy	±0.1 mV (@25°C/77°F)	±0.001 pH (@25°C/77°F)	±0.1°C/±0.2°F/±0.1K (excluding probe error)
Burette Sizes	5, 10, and 25 mL		
Burette Resolution	1/40000		
Display Resolution	0.001 mL		
Dosing Accuracy	±0.1% of full burette volume		
Display	Graphic LCD, 320 x 240 pixel LCD		
Languages	English, Italian, Portuguese, Spanish		
Methods	Up to 10,000 methods (standard and user-defined)		
Burette Auto-Detection	Burette size is automatically recognized when inserted into the unit		
Programmable Stirrer	Propeller type, 100-2500 RPM, automatically held within 10% of the set value, resolution 100 rpm		
Flow Rate	User-selectable from 0.1 mL/min to 2 x burette volumes/min		
pH/mV Measurement	Titrators can also perform direct pH and mV measurements		
Temperature Compensation	Manual or automatic (ATC)		
pH Calibration	Manual or automatic at 1-5 points with 4 buffer sets or custom buffers		
Potentiometric Titrations	Acid-Base (pH or mV-Mode), Redox, Precipitation, Complexometric, Non-Aqueous, Ion-Selective, Argentometric (in mV-mode only)		
HI 901 Titration Methods	Fixed mV or pH end-point detection & first equivalency point detection (with the 1st or 2nd derivatives)		
HI 902 Titration Methods	Fixed mV or pH end-point detection & multiple equivalency point detection (with the 1st or 2nd derivatives); back titration		
Measurement Units	User specified expression of concentration units to suit specific calculation requirements		
Real Time & Stored Graphs	mV-Volume or pH-Volume titration curve, 1st derivative curve or 2nd derivative curve, in pH-mode or mV-mode; pH/mV values versus time-datalogging results		
Data Storage:	Up to 100 complete titration and pH/mV logging complete reports		
Disk Drive:	Built-in 3.5" floppy disk drive allows storage and transfer of configurations, preprogrammed methods, custom methods, titration reports and bitmap graph files		
Peripherals	Connections for VGA display, PC-keyboard, parallel printer, RS 232 input, interface for future expansion		
GLP Conformity	Instrumentation data storage and printing capabilities		
Operating Environment	10 to 40°C (50 to 104°F), up to 95% RH		
Storage Environment	-20 to 70°C (-4 to 158°F), up to 95% RH		
Power	110V/220 Vac; 50-60Hz		
Dimensions	Width x Depth x Height = 390 x 350 x 380 mm (15.3 x 13.8 x 14.9 in)		
Weight	approx. 10 kg (22 lbs.) with one pump and stirrer assembly		

ORDERING INFORMATION

HI 901-01 (115V) and **HI 901-02** (230V) is supplied with (1) 25 mL glass burette, (1) burette driver assembly, power adapter and instructions.

HI 902-01 (115V) and **HI 902-02** (230V) back titration and multiple end-point titrators are supplied with (1) 25 mL glass burette, (1) burette driver assembly, power adapter and instructions.