

professional series

TITRATION SYSTEMS

HI 901 · HI 902

HANNA
instruments

Graph of Titration Data



T1_00013

Select Trace

ESG39R

Save as Bitmap

stir

device

results

enter

start/stop

ISO 9001 CERTIFIED

HANNA[®]
instruments

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Change a burette in only 2 steps!

With **Clip-Lock™**, it only takes a couple 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 also 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 provides the **Clip-Lock™ exchangeable burette system** to prevent cross contamination while reducing loss of time and reagents.

Having several prepared burettes at 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!



- 1** Slide the burette back from the pump assembly.
- 2** Slide the new burette into place.



Hanna's burettes feature a **threaded screw** connection to prevent leakage problems. Burettes are available in 5 mL, 10 mL & 25 mL sizes. Keep extra HANNA 900 series burettes handy for quick substitutions without changing the titrant! The burette is made of chemically resistant material to ensure many years of trouble-free operation.

Automatic Burette Volume Recognition

The automatic burette volume recognition feature of the **Clip-Lock™** system makes exchanging titrants convenient, safe and rapid. Hanna's solution to automatically recognize the burette size eliminates the problem of manually re-entering titrant concentrations used in different various applications.



Precise single or dual burette systems for multiple titrations with automatic burette volume recognition (5, 10, & 25 mL).

High resolution glass burettes feature rugged ABS protection while the tubing and burette cylinder are fully light shielded

Splashproof soft-touch keyboard with on-line help button

Daily or periodic electrode standardization reminder

Total and Low Titrant volume alert screen lets users know when its time to add supplementary titrant to the glass titrant bottle, or when the available titrant volume has decreased to under 100 mL

Titrant age reminder screen allows a programmable reminder to display when it is time to verify the titrant concentration or to change the titrant due to concentration confidence loss.

These instruments perform a complete analysis. A complete analysis comprises 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 pack 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.



Advanced features for optimum performance

HI 901 and HI 902 are automatic titrators, with high accuracy, great flexibility and repeatability.

These titrators are designed to perform a variety of potentiometric titrations, allowing the user to obtain both good results and high-speed analysis.

Large Easy to Read Display

- 320 x 240 points, 7.5" B/W high quality display with backlight.
- Easy to read text and graphs. Lots of information in the same screen.

Easy to Operate and Program

- Easy to change preprogrammed methods to fit customer applications.

Proven, Developed Methods

- For T.A. (Titratable Acidity), p.H. measurements and SO₂ (Free and Total)

Accuracy, Precision and Reliability

- Precise dosing system (accuracy under 0.001% from burette total volume for a dispensed burette full volume).
- Precise mV & pH measurements with ± 0.05 mV and ± 0.001 pH accuracy.
- Interpolated end point volume

Flexibility

- Support up to 100 titration methods (standard and user defined).

Repeatability

- Powerful built-in algorithms for equivalence point detection (first derivative and second derivative detection algorithms, filtrated derivatives option, setable range for equivalence point detection).
- Fixed end point potential or pH.

Quick Results

- Standard titration methods
- Pre-titration dosing feature
- Dynamic/Linear dosing feature.

Operation and Performance

The powerful Hanna titration systems can be customized to perform any dosing method including dynamic and linear fixed volume dosing, signal stability or timed increments and pre-titration stir-time/volume addition. The 900 Series titration systems have 10 preprogrammed and can support up to 90 user-defined methods. During the titration, temperature and measurement units are displayed or the user can choose to activate real time graphing that shows the exact curve profile of the titration on screen. The stirring speed can be displayed and adjusted if necessary as stirring the sample during titration may influence the pH/mV reading.

Burette conditioning is performed with purge, prime and rinse options that keep the burette and tubing in perfect working condition.

Complete Report

- The results are displayed directly in the selected units.
- Titration graph can be displayed on line & saved.
- User customized reports can be printed, saved on floppy disk or transferred to PC via RS232 interface.
- The sample information and data stamp are included in the report.

Direct Measurements

- The titrator can also be used for precise mV, pH and temperature measurements.
- Report of data logging is available for direct measurements.

GLP Features

- Up to 5 electrode standardization points.
- Reminders for titrant age and standardization expiration.
- Fields for specific annotations.

Self Diagnosis & Integrated Help

- Self diagnosis features for peripheral devices including pump, valve, burette and stirrer.
- Error management with warning and error messages.
- Predefined troubleshooting titration methods.

Fast and Efficient

- Change burettes quickly with Clip-Lock™ burette exchange system.

The second burette allows users the flexibility to perform the most difficult types of analyses or automate multiple titrations. The advanced 900 Series offer many auto-diagnostic and reminder functions such as a titrant age or low volume reminder for checking titrant concentration, standardized electrode-warnings and other messages to assure proper system operation. These titration systems perform direct measurement in pH, mV and temperature with a signal stability indicator. pH calibration is made easy with auto recognition of calibration buffer sets for HANNA, CRC, DIN or NIST buffers.





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

The keypad of the HI 901 and HI 902 features 29 keys grouped in 4 categories:
 Option Keys, Arrow Keys, Function/Help Keys and Numeric Keys.

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 an 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.
- RS 485 port for future expansion.



Log precision pH or mV measurements



Record up to 100 reports



Incorporate Hanna 900 series titrators into any GLP data management program



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.



PC keyboard connectivity

An external PC compatible keyboard can be connected in addition to the instruments keypad.



Printer connectivity

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

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
Accuracy	± 0.1 mV (@25°C/77°F)	± 0.001 pH (@25°C/77°F)	± 0.1°C/±0.2°F (excluding probe error)
Resolution	0.1 mV	0.1/0.01/0.001 pH	0.1°C/0.1°F
Dosing Accuracy	0.1% of full burette volume		
Display Resolution	0.001 mL		
Burette Resolution	1/40000		
Burette Sizes	5, 10, 25, and 50 mL		
Burette Volume	Accuracy	Display resolution	
5 mL	± 5 µl	0.001 mL	
10 mL	± 10 µl	0.001 mL	
25 mL	± 25 µl	0.001 mL	
50 mL	± 50 µl	0.001 mL	
Display:	Graphic LCD 120 x 90 mm (4.7 x 3.5 in)		
Languages:	English, French, German, Italian, Spanish and Romanian		
Methods:	10 standard and 2 troubleshooting methods (preprogrammed) and 12 user-defined methods		
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 burette-volumes/min		
pH/mV Measurement:	Titrators will also perform simple pH and mV measurements		
Temp. Compensation:	pH measurements are automatically temperature compensated		
pH Calibration:	Manual or automatic at 1-5 points with 4 buffer sets for custom buffers		
Potentiometric Titrations:	Acid-Base (pH or mV-Mode), Redox, Precipitation, Complexometric, Non-Aqueous, Ion-Selective, Argentometric (in mV-mode only)		
Titer Determination:	Preprogrammed methods		
Titration Methods:	Fixed mV or pH end-point detection & first equivalency point detection (with the 1st or 2nd derivatives of the titration curve)		
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 interface, RS 485 interface (for future expansion)		
GLP Conformity:	Instrumentation data storage and printing capabilities		
Mains:	100 VAC, 50-60 Hz (HI 901-03 and HI 902-03); 115 VAC, 50-60 Hz (HI 901-01 and HI 902-01); 230 VAC, 50-60 Hz (HI 901-02 and HI 902-02)		
Power Draw:	Max 40 VA, 2 exchangeable fuses		
Enclosure Material:	ABS plastic and coated steel		
Keypad:	Polycarbonate		
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 lb) with one pump and stirrer assembly		
Operating Environment:	10 to 40°C (50 to 104°F), up to 95% R.H.		
Storage Environment:	-20 to 70°C (-4 to 158°F), up to 95% R.H.		

Preprogrammed Methods Include:

Name	Dosing Type	Endpoint mode	Calculation
NaOH Titrant concentration	Dynamic	mV Equivalency, 1st derivative	Titrant concentration by weight
Titratable Acidity with initial pH measurement	Dynamic	Endpoint titration	Sample concentration by volume
I ₂ Titrant Concentration	Dynamic	mV Equivalency, 1st derivative	Titrant concentration by weight
Free & Total SO ₂ Titrations	Dynamic	mV Equivalency, 1st derivative	Sample concentration by volume

How to order

HI 901-01 Titrator supplied complete with one burette driver assembly, 25 mL glass burette, stirrer unit, 115 VAC

HI 902-01 Titrator supplied complete with two burette driver assemblies, 25 mL glass burette, stirrer unit, 115 VAC



Authorized Distributor

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