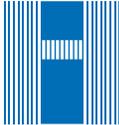




Automatic Titration Systems

 **HANNA**[®]
instruments



HI932 Automatic Potentiometric Titration System (pH/mV/ISE)

The HI932 Advanced Automatic Titrator is the answer to your advanced titration needs. Fully customizable to meet your testing needs, the HI932 delivers accurate results and intuitive user experience, all in a compact package. Titrate for a variety of published methods at the push of a button, as well as perform direct measurements and back titrations for complex samples. For those that require greater automation, pair your HI932 with the HI922 Autosampler for the most accurate results with the least amount of effort.

- Small footprint so you can fully optimize your benchtop and increase productivity.
- Reduce downtime and increase efficiency when you perform multiple analyses linked in sequence.
- Works seamlessly with the HI922 Autosampler for automation of up to 18 samples.

Superior design for superior results.

The Cycology® body is durable, heat-resistant, and resists staining. Menu buttons are part of the display making it fully sealed and easy to clean. A high contrast LCD display makes every character on the display stand out and the wide viewing angle allows measurements to be seen from any angle. The backlight is adjustable for perfect viewing and a backlight saver option protects the display during periods of inactivity.

Maximize your workspace.

This new generation of titrator features a 50% smaller footprint than the HI902 Automatic Titrator for maximum use of your lab space. Use it in any sized space while providing accurate and consistent results.

Simple user experience

Virtual keys present on the display allow for simple and quick navigation between screens and menus without getting lost in a nest of information. If you need additional information about a screen, simply press the dedicated button for help.

Multiple Titration Types

Paired with the right electrode from our sensor line, this potentiometric titrator can perform any number of standard titrations, back titrations, as well as perform direct pH, ORP, and ion selective readings.

Dynamic titrant dosing

The dynamic dosing feature allows for timely and accurate titration results by relating the titrant volume dosed to the mV response from the titration reaction. This provides for larger doses near the beginning of a titration and smaller, more precise doses near the titration endpoint.

Equivalence endpoint detection

Equivalence endpoint detection is critical in applications where fixed endpoints are not specified in standard methods. This endpoint indicates where the mV response from the titration is greatest with respect to the volume of titrant dosed.

Multiple equivalence point detection

HI932 can detect multiple equivalence points during one titration as specified and required in certain standard methods and applications.

Signal stability timing

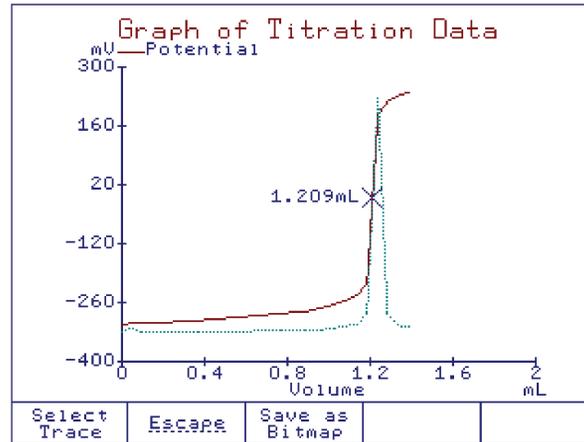
The signal stability feature monitors when the mV response of the titration reaction stabilizes before providing the next titrant dose. This ensures reliable measurement values throughout the length of a titration.

Streamline your testing with method sequencing

Reduce downtime and increase efficiency when you perform multiple analyses linked in sequence. A linked method function allows for two analyses to be run on the same sample including direct measurements, fixed endpoint titrations, multiple (up to 5) equivalence point titrations, and back titrations. Track your progress in real-time with onscreen titration curves.

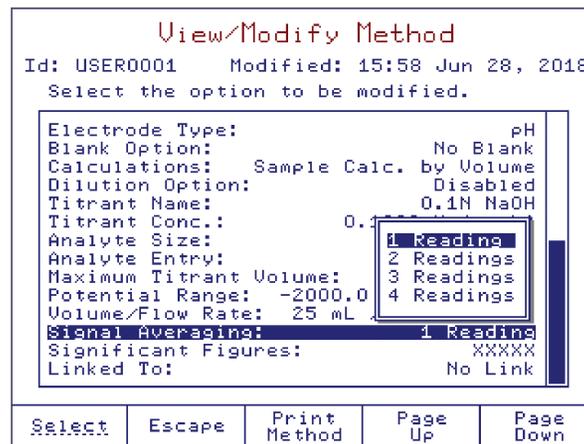
Automatic Reagent Addition

A peristaltic pump or a second burette may be programmed to volumetrically dispense reagent prior to titration or direct measurement or aspirate post-analysis. This helps achieve consistent and accurate results and prevents operator errors such as incorrect volumes or forgetting reagent addition.



Detailed titration graphs

A real-time titration curve can be displayed during each titration; this feature is useful when new methods are tested or when a procedure requires optimization.

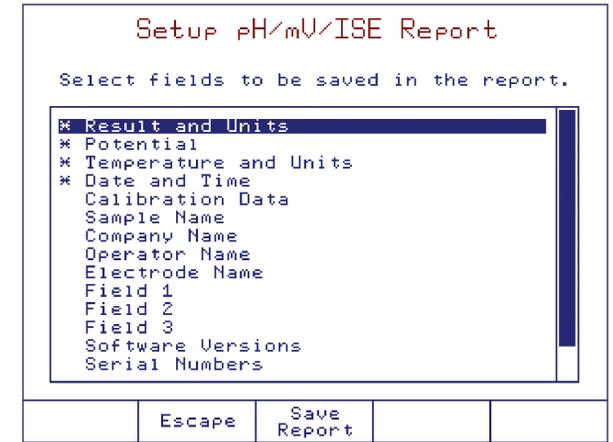


Customizable methods

These titrators can store up to 100 user-defined or standard titration and direct measurement methods. Each method may be modified and optimized for performance based on application and user requirements.

Stay connected.

Connect devices such as an analytical balance for automatic weight sample entry or a printer to print reports directly from the titrator.



Customizable Analysis Reports

Each analysis report is fully customizable to ensure the best data required for an application is stored and filed. The Multiselect feature makes batch processing simple.

Flexible GLP Management

All necessary GLP (Good Laboratory Practice) information is recorded with each sample including sample identification, company and operator name, date, time, electrode ID codes, and calibration information.



Multiple connections

The HI932 offers support for two analog boards, allowing up to two electrodes, two burettes, and two stirrers to be connected to one unit simultaneously.

Take advantage of the versatility.

HI932 functions as a titrator, pH meter, mV/ORP meter, and ISE meter. Valuable laboratory bench space is saved, and multiple tests can be performed on one sample.

Clip Lock™ exchangeable burette system

With Hanna's Clip-Lock™ burette feature, it only takes a few seconds to exchange titrants and reagents preventing cross-contamination and saving time.

Multiple burette sizes

The HI932 is supplied with a 25 mL burette but may be equipped with a 5 mL, 10 mL, or 50 mL burette. Each burette is constructed with a ground glass syringe and chemically resistant PTFE plunger.





Precision dosing pump

Our unmatched 40,000-step piston driven pump is capable of dosing extremely small and highly accurate volumes of titrant or reagent.

Chemically resistant tubing

Aspiration and dispensing tubes are constructed of durable, chemically resistant PTFE and feature a light-blocking polyurethane outer sleeve to protect light sensitive reagents.

Designed for dynamic environments.

Don't worry about small spills in the laboratory with built-in spill handling. An external gutter system protects important connections and interior trays safeguard internal electronics



Effortless data transfer

A conveniently located USB port or direct connection to a PC allows for the transfer of titration methods, titration reports, and software upgrades. Easily convert titration methods from our software to an LIMS friendly format.

Enhanced security options

Administrative users can set a PIN code on the device protecting against unauthorized access. Titration method options and results are tamper-proof while a non-administrator operates the titrator, ensuring records remain safe, secure, and traceable.



The electrode holder is easy to flip for added height.

Electrode holder

This electrode holder can hold up to 3 electrodes, 4 tubes, and 1 temperature probe at any given time. The holder is angled and the stirrer is removable for access to smaller volume titrations without hassle.

Use electrodes with different diameters when needed by simply changing the electrode guide. No need to move electrodes around, get the best tube alignment for your titration with a rotating holder.

For a more compact design, the electrode holder is mounted directly onto the titrator body. The press-to-release button makes for simple height control. Need to save more space? Just reverse the holder to accommodate larger beakers.

Smarter stirring

The removable overhead stirrer has built-in speed control for more consistent stirring.



Autosampler connectivity

The HI932 works seamlessly with our HI922 Autosampler featuring 16 or 18 sample tray options, automatic tray identification, and automatic beaker detection. Up to three peristaltic pumps for reagent addition and removal can be connected and real-time analysis and sequencing progress is visible on the HI932 display as well as indicated by the LED lights of the Autosampler.

Specifications		HI932C1 / HI932C2
Analysis Type	standard titration (standardization, fixed pH/ mV, equivalence point pH/ mV back Titration direct Reading	
End Point Mode	fixed mV fixed pH mV Equivalence Point (up to 5 points, 1st or 2nd derivate) pH Equivalence Point (up to 5 points, 1st or 2nd derivate)	
Burette	Size	5 mL / 10 mL / 25 mL / 50 mL
	Resolution	0.001 mL
	Flow Rate	0.3 mL to 2 x Burette volume per minute
	Accuracy	± 0.005 mL (5 mL Burette) ± 0.010 mL (10 mL Burette) ± 0.025 mL (25 mL Burette) ± 0.050 mL (50 mL Burette)
Stirrer	Range	200 to 2500 RPM
	Resolution	100 RPM
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1; 0.01; 0.001 pH
	Accuracy (@25°C/77°F)	±0.001 pH
	pH Calibration	up to five-point calibration, eight standard buffers and five custom buffers
mV	Range	-2000.0 to 2000.0 mV
	Resolution	0.1 mV
	Accuracy (@25°C/77°F)	±0.1 mV
	mV Calibration	single point offset
ISE	Range	1•10 ⁻⁶ to 9.999•10 ¹⁰
	Resolution	1; 0.1; 0.01
	Accuracy (@25°C/77°F)	± 0.001 pH
	ISE Calibration	up to five-point calibration, seven standard solutions and five user- defined standards
Temperature	Range	-5.0 to 105.0°C; 23.0 to 221.0°F; 268.2 to 378.2 K
	Resolution	0.1°C; 0.1°F; 0.1K
	Accuracy (@25°C/77°F)	±0.1°C; ±0.2°F; ±0.1K, excluding probe error
Data Storage	Methods	up to 100 titration methods (standard and user) up to 30 autosampler sequences
	Reports	up to 100 titration and pH/mV/ISE reports up to 40 autosampler tray reports (e.g. 720 reports for 18 beaker tray)

Connections	Measurement (per analog board)	BNC Socket (pH, ORP, ISE half-cell and ISE combination electrodes) 4 mm Banana Socket (reference electrode) RCA Socket (temperature sensor) 6-pin Connector (stirrer)
	Peripheral	6-pin Mini DIN (external PC keyboard) DB-25 Socket (printer) USB Standard B (PC connection) DB-9 Socket (analytical balance) USB Standard A (USB flash drive)
Additional Specifications	Electrode Holder	multi-purpose slots (titrant/reagent tubes) (4) 12-mm electrode slots (3) temperature sensor slot overhead stirrer slot
	Analog Board(s) Capability	2
	Dosing Pump Capability	2
	Burette Included	1 (25 mL)
	Burette Size Capability	5, 10, 25 and 50 mL
	Burette Resolution	1/40000
	Display Resolution	0.001 mL
	Dosing Accuracy	±0.1% of full burette volume
	GLP Conformity	instrumentation data storage and printing capabilities
	Linked Methods	yes
	Back Titrations	yes
	HI922 Compatible	yes
	Display	5.7" graphical color display with backlight
	Languages	English, Portuguese, Spanish
Power Supply	100-240 Vac, 50/60 Hz "-01" models, US plug (type A) "-02" models, European plug (type C)	
Power Draw	0.5 Amps	
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	
Dimensions	315 x 205 x 375 mm (12.4 x 8.1 x 14.8")	
Weight	approx. 4.3 kg (9.5 lbs.) with 1 pump, stirrer and sensors	
Ordering Information	HI932C1-01 and HI932C1-02 includes titrator with one analog board*. HI932C2-01 and HI932C2-02 includes titrator with two analog boards*. All models also include: overhead propeller stirrer with stand, 25 mL glass burette, dosing pump, temperature sensor, USB cable, USB flash drive and PC software.	
Accessories	HI930101	dosing pump with peristaltic pump
	HI930100	dosing pump
	HI930150	50 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930125	25 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930110	10 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930105	5 mL burette assembly (includes syringe, aspiration, and dispensing tubes)

*Each Analog Board Provides: (1) BNC (pH/mV/ISE) Input, (1) Reference Input, (1) Temperature Input, (1) Stirrer Input



HI931 Automatic Potentiometric Titration System (pH/mV/ISE)

The HI931 Automatic Titrator is the answer to your dedicated titration needs. Fully customizable, the HI931 delivers accurate results and intuitive user experience, all in a compact package. Titrate for a variety of measurements at the push of a button including acids, bases, redox, and selective ions. With no additional programming upgrades to purchase, you can start measuring right away.

- Small footprint so you can fully optimize your benchtop and increase productivity.
- Unmatched 40,000-step dosing pump for small volumes of titrant to help you achieve a very precise endpoint for greater consistency.
- Perfect for dedicated titration needs.

Superior design for superior results.

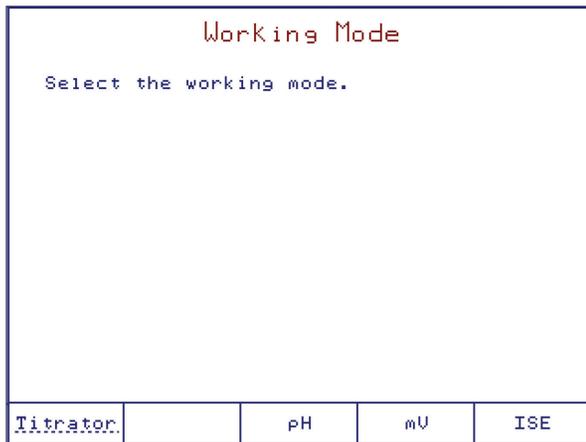
The Cycloloy® body is durable, heat-resistant, and resists staining. Menu buttons are part of the display making it fully sealed and easy to clean. A high contrast LCD display makes every character on the display stand out and the wide viewing angle allows measurements to be seen from any angle. The backlight is adjustable for perfect viewing and a backlight saver option protects the display during periods of inactivity.

Maximize your workspace.

This new generation of titrator features a 50% smaller footprint than the HI901 Automatic Titrator for maximum use of your lab space. Use it in any sized space while providing accurate and consistent results.

Simple user experience

Virtual keys present on the display allow for simple and quick navigation between screens and menus without getting lost in a nest of information. If you need additional information about a screen, simply press the dedicated button for help.



Multiple Titration Types

Paired with the right electrode, this potentiometric titrator can perform any number of standard titrations including pH and mV tests with fixed endpoints or single equivalence points.

Dynamic titrant dosing

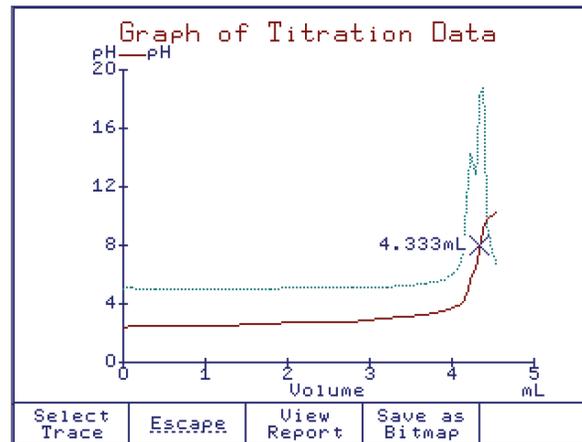
The dynamic dosing feature allows for timely and accurate titration results by relating the titrant volume dosed to the mV response from the titration reaction. This provides for larger doses near the beginning of a titration and smaller, more precise doses near the titration endpoint.

Equivalence endpoint detection

Equivalence endpoint detection is critical in applications where fixed endpoints are not specified in standard methods. This endpoint indicates where the mV response from the titration is greatest with respect to the volume of titrant dosed.

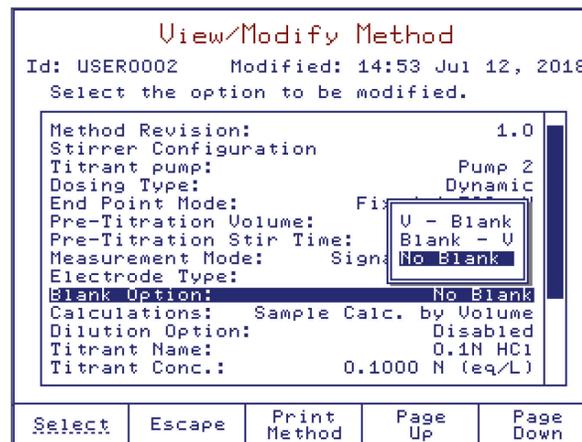
Signal stability timing

The signal stability feature monitors when the mV response of the titration reaction stabilizes before providing the next titrant dose. This ensures reliable measurement values throughout the length of a titration.



Detailed titration graphs

A real-time titration curve can be displayed during each titration; this feature is useful when new methods are tested or when a procedure requires optimization.

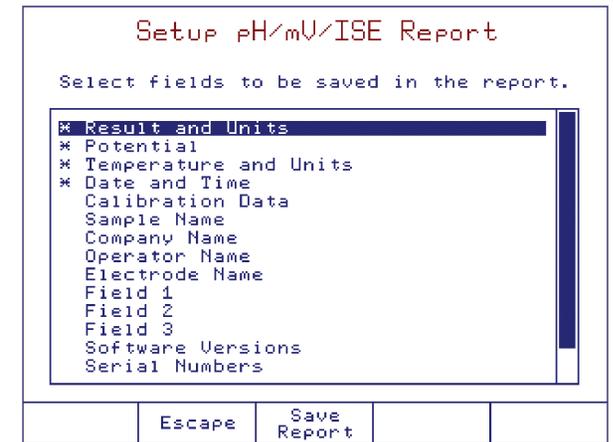


Customizable methods

These titrators can store up to 100 user-defined or standard titration and direct measurement methods. Each method may be modified and optimized for performance based on application and user requirements.

Stay connected.

Connect devices such as an analytical balance for automatic weight sample entry or a printer to print reports directly from the titrator.



Customizable Analysis Reports

Each analysis report is fully customizable to ensure the best data required for an application is stored and filed. The Multiselect feature makes batch processing simple.

Flexible GLP Management

All necessary GLP (Good Laboratory Practice) information is recorded with each sample including sample identification, company and operator name, date, time, electrode ID codes, and calibration information.



Rear connections

The HI931 offers support for one analog balance to allow an electrode, a stirrer, and up to two burettes to be connected to one unit simultaneously.

Clip Lock™ exchangeable burette system

With Hanna's Clip-Lock™ burette feature, it only takes a few seconds to exchange titrants and reagents preventing cross-contamination and saving time.

Multiple burette sizes

The HI931 is supplied with a 25 mL burette but may be equipped with a 5 mL, 10 mL, or 50 mL burette. Each burette is constructed with a ground glass syringe and chemically resistant PTFE plunger.





Precision dosing pump

Our unmatched 40,000-step piston driven pump is capable of dosing extremely small and highly accurate volumes of titrant or reagent.

Chemically resistant tubing

Aspiration and dispensing tubes are constructed of durable, chemically resistant PTFE and feature a light-blocking polyurethane outer sleeve to protect light sensitive reagents.

Designed for dynamic environments.

Don't worry about small spills in the laboratory with built-in spill handling. An external gutter system protects important connections and interior trays safeguard internal electronics



Effortless data transfer

A conveniently located USB port or direct connection to a PC allows for the transfer of titration methods, titration reports, and software upgrades. Easily convert titration methods from our software to an LIMS friendly format.

Enhanced security options

Administrative users can set a PIN code on the device protecting against unauthorized access. Titration method options and results are tamper-proof while a non-administrator operates the titrator, ensuring records remain safe, secure, and traceable.



The electrode holder is easy to flip for added height.

Electrode holder

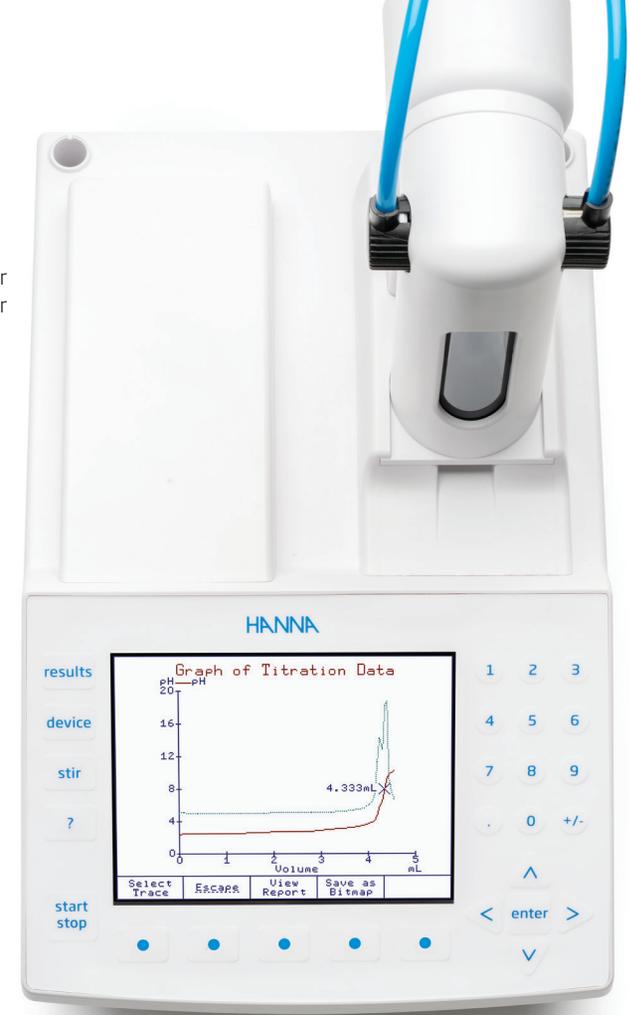
This electrode holder can hold up to 3 electrodes, 4 tubes, and 1 temperature probe at any given time. The holder is angled and the stirrer is removable for access to smaller volume titrations without hassle.

Use electrodes with different diameters when needed by simply changing the electrode guide. No need to move electrodes around, get the best tube alignment for your titration with a rotating holder.

For a more compact design, the electrode holder is mounted directly onto the titrator body. The press-to-release button makes for simple height control. Need to save more space? Just reverse the holder to accommodate larger beakers.

Smarter stirring

The removable overhead stirrer has built-in speed control for more consistent stirring.



Take advantage of the versatility.

HI931 functions as a titrator, pH meter, mV/ORP meter, and ISE meter. Valuable laboratory bench space is saved, and multiple tests can be performed on one sample.

Specifications		HI931
Analysis Type		standard titration (standardization, fixed pH/ mV, equivalence point pH/ mV)
End Point Mode		Fixed mV Fixed pH mV Equivalence Point (1st or 2nd derivate) pH Equivalence Point (1st or 2nd derivate)
Burette	Size	5 mL / 10 mL / 25 mL / 50 mL
	Resolution	0.001 mL
	Flow Rate	0.3 mL to 2 x Burette volume per minute
	Accuracy	± 0.005 mL (5 mL Burette) ± 0.010 mL (10 mL Burette) ± 0.025 mL (25 mL Burette) ± 0.050 mL (50 mL Burette)
Stirrer	Range	200 to 2500 RPM
	Resolution	100 RPM
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1; 0.01; 0.001 pH
	Accuracy (@25°C/77°F)	±0.001 pH
	pH Calibration	up to five-point calibration, eight standard buffers and five custom buffers
mV	Range	-2000.0 to 2000.0 mV
	Resolution	0.1 mV
	Accuracy (@25°C/77°F)	±0.1 mV
	mV Calibration	single point offset
ISE	Range	1•10 ⁻⁶ to 9.999•10 ¹⁰
	Resolution	1; 0.1; 0.01
	Accuracy (@25°C/77°F)	± 0.001 pH
	ISE Calibration	up to five-point calibration, seven standard solutions and five user-defined standards
Temperature	Range	-5.0 to 105.0°C; 23.0 to 221.0°F; 268.2 to 378.2 K
	Resolution	0.1°C; 0.1°F; 0.1K
	Accuracy (@25°C/77°F)	±0.1°C; ±0.2°F; ±0.1K, excluding probe error
Data Storage	Methods	up to 100 titration methods (standard and user)
	Reports	up to 100 titration and pH/mV/ISE reports
Connections	Measurement	BNC Socket (pH, ORP, ISE half-cell and ISE combination electrodes) 4 mm Banana Socket (reference electrode) RCA Socket (temperature sensor) 6-pin Connector (stirrer)
	Peripheral	6-pin Mini DIN (external PC keyboard) DB-25 Socket (printer) USB Standard B (PC connection) DB-9 Socket (analytical balance) USB Standard A (USB flash drive)

Additional Specifications	Electrode Holder	multi-purpose slots (titrant/reagent tubes) (4) 3 x 12-mm electrode slots (3) temperature sensor slot overhead stirrer slot
	Analog Board(s) Capability	1
	Dosing Pump Capability	2
	Burette Included	1 (25 mL)
	Burette Size Capability	5, 10, 25 and 50 mL
	Burette Resolution	1/40000
	Display Resolution	0.001 mL
	Dosing Accuracy	±0.1% of full burette volume
	GLP Conformity	instrumentation data storage and printing capabilities
	Display	5.7" graphical color display with backlight
	Languages	English, Portuguese, Spanish
	Power Supply	100-240 Vac, 50/60 Hz "-01" models, US plug (type A) "-02" models, European plug (type C)
	Power Draw	0.5 Amps
	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
	Dimensions	315 x 205 x 375 mm (12.4 x 8.1 x 14.8")
	Weight	approx. 4.3 kg (9.5 lbs.) with 1 pump, stirrer and sensors
Ordering Information	HI931-01 and HI931-02 includes titrator with one analog board*. All models also include: overhead propeller stirrer with stand, 25 mL glass burette, dosing pump, temperature sensor, USB cable, USB flash drive and PC software.	
Accessories	HI930100	dosing pump
	HI930150	50 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930125	25 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930110	10 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
	HI930105	5 mL burette assembly (includes syringe, aspiration, and dispensing tubes)

*Each Analog Board Provides: (1) BNC (pH/mV/ISE) Input, (1) Reference Input, (1) Temperature Input, (1) Stirrer Input



HI922 Autosampler

Automate up to 18 samples

The HI922 Autosampler is an automated titration sample handling system designed for use with the HI932 Automatic Titration System, making multiple sample titrations quick and easy.

With the Autosampler, up to 18 samples can be run consecutively. The HI922 Autosampler interfaces directly with the HI932 to access titration methods. Once a titration method is established, the user can fully customize the automation sequence of their samples for this method. Sample names and size can be customized or auto-filled with preset values. One beaker can be designated for storage purposes before and after titration sequences; up to three beakers per tray can be designated for an electrode rinse sequence, allowing for sufficient removal of solutions that are hard to clean between each sample titration. During each sample titration, the real-time progress is shown on the HI932 display. Finished sample results and graphs can be accessed during and after the titrations have finished.

Once the Autosampler sequence is complete, two reports are available for review: a sequence report featuring a table outlining each sample name, beaker position, sample size, and result for the tray, and a detailed titration report for each individual sample, including the graph of the titration data.

16 or 18 Sample Tray

The HI922 is able to automate samples using a 16 sample tray or an 18 sample tray. The 16 sample tray holds 150 mL beakers; the 18 sample tray holds 100 mL beakers. The Autosampler trays are composed of chemically resistant materials and are removable to allow for easy handling. The dishwasher safe trays provide a quick and simple way for users to clean regularly.

Built-in Magnetic Stirrer

A magnetic stirrer comes built-in with each Autosampler tray. Users simply need to add a small magnetic stir bar to each beaker to ensure homogeneity during titrations. An optional overhead propeller stirrer can also be installed for use instead of the built-in stirrer. The HI922 allows users to easily adjust the stirring speed of both the built-in and overhead stirrers for optimal use.

Built-in RFID

The HI922 sample trays feature a built-in RFID reader that is able to communicate the tray size and serial number of each tray. Users can have multiple trays, each designated to a specific set of samples. The RFID reader can ensure that the appropriate tray is used each time.

Absolute Encoder

The Autosampler consistently tracks the tray position without the need to "home" or calibrate.

Barcode Reader

A USB-compatible barcode reader can be used to associate names with each sample for improved organization of data.

Optical IR Beaker Detection

An optical IR beam is able to detect the presence or absence of beakers within the sample tray. Users can dictate the Autosampler action if a beaker is missing from the tray during a titration sequence. If a beaker is detected as missing, the HI921 can skip over the sample or stop the titration sequence.

Control Panel

The included control panel features multiple buttons to allow for manual operation of the Autosampler tray, electrode holder, and any auxiliary pumps. A two-line backlit display on the handheld panel clearly displays status information. Manual control with the control panel is desirable for calibration, sample preparation, and method optimization.

Versatile Electrode Holder

The durable electrode holder is able to accommodate three 12 mm electrodes, a temperature sensor, one aspiration tube, and five multipurpose tubes. The multipurpose tubes can be utilized for actions such as reagent addition or burette dosing.

Electrode Rinse Feature

Up to 3 beakers per tray can be designated for electrode dip/spray rinses.

Sample Leveling Feature

Automatic leveling for fast preparation of volumetric samples.

Waste Removal Feature

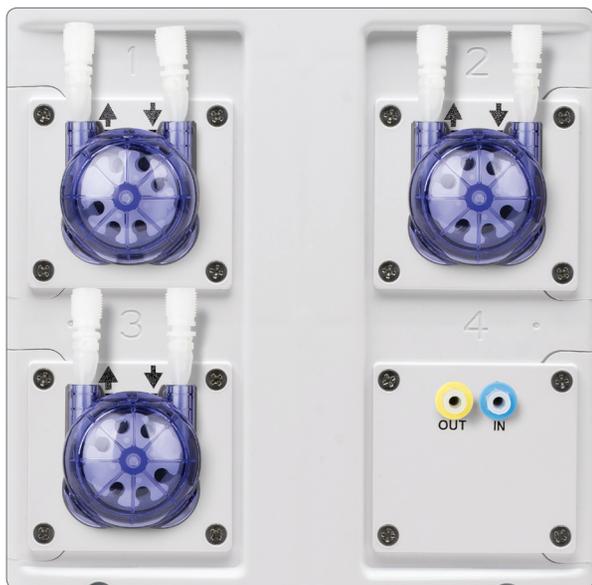
Aspirate completed samples into a waste container.

Use with the HI932 Automatic Titration System

Flexible, accurate detection of the titration endpoint with HI932 potentiometric titrator.

Real-time progress of the sequence and results shown on the HI932 titrator screen.

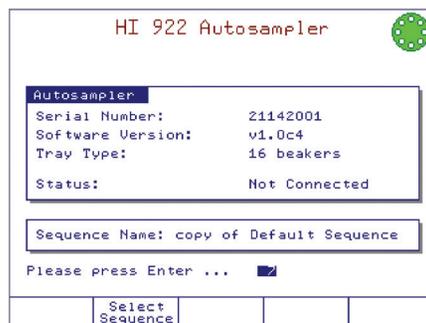




Peristaltic and Membrane Pumps

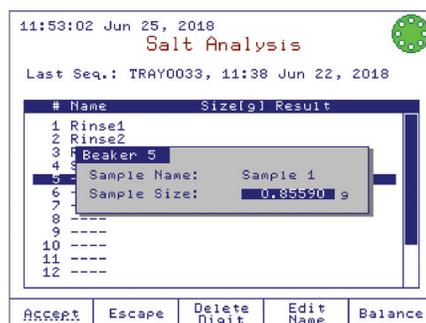
- Up to three peristaltic pumps can be added at anytime
- User replaceable pump systems
- Peristaltic pumps
 - Uses high performance plastic that is engineered to be chemically resistant and have long service life.
 - Reagent addition, sample leveling, waste removal
 - Greater than 200 mL/min flow
- Membrane pumps
 - Simple plug connection for tubing
 - Greater than 400 mL/min flow

Users can add up to three peristaltic pumps or one membrane pump at any time with the user-replaceable pump systems on the HI922. The peristaltic pumps use high performance plastic that is engineered to be chemically resistant with a long service life. These pumps have a flow greater than 200 mL/min and can be utilized for reagent addition, sample leveling, and waste removal. The membrane pump is a simple plug connection for tubing that has a flow greater than 400 mL/min.



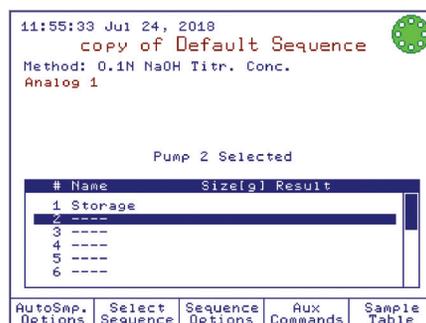
RFID recognition

Sample trays are automatically detected and identified when placed on the Autosampler.



Digital balance compatibility

Sample weights are communicated when connected to a digital balance.



Speedy sample entry

Sample names can be automatically incremented for speedy sample identification.

Status indicator lights

Highly visible status lights are located on both sides of the Autosampler. These lights correspond to the status indicator on the HI932 display and can easily be seen from far away. The lights double as a safety feature, as pressing them at any time will automatically stop the current titration sequence.



Steady green

Idle, ready to start

Flashing green

Titration sequence running



Flashing yellow

Titration sequence paused



Steady Red

Error or emergency stopped, or initializing during power on

Flashing Red

Error during sequence running or manual operation



control panel

Specifications	HI922
Electrode Holder Slots	3 x 12-mm electrodes 1 temperature sensor 1 aspiration tube 5 multi-purpose slots (titrant/reagent tubes) 1 overhead stirrer
Temperature Sensor	HI7662-A (included)
Stirrers	built-in magnetic stirrer overhead propeller stirrer (optional)
Peristaltic Pumps	up to 3 can be installed installs in slots #1, 2, 3
Membrane Pump (for cleaning)	installs in slot #4
Trays	16 beakers x 150 mL (HI920-11660) 18 beakers x 100 mL (HI920-11853) built-in RFID, transmits the tray type and serial number to Autosampler
Beakers	ASTM short-form glass beakers HI920-060 (120 mL), fits HI920-11660 tray - 20 plastic beakers HI920-053 (100 mL), fits HI920-11853 tray - 20 plastic beakers
Control Panel	buttons for manual operation of tray and titration head manual operation of peristaltic or membrane pumps 2-line backlit display with status information
Barcode Reader	compatible with USB barcode readers, used to add sample names
Report Storage	up to 40 trays of samples (e.g.: 720 reports for 18-beaker tray)

Ordering Information Choose your Autosampler configuration:

x=	1	16 sample tray
	2	18 sample tray
y=	0	no peristaltic pump
	1	one peristaltic pump
	2	two peristaltic pumps
z=	0	no membrane pump
	1	one membrane pump

HI922 – x y z



HI933 Karl Fischer Volumetric Titrator

for Moisture Determination

The HI933 is an automatic volumetric Karl Fischer titrator with high accuracy, great flexibility and repeatability.

The titrator is designed to perform titrations for a variety of sample types/matrices, allowing the user to obtain both good results and high-speed analysis. The HI933 analyzes for water content ranging from 100 ppm to 100%. This powerful titrator automatically dispenses the titrant, detects the endpoint, and performs all necessary calculations and graphing.

- Small footprint, requires minimal bench space
- Casing made with strong, chemically resistant plastic
- Powerful built-in algorithms for termination criteria based on fixed mV endpoint or absolute/relative drift
- Titrant standardization and sample analysis averaging
- Minimized water vapor entry with the Sealed Solvent System
- Balance interface for automatic weighing
- Support for 100 titration methods
- User-customizable reports
- Clearly displayed warning and error messages



Burette and Dosing System

Precision Dosing Pump

Our unmatched 40,000 step piston driven pump is capable of delivering as little as 0.125 μL of titrant accurately and precisely.



Anti-Diffusion Dispensing Tip

A specially designed glass dispensing tip delivers titrant precisely into high turbulence mixing zones, ensuring a rapid reaction. Its angular construction helps prevent titrant from diffusing into the sample solvent.

Chemically Resistant Tubing and Syringe

Aspiration and dispensing tubes are constructed of durable, chemically resistant PTFE and feature a light-blocking polyurethane outer sleeve to protect light sensitive reagents.

Titration and Solvent System

Efficient Sample Handling

The HI933 features a quick-remove sample port with a replaceable rubber septum allowing for fast and easy sample introduction to the titration vessel. An integrated magnetic stirrer ensures homogeneity for an accurate and speedy reaction.

Chemically Resistant Titration Vessel

The glass and PTFE titration cell and fittings are designed to withstand the harsh solvents and reagents involved in Karl Fischer reactions.

Sealed Solvent System

The titration vessel is completely sealed to minimize exposure to ambient humidity, keep the system dry, and reduce titrant consumption while saving time between titrations. Solvent may be exchanged in a matter of seconds without opening the titration vessel.

Visually Recognizable Desiccant

A rechargeable, color-indicating, silica gel desiccant prevents the ingress of ambient humidity into the sealed system while maintaining full titrator functionality. The desiccant color change allows a user to recognize when its adsorption capacity has depleted and is ready for replacement or recharging.

Titration Capabilities

Dynamic Titrant Dosing

The dynamic dosing feature allows for timely and accurate titration results by relating the titrant volume dosed to the mV response from the titration reaction. This provides for larger doses near the beginning of a titration and smaller, more precise doses near the titration endpoint.

Drift Rate Compensation

HI933 automatically adjusts the titration calculation to account for the effects of any ambient humidity entering the titration cell. This provides a more accurate result by correcting for water not present in the actual sample.

Titration Results Averaging

Successive results from a titration method may be averaged with recording of the standard deviation.

Titrant Recordkeeping

The HI933's titrant database can store information for up to 20 titrants. The database may be programmed to remind a user when to standardize their titrant, reducing error in analysis.

Selectable Endpoint Criteria

HI933 employs a dual platinum pin electrode for bivalent endpoint determination. Users may choose termination criteria based on mV stability times or drift rates.

Multistage Cell Preparation

A pre-titration stage eliminates residual water present in the solvent and the cell, providing a reliable baseline start to analysis. Standby mode then keeps the solvent dry between titrations and when the titrator is not in use.

Interface and Display

Detailed Titration Graphs

A real-time titration curve can be displayed during each titration; this feature is useful when new methods are tested or when a procedure requires optimization.

Interactive Color Display

A large, color LCD screen clearly shows the chosen titration method along with results, units, dosing size, titration volume, drift rate, and mV value.

Simple & Quick Navigation

Virtual key selections present on the display allow for simple and quick navigation between screens and menus without getting lost in a nest of information.

Data and Storage

Customizable Titration Reports

Each titration report is fully customizable so users can ensure they are storing and filing the appropriate data required for their application and procedures.

Flexible GLP Management

All necessary GLP (Good Laboratory Practice) information can be recorded with each sample including: sample identification, company and operator name, date, time, electrode ID codes, and calibration information.

Effortless Data Transfer

Data can easily be transferred to a USB flash drive or PC with the Hanna HI900PC application software. The USB port allows for the transfer of titration methods, titration reports, and software upgrades via USB flash drive.

Methods of Analysis

Customizable Methods

HI933 can store up to 100 user-defined or standard titration methods. Each method may be customized and optimized for performance based on application and user requirements.

Titration Method Support

Onsite installation, training, and customization is available from one of our Applications or Service experts. Hanna offers continued support via phone or webinar for any questions you might have along the way.

Adaptable Standard Methods

Our technical experts can program and customize standard methods developed by such affiliations as ISO, ASTM, AOAC, AOCS, EPA, and more directly onto your titrator. Ask our Sales Consultants which standard methods are possible with our HI933 Karl Fischer system.



Connectivity and Functionality

Configurable Balance Interface

Sample size may be automatically entered from any laboratory analytical balance with a RS232 serial output saving time and labor.

Multiple Peripherals

Users can print reports directly from the titrator using a standard parallel printer. An external monitor and keyboard may be attached for added versatility, as well as an analytical balance for automatic sample mass entry for titrations.

Versatile Data Management

Incorporate into any existing GLP data management program.

- Easily record all necessary GLP information with every sample, such as sample identification, company and operator name, date, time, electrode ID codes and calibration information
- Data can be transferred to a PC using Hanna HI900PC software
- Transfer of methods, reports and software upgrades via a USB flash drive
- Users can print reports of analyses directly from the titrator using a standard parallel printer
- A keyboard can be attached for added versatility

Specifications	HI933	
Measurement	Range	100 ppm to 100%
	Resolution	1 ppm (0.0001%)
	Result Units	%, ppm, mg/g, µg/g, mg, µg, mg/mL, µg/mL, mg/pc, µg/pc
	Sample Type	liquid or solid
Determination	Pre-Titration Conditioning	automatic
	Background Drift Correction	automatic or user-selectable value
	Endpoint Criteria	fixed mV persistence, relative drift stop or absolute drift stop
	Dosing	dynamic with optional pre-dispensing
	Result Statistic	mean, standard deviation
Titration System	Dosing Pump Resolution	1/40000 of the burette volume (0.125 µL per dose) with 5 mL burette
	Dosing Pump Accuracy	±0.1% of full burette volume
	Syringe	5 mL precision ground glass with PTFE plunger
	Valve	motor-driven 3-way, PTFE liquid contact material
	Tubing	PTFE with light block and thermal jacketing
	Dispensing Tip	glass, fixed position, anti-diffusing
	Titration Vessel	conical with operation volume between 50-150 mL
	Solvent Handling System	sealed system, integrated diaphragm air pump
Electrode	Type	HI76320 dual platinum pin, polarization electrode
	Connection	BNC
	Polarization Current	1, 2, 5, 10, 15, 20, 30 or 40 µA
	Voltage Range	2 mV to 1000 mV
	Voltage Resolution	0.1 mV
	Accuracy (@25°C/77°F)	±0.1 %
Stirrer	Type	magnetic, optically regulated, digital stirrer
	Speed	200-2000 rpm
	Resolution	100 rpm
Storage	Methods	Up to 100 (standard and user) methods
	Reports	Up to 100 complete titration reports and drift rate reports
Additional Specifications	Display	5.7" graphical color display with backlight
	Peripheral Devices	PC (USB standard B); flash drive (USB standard A); analytical balance (DB-9 Socket); printer (DB-25 Socket); keyboard (6-pin Mini DIN)
	Languages	English, Portuguese, Spanish, and French
	Power Supply / Power Draw	100-240 Vac, 50/60 Hz / 0.5 Amps
	Enclosure Material	ABS/PC and Steel
	Keypad	polyester
	Operating Environment	10 to 40 °C (50 to 104 °F); up to 80 % RH
	Storage Environment	-20 to 70 °C (-4 to 158 °F); up to 95 % RH
	Dimensions	315 x 205 x 375 mm (12.4 x 8.1 x 14.8")
	Weight	approx. 4.3 kg (9.5 lbs.) with 1 pump, stirrer and sensors
Ordering Information	HI933-01 and HI933-02 are supplied with HI76320 dual platinum pin electrode, dosing pump, 5 mL burette assembly with tubing, air pump/stirrer assembly with tubing, beaker and bottle top assemblies and all fittings, desiccant cartridges (4) with indicating desiccant, stir bar, waste bottle, calibration key, USB cable, power cable, USB flash drive, quality certificate, ISO 8655 burette compliance report and instruction manual binder.	



Specifications	HI76320
Sensor Type	dual platinum pin polarization electrode
Voltage Range	2 mV to 1000 mV
Voltage Resolution	0.1 mV
Accuracy (@25°C/77°F)	±0.1%
Polarization Current	1, 2, 5, 10, 15, 20, 30 or 40 µA
Sensor Connection	BNC

*100-240 VAC
 -01 models, US plug (type A)
 -02 models, European plug (type C)



HI934 Karl Fischer Coulometric Titrator

The HI934 is a Karl Fischer coulometric titrator with high accuracy, great flexibility and repeatability.

The titrator is designed to perform titrations for a variety of applications, allowing the user to obtain both good results and high-speed analysis. The HI934 analyzes for water content ranging from 1 ppm to 5%. This powerful titrator effectively monitors the KF reaction, detects the endpoint, and performs all necessary calculations and graphing.

- Small footprint, requires minimal bench space
- Casing made with strong, chemically resistant plastic
- Powerful built-in algorithms for termination criteria based on fixed mV endpoint or absolute/relative drift
- Sample analysis averaging and statistical data
- Minimized water vapor entry with the sealed solvent system
- Balance interface for automatic weighing
- Support for 100 titration methods
- User-customizable reports
- Clearly displayed warning and error messages

Coulometric Reagent System

Precision Iodine Generation

Hanna's dosing algorithm allows for an extremely small amount of iodine necessary for the Karl Fischer reaction to be generated electrolytically using a pulsed current up to 400 mA delivering titrant accurately and precisely.

Titration and Solvent System

Chemically Resistant Titration Vessel and Tubing

The glass titration cell and PTFE tubing is designed to withstand the harsh solvents and reagents involved in Karl Fischer reactions.

Sealed Solvent System

Ground glass joints completely seal the glass titration cell minimizing exposure to ambient humidity, keeping the system dry, and reducing reagent consumption while saving time between titrations. Solvent may be exchanged in a matter of seconds with a quick fitting adjustment.

Molecular Sieve Desiccant

High efficiency molecular sieve desiccant helps maintain low and stable drift rates within the titration cell while preventing the ingress of ambient humidity into the sealed solvent system.

Digital built-in stirrer

Automatic, integrated magnetic stirrer adjustable from 200-2000 RPM with optical feedback for automatic speed control.

Titration Capabilities

Dynamic Titrant Dosing

The titration speed feature allows for timely and accurate titration results by relating the amount of iodine generated to the mV response from the Karl Fischer reaction.

Drift Rate Compensation

The HI934 automatically adjusts the titration calculation to account for the effects of any ambient humidity entering the titration cell. This provides a more accurate result by correcting for water not present in the actual sample.

Titration Results Averaging

Successive results from a titration method may be averaged with recording of the standard deviation.

Selectable Endpoint Criteria

The HI934 employs a dual platinum pin electrode for bivoltammetric endpoint determination. Users may choose termination criteria based on mV stability times or drift rates.

Multistage Cell Preparation

A pre-titration stage eliminates residual water present in the solvent and the cell, providing a reliable baseline start to analysis. Standby mode then keeps the solvent dry between titrations and when the titrator is not in use.

Interface & Display

Detailed Titration Graphs

A real-time titration curve can be displayed during each titration; this feature is useful when new methods are tested or when a procedure requires optimization.

Interactive Color Display

A large, color LCD screen clearly shows the chosen titration method along with results, units, drift rate, and mV value.

Simple and Quick Navigation

Virtual key selections present on the display allow for simple and quick navigation between screens and menus without getting lost in a nest of information.



Data & Storage

Customizable Titration Reports

Each titration report is fully customizable so users can ensure they are storing and filing the appropriate data required for their application and procedures.

Flexible GLP Management

All necessary GLP (Good Laboratory Practice) information can be recorded with each sample including: sample identification, company and operator name, date, time, electrode ID codes, and calibration information.

Effortless Data Transfer

Data can easily be transferred to a USB flash drive or PC with the Hanna HI900PC application software. The USB port allows for the transfer of titration methods, titration reports, and software upgrades via USB flash drive.

Methods of Analysis

Customizable Methods

The HI934 can store up to 100 user-defined or standard titration methods. Each method may be customized and optimized for performance based on application and user requirements.

Titration Method Support

Onsite installation, training, and customization is available from one of our Applications or Service experts. Hanna offers continued support via phone or webinar for any questions you might have along the way.

Adaptable Standard Methods

Our technical experts can program and customize standard methods developed by such affiliations as ISO, ASTM, AOAC, AOCS, EPA, and more directly onto your titrator. Ask our Sales Consultants which standard methods are possible with our HI934 Karl Fischer system.

Connectivity and Functionality

Configurable Balance Interface

Sample size may be automatically entered from any laboratory analytical balance with a RS232 serial output saving time and labor.

Multiple Peripherals

Users can print reports directly from the titrator using a standard parallel printer. An external monitor and keyboard may be attached for added versatility, as well as an analytical balance for automatic sample mass entry for titrations.

Versatile Data Management

- Easily incorporate into any existing GLP data management program:
 - Easily record all necessary GLP information with every sample, such as sample identification, company and operator name, date, time, electrode ID codes and calibration information
- Data can be transferred to a PC using Hanna HI900PC software
- Easy transfer of methods, reports and software upgrades via a USB flash drive
- Users can print reports of analyses directly from the titrator using a standard parallel printer
- A keyboard can be attached for added versatility



- Fritted (Diaphragm) Generator
 - Anode/anolyte and cathode/catholyte separated by glass diaphragm
 - Prevents anode-generated iodine from being reduced to iodide at the cathode
 - Ideal for extremely low water content, high accuracy demand, nitrogenous compounds and easily reduced samples



- Fritless (No Diaphragm) Generator
 - Uses one easy-to-replace Karl Fischer reagent
 - Lower and more stable drift rates
 - Easier cleaning of generator cell

Specifications		HI934
Measurement	Range	1 ppm to 5%
	Resolution	0.1ppm
	Result Units	%, ppm, mg/g, µg/g, mg, µg, mg/mL, µg/mL, ppt, mgBr/100g, gBr/100g, mgBr, gBr
	Sample Type	liquid or solid (external dissolution or extraction)
Determination	Pre Titration Conditioning	automatic
	Background Drift Correction	automatic or user-selectable value
	Endpoint Criteria	fixed mV persistence, relative drift stop, or absolute drift stop
	Dosing	dynamic with 3 speed settings
	Result Statistic	mean, standard deviation
Titration Vessel	Type	borosilicate glass with standard taper glass joint connections
	Operating Volume	100 to 200 mL
	Septum	silicone rubber
	Septum Cap Thread	GL-18
	Reagent Port	standard Taper 19
Detector Electrode	Type / Connection	dual platinum pin, polarization electrode / BNC connector
	Glass Connection	standard Taper 14/20
	Polarization Current	1, 2, 5, or 10 µA
	Voltage Range	2 to 1100 mV
	Voltage Resolution	0.1 mV
Generator Electrode	Accuracy (@25°C/77°F)	±0.1%
	Type	diaphragm or diaphragm-less
	Electrode Type Detection	automatic
	Electrical Connection	5-pin connector with detachable cable
	Glass Connection	standard Taper 29/12
	Maximum Current	400 mA
Stirrer	Current Control	automatic or Fixed (400 mA)
	Type	magnetic, electronic regulated, digital stirrer
	Speed	200 to 2000 RPM
	Resolution	100 RPM
Reagent Handling System	External Stirrer	4-pin mini DIN connection allows for the control of an external stirring apparatus
	Type	sealed system with integrated diaphragm air pump
	Desiccant Type	molecular Sieves
	Bottle Thread Type	GL-45
	Glass Connection	standard Taper 19 (using supplied adapter)
Additional Specifications	Reagent/Waste Tubing	PTFE
	Display	5.7" graphical color display with backlight
	Peripheral Devices	PC (USB standard B); flash drive (USB standard A); analytical balance (DB-9 Socket); printer (DB-25 Socket); keyboard (6-pin Mini DIN)
	Languages	English, Portuguese, Spanish, and French
	Power Supply / Power Draw	100-240 Vac, 50/60 Hz / 0.5 Amps
	Enclosure Material	ABS/PC and stainless Steel
	Keypad	polyester
	Operating Environment	10 to 40°C (50 to 104 °F); up to 80 % RH
	Storage Environment	-20 to 70°C (-4 to 158 °F); up to 95 % RH
	Dimensions / Weight	315 x 205 x 375 mm (12.4 x 8.1 x 14.8") / approx. 4.3 kg (9.5 lbs.) with stirrer and sensors
Ordering Information	<p>HI934D-01 and HI934D-02 are supplied with diaphragm, HI934-01 and HI934-02 are supplied without diaphragm</p> <p>All Models Include: dual platinum pin electrode, air pump/stirrer assembly, titration vessel assembly (glass vessel, accessory port stopper, sample port cap and septum, stir bar, desiccant, desiccant cartridge, fittings), vessel support with adapter, pump locking screw with plastic head, reagent bottle assembly (bottle cap, desiccant, desiccant cartridge, fittings, tubing (silicone and PTFE)), water bottle assembly (waste bottle, bottle cap, desiccant, desiccant cartridge, fittings, tubing (silicone and PTFE)), calibration key, reagent exchange adapter, accessory holder assembly, joint grease, Karl Fischer generator electrode (removable generator electrode cable), USB cable, USB storage device, HI900 PC application software, power adapter, quality certificate and instruction manual binder.</p>	

*100-240 VAC

**01" models, US plug (type A)

**02" models, European plug (type C)



HI932 and HI931 Automatic Titration System Accessories

Code	Description
HI930100	dosing pump
HI930101	dosing pump with peristaltic pump (HI932 only)
HI930150	50 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
HI930125	25 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
HI930110	10 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
HI930105	5 mL burette assembly (includes syringe, aspiration, and dispensing tubes)
HI900250	50 mL burette syringe
HI900225	25 mL burette syringe
HI900210	10 mL burette syringe
HI900205	5 mL burette syringe
HI900260	3-way valve (includes 3 gaskets and 2 screws)
HI900942	tool for burette cap removal
HI900270S	aspiration tube set with 316 stainless steel fitting (includes blue protection tube, gasket, and tube lock)
HI930280	dispensing tube set with 316 stainless steel fitting (includes standard dispensing tip, blue protection tube, gasket, and tube lock)
HI930190	blank burette holder
HI930191	blank cover
HI930201	Replacement cap and rotor for peristaltic pump
HI930202	tubing set with plastic dispensing tube for peristaltic pump
HI930204	roller tube for peristaltic pump (3)
HI930301	overhead stirrer (includes overhead stirrer and 3 propellers)
HI930302	replacement propellers (3)
HI930303	PVDF replacement propellers (3) for organic solvents
HI930310	overhead electrode holder (includes overhead holder without electronics or propeller)
HI930320	stirrer support (metal rod only)
HI7662-TW	temperature probe
HI920013	USB cable (1.8 m)
HI930900U	USB storage device with HI900 PC software
HI930401	potentiometric analog board for HI932
HI900945	shorting cap
HI900946	power adapter 110VAC to 24VDC
HI900947	power adapter 220VAC to 24VDC

HI930100



HI930101
(HI932 only)



HI930310



burette

HI930301



HI930320





HI922 Autosampler Accessories

Code	Description
HI920-922	control panel for HI922
HI7662-AW	autosampler temperature sensor w/1.5m cable
HI920-933	titrator/autosampler communication cable
HI920-960	tray locking screw
HI920-931	BNC extension cable (1m)
HI920-932	reference extension cable (1m)
HI920-310	electrode holder
HI920-901	USB storage device
HI920-281	titrant dispensing tube (1.5 m)
HI920-103	peristaltic pump with dispensing tubing
HI920-104	peristaltic pump with aspiration tubing
HI920-113	membrane pump with tubing
HI920-11660W	16 Beaker Tray, 60 mm diameter, Single Row with RFID
HI920-11853W	18 Beaker Tray, 53 mm diameter, Single Row with RFID
HI920-060	120 mL plastic beakers that fit HI920-11660W (20)
HI920-053	100 mL plastic beakers that fit HI920-11853W (20)
HI920-212	membrane pump complete tubing set
HI920-290	Tygon tube (5 m)
HI930-301	overhead stirrer
HI920-201	replacement Cap and Rotor for peristaltic pump
HI920-208	dispensing set with plastic dispensing tube for peristaltic pump
HI920-203	dispensing set with stainless steel aspiration tube for peristaltic pump
HI920-204	roller tube for peristaltic pump (3)
HI920-205	roller tube for peristaltic pump - high chemical compatibility (3)
HI930-302	replacement propellers (3)
HI930-303	replacement propellers - high chemical resistance (3)
HI930-320	cable chain
HI920-191	pump covers
HI731319	25 mm x 7 mm stir bars (10)



HI933 KF Volumetric Titrator Accessories

Code	Description
HI76320	dual platinum pin KF electrode with BNC connector
HI900205	5 mL syringe
HI900522	beaker for HI903/HI933
HI900523	dispensing tip (2)
HI900527	septum (5)
HI900528	solvent port plugs (2)
HI900530	titrant bottle top assembly
HI900531	solvent/waste bottle top assembly
HI900532	desiccant cartridge for titration beaker or titrant bottle
HI900533	desiccant cartridge for solvent or waste bottle
HI900534	waste bottle
HI900535	tubing for solvent/waste handling (2)
HI900536	tubing for air pump (2)
HI900540	O-ring set
HI900550	desiccant, 250 g
HI900570S	aspiration tubing
HI900580S	dispensing tubing and fitting
HI900941	calibration key
HI900942	tool for burette cap removal
HI920013	USB cable
HI930100	pump assembly
HI930180	air pump and magnetic stirrer for HI933/HI934
HI930505	5 mL burette assembly
HI930520	beaker assembly
HI930900U	USB flash drive



HI934 KF Coulometric Titrator Accessories

Code	Description
HI76330	detector electrode
HI900511	generator electrode with diaphragm
HI900512	generator electrode without diaphragm
HI900534	waste bottle
HI900535	tubing for solvent/waste handling (2)
HI900536	tubing for air pump (2)
HI900537	bottle top assembly (with molecular sieves)
HI900538	desiccant cartridge for reagent/waste bottles
HI900542	o-ring set
HI900543	glass joint grease
HI900551	molecular sieves, 150 g
HI900561	titration vessel (glass only)
HI900563	glass stopper, standard taper 19
HI900564	desiccant cartridge for generator electrodes
HI900566	open-top GL18 cap
HI900567	septum (5)
HI900568	reagent exchange adapter
HI900931	generator cable
HI900940	calibration key
HI920013	USB cable
HI930180	air pump and magnetic stirrer for HI933/HI934
HI930182	reagent adapter holder
HI930560	titrator vessel assembly
HI930900U	USB flash drive



Titration Solutions and Reagents

HI70401	potassium hydrogen phthalate, 20 g
HI70402	tartaric acid, 20 g
HI70403	sodium thiosulfate pentahydrate, 20 g
HI70404	potassium iodide powder packets, 100 packets
HI70405	glucose/fructose, 20 g
HI70406	sodium chloride, 20 g
HI70407	potassium iodate, 20 g
HI70408	oxalic acid, 20 g
HI70409	potassium permanganate, 20 g
HI70422	silver nitrate (0.1 M), 1L
HI70423	sodium hydroxide solution (0.11 N), 1 L
HI70424	amino-propanol buffer, 25 mL
HI70425	sulfuric acid solution (16%), 500 mL
HI70426	glyoxal solution (40%), 100 mL
HI70427	nitric acid solution (1.5 M), 500 mL
HI70428	sodium hydroxide solution (0.25N), 1 L
HI70429	silver nitrate solution (0.05 M), 1L
HI70432	hydrogen peroxide solution (3%), 25 mL
HI70433	stabilized iodine solution (0.01 N), 1L
HI70434	phosphoric acid (85%), 500 mL

HI70435	sodium hydroxide solution (5 M), 500 mL
HI70436	deionized water, 1 G
HI70437	potassium iodide concentrated (30%) solution, 500 mL
HI70438	tris buffer set, 1 L
HI70439	sodium thiosulfate solution (0.1 M), 1 L
HI70440	iodine stabilized solution (0.02 N), 1 L
HI70441	iodine stabilized solution (0.04 N), 1 L
HI70443	sulfuric acid solution (10%), 500 mL
HI70444	sulfuric acid solution (25%), 500 mL
HI70445	nitric acid solution (1 M), 500 mL
HI70446	Fehling solution A, 500 mL
HI70447	Fehling solution B, 500 mL
HI70448	silver nitrate solution (0.02 M), 1 L
HI70449	EDTA solution (0.02 M), 1 L
HI70453	hydrochloric acid solution (0.02 N), 1 L
HI70454	sodium hydroxide solution (0.02 N), 1 L
HI70455	sodium hydroxide solution (0.01 N), 1 L
HI70456	sodium hydroxide solution (0.1 N), 1 L
HI70457	sodium hydroxide solution (1 N), 1 L
HI70458	sulfuric acid solution (0.01 M), 1 L

HI70459	sulfuric acid solution (0.05 M), 1 L
HI70462	hydrochloric acid solution (0.01 N), 1 L
HI70463	hydrochloric acid solution (0.1 N), 1 L
HI70464	hydrochloric acid solution (1 N), 1 L
HI70465	hydrogen peroxide solution (30%), 25 mL
HI70466	phenylarsine oxide (PAO) solution (0.00564N), 500 mL
HI70467	pH 4.18 acetate buffer, 230 mL
HI70468	potassium iodide, 35g
HI70469	iodine solution (0.00188N), 230 mL (4)
HI70471	phenylarsine oxide (PAO) solution (0.000564N), 500 mL
HI70472	pH 7.15 phosphate buffer solution, 230 mL
HI70436M	distilled water, 230 mL