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.

Titrator 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	atandard Taper 14/20
	Polarization Current	1, 2, 5, or 10 µA
	Voltage Range	2 to 1100 mV
	Voltage Resolution	0.1 mV
	Accuracy (@25°C/77°F)	±0.1%
Generator Electrode	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
	Current Control	automatic or Fixed (400 mA)
Stirrer	Type	magnetic, electronic regulated, digital stirrer
	Speed	200 to 2000 RPM
	Resolution	100 RPM
	External Stirrer	4-pin mini DIN connection allows for the control of an external stirring apparatus
Reagent Handling System	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)
	Reagent/Waste Tubing	PTFE
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 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	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	**HI934D-01** and **HI934D-02 are supplied with diaphragm,** **HI934-01** and **HI934-02** are supplied without diaphragm **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.	

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

Titration solutions and reagents begin on page 4.72; See accessories on page 4.75