AQUACOUNTER®

Titrators, Systems, Parts & Accessories

Potentiometric Titrators, Systems & Accessories

Karl Fischer Titrators, Options & Accessories

Salt & Mercury Analyzers

COM Series Systems & Accessories

AQUACOUNTER®
COM-1700S Automatic Titrator

Color liquid crystal display provides all information you demand clearly and quickly.

Buret B-1700-20

Buret cylinder 20mL *standard

Stirrer B-1700T2

COM-1700 main unit

Options

1 / 5 / 10 / 50 mL

Buret head
* Extra buret heads can save time for reagent change in buret cylinder.

Measurement unit

S-1700 for Potentiometric Titration *standard
M-1700 for Photometric Titration
P-1700 for Polarization Titration
E-1700 for Conductometric Titration

USB JumpDrive

AQUACOUNTER®
COM-300A
Automatic Titrator

✔ Built-in Buret and Stirrer
✔ Simple and Compact body
✔ Upgradeable and Expandable
✔ And yet... Low price!

Buret cylinder 20mL

Option

Stirrer K-530

Option

Buret B-130

Options

Sample changer
Automated determination of up to 12 samples

C-1712
..... washes the electrodes with water between tests automatically.

C-1712Y
..... washes the electrodes with the organic solvent and then with water between tests automatically.

Dispenser
is useful to add accurately a certain amount of reagent and indicator in the process of titration.
D-102T (for organic solvent)
D-1700 (simplified dispenser for aqueous solution only.)

Options

Buret 2
Buret 3
Buret 10

B-1700

*UP to 10 burets connectable

Option

Printer

Dot Impact printer
+ Conforms to GLP/ GMP requirements

Thermal printer
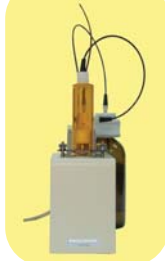+ Ultra fast print out

Option

Karl Fischer Titration Kit
For moisture determination

Electrodes

Indicator electrode	Combination electrode	Reference electrode
Glass electrode GE-101B Platinum electrode PT-301 Silver indicator electrode AG-311 (in aqueous) Silver indicator electrode AG-312 (in organic solvent) Double platinum electrode TPT-351	Glass reference electrode GR-501B (GR-521B for test tube, GR-522B for closed cell) Glass reference thermistor electrode GRT-601B Silver reference combination electrode AGR-801 Silver combination electrode AGR-811 Platinum reference electrode PR-701B Platinum reference electrode PR-731B (for closed cell)	Reference electrode RE-201 Silver reference electrode RE-241 Silver reference electrode MS-231

AQUANet
Data acquisition software
+ Complies with all titrators.
+ Windows® based 32 bit software.
+ Easily export data to Microsoft Excel or LIMS.

AQ / AQV Systems & Accessories

Karl Fischer Evaporators
For samples which are not for direct measurement (ex. solids, oils, etc.)

Additional Coulometric channel
+ Add one additional coulometric cell.
+ You can easily switch to reagent for eg. aldehydes and ketones.
+ Saves bench space for coulometric and volumetric set up.

Additional Volumetric channel
+ Add one additional volumetric cell.
+ You can easily switch to a reagent of a different titer.

Stirrer with solvent pump
+ Eliminates exposure to toxic solvents.
+ Eliminates ambient moisture from entering the measurement cell.

AQL-22320 (Automated Evaporator System)

Coulometric titrator
For best accuracy on small amount of water (10ppm to 10%)

Volumetric titrator
For large amount of water (100ppm to 100%) or wide variety of reagent is required.

Evaporator/Sample changer
Automated determination of up to 10 solid samples

AQS-22120

AQ-2200S

+ Real-time curve
+ Multi channel capability
+ Ready for automation

AQV-2200S

EV-2000 (for solid samples)

AQ-300

+ Best efficiency at the lowest price

AQV-300

EV-2000L (for heavy viscous samples)

AQUANet
Data acquisition software
+ Complies with all titrators.
+ Windows® based 32 bit software.
+ Easily export data to Microsoft Excel or LIMS.
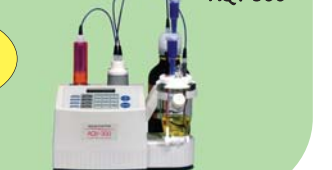
Thermal printer
*Standard
+ Ultra fast print out

Dot Impact printer
+ Conforms to GLP/ GMP requirements

Contents

Introduction

Remarkable improvements in almost all of the AQUACOUNTER® product line have been accomplished by the Hiranuma factory in Japan along with the introduction of two new products that round out our "Analyzer" category. With the exception of the salt analyzer and our low cost 300 series KF titrators, which undergo constant improvements unseen by the end user, all Hiranuma instruments have been upgraded and enhanced with the adaptation of a large, color touch screen, a USB flash memory port, a standard built-in printer, compact, easy-to-use burets, extended lifetime and enhanced software. Computer control, true plug-and-play and multitasking, multiple work stations operating in parallel contribute greatly to the flexibility and ease of use for the laboratory analyst.

One of the newest products, the CLD-100 Salt Analyzer, has been selected as a WINNER in the Analytical Instruments Category of *Laboratory Equipment* magazine's 2010 Reader's Choice Award.

As always, all AQUACOUNTER® instruments are rugged, reliable, backed by a comprehensive warranty, coupled with excellent technical support, and are very competitively priced. All in all, simply "remarkable".

Potentiometric Titrators

Automatic Titrator COM-1700S / 1750 Series

Features

• **Up to four independent titration stations can run at the same time!**

• **Comprehensive data handling!**

• **Compact design!**

• **New patented technologies!**

• **GLP compliant functions!**

Large sized color graphics LCD displays real-time titration curves and differential curves to show reaction tendencies, etc. All information is easily viewed.

Titration with a small amount of sample is possible thus reducing analysis costs and waste. (Optional)

Measurement with 1/2 of the sample volume is possible by using sample vessels and electrode holders that are designed for small amounts of samples. The reagent amount to be used and the waste solution volume after measurement can be greatly reduced, thus saving time and money.

GLP correspondent functions to support reliability of the titration results are provided.

For instance, buret precision tests and electrode calibration slope measurements add to the reliability of the titration results. Useful functions for maintenance such as electrode information display, reagent remaining volume indication etc. are also provided.

Data storing function to USB JumpDrive is provided. Large numbers of data points may be archived.
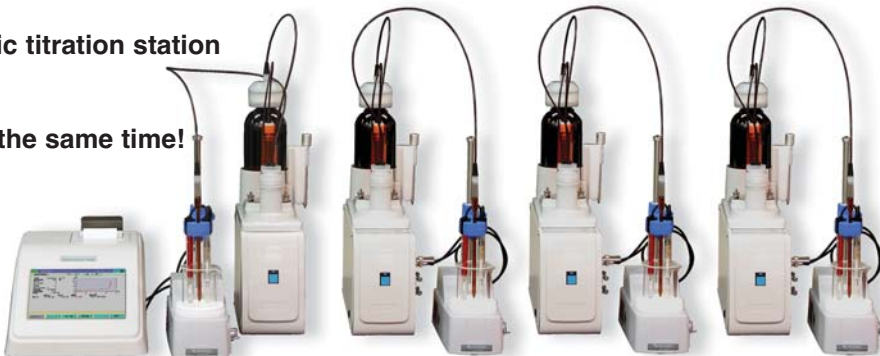
The titration results and titration conditions including titration/ differential curve data can be stored on a USB JumpDrive to perform recalculation and redetection.* Reading, recalculation and redetection of titration results, and use of data by using other application software is possible by simply downloading the data to a laptop or PC for storage or processing.
*To edit and view the data stored in USB, an optional software "Titra-Net Viewer" is necessary. The PC-controllable type, COM-1750, is provided with this software CD.

This titrator may be used as an automatic titration station for multitasking applications.

Different titrations can run in parallel at the same time!

Up to four titration stations are available on both the base stand-alone unit and the PC-controlled unit.

Measurement Modules for the COM-1700

Model	Uses	Specifications
S-1700	**For Potentiometric Titration**	3 inputs [mV, pH(mV)] 0~14 pH, ±2000mV, 0~100°C *Acid/base, redox, precipitation, non-aqueous titrations
M-1700	**For Photometric Titration** Chelatometric titration, Neutralization titration, Oxidation reduction titration, Deposition titration, Non-aqueous titration	3 inputs [T%(Abs), pH(mV), mV] 0~100T%, 0~14 pH, ±2000mV, 0~100°C Includes: optical probe, interference filters (650nm, 530nm) *Chelatometric, acid/base, redox, precipitation, non-aqueous titrations
P-1700	**For Polarization Titration** Amperometric titration, Neutralization titration, Oxidation reduction titration, Deposition titration, Non-aqueous titration	3 inputs [mV(μA), pH(mV), mV] ± 200μA, 0~14 pH, ±2000mV, 0~100°C Polarization voltage: 0~1V current: 1~5μA (5 steps, selectable) Includes: TPT-351 twin platinum electrode *Amperometric, acid/base, redox, precipitation, non-aqueous titrations
E-1700	**For Conductometric Titration** Conductometric titration, Neutralization titration, Oxidation reduction titration, Deposition titration	3 inputs [μS, pH(mV), mV] 0~14 pH, ±2000mV, 0~100°C, 0~200 / 2000 / 20000μS Includes: TPT-351 twin platinum electrode, power box, platinum black electrolyte solution *Conductometric, acid/base, redox, precipitation, non-aqueous titrations

*One of the measurement units must be attached to the main unit.

Options

Various optional probes are available.

Photometric Titration, Polarization Titration, Conductometric Titration are possible by using the appropriate measurement probe.

COM-1750 Series shown with PC Control.
•PC must be provided by end user.

COM-1700S/1750 Potentiometric Titrator Specifications

Item	Specifications
Multitasking function	Control up to 4 parallel titration stations
Titration methods	Potentiometric titration (acid/base, redox, precipitation, non-aqueous, complexometric titrations), Photometric titration, Polarization titration, Conductometric titration *each requires a proper measurement unit: S/M/P/E-1700 amplifier.
End-point detection method	Learn titration, Auto inflection-point detection, Set-point detection, Set/Auto end-point detection, Cross-point (F,B,V1,V2) detection, Dispensing, TAN/TBN in petroleum products (Oil1/Oil2), pH measurement, pH-Stat, pKa, Calculation mode.
Number of end-points	Learn titration: up to 5 end-points with linked method files
File function	Titration run files: 50 files Sample files: 99 files (Sample No., ID code, Sample size, Master file)
Auto input function	Automatic input of blank, factors, concentration measurement results
Calculations	Concentration calculation, statistics calculations, pH automatic compensation, recalculation
Data capacity	COM-1700 Internal memory: 100 data USB flash memory (≥256MB) Max. approx. 9900 data COM-1750 255 data/folder
GLP compliant function	Buret precision test, Electrode check, Buret use frequency, Electrode maintenance, Reagent level alarm
Burets	Expandable up to 10 burets per titration station
Printer	COM-1700 Built-in thermal printer (paper width: 58mm) *Optional external printers: Thermal printer PRINTY3 or Dot impact printer PR-302B
Touch panel screen	COM-1700 7.5 inch color graphics LCD
Kit for PC system	COM-1750 PC card, connector, software *PC is not included. *The PC must have a slot for PC card type I&II
External input/output	RS-232C: 1 port, LAN: 1 port, USB flash memory stick: 1 port Interfaces for external printer and C-1712 sample changer
Power supply	COM-1700 AC100-240V, 50/60Hz, 60VA COM-1750 AC100-240V, 50/60Hz, 220VA (depends on the PC)
Dimensions / Weight	COM-1700 Main unit: 250(W) x 400(D) x 150(H) mm / Approx.6kg

B-1700 Buret / TS-1700 Titration Station

Buret capacity	20-mL clear glass syringe (standard) *Options: 1, 5, 10, 50mL syringe
Minimum increment volume	1.25μL (in 20mL syringe)
Buret precision	Accuracy: ≤ ± 0.1% (full discharge of 20mL syringe) Repeatability: ≤ 0.01mL (full discharge of 20mL syringe, SD for n=6)
Linkable buret number	TS-1700 Up to 9 units of B-1700
Power supply	AC100-240V, 50/60Hz, 50VA
Dimensions / Weight *Buret-head included	B-1700 104(W) x 240(D) x 410(H) mm / Approx. 4kg TS-1700 104(W) x 325(D) x 410(H) mm / Approx. 5.5kg

COM-1700S Automatic Potentiometric Titrator

Add a Model C-2012 Automatic Sample Changer and automate repetitive testing.

When using the Sample Changer, pH calibration can be performed automatically too. Reliable measurements can be carried out efficiently.
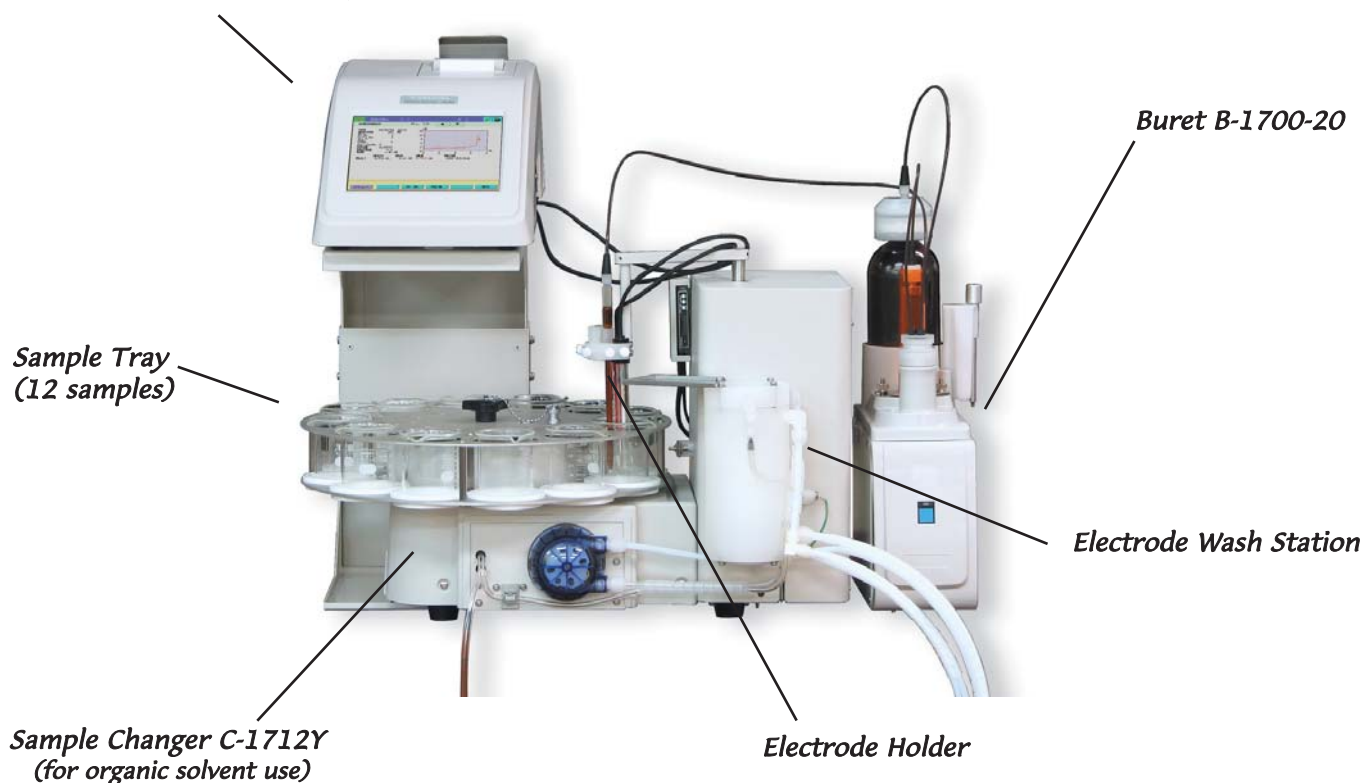
Totally compatible with various ASTM methods including ASTM D664 for TAN analysis, ASTM D2896, and D4739 for TBN analysis.

Fully programmable Titration Sequence; Determination of end point pH using stock buffer solution can also be automated.

Electrode preparation between tests is performed in the washing station automatically.

Environmentally responsible; separate collection of electrode washing solvent and water.

Potentiometric Titrator COM-1700S

Buret B-1700-20

Sample Tray
(12 samples)

Electrode Wash Station

Sample Changer C-1712Y
(for organic solvent use)

Electrode Holder

COM-300A Potentiometric Titrator

The Total Solution for All Your Titration Needs...

Looking for a titrator that is reliable and simple to operate yet expandable and upgradeable? The COM-300A titrator from AQUACOUNTER® offers the Total Solution - the features you asked for at a price you can afford.

Think you'll need more later? No problem.

The COM-300A can be upgraded to fit your growing demands. Of course, we're also the leading manufacturer of other titration products you've come to depend on in your lab, such as Karl Fischer titrators. But, we have so much more to offer you than just great titrators - experience the Total Solution!

Features

COM-300A TITRATOR - the right features at the right price!

• Performs pH, acid/base, complexometric, redox, Karl Fischer, non-aqueous titrations and ISE measurements

• Determines TAN/TBN in oils and p and m alkalinity

• Optional extra buret available

• Choice of impact printer or thermal printer

• Linked methods are available - up to three (3) per titration

• One-touch calculations - including statistics package!

• Over thirty (30) files of built-in method memory, including Karl Fischer

• Built-in memory of up to 50 results or via external computer link

• Balance and computer interfaces for GLP and ISO documentation

COM-300A with additional buret (option).

Options	
Thermal printer	PR-2000T2 or PR-301
Dot impact printer	PR-302
Extra buret	B-130-20
Extra stirrer unit	K-2000A2S
Photometric unit	M-530
Karl Fischer titration kit	KF-300

COM-300A Potentiometric Titrator Specifications

ITEM	SPECIFICATIONS
Titration process	Potentiometric and Polarization (Karl Fischer)
Measuring range	pH: 0 to 14, Resolution 0.01pH mV: -2000 to +2000 mV, Resolution 0.1 mV
Electrode inputs	Indicator electrode : 1 Reference electrode : 1 Temperature electrode : 1 KF electrode : 1
Titration steps	Up to three (3) steps
Number of endpoints	Up to two (2) endpoints
Endpoint detection	Automatic detection by: -Inflection point -Set point -F Cross point -B Cross point
Display system	2 lines, 16-digit LCD with backlighting
Display items	Titration parameters, results, statistics
Display units	pH, mV, mg H_2O, %, ppm, M, g/L, mg/g, Fact 1, Fact 2
pH calibration	2 or 3 points (compliant to ASTM or other standard buffers)
File function	30 files for potentiometric titrations 3 files for Karl Fischer titrations 10 files for titration control methods
Calculation items	Concentration, statistics
Memory	50 titration results along with titration curves and parameters and via external computer
Precautions against power failure	Built-in backup battery
Buret capacity	20 mL, minimum drop size = 0.01 mL Resolution = 1/16000 of buret volume
Stirrer	Integrated, variable speed, magnetic stirrer
External input / output	Balance interface and RS-232C data output
Dimensions	310 (W) x 270 (D) x 310 (H) mm
Weight	7 kg
Power supply / Power consumption	AC100 - 240V, 50/60 Hz
Safety approval	CE approved

AQ-2200S Karl Fischer Coulometric Titrator

The AQUACOUNTER® AQ-2200S high-end titrator is ideal for the trace level water content determination with its excellent capability and upgraded performance.

Features

Economical & Eco-friendly small-volume cell!

Three types of electrolytic cell are available now. One-room small size cell will require only 25mL anode solution, helpful to cut back cost and waste.

Standard   One-room   Small

Enhanced memory data capacity!

Store results data on the USB memory stick and the stored data can be read out on the color display.

Two KF channels run in parallel -- Plug and Play!

Combining one additional KF station with either a volumetric or coulometric module enables two different measurements to be performed at the same time. With both a volumetric and coulometric channel, one can measure moisture over the entire range from 1ppm to 100% or double your sample throughput with 2 identical KF stations.

Intuitive control panel display!

Current status, data and function keys are displayed on a colorful and large screen. Color touch screen is 7.5-inches wide. All helpful and necessary information is always at hand!

Use less reagents!

Reducing expensive KF reagent consumption makes this more economical and ecological.

Browse data by PC on a LAN connection!

Result data with curves can be viewed on your PC internet browsing program without optional software.

Built-in thermal printer!

Easy paper loading. High resolution, clear printout.

AQ-2200S configured for two-channel capability.

AQ-2200S KF Coulometric Titrator Standard Specifications

ITEM	SPECIFICATIONS
Titration method	Coulometric Karl Fischer titration method
Multitasking function	Up to two KF titration stations (Double coulometric channels or combination of coulometric and volumetric channels)
End-point detection method	AC polarization potentiometric detection method
Background correction	Automatic correction (selectable ON/OFF)
Measuring range	$10\mu g$ H_2O ~ 99mmg H_2O
Accuracy	CV ≤ 0.3% (1g of 1mg H_2O/mL water-in-methanol measured 10 times)
Required measurement time	FAST : 1.8mg H_2O/min ($30\mu g$ H_2O) MEDIUM : 1.2mg H_2O/min ($20\mu g$ H_2O) SLOW : 0.6mg H_2O/min ($10\mu g$ H_2O)
Electrolytic cell capacity	Standard : 150mL (min.usage: approx. 100mL), two compartments One-room : 150mL (min.usage: approx. 100mL), one compartment Small : 75mL (min. usage: approx. 25mL), one compartment
Memory data capacity	Internal memory: 100 data / channel USB flash memory (≥256MB): Max. approx. 9900 data
GLP compliant functions	Electrolytic cell maintenance, Measurement accuracy test
Calculation modes	6 modes corresponding to sample status and sampling methods
Printer	Built-in thermal printer (paper width: 58mm) *Optional external printers: Thermal printer PRINTY3 or Dot impact printer PR-302B
Touch panel screen	7.5 inch color graphics LCD
External input/output	RS-232C: 1 port, LAN: 1 port, USB flash memory stick: 1 port Interface for Evaporators: 1 port
Power supply	AC100-240V, 50/60Hz, 100VA
Dimensions / Weight	Main unit: 220(W) x 400(D) x 200(H) mm / Approx. 5kg

AQV-2200S Karl Fischer Volumetric Titrator

AQUACOUNTER® AQV-2200S Karl Fischer Volumetric high-end titrator is the perfect choice for a very wide range from 100 ppm to 100% water content with its maximum capability for automation and future up-gradability.

Features

Economical & Eco-friendly small-volume cell!

Small-volume titration cell requires only 20mL of titration solvent for accurate measurements. Less reagent volume reduces waste and easy to replace with fresh solvent for the next measurement.

Standard   Small

Two KF channels run in parallel -- Plug and Play!

Combining one additional KF station with either a volumetric or coulometric module enables two different measurements to be performed at the same time. With both a volumetric and coulometric channel, one can measure moisture over the entire range from 1ppm to 100% or double your sample throughput with 2 identical KF stations.

Additional burets and buret-heads!

Compact additional burets and easy, snap-on buret-heads are useful for quick KF reagent exchange or back titration applications.

Intuitive control panel display!

Current status, data and function keys are displayed on a colorful and large screen. Color touch screen is 7.5-inches wide. All helpful and necessary information is always at hand!

Browse data by PC on a LAN connection!

Result data with curves can be viewed on your PC internet browsing program without optional software.

Enhanced memory data capacity!

Save & load parameters and results via USB flash memory.

Built-in thermal printer!

Easy paper loading. High resolution, clear printout.

AQV-2200S configured for two-channel capability.

AQV-2200S KF Volumetric Titrator Standard Specifications

ITEM	SPECIFICATIONS
Titration method	Volumetric Karl Fischer reagent titration method
Multitasking function	Up to two KF titration stations (Double volumetric channels or combination of coulometric and volumetric channels)
Detection method	AC polarization current detection/ potentiometric detection methods
Background correction	Automatic correction (selectable ON/OFF)
Measuring range	0.1mg H_2O ~ 500mg H_2O (suitable for range: 10ppm ~ 100%)
Accuracy	CV ≤ 0.3% (1g of 1mg H_2O/mL water-in-methanol measured 10 times)
Electrolytic cell capacity	Standard : 150mL (min.usage: approx. 30mL) Small : 75mL (min. usage: approx. 20mL)
Memory data capacity	Internal memory: 100 data / channel USB flash memory (≥256MB): Max. approx. 9900 data
GLP compliant functions	Electrolytic cell maintenance, Measurement accuracy test
Calculation modes	6 modes corresponding to sample status and sampling methods
Printer	Built-in thermal printer (paper width: 58mm) *Optional external printers: Thermal printer PRINTY3 or Dot impact printer PR-302B
Touch panel screen	7.5 inch color graphics LCD
External input/output	RS-232C: 1 port, LAN: 1 port, USB flash memory stick: 1 port Interface for Evaporators: 1 port
Power supply	AC100-240V, 50/60Hz, 60VA
Dimensions / Weight	Main unit: 220(W) x 400(D) x 200(H) mm / Approx. 5kg

AQ-300 Karl Fischer Coulometric Titrator

On a tight budget and looking for a reliable, easy-to-use coulometric Karl Fischer titrator?

Then look no further than the AQUACOUNTER® AQ-300. With state-of-the-art performance features, like a fritless cell option, the AQ-300 offers the same fast and accurate results you've come to expect from other AQUACOUNTER® products.

Comes with training movie CD, plasticized Quick-Start guide for use in the lab, paper and pdf manual. Also included, complete accessories, download software, RS-232 cable, and AQUACOUNTER® KF Reagent starter kit.

Features

- Six (6) built-in calculation modes accommodate solid, liquid and gas samples.

- One-touch calculations - including statistics package!

- Four (4) files of preset conditions can be stored in memory.

- Balance and computer interfaces for GLP and ISO documentation. Instant recall of data for up to 20 samples.

- Built-in detector monitors titration status.

- Choice of ion exchange membrane or fritted cell system.

- Choice of thermal printer or impact printer.

- Free software for downloading titration results to a laptop or PC; includes the correct RS-232 cable.

- Competitive price.

- Complete accessories kit enables the end-user to run samples right out of the box. There is nothing else to purchase on start-up.

AQ-300 KF Coulometric Titrator Standard Specifications

ITEM	SPECIFICATIONS
Titration method	Coulometric Karl Fischer titration method
Electrolytic control method	Constant current electrolysis, intermittent electrolysis in the vicinity of the end point only
Titration control method	AC polarization potential difference detection method (1) Automatic stop at endpoint after elapsed INTERVAL time (INTERVAL: Max. 99 sec.) (2) Titration time settings system (T-TIMER: Max. 99 min.)
Automatic background compensation range	0 - 50μg H_2O/min
Display screen	2-lines, 16 digit LCD with backlighting
Display unit	μg H_2O, %, ppm
Detection sensitivity	0.1μg H_2O
Accuracy	CV of 0.3 % With water-methanol (1 mg H_2O/mL),1 g is measured 10 times
Measuring range	10μg H_2O - 99mg H_2O
Required measuring time	FAST 50 sec/mg H_2O SLOW: 100 sec/mg H_2O
Titration cell capacity	150 mL
File function	4 files for titration parameters
External input/output	Balance, printer and RS-232C data output
Printers	Optional thermal / impact printer
Alarm	5 sec alarm when titration ends
Power supply / Power consumption	AC100 - 240V, 50/60 Hz & 100VA
Dimensions	310 (W) x 270 (D) x 300 (H) mm
Weight	Approx. 5kg
Safety approval	CE approved

AQV-300 Karl Fischer Volumetric Titrator

On a tight budget and looking for a reliable, easy-to-use volumetric Karl Fischer titrator? Then look no further than the AQUACOUNTER® AQV-300. State-of-the-art performance features let you measure moisture content from low to high concentrations quickly and accurately.

Measurements are simple and routine with unsurpassed precision.

Comes with training movie CD, plasticized Quick-Start guide for use in the lab, paper and pdf manual. Also included, complete accessories, download software, RS-232 cable, and AQUACOUNTER® KF Reagent starter kit.

Features

- Small footprint with integrated magnetic stirrer.

- Function guide display allows simple operation.

- Newly designed buret tip ensures precise titration.

- Non-corrosive PBT (polybutylene terephthalate) resin body.

- Two RS-232C ports for balance and PC.

- Free software for downloading titration results to a laptop or PC; includes the correct RS-232 cable.

- Competitive price.

- Complete accessories kit: Requires only dry methanol in order to run samples right out of the box. There is nothing else to purchase on start-up.

AQV-300 KF Volumetric Titrator Standard Specifications

ITEM	SPECIFICATIONS
Titration method	Volumetric Karl Fischer reagent titration method
Titration control method	Intermittent addition of titrant while approaching the end point. (1) Control using a waiting interval timer of 1 - 99sec (INTERVAL). Titration stops when there is no change in the electrode potential during this interval. (2) Control by titration timer. (T-TIMER: 1 - 99min.)
End point detection	DC polarization potential difference detection
Buret capacity	10mL Reproducibility ±0.01 mL (for full discharge, standard deviation for n=5)
Liquid contact material	PTFE, ceramic and glass
Number of burets	1
Display screen	2 lines, 16 digit LCD with backlighting
Display units	mL (min. display is 0.001mL), mg H_2O, %, or ppm
Measuring range	10 ppm - 100%
Minimum volume of titrant addition	0.005mL or 0.01mL
Calculation function	Concentration, factor standardization, statistics, recalculation
Titration cell capacity	150mL
Minimum volume of solvent	Approx. 30mL
External input/output	Two RS-232C ports Port 1 (HOST) for PC connection. Port2 (BALANCE) for Balance connection.
Printers	Optional thermal and impact printer - please inquire
Power supply / Power consumption	AC100 - 240V, 50/60 Hz, 100 VA
Dimensions	310 (W) x 270 (D) x 300 (H) mm
Weight	Approx. 6kg
Safety approval	CE approved

Solid Evaporator EV-2000

The EV-2000 is designed for solid/powdery samples, which may not be soluble in the Karl Fischer reagent or solvents or may contain interfering substances. The EV-2000 works with all of our AQUACOUNTER® Karl Fischer titrator series, can be automatically controlled via the AQ/AQV-2200 titrators or via optional control key pad for the AQ/AQV-300 models and other brand of KF titrators.

AQ-2200S + EV-2000

Solid Evaporator EV-2000 Standard Specifications

ITEM	SPECIFICATIONS	
Heating Temperature	Room temperature to 350 °C	
Carrier gas	Nitrogen gas or dry air*	*Optional N_2 gas generator from JMS is recommended
Carrier gas flow rate	30 – 300 mL/min	
Carrier gas input pressure	0.8MPa or less	
Carrier gas desiccant	Molecular sieves	
Heater	Aluminum block heater	
Sample volume	Max. 10mL	
Power supply / Power consumption	AC100 - 240V, 50/60Hz, 150VA	
Dimensions	220 (W) x 430 (D) x 200 (H) mm	
Weight	Approx. 8kg	
Safety approval	CE approved	

Oil Evaporator EV-2000L

The EV-2000L Oil Evaporator utilizes azeotropic distillation (Micro Dean & Stark Distillation). It completely separates water from sample matrices, thus eliminating any side reactions with interfering substances. The EV-2000L can be used with all AQUACOUNTER® Karl Fischer titrators, or any other manufacturer's titrators.

AQ-2200S + EV-2000L

Oil Evaporator EV-2000L Standard Specifications

ITEM	SPECIFICATIONS	
Evaporation method	Azeotropic distillation method	
Heating temperature	Room temperature to 200°C	
Carrier gas	Nitrogen gas or dry air*	*Optional N_2 gas generator from JMS is recommended
Carrier gas flow rate	30 - 300mL/min	
Carrier gas input pressure	0.8 MPa or less	
Carrier gas desiccant	Molecular Sieves	
Heater	Aluminum block heater	
Evaporation chamber capacity	Max. 10mL	
Measurement range	The same as that of the connected titrator	
Azeotropic solvent	Toluene or Xylene 5-10mL per measurement	
Power supply / Power consumption	AC100 - 240V, 50/60 Hz, 150 VA.	
Dimensions	220 (W) x 340 (D) x 265 (H) mm	
Weight	Approx. 7kg	
Safety approval	CE approved	

Automated Solid Evaporator System AQS-22010S
(AQ/AQV-2200 + EV-2010)

The EV-2010 automated evaporator/sample changer can be connected with both the AQ-2200 coulometric titrator and the AQV-2200 volumetric titrator, which makes the AQS-22010S a complete, automated evaporation KF titration system.

For medium to heavy workloads

Up to 10 samples can be placed on the turntable at the same time.
Up to 99 samples can be run by simply removing the finished sample and adding a new one.

Extremely compact design

A compact upright design for both the heating block and the KF titrator saves valuable bench space.

Wide temperature range and programmable temperature control

The heating temperature can be set up to 300 °C and programmed up to 3 steps. This feature makes it easier to find the optimum temperature for each individual sample, or allows you to differentiate surface water from bound water.

Dry Air Pump (Optional)

Compact, integrated air pump eliminates the need for nitrogen carrier gas or select a N_2 gas generator from JM Science.

AQ-2200 + EV-2010

Evaporator EV-2010 Standard Specifications

ITEM	SPECIFICATIONS	
Number of sample vials	10 positions	
Volume of sample vial	10mL	
Seal	PTFE cap with Aluminum foil	
Carrier gas	Nitrogen or Dry air*	*Optional N_2 gas generator from JMS is recommended
Carrier gas flow rate	100 - 300 mL/min	
Carrier gas desiccant	Molecular Sieves	
Heater	Aluminum block heater	
Heating temperature	Room temperature to 300 °C	
Power supply / Power consumption	AC100 - 240V, 50/60Hz, 150VA	
Dimensions	260 (W) x 600 (D) x 280 (H) mm	
Weight	Approx. 11kg	
Safety Approval	CE Approved	

Automated Solid Evaporator System AQS-22320
Automated Oil Evaporator System AQL-22320
(AQ/AQV-2200 + SE/LE-320)

The AQS/AQL-22320 is an automated KF Titrator System that requires the analyst to load the samples into the glass vials and then place the glass vials on the sample tray of the system. The operator only needs to push the "start" button once to begin the analyses.
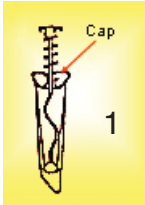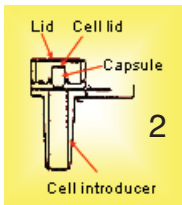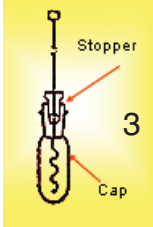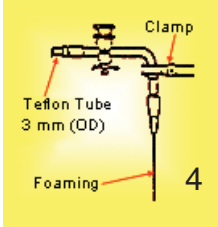
- Sample changer holds up to 20 vials.

- Equipped with Automatic KF reagent exchanging function.

- Wide temperature setting covers the full range of azeotropic points.

- Reduces costs for KF reagent and waste disposal.

- Can process large numbers of samples.
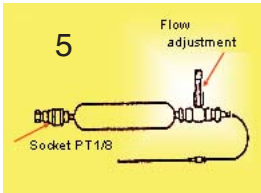
*Chemical reagents are not included.

Evaporator SE-320/LE-320 Standard Specifications

ITEM	Solid Evaporator SE-320	Oil Evaporator LE-320
Number of sample vials	20 positions	20 positions
Volume of sample vial	Max. 10mL	Max. 3 mL
Seal	PTFE cap with Aluminum foil	PTFE cap with PTFE septum
Carrier gas	Nitrogen gas*	Nitrogen gas* *Optional N_2 gas generator from JMS is recommended
Carrier gas flow rate	30 - 300mL/min	50 - 300mL/min
Carrier gas desiccant	Molecular Sieves	Molecular Sieves
Heater	Aluminum block	Aluminum block
Heating temperature	Room temperature to 300°C	Room temperature to 200°C
Power supply / Power consumption	AC100 - 240V, 50/60Hz, 150VA	AC100 - 240V, 50/60Hz, 150VA
Dimensions	Sample changer + heater unit: 350 (W) x 510 (D) x 390 (H) mm Valve unit: 275 (W) x 440 (D) x 280 (H) mm	
Weight	Sample changer + heater unit: Approx. 19kg Valve unit: Approx. 9kg	

NAME	DESCRIPTION	FIGURES
1 Micro Solid Sampler	For solid/powder samples. Sample size up to 3mL	
2 Ultra - Micro Solid Sampler	For solid/powder samples. Especially for very small amount of sample. (sample size up to 0.17mL)	
3 Grease Sampler	For viscous samples such as grease	
4 Gas Sample Foaming Tube	A device for introducing a gas sample into the titration cell.	
5 Liquefied Gas Sampler	For liquefied gas sample.	
6 Sampler	A container for powder or pellets. Use with solid evaporator EV-2000.	

Reagents-Solvents-Standards

Karl Fischer Reagents

AQUACOUNTER® Karl Fischer reagents *have been carefully developed and optimized to meet the exacting demands of a wide range of moisture determinations. A complete selection of coulometric and volumetric reagents, water standards and dehydrated solvents are available to analyze moisture in a diverse array of applications. An extended shelf life assures a stable titre, rapid titrations and accurate results. AQUACOUNTER® reagents are manufactured in the USA, are pyridine-free and thus are less toxic with no unpleasant odors. Reagents are competitively priced and demo kits are available.*

Water Standards

Although pure water can be used for calibration and validation, the amounts required may be difficult to weigh. We, therefore, recommend our volumetric and coulometric water standards available in standard 5 mL ampoules. Choose from 9 different standards for titre determination, for determining precision and accuracy or for validating KF titrators according to ISO 9000, GMP, GLP and FDA guidelines.

Dry Solvents

Dehydrated solvents for KF Titrators are available.

Titrator Parts & Accessories

Several accessories are also available for your AQUACOUNTER® titrator or evaporator including a wide selection of electrodes, printers, cables, balances and sampling devices. Consumable parts like Ion exchange membranes, fluorine grease, rubber septa, indicator electrodes, 4M KCl are available from stock. Simply call or go to *jmscience.com/titratorparts* to order.

Customer Service & Technical Support

Potentiometric and KF titrators are manufactured by the Hiranuma Company in Japan and have been sold in North America under **<u>VARIOUS</u>** brand names for more than 20 years. Titrator service and technical support are available for ALL Hiranuma titrators.

Call or send an email message to *sales@jmscience.com*.

Mercury Analyzer

HG-400 Series

The HG-400 series is an automated mercury analyzer that achieves a 0.5 ppt detection limit based on Cold Vapor Atomic Absorption Spectrometer complying with EPA and other standard methods.
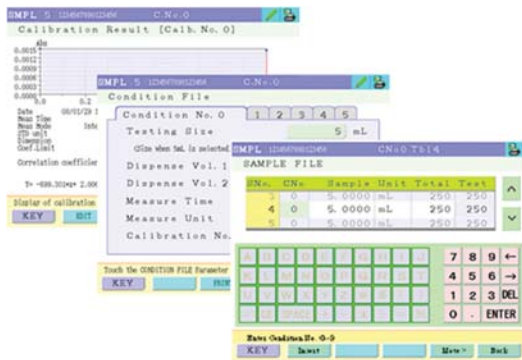
Features

High sensitivity - detection limit 0.5ppt.

Perfect for trace levels of mercury detection. The improved optical system and measurement flow path enables the analyzer to reach a lower detection limit of 0.5ppt of Hg.

User friendly - color touch screen.

A large 7.5 inch LCD color touch screen provides all the information that the analyst requires.

Touch lightly on the colorful, clear screen for easy control and analysis.

Comprehensive data handling.

Browse data on PC with LAN connection. Special software is also optionally available.

Expandable and flexible - widest variation of applications.

The HG Series is needed in the following settings:

- Water Treatment Plants
- Laboratories
- Steel / Light Metals
- Food
- Government Testing Facilities
- Chemicals
- Pharmaceuticals
- Electrical & Electronics

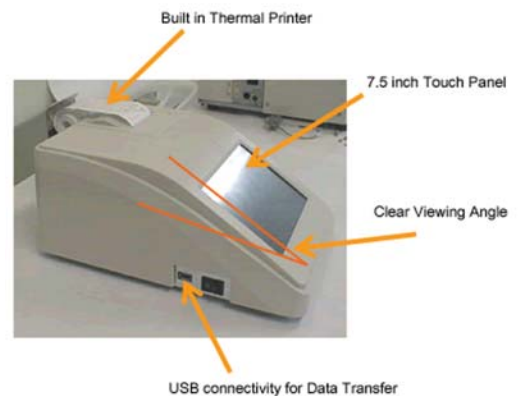**HG Series is more cost effective and environmentally friendly.**

- Smaller sample sizes are needed
- Minimal chemical reagents
- Less waste

Compact design.

Built-in printer saves more valuable bench space.

GLP compliant functions.

Helpful system maintenance information provided.

Built in Thermal Printer

7.5 inch Touch Panel

Clear Viewing Angle

USB connectivity for Data Transfer

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HG-400 Mercury Analyzer Standard Specifications

ANALYSIS UNIT

ITEM	SPECIFICATIONS
Measurement method	Cold vapor atomic absorption spectrometry
Testing size	5-mL
Detection range	0 - 500ng / 5mL (0 - 100 ppb)
Lower detection limit	0.5 ppt
Desiccation method	Electronic cooling method
Mercury collection method	Collection by activated charcoal
Light source	Low pressure mercury lamp
Measurement mode	Peak height mode / Integration mode
Printer	Built-in thermal printer (paper width: 58mm)
Power requirement	AC100-240V, 50/60Hz, 30 VA
Dimensions	220 (W) x 400 (D) x 220 (H) mm
Weight	Approx. 12kg

HG-400-5D

MAIN CONTROL UNIT

ITEM	SPECIFICATIONS
Printer	Built-in thermal printer (paper width: 58mm)
Touch panel screen	7.5 inch color graphics LCD
Power supply	AC100-240V, 50/60Hz, 30 VA
Dimensions	220 (W) x 400 (D) x 150 (H) mm
Weight	Approx. 4kg

HG-450-5D shown w/ PC

C-430-5 SAMPLE CHANGER

ITEM	SPECIFICATIONS
Testing size	5-mL
Number of measurements	30 specimens
Power Supply	AC100-240V, 50/60Hz, 30 VA
Dimensions	240 (W) x 380 (D) x 370 (H) mm
Weight	Approx. 12kg

Options

- **Sample changer C-430-5** for 5-mL test volume, 30 positions, rinsing bath is equipped.

- **PC software "Hg-Net Viewer"** for viewing and editing data stored in USB flashmemory on PC.

- **Mercury Analyzer HG-450** PC controllable type is also available.

- **Reagent dispenser D-401** to automatically deliver sulfuric acid and tin chloride solution.

- **Dot impact printer PR-302B** chart paper, paper width 58mm.

Salt Analyzer

CLD-100

The new CLD-100 Salt Analyzer achieves speedy and accurate determination of chloride ions by coulometric titration method.

Features

Easy maintenance.

No standardization of reagent required.

No troublesome maintenance work such as reagent filling into flow-path and the dispenser is as required in volumetry.

Simple operation with an injection by micro syringe.

High Speed Measurement.

Rapid measurement is achievable (measure 20μL of 1% NaCl standard in only 20 seconds!). Colored samples can also be accurately measured easily using the potentiometric End-Point Detection method.

Electrolyte, micro syringe and NaCl standard solution included.

Compact design.

Low running cost.

The reusable electrolyte can be used for several measurements thus achieving real cost savings. (approx. 100 measurements of 20μL of 1% NaCl).

Design & materials have been adopted for safety.

Mercury-free and trouble-free sleeve-type reference electrode is adopted for safety.

Options

Thermal printer PR-2000T2

Dot impact printer R-302B

CLD-100 Salt Analyzer Standard Specifications

ITEM	SPECIFICATIONS
Measurement method	Coulometric Titration Method
End point detection method	Potentiometric detection detection method
Electrodes	Indicator electrode : Silver electrode Reference electrode: Silver sulfate electrode
Measured components	NaCl or Cl- *selectable
Concentration units	% (w/v, w/w), mg/L, mmol/L
Data storage capacity	300 results
Calibration	1-point calibration using NaCL standard solution
Sampling	20-μL micro dispenser
Measurement ranges / Sample sizes	Range 1: 1.0000 ~ 50.00 % 0.002mL Range 2: 0.2000 ~ 10.00 % 0.010mL Range 3: 0.1000 ~ 5.000 % 0.020mL Range 4: 0.0500 ~ 2.000 % 0.050mL Range 5: 0.0200 ~ 1.000 % 0.100mL Range 6: 100.0 ppm ~ 5000 ppm 0.200mL Range 7: 40.0 ppm ~ 2000 ppm 0.500mL Range 8: 20.0 ppm ~ 1000 ppm 1.000mL
Power requirement	AC100-240 ± 10V, 50/60Hz, 50VA
Dimensions	310 (W) x 270 (D) x 300 (H) mm
Weight	Approx. 5kg

The CLD-100 Salt Analyzer was awarded *Laboratory Equipment*'s 2010 Reader's Choice Award in Analytical Instruments.