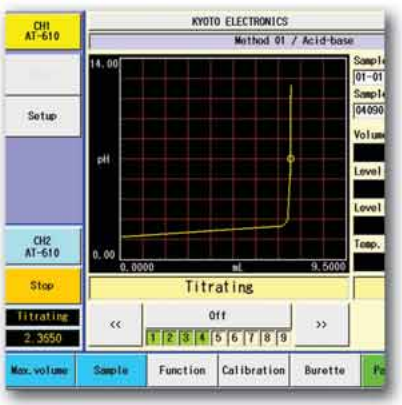
Automatic Potentiometric Titrator

AT-610



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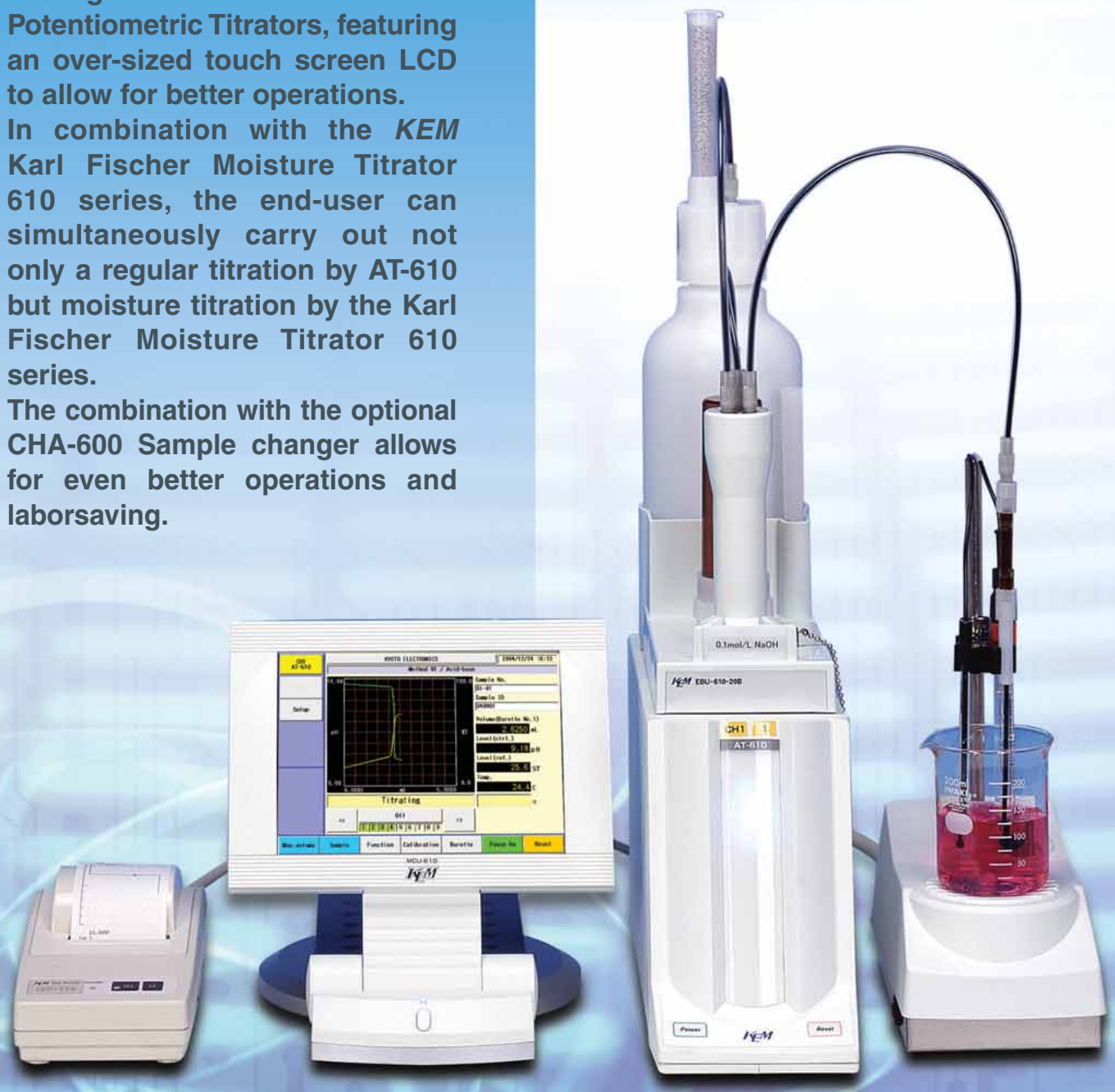
AT-610

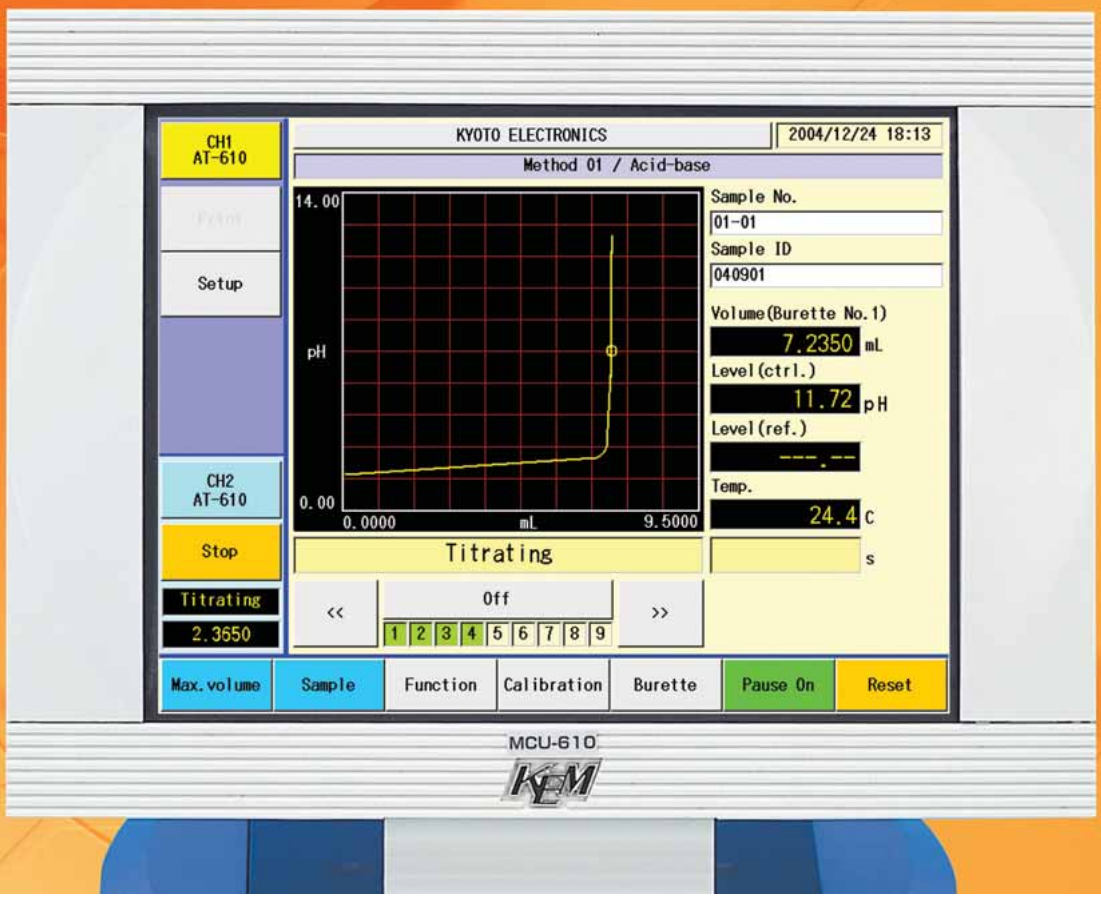
Two Different Titrations can be Performed Simultaneously --- Allow for Space-saving. Also, a Karl Fischer Moisture Titrator can be combined.

AT-610 is the highest-end model among the *KEM* Automatic Potentiometric Titrators, featuring an over-sized touch screen LCD to allow for better operations.
In combination with the *KEM* Karl Fischer Moisture Titrator 610 series, the end-user can simultaneously carry out not only a regular titration by AT-610 but moisture titration by the Karl Fischer Moisture Titrator 610 series.
The combination with the optional CHA-600 Sample changer allows for even better operations and laborsaving.



Features

Touch Screen LCD Input System



Large color LCD with a touch screen feature (8 inch-wide)

Newly adopted a logical, easy-to-use Graphical User Interface utilizing a high-resolution touch-screen LCD (Liquid Crystal Display) provides easy viewing and high visibility in addition to simplified key entry by touch-screen control for swift maneuverability in operation.

Temperature measurement with Platinum Thermal Resistor (Pt100)

Pt100 platinum thermal resistor specified in JIS C1604 as thermal resistor is a most precise and reliable one compared with a conventional temperature measurement by thermistor.

Feature of the Karl Fischer moisture titration is now added

This new model can work on moisture titration when connected with the optional Karl Fischer Moisture Titration unit. That is, not only regular but moisture titration can be simultaneously performed on a single control panel. For an optional moisture titration, both volumetric and coulometric systems are available.

Two different potentials (pH / temperature, pH / transmittance or the like) can be simultaneously recorded

The two potentials, e.g. pH and temperature, pH and conductivity or pH and transmittance can be plotted on single titration curve. Thereby, you can see the behavior of conductivity in relation to changing pH or the changes of color by the indicator in correlation to the actually changing pH.

The control unit and the titration unit can be remotely placed and operated

The control panel and the titration unit can be separated more than 10 meters away. Safe measuring environment is secured by installing the titration unit in a drafter while the operator works on the control unit outside a drafter.

Compact Flash (CF) card is now equipped for an extended memory storage

CF card can store measurement results and methods for titrations. The electronically stored data can serve as future references to review the results or the reevaluation of past records.

Two titrations can be simultaneously performed in parallel

This new model works as two titration units in one when connected with an optional titration unit. For instance, both acid base and salt titration can be performed at the same time. It goes without saying that this unit can save your bench space a lot.

Feature of GLP/GMP support

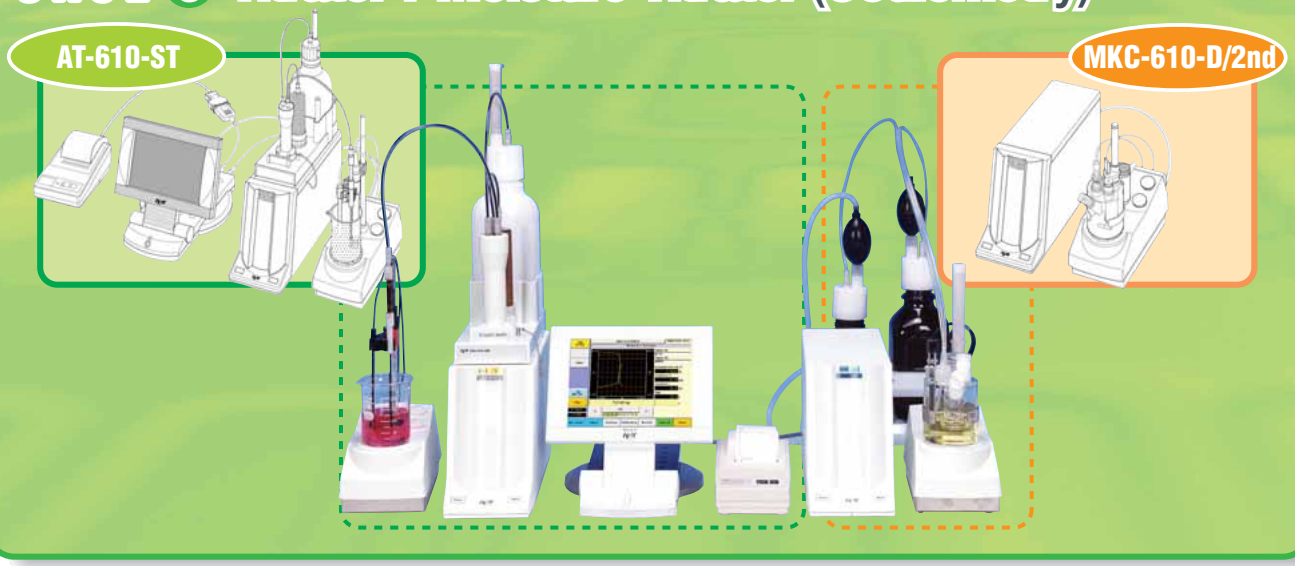
Conforming to GLP and GMP, those requirements like control of the testing equipment including checks of the unit performance with standard substances or calibrating the electrode are satisfied by recording their results. Those records can be viewed on history archive screen. In addition to recording maintenance results, the advance notice of reagent replacement date and piston replacement date appears on display to affirm correct and in-time maintenance.

Examples of Combination

CASE 1 Titrator + Titrator

CASE 2 Titrator + Moisture Titrator (Volumetry)

CASE 3 Titrator + Moisture Titrator (Coulometry)



Specifications / Accessories

Specifications

Model name	AT-610 Automatic Potentiometric Titrator
Detection range	1) Potentiometric : -2000mV~+2000mV 2) pH : 0.00~14.00pH 3) Temperature : 0~100°C
Burette precision	50mL(option) : ±0.05mL, Repeatability ±0.02mL 20mL(standard): ±0.02mL, Repeatability ±0.01mL 10mL(option) : ±0.015mL, Repeatability ±0.005mL 5mL(option) : ±0.01mL, Repeatability ±0.003mL 1mL(option) : ±0.005mL, Repeatability ±0.001mL
Titration mode	Blank, Auto Titration, Auto Intermit, Intermit, Petroleum Titration COD control and Stat control--Total 7 modes
Number of methods	Standard methods: 50; Combined methods: 10(Max five methods can be combined.)
Kinds of titration	Potentiometric (acid/base, redox, precipitation) Photometric, Polarization and Conductometric titrations
Titration forms	Full titration(Auto EP detection) / EP Stop / Level Stop/ Intersect / EP Stop • Level Stop / Learn titration
Special applications	Measurement of electrode potential(pH, potential), pKa(Dissociation constant of acid) Two-system simultaneous recordings of input potentials (Examples: Titration volume vs. pH+%T, Titration volume vs. pH+μS)
Input method (MMI)*1	Direct operations on a touch screen
Display	1) 8-inch color LCD with 256 colors (800x600-dot resolution) 2) Simultaneous 2-channel display(even for a Karl Fischer Moisture Titrator)

Ext. I/O	COM port (Mini DIN 8-pin) x 2 channels For Printer, Electronic balance and Data Capture Software K-NET port x 2 channels, For titrating unit
Calculation	Concentration, Statistical data (Mean, SD*2 and RSD*3)
GLP support functions	Advanced registration of operators (Max 50 persons) Titrant: Warning of low-level titrant residue, Announcement of factor calibration date, Announcement of piston replacement date, Announcement of titrant replacement, Inspection: Announcement of inspection date, Records of inspection results Maintenance of electrodes: Announcement of calibration date, Records of calibration Inspection of burette capacity: Inspecting function and records of inspection results
Scalability	Burette unit: Max 10 units (Including one built-in) Measuring unit: Titrator (AT-610), Moisture titrator (either MKA-610 or MKC-610), Multiple sample changer (CHA-600)
Ambient conditions	1) Temperature: 5~35°C 2) Humidity: Below 85%RH (No condensation)
Power consumption	Main control unit: 100~120V AC / 200~240V AC ±10% 50/60Hz; Approx. 20W Titration unit/Stirrer: 100~120V AC / 200~240V AC ±10% 50/60Hz; Approx. 25W Printer: 100V, 120V or 230V AC ±10%, 50/60 Hz; Approx. 7W
Dimension and Weight	Main control unit : 230(W)x280(D)x255(H)mm; Approx. 2.0kg Titration unit : 120(W)x363(D)x610(H)mm; Approx. 4.0kg Stirrer : 118(W)x225(D)x320(H)mm; Approx. 2.0kg Printer : 106(W)x180(D)x88(H)mm; Approx. 0.4kg

*1 MMI : Man Machine Interface
*2 SD : Standard Deviation
*3 RSD : Relative Standard Deviation

Accessories

Type / Part name	Standard kit AT-610-ST	Photometric titration kit AT-610-PT	Polarization titration kit AT-610-OT	Conductivity titration kit AT-610-CT	pH Dual input kit AT-610-TT
Combined glass electrode(98100C171)	1	1	1	1	1
Connecting cable for electrode(984290012)	1	1	1	1	1
Temperature compensation electrode(98100T171)	1	1	1	1	1
Photometric sensor(120011001448)	—	1	—	—	—
Interference filter 530nm(12001120048)	—	1	—	—	—
630nm(12001120148)		1			
Twin platinum electrode(98100M511)	—	—	1	—	—
Conductometric sensor(98101K321)	—	—	—	1	—
Connecting cable(984280032)	1	1	1	1	1
Internal solution for reference electrodes(988115001)	1	1	1	1	1
Single head wrench(985143339)	1	1	1	1	1
Piston extraction rod(985515002)	1	1	1	1	1
Stirrer rotor	1	1	1	1	1
Number sticker	1	1	1	1	1
Polyethylene bottle(69000280048)	1	1	1	1	1
Printer roll	1	1	1	1	1
Ribbon cartridge	1	1	1	1	1
Operation manual	1	1	1	1	1
Remarks	Used for ordinary titration such as Acid-base titration or Redox titration	Used for not only Acid-base titration or Redox titration but Water hardness Metal concentration of plating bath or the like	Used for not only Acid-base titration or Redox titration but Diazotisation titration for such as dyestuff	Used for not only Acid-base titration or Redox titration but Conductometric titration	Used for ordinary titration such as Acid-base titration or Redox titration

Additional equipment (Option)

Multiple Sample Changer CHA-600

Specifications

Model name		CHA-600-12	CHA-600-18
Max No. of sample		12	18
Available Vials	200mL beaker (PP)*1	Standard accessory	—
	100mL beaker (PP)	Yes(Need adjuster)	Standard accessory
	200mL beaker	Yes	—
	300mL tall beaker	Yes	—
	200mL Erlenmeyer	Yes (Need adjuster)	—
	50mL beaker	Yes (Need adjuster)	Yes
	100mL beaker	Yes (Need adjuster)	—
	100mL tall beaker	Yes (Need adjuster)	—
	200mL tall beaker	Yes (Need adjuster)	—
Rinsing method		Shower rinsing and dip rinsing(Option: It can be rinsed by two solutions.)	
Rinsing equipment		Exclusive rinse bath	
Rinse solution		Pure water, Alcohol or the like	
Stirring unit		Magnetic stirrer(built-in at the titration position) Propeller stirrer(Option)	
Sequence setting		Set on Automatic potentiometric titrators	
Sequence control		1) Automatic: Start on Automatic potentiometric titrators 2) Manual : Control with keys	
Method of display		LED	
Data communication		S-BUS: For connecting with AT-610/AT-510	
Dimension		520(W)x426(D)x369(H)mm	
Ambient conditions		5~35°C; Below 85% RH	
Power supply		100-120/200-240V AC, 50/60Hz	
Power consumption		Approx. 50W	
Weight		Approx. 17kg	

*1 PP : Polypropylene

Features

1) A plural number of samples can be automatically measured in a simple operation

From the beginning of start until the end of measurements, a number of samples in vials on the rack of a turn table can be continuously measured while unattended.

2) Well designed cleaning method, pre-treatment and post-treatment

The option of selecting shower or dip rinsing, and more elaborated combination of these processes can cope with various types of samples at a time. In addition to pre-treatment or dosing solvent medium, the waste liquid after measurement can be separately drained out and collected.

3) User sequence that can be programmed as you want

User can select a desired cleaning process the most appropriate to each sample character when connected to AT-610 or AT-510 automatic potentiometric titration unit so that both aqueous and non-aqueous samples can measured at the same time.

4) Pre-treatment by adding pre-dose reagent in advance

This is most useful for those samples of slow reaction. Reagent can be dosed to each or all of the samples on rack prior to start of a series of measurement.

5) Hood can be installed for safety use (Option)

The hood provides an environment of safety and security protecting the operator from hazardous condition when handling toxic chemicals like acetic acid or pyridine.

6) Thermal water circulator can be installed (Option)

This optional thermal water circulator is necessary for those samples that can be measured only at low temperature (approx. 10°C) or at high degrees (approx. 60°C). Also, it is useful for those samples that generate heat while being titrated.

Automatic Piston Burette

APB-600-AT

Specifications

Description	Automatic piston burette	
Type	APB-610	APB-600-AT
Display unit	LCD, 2 lines x 16 char., Backlight	Blue LED
Burette precision	50mL burette ±0.05mL; Repeatability ±0.02mL 20mL burette ±0.02mL; Repeatability ±0.01mL 10mL burette ±0.015mL; Repeatability ±0.005mL 5mL burette ±0.01mL; Repeatability ±0.003mL 1mL burette ±0.005mL; Repeatability ±0.001mL	
Delivery rate	Setting of delivery rate can be changed 50mL burette: 0.1~150mL/min 20mL burette: 0.02~60mL/min 10mL burette: 0.01~30mL/min 5mL burette: 0.05~15mL/min 1mL burette: 0.001~3mL/min	
Suction/Delivery selection	Automatic selection by ceramic valve	
Wetted materials	PTFE, glass and ceramic	
Reagent bottle	1000mL Polypropylene (PP) bottle	
I/O interface	S-BUS x 2ch for Automatic Potentiometric Titrator and Sample Changer Power jack for magnetic stirrer (Optional at the factory) RS-232C Mini DIN 8-pin x 1ch Jack for sensor of compensating titrant temperature and Sensor Pt100; precision of temperature reading: ±0.5°C	Communication established exclusively with the measuring unit
Power supply	100~120/200~240V AC, 50/60Hz	
Power consumption	Approx. 20W	
Dimension	120(W)x363(D)x610(H)mm (Including burette unit)	
Weight	Approx. 5kg	

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