



Automatic Potentiometric Titrators



High Performance: AT-510

Low Cost : AT-500N-1, AT-500N-2

Multi-channel Software : AT-Win

FDA 21 CFR Part 11 Compliant Software : AT-Win/ER



KEM Product Line

A wide selection of KEM Automatic Potentiometric Titrators models is available from process or quality control in production to research and development works in laboratory.

High Performance : AT-510



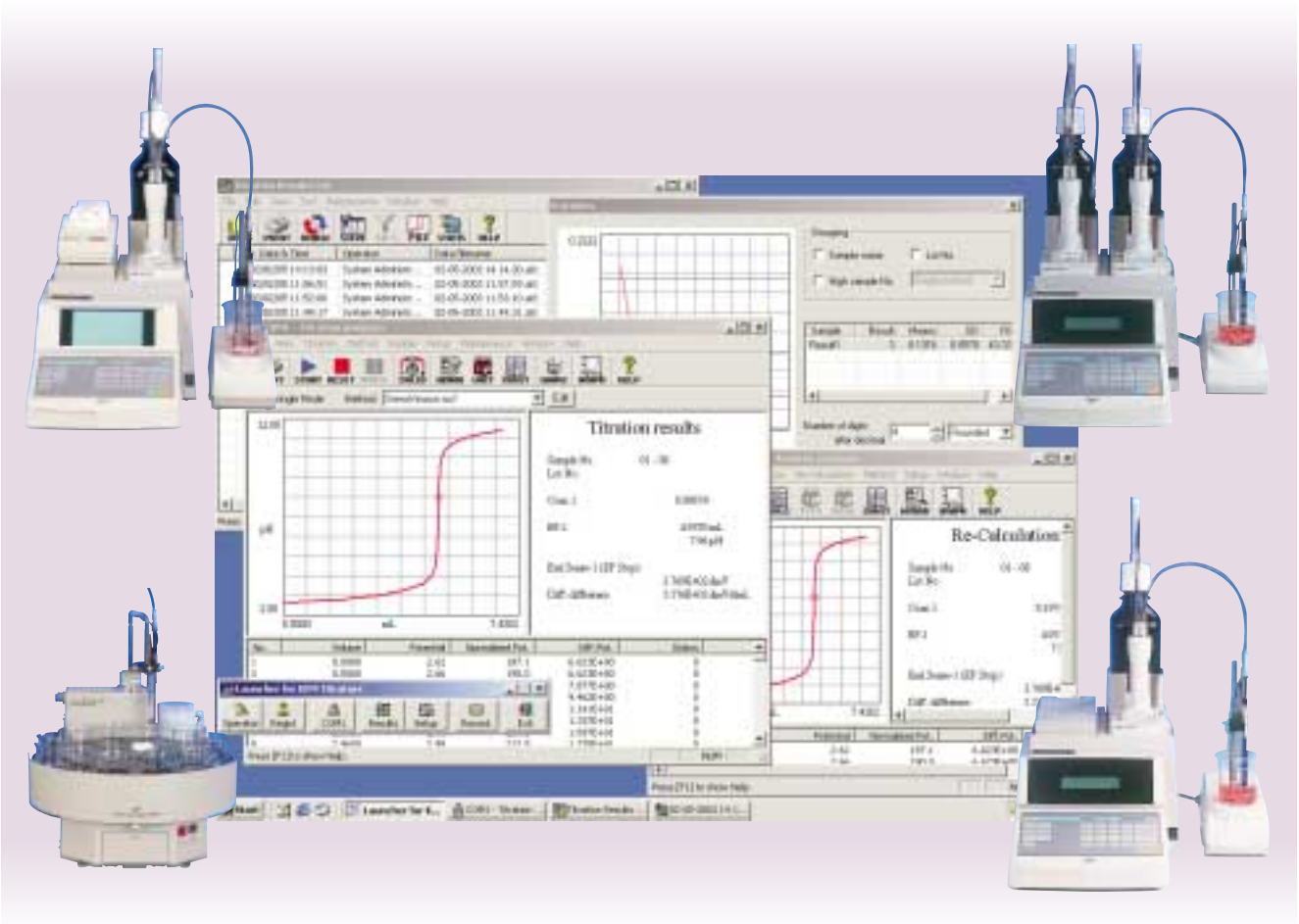
CHA-500 Multiple Sample Changer as an option.

Low Cost : AT-500N-1, AT-500N-2



KEM Product Line


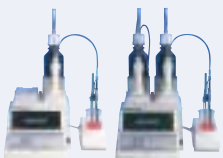


Multi-Channel Software : AT-Win



FDA 21 CFR Part 11 Compliant Software : AT-Win/ER



Features and Functions of KEM Product Line

	 AT-510	 AT-500N-1, 2	 AT-Win	 AT-Win/ER
Controlling unit	<i>Main unit</i>	<i>Main unit</i>	<i>PC</i>	<i>PC</i>
Language	<i>English / Japanese</i>	<i>English</i>	<i>English / Japanese</i>	<i>English / Japanese</i>
Data entry	<i>Key-in</i>	<i>Key-in</i>	<i>Keyboard and Mouse</i>	<i>Keyboard and Mouse</i>
Multitasking	<i>1 channel</i>	<i>1 channel</i>	<i>4 channels</i>	<i>4 channels</i>
Display	<i>126 x 70mm LCD with backlight</i>	<i>16 digits x 2 lines LCD with backlight</i>	<i>Screen display on PC</i>	<i>Screen display on PC</i>
Real time titration curve	<i>Yes</i>	<i>No</i>	<i>Yes (Multi-line)</i>	<i>Yes (Multi-line)</i>
GLP/GMP conformed	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Connectable number of APB-510	<i>10 (one built-in)</i>	<i>No</i>	<i>10 APB-510 to AT-510 (one built-in). 40 APB-510 to 4 AT-510 (4 built-in)</i>	<i>10 APB-510 to AT-510 (one built-in). 40 APB-510 to 4 AT-510 (4 built-in)</i>
Burette capacity	<i>50mL, 20mL, 10mL, 5mL, 1mL</i>		<i>—</i>	<i>—</i>
Data storage media	<i>PC card</i>	<i>No</i>	<i>HD and other devices</i>	<i>HD and other devices</i>
Sample changer	<i>Yes</i>	<i>Yes</i>	<i>—</i>	<i>—</i>
FDA 21 CFR Part 11	<i>Need AT-Win/ER</i>	<i>Need AT-Win/ER</i>	<i>No</i>	<i>Yes</i>
Electronic balance	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Preamplifier	<i>STD-510, POT-510 PTA-510, CMT-510 TET-510</i>	<i>STD-510 PTA-510 POT-510</i>	<i>Depending on a titrator</i>	
SOFT-CAP_E	<i>Yes</i>	<i>Yes</i>	<i>—</i>	<i>—</i>

AT-510 Automatic Potentiometric Titrator

The AT-510 Automatic potentiometric titrator is a new version of AT series offering better operational maneuverability and compactness in size while inheriting KEM's many years' advanced proven technology. This new model can perform potentiometric titration including acid-base, redox, precipitation, chelatometric and non-aqueous titrations. With optional peripherals, it also can perform photometric, polarization and surfactant titrations. When the multiple sample changer CHA-500 is connected, it can automate measurements of a number of samples unattended and save both time and man-power with reliable results and simpler operations, thus applicable to many fields where quality and inspection control, analytical works and R&D activities are demanded and conducted.



Features

1. Oversized LCD provides clearer readout of information such as Titration Curve and Messages
2. Increase in the types of endpoint detection
3. Anti-diffusion structure on titration nozzle of burette
4. GLP/GMP conformed
5. Data storing / recalling with PC cards
6. KF (volumetric) moisture titration unit as an option
7. COD titration unit as an option
8. Printing on A4/Letter size paper as an option

AT-500N Automatic Potentiometric Titrator



Features

1. Low cost and High performance
2. Easy-to-read LCD with backlighting
3. Anti-diffusion titration nozzle tip
4. Safety cover to protect burette
5. Selection of one or two burettes
6. GLP/GMP conformed
7. CE-marked level of safety and noise immunity
8. Easy-to-enter colored key pad
9. Three(3) interface ports : Balance, PC and Printer

Configuration of Function Keys



- APB** APB Enter Purge mode of burette or dose volume
- Up key** Deliver Titrant
- Down key** Fill Titrant and exchange burette unit
- Purge key** Purge Titrant
- Print** Print key Print out
- Stirrer** Stirrer key Turn on/off stirrer and select stirring speed
Push this key for two seconds, and the display shows setting stirring speed.
- Method** Method key Set Methods
- Titration** Titration key Set titration parameters
- Control** Control key Set control parameters
- Result** Result key Set calculation or print format
- Sample** Sample key Set parameters on a sample including the number of sample, sample size, etc.
- Function** Function key Set up functions as below:
 - 0. Method Copy 3. Changer File 6. Memory Clear
 - 1. Data File 4. Set Check
 - 2. Sample File 5. Periodic Check

Sample Key to enter sample number, lot number and sample size in weight

Function Parameters can be set with this key.
Functions include:

- 0.Method File 10.Auto Statis.
- 1.Data File 11.Common Blank
- 2.Sample File 12.pH Cal.Table
- 3.Changer 13.Card Utility
- 4.Re-Titr. 14.Memory Clear
- 5.Check Titr.
- 6.Set Check
- 7.Periodic
- 8.Buret Check
- 9.Auto Start

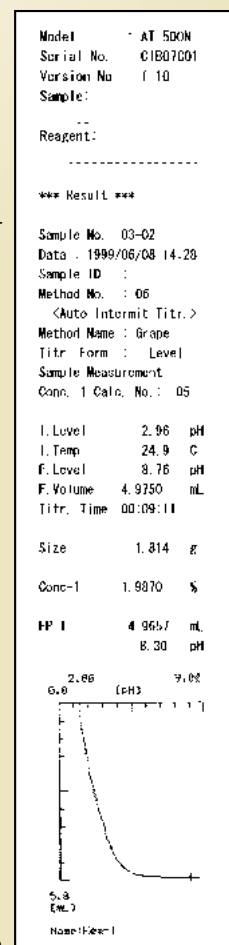
Setup Time and date can be set with this key.
Setup items include:

- 0.Interface
- 1.Date&Time
- 2.Regist Operator
- 3.Serial/Version No.
- 4.LCD Contrast
- 5.Language
- 6.Lock
- 7.Beep
- 8.pH Polarity

Esc. Key to return to the main screen display (standby state)

Disp. Key to switch displays or key functions and also used for auto input of sample size measured by an electronic balance

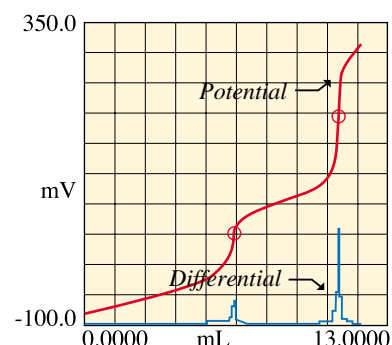
Example of printout



Features of KEM titrators

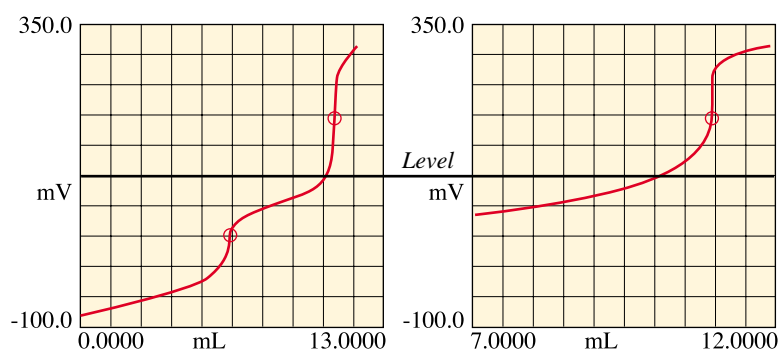
1. An endpoint can be detected precisely.

A precise endpoint, which is the most important target in titration, can be obtained from two detecting factors of dE (endpoint detecting potential) and dE/dmL (Max differential potential) without taking undesirable noises for endpoints.



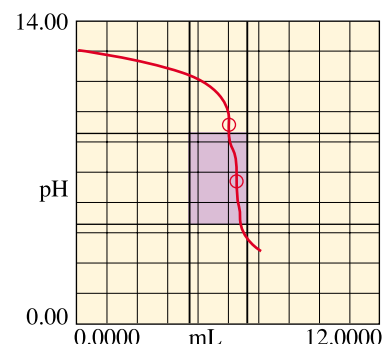
2. The endpoint whether single or multiple can be clearly indicated and separated in titration.

For example, Level Stop mode determines the detected single endpoint as EP2.



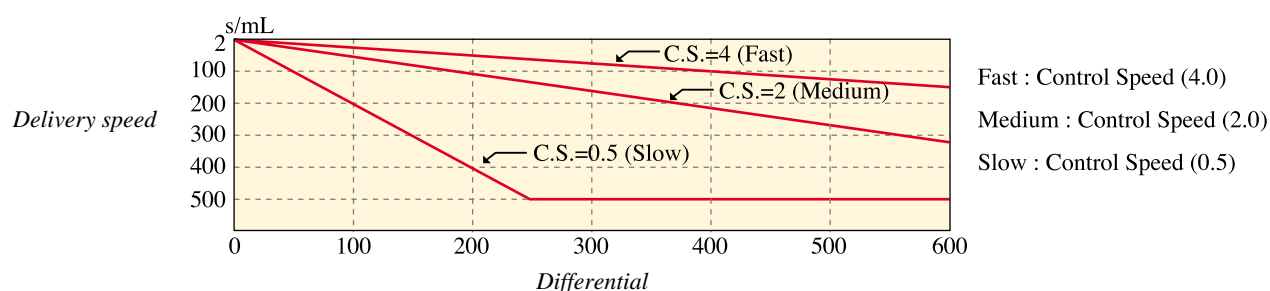
3. EP detection range can be set.

User can define titration volume and potential range, most useful in measurement under the influence of noise and carbon dioxide.



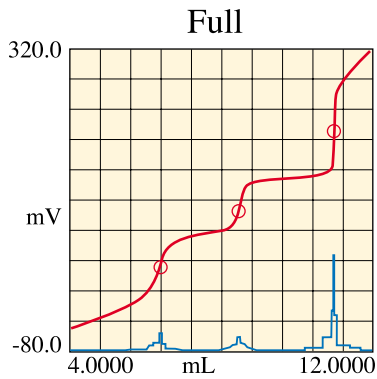
4. Delivery speed in titration is automatically controlled.

Where titration potential change (differential) is small the speed increases, while it is large the speed slows down automatically. Optimal control method in chemical reaction comes from the related combination of delivery speed and control speed : C.S.

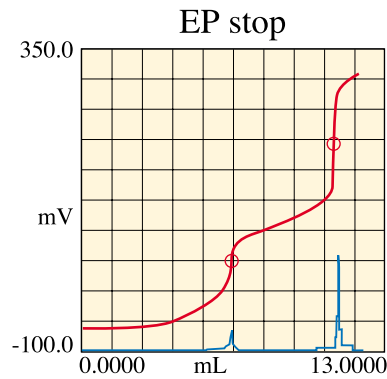


EP detection forms

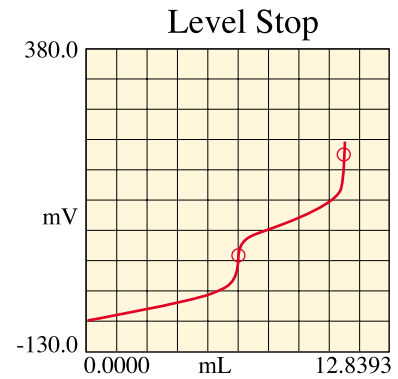
Various detection forms can be selected suitable for users' titration needs.



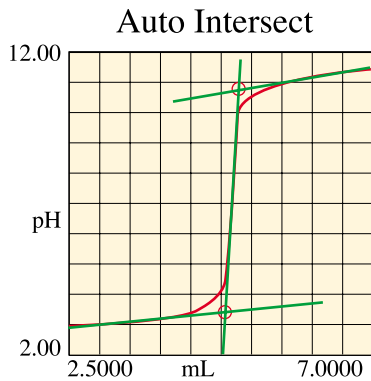
Titration will last to the preset volume and finds endpoints. This is useful for a sample of which endpoint number is unknown. Up to 3 EPs can be detected by AT-500N and 5 EPs by AT-510.



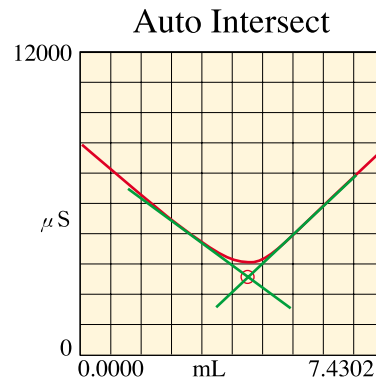
Titration will last until it finds preset number of endpoints defined by user on control parameter setup. Up to 3 EPs can be detected by AT-500N and 5 EPs by AT-510.



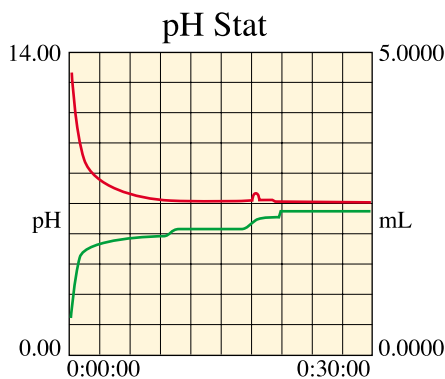
Titration will last up to the preset potential level (up to 2 levels) before stopping.



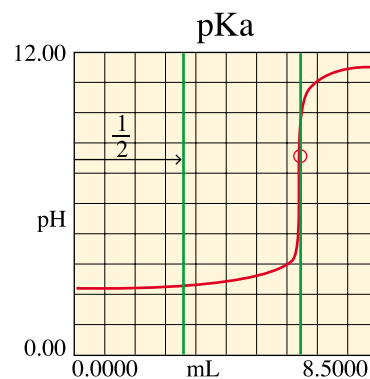
Two-tangent lines crossing point is determined as the endpoint, which is adopted in photometric titration or the like.



Two-tangent lines crossing point is determined as the endpoint, which is adopted in conductometric titration or the like.



Reagent is dosed to maintain control potential in Stat titration, and titration volume will be displayed at given interval.



A pKa value can be determined by finding pH at the half of titration volume in neutralization titration.

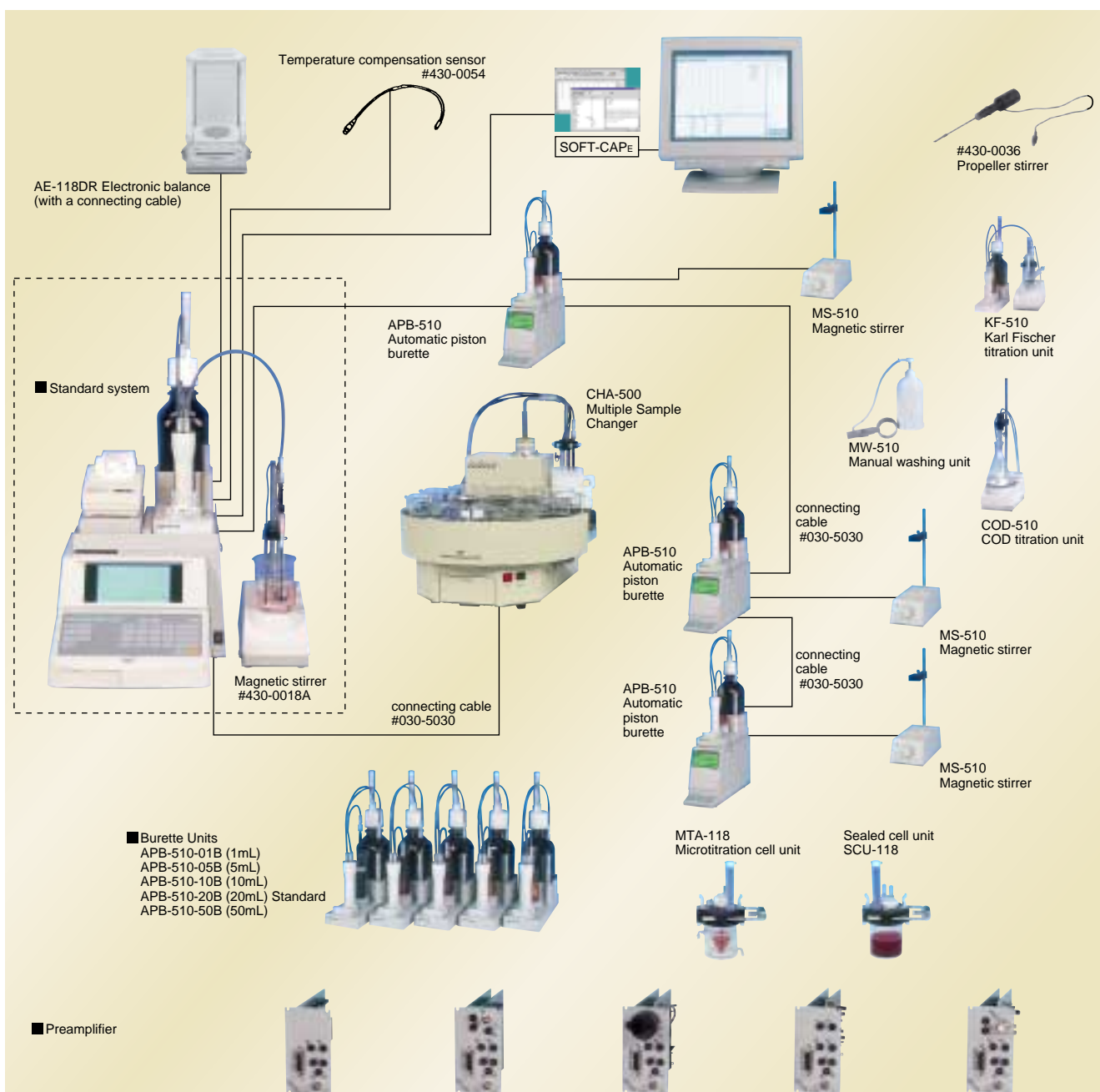
Applications of Automatic Titrator

Type of Industry	Object of Analysis	Titration Types	Titrant	Electrode / Preamplifier
Petroleum	Total acid number of petroleum products	Acid-Bass Titration	KOH	#100-H171d-R172
	Total base number of petroleum products		HClO ₄ / HCl	or #100-C172
	Chloride	Precipitation Titration	AgNO ₃	#100-C373
	Bromine Number	Polarization Titration	NBr, KBrO ₃	#100-M511or#100-M512/POT-510
	Mercaptan	Precipitation Titration	AgNO ₃	#100-C373
Medicine	Determination of Iodine	Oxdation-Reduction Titration	Na ₂ S ₂ O ₃	#100-C272
	Determination of Sodium acetate	Acid-Base Titration	HClO ₄	#100-H171d-R172
	Determination of Benzethonium chloride		Na(B(C ₆ H ₅) ₄)	or #100-C172
	Ca and Mg in Dialysis solution	Chelatometric Titration	EDTA	Photo Sensor / PTA-510
	Chloride in pharmaceutical products	Precipitation Titration	AgNO ₃	#100-C373
Foods	Acid value of beverages	Acid-Base Titration	NaOH	#100-C172
	Salts in seasoning/dressing	Precipitation Titration	AgNO ₃	#100-C373
	Vitamin C	Oxdation-Reduction Titration	indophenol	#100-C272
Electronic Power	Boric acid concentration in nuclear power plant	Acid-Base Titration	NaOH	#100-H171d-R172
	Total Acid Number of insulating oils		KOH	or #100-C172
Fats and Oils	Acid Value	Acid-Base Titration	KOH	#100-C172
	Peroxide Value	Oxdation-Reduction Titration	Na ₂ S ₂ O ₃	#100C-272
	Saponification value	Acid-Base Titration	HCl	#100-C172
	Hydroxy Value		KOH	
Electronic and Metal Planting	Metal Plating Solution Ni	Chelatometric Titration	EDTA	Photo Sensor / PTA-510
	Metal Plating Solution Cu			
	Free cyanide concentration	Precipitation Titration	AgNO ₃	#100-C373
	Boric acid in plating baths	Acid-Base Titration	NaOH	#100-C172
	Etching Solution H ₂ SO ₄			
	Chromic acid in chrome plating bath	Oxdation-Reduction Titration	Na ₂ S ₂ O ₃	#100-C272
City water/ Industrial water	Total hardness	Chelatometric Titration	EDTA	Photo Sensor / PTA-510
	Chloride	Precipitation Titration	AgNO ₃	#100-C373
	Alkalinity	Acid-Base Titration	H ₂ SO ₄	#100-C172
Detergents	Anionic Surfactants	Colloid Titration	Hyamine	#100-S173
	Cationic Surfactants		SDS	
Chemicals	Determination of Isocyanate	Acid-Base Titration	HCl	#100-C172
	Monomer residues in polyethylene	Oxdation-Reduction Titration	Na ₂ S ₂ O ₃	#100-C272
	Carboxyl group in PET resin	Acid-Base Titration	KOH	#100-C172
	Sodium hydroxide		HCl	
	Purity of acrylic acid		KOH	
Iron and steel/ Ceramics	Ferric iron in hydrochloric acid	Oxdation-Reduction Titration	Na ₂ S ₂ O ₃	#100-C272
	Fluoric acid and nitric acid in pickling solution	Acid-Base Titration	NaOH	#100-C172
	Trace chlorine in cements	Precipitation Titration	AgNO ₃	#100-I271d-R272
	Aluminum oxides in cements	Chelatometric Titration	EDTA	Photo Sensor / PTA-510

Specifications

Type and Model	AT-510 Automatic Potentiometric Titrator	AT-500N Automatic Potentiometric Titrator
Titration mode	Blank, Auto control, Auto cut off, Continuous/Intermittent constant rate, Petrochemical neutralization number, KF titration control, COD titration control	Blank, Auto control, Auto cut off, Continuous/Intermittent constant rate
Method	STD:7, User:38, Combined:5; Total 50	STD:4, User:16; Total 20
Type of titration	Acid-base, Redox, Photometric, Polarization, Combined, pH stat, pKa, Learning, KF moisture and COD titration	Acid-base, Redox, Photometric and Polarization titration
Titration form	Auto: Max inflection point, Level stop, Intersection Manual: EP stop, Intersection	Auto: Max inflection point(Full or EP stop titration), Level stop
Preamplifiers	STD-510, (TET-510, PTA-510, POT-510, CMT-510)	STD-510, (PTA-510, POT-510)
Display	LCD with back light, 126 x 70 mm, 30 digits by 13 lines	LCD with back light, 16 digits by 2 lines
Displayed contents	Titration curves, Titration parameters (titer, potential, temperature, etc.), Messages, etc.	Titration parameters (titer, potential, temperature, etc.), Messages, etc.
External input/output	RS-232C, Electronic balance, Ext. printer, Multiple sample changer	
Printer connection	Standard accessory: Impact dot printer (Ink-ribbon style), IDP-100 Options: A4/letter-size printers	Options: Impact dot printer (Ink-ribbon style), IDP-100
Data storage	Internal: 100 samples External: 100 samples per PC card	Internal: 100 samples
GLP/GMP conformity	Calibration history for electrodes, Setting of periodic inspection interval, Checking of burette precision, Alarm for replacing electrodes, Alarm for shortage of titrants, Inspection history for titration performance (one point), File for operator's name (up to 10)	Setting of periodic inspection interval, Inspection history for titration performance (one point), File for operator's name (one person)
Structure	Integrated construction of main unit and burette, Stirrer(#430-0018A) with a built-in preamplifier	
Burettes	One built-in APB-510 and up to 9 external APB-510 connectable Burette capacity: 20mL Optional burettes (mL): 1, 5, 10, 50	One built-in APB-510 (AT-500N-1) or two built-in APB-510 (AT-500N-2) Burette capacity: 20mL Optional burettes (mL): 1, 5, 10, 50
Steps for a full stroke	20,000 steps	20,000 steps
Burette precision	50mL burette ±0.05mL, Repeatability 20mL burette ±0.02mL, Repeatability 10mL burette ±0.015mL, Repeatability 5mL burette ±0.01mL, Repeatability 1mL burette ±0.005mL, Repeatability	±0.02mL ±0.01mL ±0.005mL ±0.003mL ±0.001mL
Switching for discharge or suction	Automatic with ceramic cock	
Liquid contacting materials	PTFE, glass and ceramics	
Ambient conditions	Temperature: 5 to 35°C; Humidity: Below 85%RH (No condensing)	
Power/Consumption	AC100-240 V, 50/60 Hz; approx. 30W	
Dimension	Main unit: 288(W) x 468(D) x 601(H) mm; Stirrer unit: 118(W) x 225(D) x 336(H) mm	
Weight	Approx. 10kg	
Standard accessories	Instruction Manual 1 Rotor for stirrer(25mm) #500-3141 1 Piston removing stick #551-5002 1 Combined glass electrode #100-C172 1 Temperature comp. electrode #100-T111 1 Impact dot printer IDP-100 1 Electrode cable #429-0012 1	Instruction Manual 1 Rotor for stirrer(25mm) #500-3141 1 Piston removing stick #551-5002 1 Combined glass electrode #100-C172 1 Temperature comp. electrode #100-T111 1 Electrode cable #429-0012 1

System Configuration



Model	STD-510	POT-510	PTA-510	CMT-510	TET-510
Application	Potentiometric	Polarization	Photometric	Conductometric	3-way titration
	Acid-base titration Redox titration Precipitation titration Non-aqueous titration	Potentiometric titration at constant current Amperometric titration at constant voltage Acid-base titration Redox titration Non-aqueous titration	Chelate titration Acid-base titration Redox titration Precipitation titration Non-aqueous titration	Conductometric titration Acid-base titration Redox titration Precipitation titration Non-aqueous titration	Acid-base titration Redox titration Precipitation titration Non-aqueous titration
Equipped as	Standard	Option	Option	Option	Option
Detected properties	1	pH	pH	pH	pH
	2	mV	mV	mV	mV
	3		Polar·Potential/Current	Transmittance	Conductivity
Detection range	1	0 ~ 14pH	0 ~ 14pH	0 ~ 14pH	0 ~ 14pH
	2	±2000mV	±2000mV	±2000mV	±2000mV
	3		0 ~ 2000mV 0 ~ 100µA	0 ~ 120%T	0 ~ 100µS 0 ~ 1000µS 0 ~ 10000µS
Remarks		Twin Pt. electrode not included	Photo sensor (530nm) included	Conductivity sensor included Exclusive for AT-510	Exclusive for AT-510

Options for AT-510 and AT-500-1,2

Automatic Piston Burette

APB-510



■ Features

- Titration nozzle of burette is made of PTFE and two kinds of nozzle, anti-diffusion type and normal type, are given as standard accessories.
- Safety cover to protect glass burette.
- Easy replacement of valve with newly designed flow-control valve for titrants.

■ Specifications

Type and model	APB-510, Automatic Piston Burette
Display	LCD , capable six digits display
Burette capacity	1)20mL glass burette (standard) 2)Unit with 50/10/5/1mL glass burette (option)
Reagent bottle	1000mL brown glass bottle
Power source	1) AC100-120 V or AC200-240 V 2) 50/60 Hz
Power consumption	20W
Dimension	120(W) x 365(D) x 450(H) mm
Weight	Approx. 5kg

Multiple Sample Changer

CHA-500-12/CHA-500-18



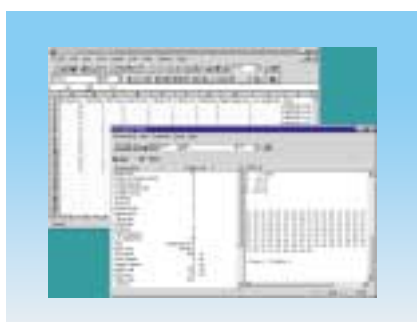
■ Features

- Can select washing sequences for electrodes suitable for titration applications:
 1. Acid-base titration
 2. Precipitation titration
 3. Standard non-aqueous titration
 4. Neutralization number titration on petrochemical products
- Optional Power Shut-off Unit POU-310 can be connected with CHA-500.

■ Specifications

Type and model	CHA-500 Multiple Sample Changer
Number of samples	12 or 18 samples
Sample vessels	Standard: 200mL beaker or 300mL tall beaker Optional: 50, 100mL beaker or 200mL Erlenmeyer flask
Rinsing method	Standard: Shower (equipped with rinse pot) Optional: Dip; Dip plus shower
Rinsing solution	Standard: Pure water; Ethanol or IPA (Isopropanol) Optional: Organic solvents such as toluene; Aqueous acid/alkali solution
Drain capabilities	Standard: Natural falling drain from rinsing pot Optional: Mixing/Separating drain by drain pump
Dosing of pre-treatment solution	Standard: N/A Optional: APB-510 or filling pump can be connected to CHA-500.

Data Capture Software **SOFT-CAPE**



■ SOFT-CAPE the Data Capture Software for AT-510/AT-500N Automatic titrators

- Data Capture Software can control Automatic titrators.
- Measurement results of Automatic titrators can be downloaded directly to workbook in Microsoft® Excel or filed in CSV format, such as Lotus1-2-3.
- Microsoft® Excel must be installed on the connected personal computer.

Combination Surfactant Electrode **#100-S173**



- Surfactants used to be determined by the Epton's method with the toxic solvent of Chloroform, but with this electrode one can measure the concentration of cationic or anionic surfactants quickly without Chloroform.

Main specifications

Item	Specifications
Concentration range	1x10 ⁻² M ~ 1x10 ⁻⁵ M
pH range	pH2 ~ 12
Temperature range	0 ~ 50°C

Stream Potential Titration Unit **PCD-500**



- Titration instrument for measuring on surfactants and polymer coagulants.
- A number of samples can be automatically measured using the Multiple Sample Changer.

Main specifications (not CE conformed)

Item	Specifications
Measured objects	Surfactants, polymer coagulants and the colloid solution with dispersing charged particles in Food industry
Measuring range	1x10 ⁻⁵ M or more
Output power	-2 to +2 VDC
Power source	100 to 240 VAC, 10W

Options for AT-510 and AT-500N-1,2

Micro Titration Assembly MTA-118



- This cell unit is useful for measuring trace amount of samples by titration. The structure features the sealed jacket of thermostatic bath.

Type	Cell shape	Min. sample vol.	Max. sample vol.
MTA-118-1	Tube	1mL	2.5mL
MTA-118-5	Cone	5mL	35mL
MTA-118-50	Cone	25mL	100mL

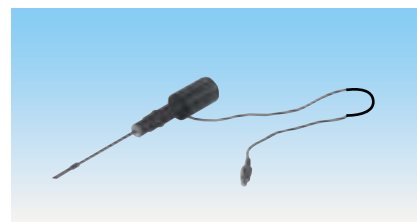
Sealed Cell Flask Assembly SCU-118



- This flask assembly with an electrode supporting holder is designed for samples that cannot be measured under normal ambient conditions. Titration can be performed with minimal influence of atmosphere by purging the inside of the flask with Nitrogen gas or filling the desiccant tube with Soda lime or the like.

Capacity of titration cell	200mL
Minimum sample required	At least 50mL

Propeller stirrer #430-0036



- This unit features stirring titrated sample solution with rotating propeller at the tip of a motoring rod as the substitute for a magnetic stirrer. (Exclusive for AT-510 and AT-500N)

Options Exclusive for AT-510

PC Card



■ The following three types of PC cards are available:

1. Memory card (#434-0039)

Can store, read and write measurement methods, titration conditions and other parameters. Further, can perform recalculation or statistical calculations by recalling measured data.

2. Application card (#434-0173)

Can use 70 various measurement conditions (parameters for such as titration, control or calculation) prepared by us.

3. pH temperature compensation card (#434-0175)

Can make temperature compensation on pH, based on international standards, with pH temperature compensation tables of ASTM, DIN, BS, NF and JIS.

PC Card Read Software

SOFT-PCR_E



■ Features:

1. Can store all data in PC card for backed up on a personal computer. In reverse, data stored in personal computer can be transferred to Memory card, meaning that instrument can be easily recovered.
2. Measurement results can be directly captured to MS Excel Workbook.
3. Measured data can be directly stored as files in CSV format. This CSV file is compatible with Lotus 1-2-3 spreadsheet software package.
4. Personal computer can separately store and manage measured data, measurement conditions or sample conditions stored in Memory card. In addition, data stored in personal computer can be transferred to Memory card. (This picture is superimposed.)

KF titration unit

KF-510

- KF titration unit KF-510
With this unit and the Karl Fischer reagents, one can measure water in samples.



COD titration unit

COD-510

- COD titration unit COD-510
This unit is used for the titration with Potassium permanganate in the last step of COD measurement.



Multi-Channel software perfectly supporting titration

- Can run four measurements simultaneously and concurrently.
- Can display four titration curves simultaneously.



Software for Titrators

AT-Win



AT-510



AT-500N-1



AT-500N-2



AE-118DR

Examples of connection of AT-510/AT-500N Automatic Potentiometric Titrator with Electronic Balance (AE-118DR)

Features

1. Auto settings of measurement conditions with the Navigating feature:

Just by entering user's intended main criteria including international standard (e.g. JIS, ASTM, ISO), sample type, measured object and measuring range, the complete titration conditions can be set up automatically. Additional powerful help by the Wizard enhances setting up measurement conditions through dialogue interactions.



2. Operational procedures displaying feature:

Simply select what you want to do-- the necessary procedures for user's desired measurement will be displayed sequentially prompting the entry step by step, allowing operators to avoid unintended or ignorant entry of numerical constants such as sample size and the like.



3. IT Support:

Details of AT-Win can be viewed at <http://www.kem.jp/itsupport/>, where the user can see and download data files on measurement conditions plus the up-to-date information on titration technique.



Features

4. GLP/GMP fully conforming:

Electrode and sensor	Notice of periodic calibration date Display of electrode calibration records
Burette validation	Notice of periodic check date Display of burette validation record Notice of piston head replacement date
Check with standard substance	Notice of periodic check date Display of check records
Others	Operational level authentication by user Display of operational records Alarm for remaining reagent volume



5. Operational management with security measures:

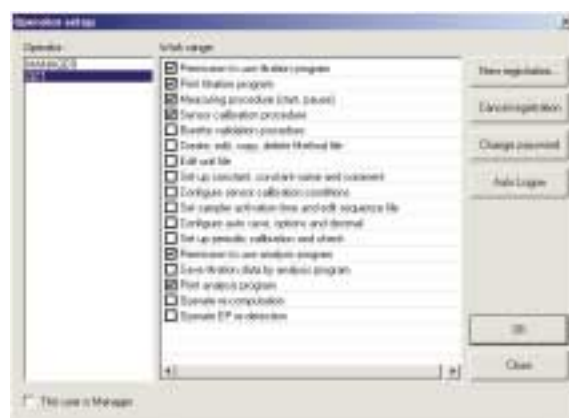
User ID and password security support operational management allowing solely managerial person to change parameters in order to avoid illegal or unauthorized alteration of measurement conditions or the like.

<The range of authentication of operational level>

Create, edit, copy or delete titration conditions of Methods.

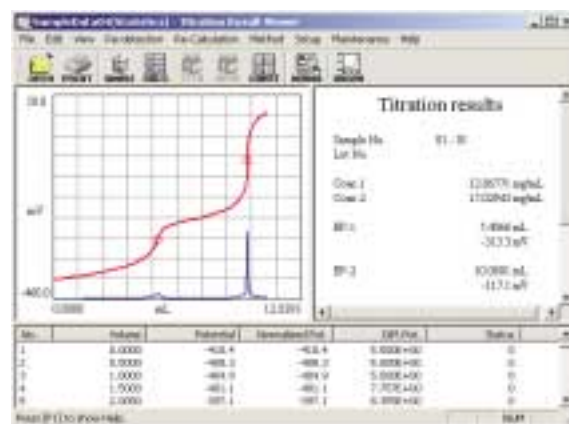
GLP/GMP requirements including electrode calibration and burette validation

Analysis of measurement data like re-calculation or re-detection of endpoints.



6. Standard-equipped Viewer linked to Network:

Not only measurement results can be viewed, but also the simulation of measurements, recalculation or analysis can be manipulated by other computers installed with Viewer via LAN linked. Of course, the user can create report and print it out with the Microsoft Word. The Viewer can be installed on plural personal computers.



7. Creating Report:

Since titration data are now converted to CSV format, they can be manipulated in other application softwares like Microsoft Excel, Lotus 1-2-3 spread sheet or Microsoft Access database software on the word-processing Microsoft Word.

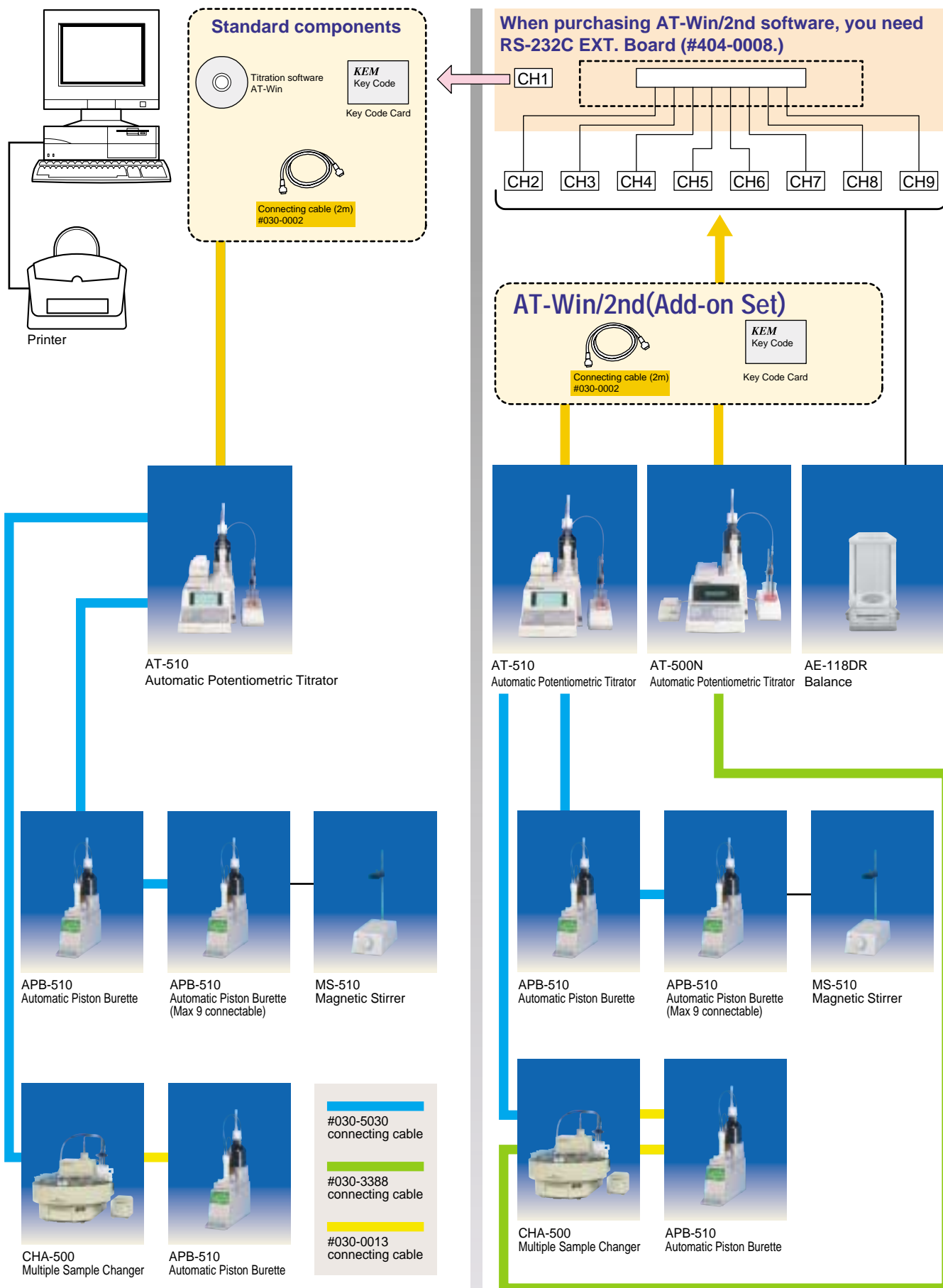
Therefore, the user can create Report easily and faster than before in one's original form, for example, using Microsoft Word's auto function, making use of its template and macro.



8. Barcode reader:

Sample ID or lot number can be easily input with a barcode reader sold on the market connectable to the keyboard of user's personal computer.

System Configuration



Specifications

■ Standard components:

Name of software	AT-Win	AT-Win/2nd
	Base set	Add-on set
Compatible model	AT-510/AT-500N	AT-510/AT-500N
Media	CD-R 1 pc.	No
Connecting cable	Connecting cable(2m) #030-0002 1	Connecting cable(2m) #030-0002 1
Key Code Card	*1	*1
Operation manual	1 copy	No

*1 For the purchase of a Key Code Card, the serial number of user's unit is required. This serial number must be notified by the user when used in combination with the unit already in use.

■ System requirements:

Device	Description
Computer	Personal computer with CPU of 500MHz or better * Intel Pentium/Celeron family, AMD K6-2/Athlon/Duron family or Intel compatible CPU's
Operating system	Windows 98SE/Me/2000/NT4.0(SP5 or later)/XP
Other programs	Microsoft Internet Explorer (Version 5.01 or later) Adobe Acrobat Reader (Version 4.0 or later)
RAM	128MB or more
Hard disk space	50MB or more free
Display	Resolution of 1024x768 or better
Disk drive	CD-ROM or DVD-ROM
Serial port	RS-232C D-sub (male) 9 pin or USB port: 1 port *2

*2 1) Each titrator has to have an extra serial port. Likewise, when a balance or barcode is connected to a PC, a separate serial port will be required in the computer accordingly.

2) With the optional RS-232C expanded serial port, up to four (4) titrators can be linked through the interface. Note, however, that at least one slot must be free on PCI bus. Additionally, Low Profile type of PCI bus may not be compatible.

3) If a PC has a built-in modem, one serial port may be already assigned.

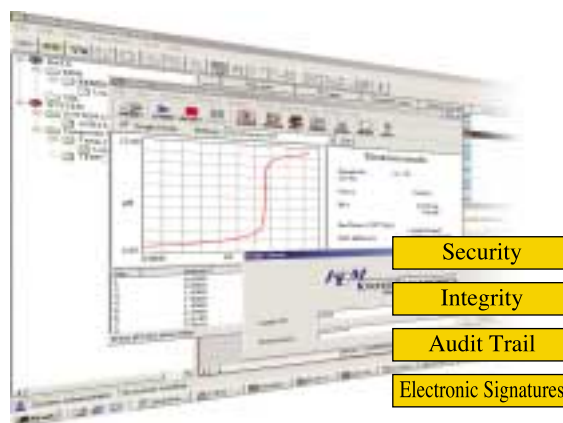
■ Options:

RS-232C EXT. Board	#404-0008	RS-232C expanded serial port (8ch, converting cable included)
Extension cable (For AT-510/AT-500N)	#008-0003	Connecting cable set (120 VAC) 10m
	#008-0004	Connecting cable set (230 VAC) 10m
	#030-5289	TCU cable (10m)
	#350-0005	Optical cable (30m)
	#350-0006	Optical cable (50m)
Extension cable (For AT-420N)	#030-5287	TCU cable (1m)
	#030-5288	TCU cable (5m)
	#030-5289	TCU cable (10m)
	#350-0005	Optical cable (30m)
	#350-0006	Optical cable (50m)

FDA 21 CFR Part 11 Compliant Software

AT-Win/ER

AT-Win/ER Titration Software featuring Electronic Records and Signatures compliant with FDA 21 CFR Part 11, inheriting proven user-friendly and competent features of AT-Win Software for titrators.



Software specifications:

Item		Description
Name of software		AT-Win/ER, FDA 21 CFR Part 11 Compliant Software
FDA 21CFR Part 11 compliant features	User authentication	Login ID and Password security User name and title registration Group management for up to 11 user groups Password valid period Detection of illegal access and lockout (access number counting and its time length)
	Electronic signatures	Signatures according to users' authentication Verified data is stored in database with comments
	Data integrity	Auto recording raw data and meta data in database Auto recording measurement parameters and results (Database:compatible with the Microsoft SQL Server/MSDE, Oracle) Can see stored and compressed data with Viewer
	Audit trail	Record created or changed Methods with comments Auto recording of results and re-evaluated data with all changes noted. Search the recorded data
	Backup function	Direct backup recording in CD-R or other device Backup data can be viewed directly.
GLP/GMP compliant features		Electrode calibration/Check with standard substances/Validation of burette dosing volume Notify Periodic calibration/check/validation (by setting date or its interval) Auto recording of the results of calibration/check/validation in database
Network link		Interface to the Shimadzu CLASS-Agent System
Compatible models		AT-510 and AT-500N

* "Windows, Internet Explorer, MSDE and SQL Server", "Oracle", "Acrobat" and "CLASS-Agent" are registered trademarks of Microsoft, Oracle, Adobe Systems and Shimadzu Ltd., respectively.

Standard components:

Name of software		AT-Win/ER	AT-Win/2nd
		Base set	Add-on set
Media	Titration software	CD-R 1 pc.	No
	Database controlling software	CD-R 1 pc.	No
Connecting cable		#030-0002 1piece	#030-0002 1piece
Key Code Card		*1	*1
Operation manual		One copy	No

*1 For the issue of a Key Code Card, report of the serial number on a user's AT unit is a must. When this software is used with the formerly delivered AT units, be sure to let us know the serial numbers of the concerned AT's.

* Hardware validation is required for user's computers on which this software is installed. For more details, please contact our local sales representatives in your country.

Features

1. Electronic signatures with ID and Password security

User authentication is secured by login/logout with ID and password. The password length and validity period can be precisely set for each user. Illegal access is prevented by lockout system, which records the attempt.



2. User group registration

Up to 11 separate user groups can be registered, each with its own password entry and individual level of access.

3. Audit trail

The required audit trail feature is fully compliant by recording data both before and after the change, which is traceable by the feature of log file self-generation.

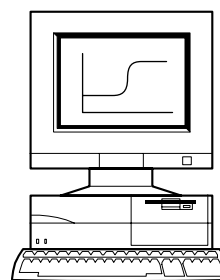


4. Secured data integrity

Database management of user information (name, title, e-mail address, etc) can be secured at higher level by linking the access-controlled database such as Microsoft SQL Server/MSDE or Oracle.

5. Electronic records and signatures

Data such as measurement results or conditions, electrode calibration or check with standard substances are automatically recorded onto the database, which can be electronically signed according to an approved workflow.

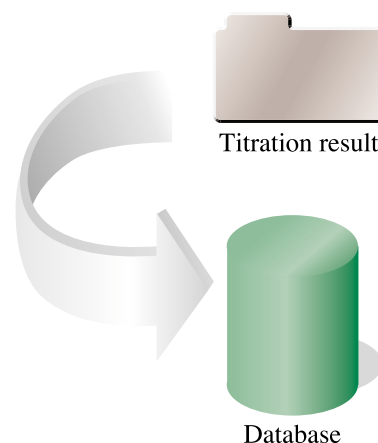


6. Network compatibility

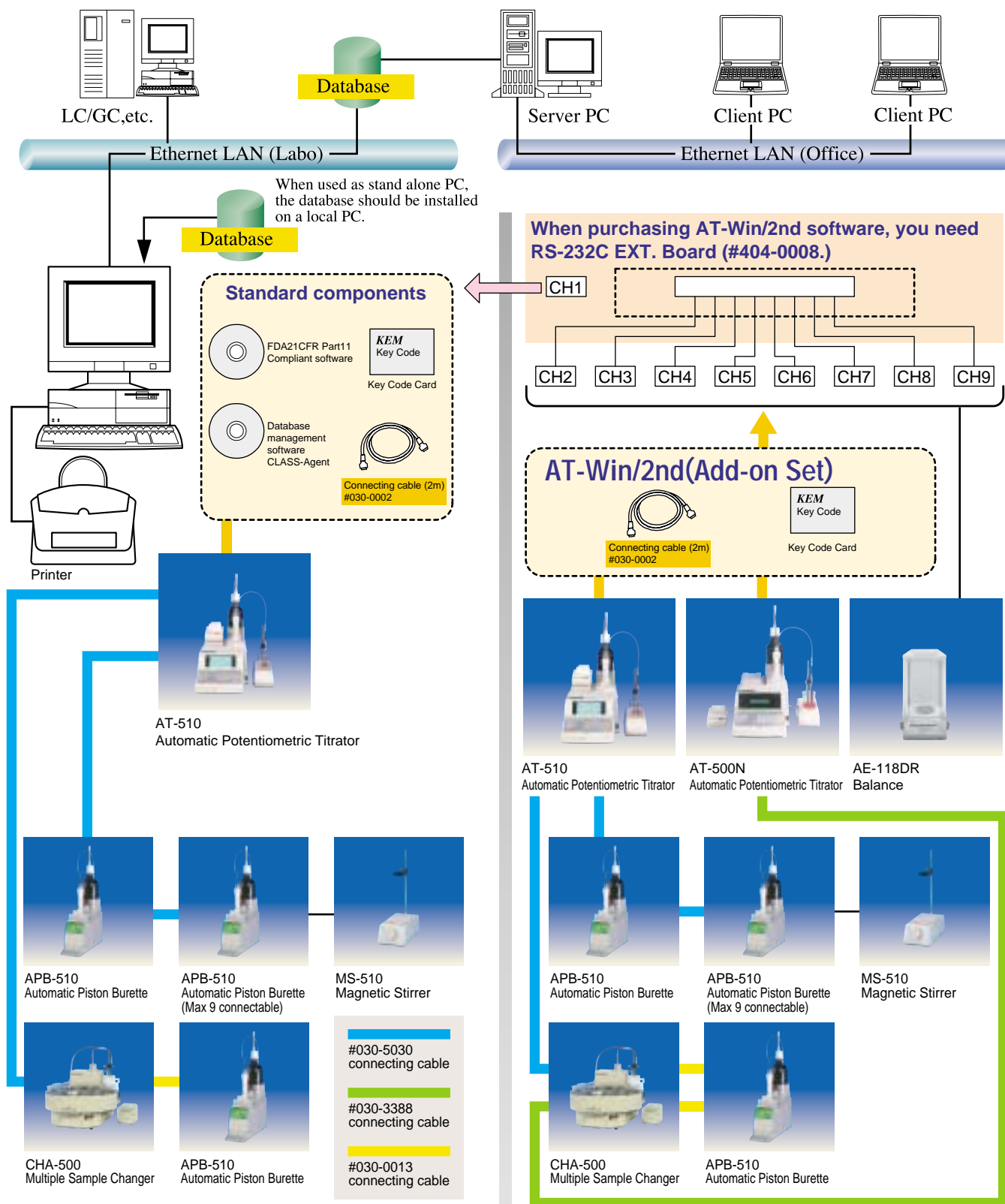
The network-interfacing feature, also compatible with the LAN on Client/Server system, allows the users to control their login records. In addition, the feature includes the interface to the Shimadzu LC/GC Network.

7. Backup system

The backup copies of data and log records together with the reasons can be made on commercial media such as CD-R using a CD-R/RW drive and a CD writing software.



System Configuration



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