

AUT-801

Automatic titrator

Various functions support
quality control and research
& development



- ◆ Enhanced functions for shortening titration time
- ◆ Simultaneous titration and display of 2 series

AUT-801 is a titrator that meets a variety of applications, such as simultaneous two-line titration.

Simultaneous titration of 2 series

By adding an optional burette to the standard configuration (single system), two different titration such as neutralization and oxidation-reduction titration can be performed simultaneously. In addition, it can be used for various purposes such as simultaneous measurement of pH and neutralization titration.

In addition, two sets of multi-sample measurement devices (turntables) are connected, and can construct a two-line multi-sample simultaneous titration system.

Single System

A system without simultaneous based on standard configuration

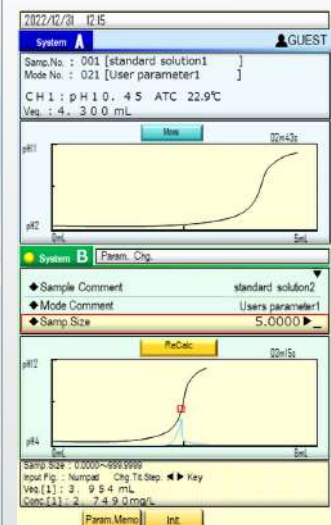


Dual System



Supports simultaneous display of two lines

Easy-to-read color graphic



Simultaneous display and titration of system A and B are supported. Viewing data and reanalyzing is available from one system while measuring with another.

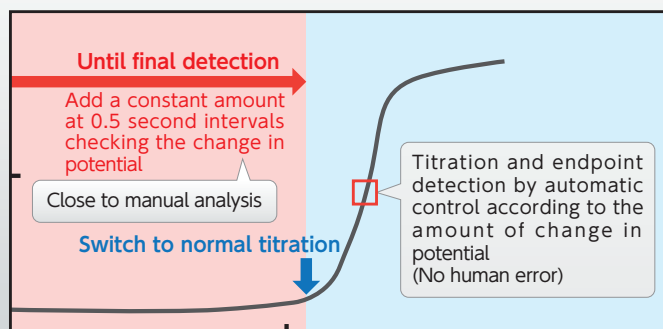
Dual-strain simultaneous titration system

In addition to the standard configuration, a titration burette (ABT-8), stirrer (ST-8), electrode, electrode stand, and electrode holder are required separately.

Versatile functions to support titration

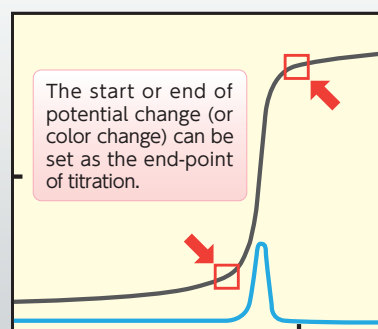
Support functions including optimization of titration conditions

Titration time shortened with an operation similar to manual analysis (semi-automatic mode)



Set point detection function

The set differential value can be selected as the end-point



Compatible with various titrations lineup of high-performance electrodes

- ◆ The pH electrode uses a pH glass electrode (Strong-pH) that is hard to break (excluding some electrodes).
- ◆ We offer various types of electrodes suitable for various titration methods, such as ORP electrodes for redox titration, silver composite electrodes for salinity titration, electrodes for non-aqueous titration, and EC cells for electrical conductivity titration.

Compatible with various titrations

- ◆ Equipped with 2 channels of pH/mV input as standard. Optional titration units (light intensity, polarization, electrical conductivity, potential difference) can be added to the 3rd and 4th channels.

Data Memory Function

- ◆ At the time of single system, 600 data can be memorized in the main body.



*300 data for each system when multi-tasking in 2 lines (dual system)
(300 x 2 = 600 data)

Equipped with USB port as standard (memory only)

Data Print Example

```

System [A]
[Titration Result]
Sample No.002
Date          2023/  2/ 13 11:50
Titration Time      00:01:23
Operator Name      GUEST
Sample Size        1.0000

Mode No.          1
Neutral.tit.1
Electrode Ch.     1
Buret Ch.         1
Wait Time         0
Tit.Step          1
Tit.Unit          pH(ATC)
Valid Diff.1     400.0
Cont.P.1(Unit)   NoSet
Over Tit.Cnt.1   4
Fast Tit.         Normal
    
```

The built-in printer prints in English, Korean, and Japanese making it easier to understand the titration conditions.

Equipped with validation support function

- ◆ pH calibration history (up to 20 calibrations), burette capacity verification history creation function.

Various applications and labor saving through expandable system



Turntable
TTT-710 (second)



Automatic Sampling
Device
AST-3210



Turntable TTT-710



Electronic
balance



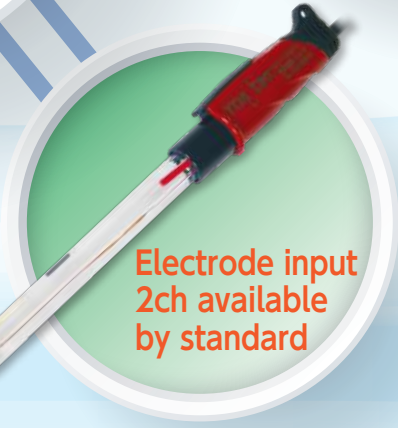
Either one is
connectable



Titration Burette
ABT-8 or ABT-7
(Can connect up to 10 burettes
to a single AUT-801 main unit)



External printer
EPS-P30



Electrode input
2ch available
by standard



USB or RS-232C

Optional Detector Unit

- Photometric Titration Unit (FUT-8010)
- Polarization Titration Unit (FUT-8030)
- Conductivity Titration Unit (FUT-8040)
- Potentiometric Titration Unit (FUT-8050)

Up to 2 types connectable
(2 types of same unit are connectable)

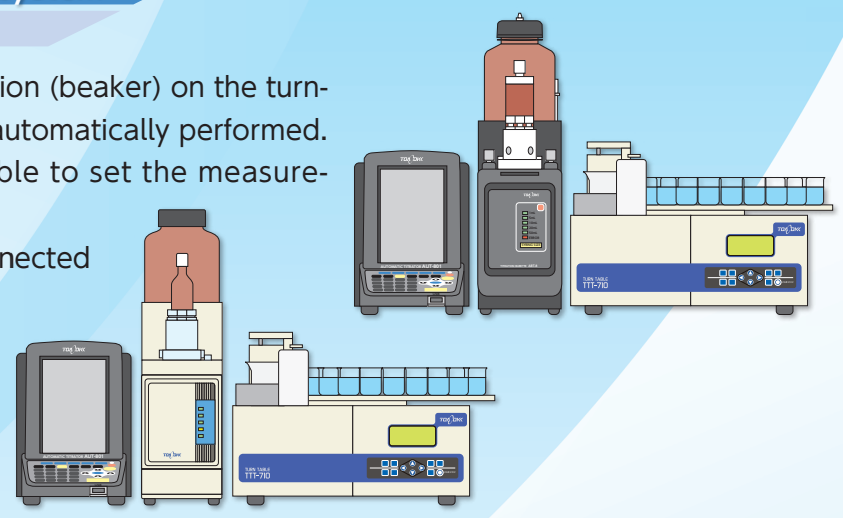


System Example

Multi-sample Automatic Titration System AUT-801(single) + TTT-710

By setting the pretreated sample solution (beaker) on the turntable, titration of multiple samples is automatically performed. By using the flex function, it is possible to set the measurement conditions for each sample.

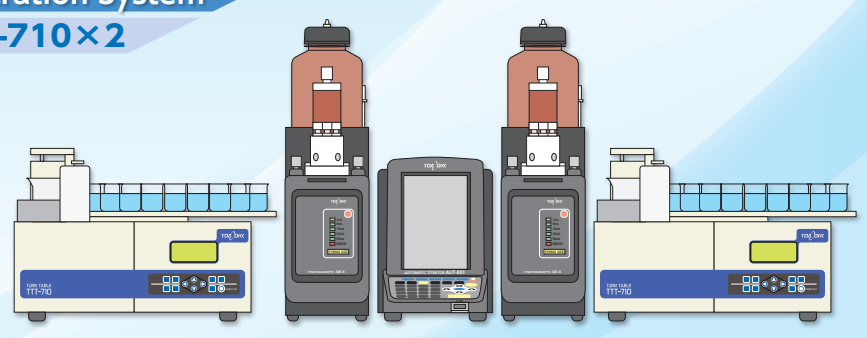
*The titration burette can also be connected to the previous model ABT-7.



Dual Multi-sample Automatic Titration System AUT-801(dual system) + TTT-710x2

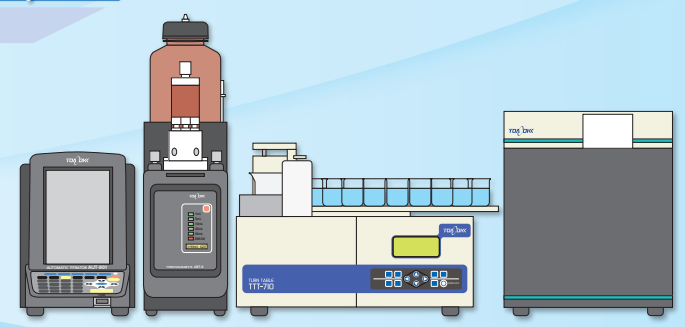
Multi-sample titration is available for two different types of measurement item. Also it can be utilized for upgrading the titration process function of the same samples.

*Titration burettes can also be connected to the previous model ABT-7.



Multi-sample Automatic Sampling Titration System AUT-801 + TTT-710 + AST-3210

By setting an appropriate amount of sample (beaker) on the turntable in advance, a series of processes such as sample weighing, dilution, reagent dispensing, titration, and washing can be automatically performed for multiple samples.



Titration burettes can be connected to one AUT-801 unit (maximum 10 units).

Connection between the current model ABT-8 and the previous model ABT-7 is available

Auxiliary Equipments

Supports continuous automatic measurement of multiple samples

Turntable TTT-710

Excellent Maintenance

Electrode cleaning tank and electrode storage tank placed on the front of the device. Maintenance of pipes, electrodes, etc. has become easier.

Abundant electrode cleaning mode

Equipped with shower cleaning with pure water as standard. Chemical cleaning, bubbling cleaning, and air blowing are available as options.

Equipped with a stand for the analyzer (optional)

In order to save space including the analyzer, we have prepared a dedicated analyzer installation stand.



Specification

Number of samples/ response beaker	12 samples	200mL beaker, 300mL tall beaker (Recommend: AGC Techno Glass or HARIO glass beaker)
	18 samples	100mL tall beaker (Recommend: AGC Techno Glass or HARIO glass beaker)
	36 samples	30mL beaker, 50mL tall beaker (Recommend: AGC Techno Glass beaker)
	60 samples	20mL dedicated beaker (Nichiden Rika Glass Co., Ltd. H-20)
	100 samples	20mL dedicated beaker (Nichiden Rika Glass Co., Ltd. H-20)
Stirring method		Standard: Magnetic stirring method Optional: Propeller Stirring method
Cleaning mode		① Pure water shower → Air blow ② Pure water bubbling → Pure water shower → Air blow ③ Chemical shower → Pure water shower → Air blow ④ Chemical bubbling → Pure water shower → Air blow ⑤ Chemical bubbling → Pure water bubbling → Pure water shower → Air blow ⑥ Chemical bubbling → chemical shower → air blow ⑦ Chemical shower → Air blow ⑧ Chemical bubbling → Pure water bubbling → Chemical shower → Air blow Note) ・Air blow cleaning is available in the optional air pump box at time of usage. ・Bubbling cleaning is available with optional air pump box and waste liquid valve at time of usage. ・Please contact us for details on chemical cleaning.
Cleaning time		0 to 9999 sec.
End sample detection		Detecting by end detector pin or end table number setting
Cleaning Tank Material		PP
Performance guarantee temperature		5 to 40°C
Power		AC100 to 240V 50/60Hz
Power Supply	Standard	AC100V at time of usage: Max. Approx. 60VA AC240V at time of usage: Max. Approx. 90VA
	Optional Connection	AC100V at time of usage: Max. Approx. 100VA AC240V at time of usage: Max. Approx. 130VA
Dimensions		Approx. 440(W) × 409(H) × 391(D) mm (When the table plate is not attached)
		Approx. 566(W) × 409(H) × 507(D) mm (When the table plate is attached)
		Approx. 566(W) × 534(H) × 507(D) mm (During operation Max. dimension)
Main Unit Weight		Approx. 16kg (When the table plate is not attached) Approx. 18kg (When the table plate is attached)

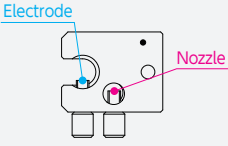
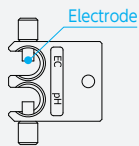
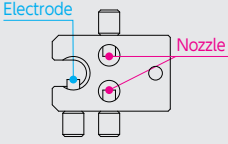
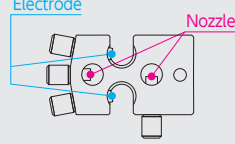
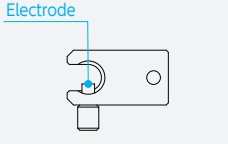
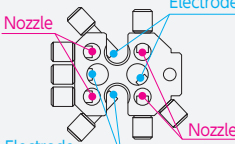
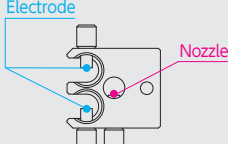
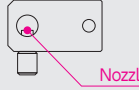
Standard Accessories

Table (Select one from 12, 18, 36, and 60 samples)	End detecting pin
	O ring
Electrode cartridge (Numbers of samples/specify one type depending on the application)	Small hoffman pinch cock
	Power code
Cleaning water tank (with 10L solution level sensor)	2P·3P transmitter adapter
Waste solution tank (with 10L solution level sensor)	Disposal beaker(200ml)
Cleaning water tube (3m)	Instruction Manual
Waste water hose (1.5m)	

Option

Product name	Code
For connecting turn table RS-232C cable (2m) (For connecting AUT-801)	7703820K
Air pump box (For air blow)	7400560U
Air pupm box (For air blow + bubbling)	7401640U
Waste liquid valve for TTT-710 (Pinch cock)	7401650U
Waste liquid valve for TTT-710 (Solenoid valve)	7401660U
Propeller stirring unit (For 12, and 18 sample table)	7401670U
Propeller stirring unit (For 36 samples)	7401680U
Propeller stirring unit (For 60, and 100 sample table)	7401690U
Installation table for analyzer (For AUT-801)	7401710U

Electrode Cartridge

Product name (Numbers of connectable electrodes / nozzles)	Code	Exterior	Product name (Numbers of connectable electrodes / nozzles)	Code	Exterior
1CH cartridge 1 (X) (X mounting hole:1, N mounting hole:1) (12, 18, 36, 60, 100 samples)	7505010K		2CH cartridge 2 (X) (X mounting hole :2) (12, 18, 36samples)	7505030K	
1CH cartridge 2 (X) (X mounting hole:1, N mounting hole:2) (12, 18, 36 samples)	7505020K		2CH cartridge3 (X mounting hole :2, N mounting hole :2) (12, 18samples)	6597940K	
1CH cartridge3 (X) (X mounting hole:1) (12, 18, 36, 60, 100samples)	7506840K		Multi cartridge (J mounting hole :2, ION mounting hole :2, N mounting hole :4) (12samples)	6597980K	
2CH cartridge1 (J mounting hole :2, N mounting hole :1) (12, 18, 36samples)	6597970K		Sample suction cartridge (N mounting hole :1) (12, 18, 36, 60, 100samples)	6597990K	

* X, J, ION, N indicated on the mounting hole describes mounting electrodes and nozzles.
X: for X/R series electrode J: for J/S series electrode ION: single-purpose type ion electrode N: nozzles

* Beakers for each table plate

- 12 sample table plate :200mLbeaker, 300mL tall beaker
- 18 sample table plate :100mL tall beaker
- 36 sample table plate :30mLbeaker, 50mL tall beaker
- 60 sample table plate :20mL Dedicated beaker
- 100 sample table plate :20mL Dedicated beaker

For the expansion of dual systems, etc.

Titration burette
ABT-8



Stirrer
ST-8



For printing of measurement conditions and analysis results

External printer
EPS-P30



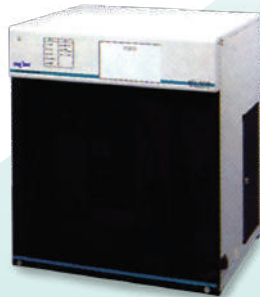
Data-management PC software

Data-gathering software
801-LOG

The titration data can be saved to a personal computer via microUSB cable or RS-232C cable.

Automation of measurement to titration to clean

Automatic sampling measuring equipment
AST-3210



Sample lightweight method	Three-method cock switching measuring tube system
Amount of sample	Approx. 0.2 to 20mL (loop volume (measuring tube) fixed)
Light weight repeatability	Not more than 0.5% CV (with sample volume 10mL)
Measuring tank	Material : Hard glass
	Maximum capacity : Approx. 150mL
	Minimum requirement : Approx. 100mL
	Number of Electrodes Mounted : Up to 4 bottles Number of titration nozzles installed : Up to 4 bottles
Alarm display	Pure water empty, waste liquid, system failure
Waste liquid/pure water porin tank	20L polyethylene tank
Power supply	AC100V 50/60Hz
Power consumption	Approx. 100VA
Dimensions·Weight	Approx. 565 (W) × 635 (H) × 480 (D) mm Approx. 45kg

*Connection cables to the titrator main unit, electrode relay leads, etc. are required separately.

Optional Detection Unit

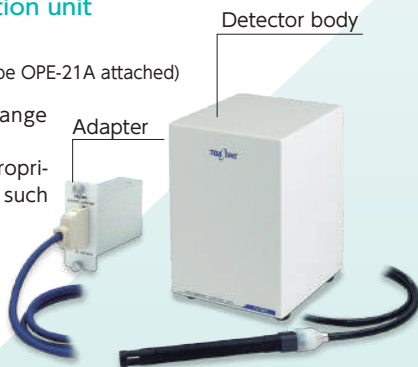
Photometric titration unit
FUT-8010

(photometric sensor probe OPE-21A attached)

Used to detect color change by indicator method. It can be used for an appropriate amount of metal ions such as plating solution.

※Adapter is incorporated into the main body, and detector main body is separately placed.

Detector body dimensions : Approx. 102 (W) × 153 (H) × 119 (D) mm
Standard-Interference Filter : 530nm, 630nm



Potentiometric titration unit
FUT-8050

(electrodes sold separately)

Used as a potentiometric titration unit other than the potentiometric input of the standard 2ch.

※The unit is integrated into the main body.
※Separately arrange pH, ORP electrodes.

mV : 0 to ±200.0mV
Temperature : 0 to 100.0°C



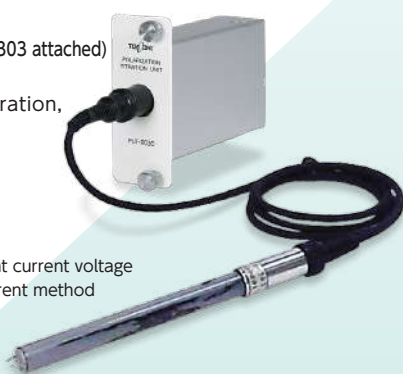
Polarizable titration unit
FUT-8030

(Bi-platinum electrode HPD-303 attached)

Used for bromine value titration, diazotization titration, etc.

※The unit is integrated into the main body.

Measurement method : Constant current voltage method or constant voltage current method
Applied voltage : 0 to ±1000mV (arbitrarily set)
Applied current : 0 to ±99.9μA (arbitrary setting)



Electrical conductivity titration unit
FUT-8040

(Electric conductivity cell CT-58101B)

In addition to conductivity titration, it can also be used for conductivity measurement.

※The unit is integrated into the main body.

Measuring range : 0 to 200.0S/m (depending on the cell used)
Manual range for the titration mode (The range is set by the main unit)
Temperature : 0 to 100.0°C



Small titration unit

Small titration-kit ASSY 7075600K

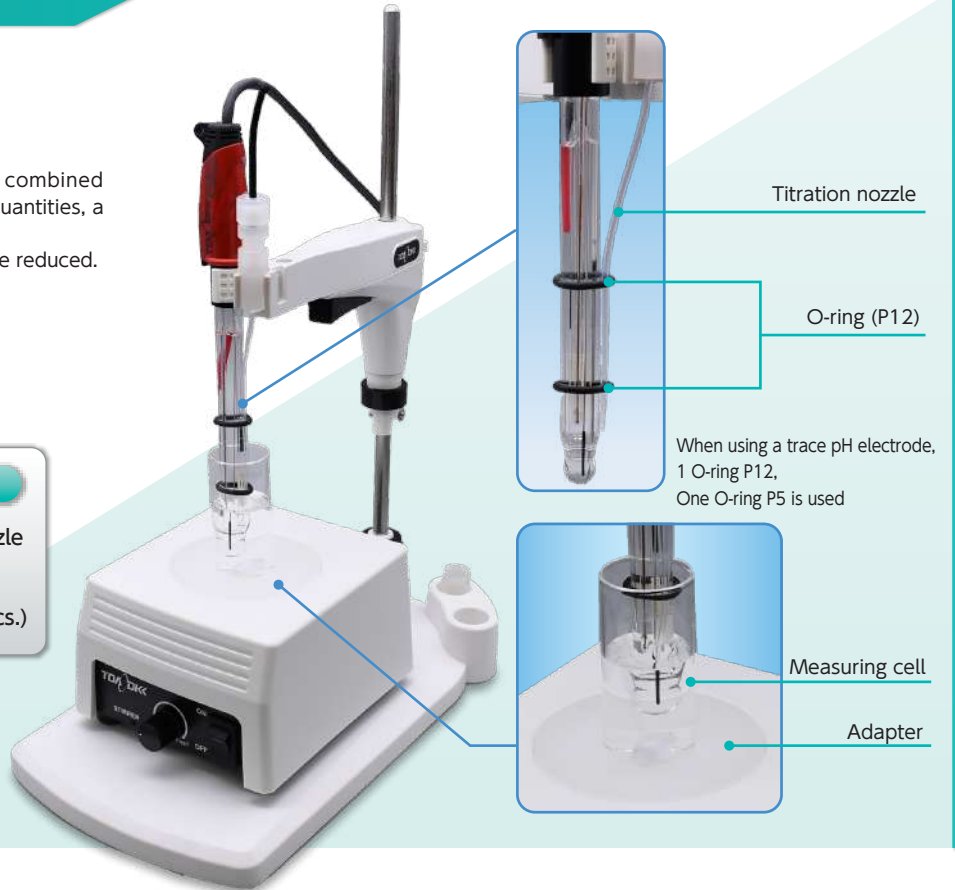
We have prepared a small titration unit combined with a pH composite electrode for trace quantities, a silver composite electrode, etc. The amount of titrant waste solution can be reduced.

(Some titrations may not be available.)

Min. volume : Approx. 10mL
Max. volume : Approx. 20mL

Configuration

Adapter, stirrer (2 pcs), Titration nozzle
Measuring cell (50 pcs.),
O-ring (P5) (2 pcs.), O-ring (P12) (2 pcs.)



Electrodes

Uses (Representative titration examples)	Item name	Model/ Code No.	Note
Neutralization titration	pH compound electrode (For general use) Strong-pH	GST-5841C	AUT-801 standard-attached electrode
	pH Combined Electrode (For Trace) Strong-pH	GST-5845C	
	pH combined electrode (Double junction)	ELP-062	Liquid junction replaceable Useful when spillage of KCL solutions is problematic
Oxidation reduction titration	ORP compound electrode (For general use)	PS-5011C	
	ORP composite-electrode (Double junction)	ELM-016	Liquid junction replaceable Useful when spillage of KCL solutions is problematic
Salinity titration	Silver composite electrode (Double junction)	ELX-006	Liquid junction replaceable
Nonaqueous titration	Glass electrodes (For general use)	HGS-2005	Electrode adapter (0JD00001) for connecting the main unit
	Comparison electrode (Double junction)	HS-305DS	An electrode-holder (S-HLD-S) is required separately
Photometric titration	Light sensor probe	OPE-21A	Photometric titration unit standard attached probe
Polarizable titration	Two platinum electrodes	HPD-303	Polarized titration unit standard attached electrode
Titration electrical conductivity	Conductivity cell	CT-58101B	Electrode with electrical conductivity titration unit standard

Use of pH glass electrodes that are resistant to cracking

We have used Strong & Float-pH electrodes that combine our sensor technologies. (excluding some electrodes)

Strong UP the strength of the tip
(more than 10 times that of us)

Float Built-in float that can be checked for inner
liquid density at a glance



Parts and standard solutions

Main unit related parts

※Standard Accessories: Additional arrangements are required when constructing the standard accessory dual system.

Item name	Model/Code No.	Note
Stirrer	ST-8	
Electrode stand ※Standard Accessories	7702590K	With support and stopper
Electrode Holder ※Standard Accessories	7430850K	
Electrode attachment (G) ※Standard Accessories	0IB00004	For electrodes of X series etc.
Electrode attachment (J) ※Standard Accessories	0IB00005	For electrodes of J series etc.
Electrode attachment (N) ※Standard Accessories	0IB00008	For nozzle, etc.
Electrode attachment (ION)	0IB00006	Single capacity ion electrode
Electrode adapter	0JD00001	Single-function electrodes can be connected
Electrode holder (R series)	0IB00001	Required when attaching 4 to 5 electrode attachments
Electrode relay lead (1m)	0GB00001	
Electrode relay lead (3m)	0GB00002	
Minor titration kit	7075600K	Configuration: Adapter, Stirrer (2 pcs.), Titration Nozzle, Measuring Cell (50 pcs.), O-ring (P5) (2 pcs.), O-ring (P12) (2 pcs.)
Turntable Connecting Cable (2m)	7703820K	For connecting TTT-510/TTT-710
AST connecting cable (2m)	7703830K	For connecting AST-3210
RS-232C connecting cable (2m)	0GC00002	For PC connection (PC connector standard: D-Sub9P)
USB Communication Cable (2m)	7473100K	For connecting a PC (cable length 2m)
Comparative electrode-internal-liquid RE-1 100mL	143F230	Internal solution of monofunctional comparative electrode (HS-305DS, etc.)
Comparative electrode-internal-liquid RE-2 100mL	143F238	Outer cylinder liquid such as an electrode for salinity titration
Printer paper (Volume 5)	PAP-HCS	AUT-801 Standards Attached/Thermosensitive Paper for Built-in Printer
OA tap out WCH2436H	102DE26	If the number of outlets is insufficient, purchasing is required Wire length 3m, 6 ports

Bullet-related parts

Item name	Model/Code No.	Note
Syringe unit base (for 1 to 20mL syringes)	7703030K	Standard accessories for ABT-8 Syringes, nozzles, tubes, and reagent bottles are sold separately ※If a syringe other than "20mL syringe module brown" is used, a syringe holding ring is required separately
Syringe unit base (for 50mL syringes)	7708720K	Dedicated for ABT-8 : Syringes, nozzles, tubes, and reagent bottles are sold separately
Syringe holding ring (syringe (brown) 1 to 20mL)	X8774900	
Syringe holding ring (for syringe (brown) 50mL)	X5009600	
Cap nut (for 3-way cock) 5pcs	AUT-061P	
Contains 5 bag nuts (for syringe)	AUT-062P	
Tapered piece (10 pcs.)	AUT-063P	
20mL Syringe Unit (brown)	7702900K	Standard accessories 20mL syringes (for modules), syringe covers (brown), syringe caps for 20mL, bag nuts, and one tapered piece



Bullet-related parts

Item name	Model/Code No.	Note
For 20mL Syringe Module Unit	7702910K	20mL syringe-unit (brown) components
Syringe cover brown	76808800	20mL syringe-unit (brown) components
20mL syringe cap	76274500	20mL syringe-unit (brown) components ※O-ring for 20mL syringes, syringe packing, bag nut, and tapered piece are sold separately
O-ring for 20mL syringes	115A089	20mL syringe-unit (brown) components
20mL syringe packing	115J074	20mL syringe-unit (brown) components
Retaining washer	77078700	1 bottle For retaining pipes
50mL syringes brown	P000010	With one cap nut and one taper piece For ABT-8 use, a separate syringe-unit base (50mL) is required
20mL syringes brown	AUT-045P	With one cap nut and one taper piece For ABT-8 use, a separate syringe-holding ring (X8774900) is required
10mL syringes brown	AUT-046P	With one cap nut and one taper piece For ABT-8 use, a separate syringe-holding ring (X8774900) is required
5mL syringes brown	AUT-047P	With one cap nut and one taper piece For ABT-8 use, a separate syringe-holding ring (X8774900) is required
1mL syringes brown	AUT-048P	With one cap nut and one taper piece For ABT-8 use, a separate syringe-holding ring (X8774900) is required
Defoaming nozzle (for 1 to 20mL syringes)	P000070	Standard accessories Brown with bag nut
Defoaming nozzle (for 50mL syringes)	P000071	Brown with bag nut
Reagent bottle (with tube joint)	7075630K	ABT-8 reference product attached 1000mL semi-transparent brown poly bottle
Carbon dioxide absorption tube (with tube)	7075640K	ABT-8 reference product attached
Teflon tube black (for 5-50mL syringes) 2m	AUT-022P	ABT-8 reference product attached For 5 to 50mL syringes ($\phi 2 \times \phi 3$)
Teflon tube black (for 1mL) 2m	AUT-024P	For 1mL syringes only ($\phi 1 \times \phi 3$)
Hardware for syringes	AUT-066P	ABT-8 reference product attached
Cleaning metal fitting for nozzle	AUT-067P	ABT-8 reference product attached
Nozzle purge tube	P000108	ABT-8 reference product attached
Adapter	70774700	Minor titration kit components
Stirrer bar	107D101	Minor titration kit components
Titration nozzle (for trace amounts)	AST-P008	Minor titration kit components
H-20(50 pcs. / 1 box)	136C591	Minor titration kit components
O-ring (P12)	115A620	Minor titration kit components
O-ring (P5)	115A628	Minor titration kit components

Titration body AUT-801

◆ Specifications

Display	7inch color graphics LCD	
Display language	Japanese / English / Korean	
Display content	Titration curves, titrations, pH or mV, liquid temperature, and titration times concurrently displayed For dual-system: System A/ system B simultaneous display/switch display is enabled	
Operation key/ operation method	Flat key/function key, numeric keypad interactive method Numeric keypad toggle input supported	
JIS Model (pH)	JIS type I	
Law Type Approval No. (pH)	Application pending	
Titration / measurement method	Inflection point detection titration	Stat titration
	Setpoint detection (titration unit/derivative value)	Pre-titration
		pKa determination
	Total titration (inflection point detection/set point detection)	pH/mV determination
		pH control
Intersection detection titration	Electrical conductivity measurement	
Titration stage number	Up to 5 stages (intersection detection up to 2 stages)	
Titration mode	Standard mode: 20/System User mode: 40/system Link Mode (For Sequence Titration): 20/System	
Titration control system	Single System (System A) Switching dual system (System A and System B) sets Dual-system simultaneous two-series titration/measurement enabled	
Measurement items/range	pH:pH 0.00 to pH 14.00 reference 2ch only mV:0.0 to ±2000.0mV Temperature :0.0 to 100.0°C [When the option is connected below] Galvanostatic method: 0-2.000 μA 0-20.00 μA 0 to 200.0 μA 0 to 1000 μA (depending on the range switching) Constant current/voltage method: 0.0 to ±2000.0mV Electrical conductivity: depending on the cell used Display range 0 to 200.0μS/m (0 to 2.000μS/cm) 0 to 2.000mS/m(0 to 20.00μS/cm) 0 to 20.00mS/m(0 to 200.0μS/cm) 0 to 200.0mS/m(0 to 2.000mS/cm) 0 to 2.000S/m (0 to 20.00mS/cm) 0 to 20.00S/m (0 to 200.0mS/cm) 0 to 200.0S/m (0 to 2.000S/cm) (Manual range when performing titration mode, For electrical conductivity measurement, only auto range. During electrical conductivity measurement in the potential measurement mode, Manual range/Auto range selectable.) Transmittance (photometric titration): 0.0-100.0%	
	Number of electrode inputs	Max. 4ch Potentiometric (pH/mV)2ch equipped as reference) 3ch, 4ch is added by the optional detecting unit
Number of titration burette connections	Up to 10 units can be linked	
pH Calibration	Automatic 5-point calibration (manual calibration for optional standard solution calibration)	
pH reference solution selection	JIS Standard Solution / US Standard Solution / Type 2 / Optional Standard Solution (Max. 5-point Calibration)	
Standard solution for pH optional	Input 2 arbitrary standard solution table	
pH Temperature compensation range	ATC (automatic temp. compensation): 0.0 to 100.0°C MTC (manual temp. compensation): 0.0 to 100.0°C	

Temperature electrical conductivity compensation	The temperature compensation range	ATC (automatic temp. compensation): 0.0 to 100.0°C MTC (manual temp. compensation): 0.0 to 100.0°C No Temp. Compensation (ATC OFF)
	Reference temperature setting	0 to 100.0°C
	Temperature coefficient (linear)	0 to 10.0%/°C
Data memory (re-analyzable)	Up to 600 data per series 300 × 2 = 600 data for multitasking in 2 series (dual system)	
Printer	Built-in line thermal printer	
Validation Support Functions	pH Calibration History: Up to 20 Calibration minutes Voluntary Inspection History: Up to 6 (Voluntary Inspection with Checker Input) Periodic Inspection History: Up to 10 (Periodic Inspection with Standard Reagents) Bullet Capacity Assay History: Up to 6 (The burette has information) Instrument and electrode control deadline alarm (date control) Reagent Replacement Alarm (Date Control) Syringe Replacement Alarm (Select either Date Control/Stroke Count Control) Reagent remaining amount warning (set reagent amount beforehand)	
Communication function/external control input/output	RS-232C×5ch 1.Titration burette (up to 10 units can be linked) 2.PC (D-sub) 3.Turntable (TTT-710) 4.Any one of Automatic sampling measuring device (AST-3210), Turntable(TTT-710) and electronic balance 5.External printer (for plain paper printing) (EPS-P30) 1 USB (for memory) 1 USB peripheral	
Other functions	Burette connecting function ※Stat titration Semi-automatic mode (time-shortening titration mode) Manual end point detection Wireless communication available (optional)	
Performance guaranteed temperature and humidity	5 to 35°C 20 to 85% (non-condensing)	
Power supply	AC100 to 240V 50/60Hz (dedicated AC adapter)	
Power consumption	Max. 45VA(AC100V) Max. 60VA(AC240V) (Adapter DC Out DC24V 33VA)	
Dimensions	Approx. 150(W) × 215(H) × 385(D) mm	
Weight	Approx. 3.2kg	

◆ AUT-801 reference product attached

Item name	Model/Code No.
Stirrer (with one stirrer)	ST-8
Stirrer-burette connection cable	7692410K
pH electrode (Strong-pH compound electrode)*	GST-5841C
pH6.86 reference solution 500mL*	143F192
pH4.01 reference solution 500mL*	143F191
Solution within the reference electrode (50mL)	—
Electrode stand (with support, stopper)	7702590K
Electrode holde	7430850K
Electrode Attachment (Type G)	OIB00004
Electrode Attachment (Type J)	OIB00005
Electrode Attachment (Type N)	OIB00008
Printer paper (Volume 5)	PAP-HCS
Power cord	118C252
AC adapter	134L070
2P-3P converter adapter	118C504
Ground wire (2m)	XL600697
Ring instructions manual	—

※When no electrode or standard solution is specified, it is not attached.

Titratable burette ABT-8

◆ Specifications

Display	Syringe size indicators: LED indication Error indicators: LED indication
Syringe size setting	Flat key
Syringe	Syringe inner cylinder precision polishing type 20mL clear glass syringe with brown syringe cover Optional syringe (brown glass syringe) 1 mL, 5 mL, 10 mL, 20 mL, 50 mL
Material of wet part	PTFE, PCTEF, hard glasses, fluorine rubber
Tube used	Tube to be used $\phi 2$ (inside) x $\phi 3$ (outside) Black Teflon tube ($\phi 1$ (inside) x $\phi 3$ (outside) black Teflon tube when using 1mL syringe)
Aspiration rate	Full stroke Approx. 20 sec.
Discharge speed	50mL syringes: 2 to 150 mL/ min 20mL syringes: 0.6 to 60.0 mL/ minutes 10mL syringes: 0.3 to 30.0 mL/ 5mL syringes: 0.2 to 15.0 mL/ minutes 1mL syringes: 0.03 to 3.00 mL/ minutes
Minimum output	50mL Syringes: 0.0025 mL 20mL syringes: 0.001 mL 10mL Syringes: 0.0005 mL 5mL Syringes: 0.00025 mL 1mL Syringes: 0.00005 mL
Bullet accuracy	In 20mL syringes Total volume error: ± 0.1 % Dispensing repeatability: ± 0.01 mL
Validation Support Functions	Burette Volume Test History: Up to 6
Power supply output for stirrer	DC5V for dedicated stirrers
Performance guaranteed temperature and humidity	5 to 35°C 20 to 85% (non-condensing)

Power supply	AC100 to 240V 50/60Hz (dedicated AC adapter)
Power consumption	Max. 35VA(AC100V) Max. 45VA(AC240V) (Adapter DC Out DC24V 28VA)
Dimensions	Approx. 113 (W) x 396 (H) x 348 (D) mm
Weight	Approx. 5.2kg

◆ ABT-8 reference product attached

Item name	Code No.
Syringe unit base (for 1 to 20mL) Including test tubes for nozzle standing	7703030K
Reagent bottle (1000mL semi-transparent brown poly-bottle)	7075630K
Carbon dioxide absorption tube (with tube)	7075640K
20mL Syringe Unit (brown)	7702900K
Syringe mounting brackets	AUT-066P
Defoaming nozzle (for 1 to 20mL)	P000070
Cleaning metal fitting for nozzle	AUT-067P
Purge tube for nozzle	P000108
O-ring for syringe	115A089
Teflon tube black (2m)	AUT-022P
Burette connecting cable (1.8 m)	118B129
Retaining washer	77078700
Power cord ※	118C252
AC adapter ※	134L070
2P-3P converting adapter ※	118C504
Earth wire (2m) ※	XL600697
Ring instructions manual	—

※No service outlets. One power supply is required for each burette body.
Buy optional power taps (6 units) (Item Code: 102DE26) as needed.

Stirrer ST-8

Compliant beaker	Up to 200mL beaker
Connector terminal	Power supply for upper agitation unit
Power supply	DC5V (dedicated cable/dedicated AC adapter AC100 to 240V 50/60Hz optional)

Power consumption	Max. 5VA(AC100V) Max. 9VA(AC240V) (Adapter DC Out DC5V 5VA)
Dimensions•Weight	Approx. 110(W)x73(H)x135(D) and Approx. 0.8kg

◆ Standard accessories

Item name	Code No.
Stirring bar ($\phi 8 \times 25$ mm)	107D039

※Dedicated AC adapter instead of stirrer bullet connecting cable if purchased separately (7430880K) And the power cord (118C229) is included.
If the dedicated AC adapter is used, there is no service outlet.

Analysis Solutions in Wide Range of Applications



Food Processing

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841C	Fruit beverages by set point titration Acidity analysis of yogurt, etc.
		Continuous analysis of acidity and formol nitrogen in fruit beverages
	pH multiple electrode GST-5823 S	Analyze the emulsion (C ₃ H ₆ O ₃) concentration of the noodle processing solution
Oxidation-reduction titration	ORP compound-electrode PST-5821C	Total acidity and amino acid content analysis of sake
		Vitamin C concentration analysis in juices Peroxide value (POV) analyses of edible oils
Precipitation titration	Silver combined electrode ELX-006	Seasonings (soy sauce, sauce, vinegar, etc.) Salinity analysis of dried sauce
Chelatometric titration	Photometric titration unitFUT-7010 (filter 630nm)	Calcium concentration analysis in cornflakes
	Calcium ion-electrode CA-135B Reference electrode HS-305DS	Calcium concentration analysis in nutritional fortification agents
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Oxidation analysis of edible oils
		Analysis of Amino Acids by Perchlorate Titration Method
Titration electrical conductivity	Conductivity titratable unit FUT-8040	Sulfate ion (SO ₄ ²⁻) concentration analysis
Acid-base titration Precipitation titration	KCL Supply-type pH combined electrode ELP-062	Continuous analysis of acidity and salinity of vinegar, mayonnaise, etc.
	Silver combined electrode ELX-006	



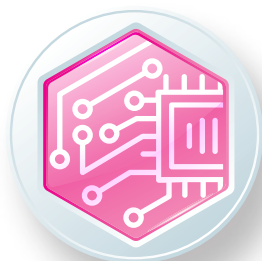
Chemical and Analytical

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841C	Phosphate (H ₃ PO ₄) concentration
		Phosphate ester concentration analysis
		With barium(Ba(OH) ₂ hydroxide.Fractional and appropriate amounts of barium carbonate (BaCO)
		By the sodium sulfite method Formalin (HCHO) concentrations analyses
		Hydrazine (N ₂ H ₄) concentration-analysis
Oxidation-reduction titration	ORP compound-electrode PST-5821C	Analysis Iodine (I ₂) Concentration
		Hydrogen peroxide (H ₂ O ₂) concentration analysis
		Sodium Sulfite (Na ₂ SO ₃) Concentration Analysis
		Purity Analysis of Sodium disulfite (Na ₂ S ₂ O ₅)
		Purity of ammonium persulfate ((NH ₄) ₂ S ₂ O ₈)
		Potassium Ferricyanide (K ₃ [Fe(CN) ₆]) Concentration Analyses
		In hydrogen sulfide absorption caustic soda Analyses of Flowing Soda (NaSH)
		Sulfur-ion (S ²⁻) densitometry
		Hydrazine (N ₂ H ₄) concentration-analysis
Precipitation titration	Chloride ion-electrode CL-125B Reference electrode HS-305DS	Salinity analysis in raw concrete
		Chloride ion (Cl ⁻) concentration (JIS R 5202) In Portland cement
	Silver combined electrode ELX-006	Analysis of low chlorine (Cl ⁻) levels Sulfur-ion (S ²⁻) densitometry
Chelatometric titration	Photometric titration unit FUT-8010 (filter 530nm)	In cobalt(CoCl ₂) chloride Cobalt ion concentration analysis
	Silver ion electrode CU-125 Reference electrode HS-305DS	In basic copper base (CuCl ₂ · Cu(OH) ₂) Copper ion concentration analysis
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Fractional determination of fluorine (HF) and nitric acid (HNO ₃)
		Analysis of epoxy equivalents
		Saponification number analysis
Titration electrical conductivity	Conductivity titratable unit FUT-8040	Sodium hydroxide (NaOH)Fractional Determination of Triethylamine ((C ₂ H ₅) ₃ N)



Plating

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841 C	Analysis of Borate (H_3BO_3) Concentration in Nickel Plating Solution
		In permanganate solution NaOH (NaOH) concentration analyses
		Separate determination of sodium hydroxide (NaOH) and sodium carbonate (Na_2CO_3) in cadmium cyanide plating solution
Oxidation-reduction titration	Platinum-combined electrode PST-5821C	Chromate (CrO_3) concentration in the plating solution
		Analysis of Sn^{2+} content in solder plated solution
		Analyzing Sodium Hypophosphite (NaH_2PO_2) In nickel sulfamate plating solution
Precipitation titration	Combined silver-electrode ELX-006	Rochelle salt ($KNaC_4H_4O_6$) concentration-analysis In the bronze plating solution
		Nickel-chloride ($NiClO_2$) concentration In the nickel plating solution
Chelatometric titration	Photometric titration unit FUT-8010 (filter 530nm)	In the bronze plating solution Sodium cyanide (NaCN) concentration
		Nickel (Ni) concentration-analysis in nickel-plating solution Lead(Pb) levels in solder plating solution Zinc Oxide (ZnO) Concentration in Zinc Plating Solution
	Copper-ion-electrode CU-125 Reference electrode HS-305DS	In cadmium blue plating solution Cadmium(Cd) level analysis
		Copper (Cu) concentration-analysis in bronze plating solution Nickel (Ni) concentration-analysis in nickel-plating solution (Reverse Liquid Constant Method with Copper Ion Electrode)
Acid-base titration Chelatometric titration Precipitation titration	Photometric titration unit FUT-8010 (filter 530nm) pH Electrode ELP-062 Combined silver-electrode ELX-006	Borate (H_3BO_3) in nickel plated liquid, All nickel (Ni) and nickel chrolide ($NiCl_2$), Sequential analyses of nickel sulphate ($NiSO_4$)



Electricity, Steel and Metals

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841 C	Acid concentration analysis in the etchant
		Fractional Determination of Total Acid and Iron in Stainless Steel Treatment Solution
		Determination of Sulfuric Acid (H_2SO_4) and Copper (Cu) Concentrations in Print Board Etching Solutions
		Analysis of Free Hydrochloric Acid Concentration in Mask Treatment Solution
		Acid-concentration, aluminium(Al)-concentration analyses in chemical conversion agents
		Ammonium fluoride (NH_4F) concentration Hydrofluoric (HF) in the etchant
Oxidation-reduction titration	Platinum-combined electrode PST-5821C	Densitometry of oxalic acid ($(COOH)_2$) in an etchant
		Copper-ion (Cu^{2+}) densitometry (JIS M 8121)
		Chromium ion (Cr^{6+}) densitometry
	Platinum-combined electrode ELM-016	Cobalt-ion (Co^{2+}) densitometry
		Analyzing Titanium(Ti^{3+} , Ti^{4+}) Density in Etching Solution
		Analysis of Fe-ion (Fe^{2+}) Concentration in Pickling Solution
Precipitation titration	Combined silver-electrode ELX-006	Sodium Thiosulphate ($Na_2S_2O_3$) Concentration Analysis In the desulfurization solution
		Analyzing the Concentration of H_2O_2 in Chemical Polish Liquid
		Densitometry of oxalic acid ($(COOH)_2$) in an etchant
Chelatometric titration	Copper-ion-electrode CU-125 Reference electrode HS-305DS	Chloride ion (Cl^-) concentration-analysis in fluxes
		Thiourea ($(NH_2)_2CS$) Concentration Analysis In the continuous surface treatment solution
		Concentration of thiocyanate(SCN^-) in desulfurized liquor
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Analyzing Silver Ion (Ag^+) Concentrations
		Nickel(Ni) concentrations in etchants
Chelatometric titration	Photometric titration unit FUT-8010(filter 530nm) Photometric titration unit FUT-8010(filter 630nm)	Purity-analysis of zinc-oxide (ZnO) (JIS K 1410)
		Lead-ion (Pb^{2+}) Density Analysisiss
		Analysis of high-purity strontium chloride ($SrCl_2$) concentrations
Chelatometric titration	Copper-ion-electrode CU-125 Reference electrode HS-305DS	Copper(Cu) Concentration in Chemical Polishing Liquids
		Acid value analysis of the flux
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Hydrochloric acid (HCl) in the surface-treated solution, Fractional determination of hydrofluoric acid (HF)

Applications



Environment

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841C	Alkalinity analysis of the upper and sewage
		Acidity analysis of upper and sewage
Oxidation-reduction titration	ORP compound-electrode PST-5821C	Residual Chlorine (Cl ₂) Level Analyses of Upper Water
		Analyzing Potassium Permanganate (KMnO ₄) Consumption
		Dissolved-oxygen (DO) concentration analyses of seawater
Precipitation titration	Photometric titration unit FUT-8010 (filter 630nm)	Low concentration sulfuric acid (SO ₄ ²⁻) concentration analysis (JIS K 0103)
	Combined silver-electrode ELX-006	Chlorine-ion (Cl ⁻) analyses of surface water
Chelatometric titration	Photometric titration unit FUT-8010 (filter 630nm)	Total hardness analysis of clean water
		Calcium(Ca) in tap water, Fractional determination of magnesium(Mg)



Oil

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841C	Control of Sodium Hydroxide (NaOH), Amines, and Potassium Carbonate (K ₂ CO ₃) Levels in Desulfurized Effluent
Precipitation titration	Combined silver-electrode ELX-006	Control of H ₂ S levels in desulfurized effluent
		Chlorine-ion (Cl ⁻) analyses of desulfurized effluent
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Acid value analyses of engine oil (JIS K 2501)
		Base Value Analysis (JIS K 2501) of Engine Oil
		Acid Number Analysis (JIS K 2101) of Electric Insulating Oil
		Analyzing Vinyl Acetate (C ₄ H ₆ O ₂)
		Analysis of the carbonyl value of fats and oils
	Polarizable titratable unit FUT-8030	Bromine Value Analysis (JIS K 2605) of Petroleum Products



Pharmaceuticals, cosmetics, and Perfume

Type of titration	Used electrodes (unit)	Titration content
Acid-base titration	pH multiple electrode GST-5841C	Sodium bicarbonate (NaHCO ₃) concentrations in stomach drugs
Oxidation-reduction titration	ORP compound-electrode ELM-016	Purity-analysis of sodium sulfide (Na ₂ S)
Precipitation titration	ORP compound-electrode ELM-016	Analyzing Benzethonium Chloride(C ₂₇ H ₄₂ ClNO ₂) With sodium tetraphenylborate
Chelatometric titration	Photometric titration unit FUT-8010 (filter 530nm)	Analyzing Aluminium Oxide (Al ₂ O ₃) Concentrations in Stomach Drugs
	Photometric titration unit FUT-8010 (filter 630nm)	Magnesium-oxide (MgO) concentration-analysis of stomach chemicals
Nonaqueous titration	Glass electrode HGS-2005 Reference electrode HS-305DS	Ester value analysis of cosmetic perfumes
		Acid value analysis of cosmetic perfumes
		Cyclohexidin Gluconate (C ₂₂ H ₃₀ Cl ₂ N ₁₀) Concentration analysis
		Ethyl Aminobenzoate(NH ₂ C ₆ H ₄ COOC ₂ H ₅) Concentration analysis
Titration electrical conductivity	Conductivity titratable unit FUT-8040	Sulphate (SO ₄ ²⁻) density analyses

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CAUTION

Please read the operation manual carefully before using products.

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