

AUTOMATIC TITRATOR

Model: AUT-501

The AUT-501 is a high performance, microprocessor-based, solution-type titration system which can perform all types of classical titration routines. The instrument provides all functions for compliance with GMP/GLP. Instrument set-up is performed using dialog-type on screen menus. A large display, new titration control for fast analysis time and expandability further enhance this instrument.

FEATURES

- Easy to use menu-driven operation**
 Easy operation and set-up using "soft" selection keys corresponding to menus indicated on the display enables the operator to easily execute the exact function required.
- Large display with backlight**
 320 x 240 pixel LCD displays titration curve and text data with excellent legibility.
- Exceptionally quick titration time**
 Reduced analysis times are achieved by a newly developed titration control system (patent pending). General potentiometric titration times are reduced by $\frac{1}{2} \sim \frac{2}{3}$ compared with conventional titration instruments.
- Parameter setting possible during titration operation**
 True multi-tasking operation enables set-up and operation to be carried out while the titration operation is in progress.
- GMP/GLP Compliance**
 Conforms to GMP (Good Manufacturing Practice) and GLP (Good Laboratory Practice). Includes a complete electrode confirmation and replacement routine for compliance and validation.
- Wide-range of titration methods available**
 Titration methods for general titration analysis, pH stat titration for circulation test of gastric juice and pKa measurement are possible. Complex sequence measurements requiring combination of multiple titration, pH measurement and dispensing mode can be achieved using link mode.
- Up to 3 Electrode Input Channels**
 Standard instrument is equipped with two input channels for pH (mV). Third input is available as an option.
- Enhanced Data Storage function**
 Results for 100 measured samples can be stored in the memory. The instrument also features a total re-analysis function of previous data for last 40 results.
- Most appropriate titration method can be selected by preliminary titration**
 If the titration-setting match to the sample is unknown, it is possible to set the most suitable titration condition automatically.
- Concentration units and calculation formulas can be freely set**
 9 types of concentration unit (including %, ppm, g/L, mg/L, mg/g, mg/kg, mol/L, meq/L) and 18 types of standard calculation formula including reverse titration are available.



- High performance with low cost of ownership**
 Independent titration system, does not require combination with personal computer.
- Superior System Expandability**
 A wide range of labour-saving peripherals and accessories are available including automatic burette (can connect up to 10 units in series), balance interface, computer interface, external printer and turntable system.

AUTOMATIC TITRATOR SPECIFICATIONS

Model AUT-501 Main Unit

Measuring item/range

pH	: pH0.00 to pH14.00 (standard 2ch only)
mV	: 0 to ± 1.999 mV
Temp	: 0 to 100°C
Current	: 0 to 200mA (by range selection)
Electric conductivity	: 0 to 20S/m (by range selection)
Light penetration rate	: 0 to 100% (photometric titrator)

pH calibration : Automatic 3-point calibration (pH4.01, 6.86, 9.18)

Titration/titration method/
measuring method

: Automatic end point detection method (up to 5 points detectable)
 Set point titration(ditto) (up to 5 points detectable)
 Full volume titration(ditto) (up to 5 points detectable)
 Intersection detection method (up to 2 stages detectable)
 Stat titration
 Preliminary titration
 pKa measurement
 pH(mV) measurement
 pH adjustment

Display	: LCD (320x240 dots) with back-light English or Japanese language selectable Simultaneous indication of titration curve, titration volume, pH(mV), temperature, titration time
Operational key/ operating method	: Flat key Dialog method using function keys and data entry keys
Printer	: Thermal paper printer
Number of electrode input channels	: Max. 3 channels 2 channels of pH/mV input installed as standard One of following can be installed as a 3rd channel <ul style="list-style-type: none"> • photometric unit FUT-3010 • Polarization unit FUT-3030 • Electric conductivity unit FUT-3040 • Potentiometric unit FUT-3050
Ext control input/output	: RS-232C x 4 channels
1ch	: auto burette (ABT-511 max. 10 units connectable)
2ch	: PC (connector: H-14)
3ch	: turn-table TTT-3100
4ch	: electronic balance interface Turn-table (TTT-510) External printer output State signal input/output (standby, operation, titration start/stop) Analogue voltage output pH/mV(continuous output), pH0 – 14 → -700mV to 700mV, 0~±2000mV→0~1V, titration volume (output at only stat titration: 0 to 1V full stroke (syringe capacity))
Conforming to GLP	: Electrode calibration record preparation function, Electrode replacement notice function
Power source	: AC line, 50/60Hz
Power consumption	: Approx. 50VA (when connecting one ABT-511 Automatic burette)
Dimensions & weight	: Approx. 190(w)x 192(h) x385(d)mm Approx. 4.0kgs

STANDARD ACCESSORIES

Three-in-one pH electrode GST-5311C	1 pc.
Standard pH solution, pH6.86, 500ml	1 btl.
Standard pH solution, pH4.01, 500ml	1 btl.
Saturated KCl solution, 100ml	1 btl.
Electrode holder	1 pc.
Electrode stand with stopper	1 pc.
Magnetic stirrer ST-15	1 pc.
Earth lead wire	1 pc.
Power cord	1 pc.
Connection cable to burette	1 pc.
Printer chart paper(5 rolls/pack)	1 pack
Instruction manual	1 copy

SPARE PARTS & CONSUMABLES

pH electrode GST-5311C, pH standard solution (pH4.01, 6.86, 9.18, 500ml), Buffer powder (pH4.01, 6.86, 9.18, box of 10 bags, bag for 500ml solution), Printer paper (5 rolls/pack), Saturated KCl powder.

AUTOMATIC BURETTE SPECIFICATIONS

Model	: ABT-511 Automatic Burette
Display	: LCD (16 digits x 2 lines)
Operational key/ operating method	: Flat key Function key method
Syringe	: Inner tube grinding type 20ml brown glass syringe (1ml, 5ml, 10ml, 50ml option)
Wetted materials	: Hard glass ware, Teflon, Diflon
Using tube	: ø2(I.D)x ø3(O.D) black Teflon tube (ø1(I.D)x ø3(O.D) for 1 ml syringe)
Absorption speed	: Approx. 20 seconds for full stroke
Discharge spd	
50ml syringe	: 0.05~125 ml/min
20ml syringe	: 0.02~50 ml/min
10ml syringe	: 0.01~25 ml/min.
5ml syringe	: 0.005~12.5 ml/min.
1ml syringe	: 0.001~2.5 ml/min.
Min. dropping volume	
50ml syringe	: 0.0025ml
20ml syringe	: 0.001ml
10ml syringe	: 0.0005ml
5ml syringe	: 0.00025ml
1ml syringe	: 0.0001ml
Accuracy of burette	: In case of 20ml syringe
Whole volume error	: ±0.1%
Repeatability	: ±0.01ml
Titration Mode	: Constant volume dispensing, Constant speed dispensing, Dilution (sampling)
Conforming to GLP	: Syringe volume confirmation function, volume confirmation record preparation function, Alarm for residual reagent volume
External connection	: Turn-table (TTT-510)
Ext control input/output	: RS-232C (for PC) Pulse output Operation signal input(delivery start/stop) State signal output(standby/operation) Empty reagent signal input
Power source	: AC line 50/60Hz
Power consumption	: Approx. 30VA
Dimensions & weight	: Approx. 120(w)x380(H) x 345(d)mm Approx. 5.5kgs

STANDARD ACCESSORIES

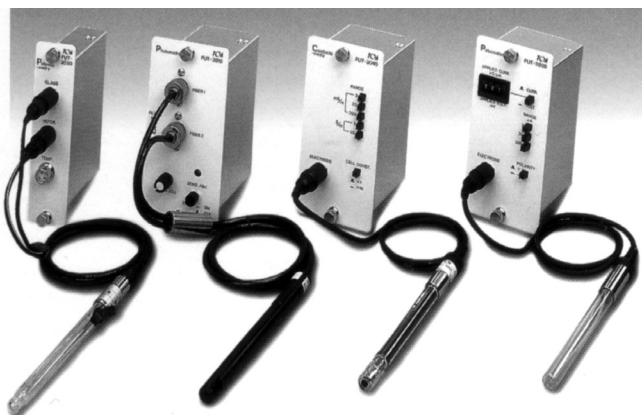
20ml brown syringe	1 pc.
Brown nozzle	1 pc.
Metal device	1 pc.
Nozzle cleaning wire	1 pc.
Soda lime tube(w/rubber stopper)	1 pc.
Polyethylene bottle ,500ml,brown	1 pc.
Earth lead wire	1 pc.
Power cord	1 pc.
Instruction manual	1 copy

SPARES & OPTIONAL ELECTRODE

Glass electrode HGS-2005
 Trace volume pH electrode GS-5015C
 Combination platinum electrode PTS-5011C
 Silver electrode HA-101
 Platinum electrode HP-105
 Double junction type ref. electrode HS-305DS
 Chloride(CL-125B)/copper(CU-125),calcium
 (CA-135B) ion electrode

OPTIONAL UNITS

Analogue Expansion Modules



Potentiometric titration unit FUT-3050

Measuring range : mV:0 to 1999mV
 Temperature : 0 to 100°C

Photometric titration unit FUT-3010

This unit shall be used to detect the colour variation of reagent IDP and used for chelete titration which measure conc. of metal ion.

Detector : immersion type electrode (OPE-21A)
 Standard interference filter : 530, 630nm
 Optional interference filter : 450, 500, 550nm

Polarization titration unit FUT-3030

This is used for iodide value, diazo titration.

Measuring method : constant-current voltage method,
 constant-voltage current method
 Detecting electrode : twin platinum electrode (HDP-303)
 Applied voltage : 0 to 999mV (settable at optimum
 voltage)
 Applied current : 0 to 99.9uA(settable at optimum
 current)

Electric conductivity titration unit FUT-3040

Used to detect the change of electric conductivity brought by chemical reaction.

Detecting electrode : conductivity cell (CG-511B)
 Measuring range : 0 to 2mS/m, 20mS/m, 200mS/m,
 2S/m, 20mS/m
 Cell constant : x1, x10

PERIPHERAL ITEMS



Trace volume titration cell SC-321

Trace volume titration analysis from 1mL can be done.

It is used in titration for small volume sample and possible to keep at constant temperature or to be in gas purge because of the sealed construction.

Max. capacity : approx. 3mL
 Min sample : approx.1 to
 1.5mL
 Nozzle : special nozzle
 Electrode : pH electrode
 (GS-5015C)

Magnetic stirrer ST-15

Smooth stirring speed change



Rotation No. : approx. 300 to 1000rpm
 Power source : AC line 50/60Hz
 Power consumption : approx. 5VA
 Dimensions : approx.124(w)x65(h)x162(d)mm
 Weight : approx. 0.8kgs
 Additional feature : power source terminal for overhead
 rod type stirring electrode holder

REPLACEMENT ITEMS & ACCESSORIES

- Titration unit plate P000068/69 for 1 to 20ml (68), for 50ml(69)
- Multi-electrode holder P000120
- Electrode holder for overhead rod type stirrer P000121/122/123

Turntable TTT-510

This turntable unit shall be used when doing titration analysis of multiple samples.

Number of beakers : 12,18 or 36 (designated)
 Cleaning period : 0 to 9999 sec.
 Alarm : Empty of cleaning water or detergent,
 fullness of wasted water
 Power consumption : approx.55VA
 Dimesions : approx.380(w)x392(h)x622(d)mm
 Weight : approx.18kgs

No. of sample : 12, 18, 36
 Usable sample container : 200ml , 300ml tall beaker
 14ml tall(specified manufacturer)
 30ml, 50ml(specified manufacturer)

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CAUTION

Do not operate products before consulting instruction manual.

<http://www.toadkk.co.jp>

Information and specifications are for a typical system and are subject to change without notice.