

SPECIFICATIONS

Standard Configuration

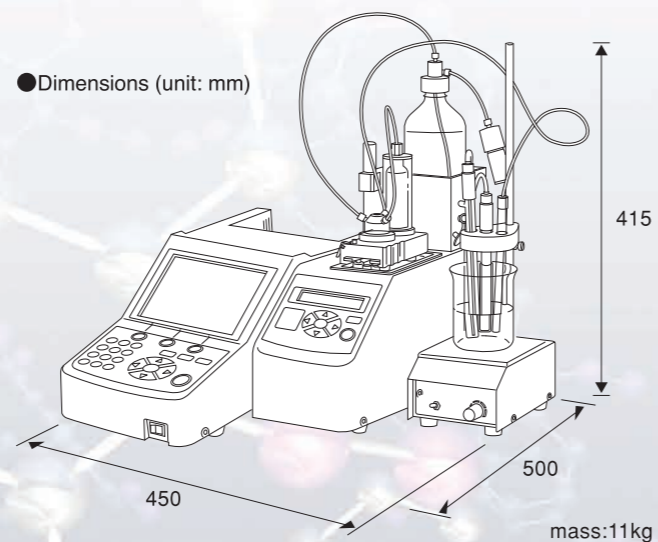
GT-200	
Type of Measurement	potentiometric titration (Acid-base, Redox, Chelate, Precipitation) Option: polarization (amperometry)/conductivity, photometry
Sensor	2 x detector, 1 x reference, 1 x temperature.
Operating Range	pH : 0 -14 (resolution 0.001pH) mV: -2000 - +2000 (resolution 0.1 mV) Conductivity : 0 -20 μ A Temperature : 0 - 99°C (0.1°C, depend on electrode)
Titration Modes	TEST, INF, SET-P, INF/SP, OIL-A, OIL-J CROSS-F, CROSS-B, CROSS-V, R-TIME STAT, ADJUST, pKa
Combination Titration	Two titration files can be set.
USB Export	display, raw data, method, system
Number of Burets and Dispensers	max. 12 (include syringe type)
Pre-set	3 points for one titration file.
GLP	Validation (buret, detection, dispense, measurement). Login with passwords. Historical display of pH calibration
Number of Files	56 titration, 99 result, 40 reagent, 20 formula.
Display	5.7 inch color LCD result, parameter and chart, Multi-language.
Ports	3 x USB, 5 x COM (balance, GT/KF Burettes, printer, RS232C)
Power	100-240VAC, 100VA
Dimension	175 (W) x 408 (D) x 176 (H)mm
Mass	4 kg

*Electrodes can be selected separately for each application indicated in the brochure.

Stirrer GT-200STR	
Beaker volume	up to 1000 ml
Sample vessel	max 300mm height
Cable	1 m
Power	supply from main unit
Dimension	110 (W) x 165 (D) x 415 (H)mm
Mass	1.2 kg

Buret GT-200BRT	
Buret volume	1,10,20ml.
Accuracy	repeatability +/- 0.01ml (20ml) resolution 0.002ml
Flow	auto valve made of fluoro-plastic
Wetted part	fluoro-plastic, glass, PP
Reagent bottle	500 -1000 ml
Cable	0.5m (option 2m)
Power	supply from main unit or power box
Dimension	127 (W) x 378 (D) x 260 (H)mm
Mass	5.5 kg

BURET CASSETTE AND HOLDER FOR QUICK CHANGE	
Type	10ml, 20ml,
Standard 20ml	Option: 1ml, 20ml with temp sensor, 20ml with internal coating.
Precision (10,20ml)	1.000ml +/- 0.01ml 10.000ml +/- 0.02ml 20.000ml +/- 0.03ml
Dimension	69 (W) x 121 (D) x 131 (H)mm



Automatic Titrator GT-200

Advanced interface and the new algorithm have enhanced the ease of use in versatile potentiometric titration measurement.



MITSUBISHI CHEMICAL ANALYTECH CO., LTD.

370 Enzo, Cigasaki-shi, Kanagawa 253-0084, Japan.
Tel: +81-467-86-3864 Fax: +81-467-86-3862
URL: <http://www.mccat.co.jp>

CAT No.1406GT200

Analysis for Solution

MITSUBISHI CHEMICAL ANALYTECH CO., LTD.

Advanced, intuitive GUI interface and the new algorithm have enhanced the ease of use in versatile potentiometric titration measurement.

The GT-series has developed into a new generation stage. GT-200 is now operated like a PC, such as mouse and USB memory for the ease of use. Intuitive graphical display has enabled one click quick start and is also easy set up for versatile measurements. Comprehensive options are ready for a fully automated system with up to 12 burets and 24 sample changer.

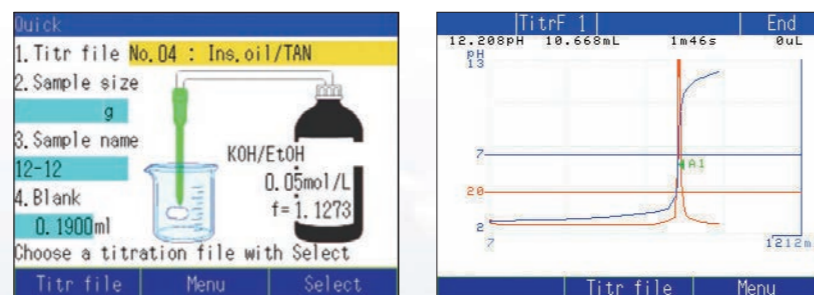


DATA on USB

USB memory can be used for multipurpose now.

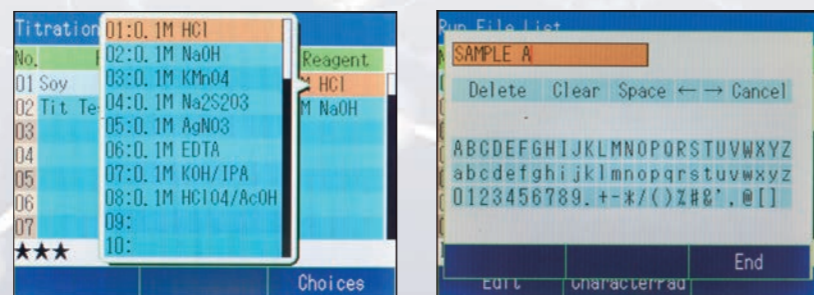
- [PRINT SCREEN],
- [EXPORT RAW DATA],
- [EXPORT METHOD],
- [ALL SYSTEM BACKUP].

Print Screen on USB



STRESS FREE WITH MOUSE

Mouse control enables improved user accessibility. Popup menu and scroll bar will bring smooth operation like a PC also for inputting alphanumeric names.



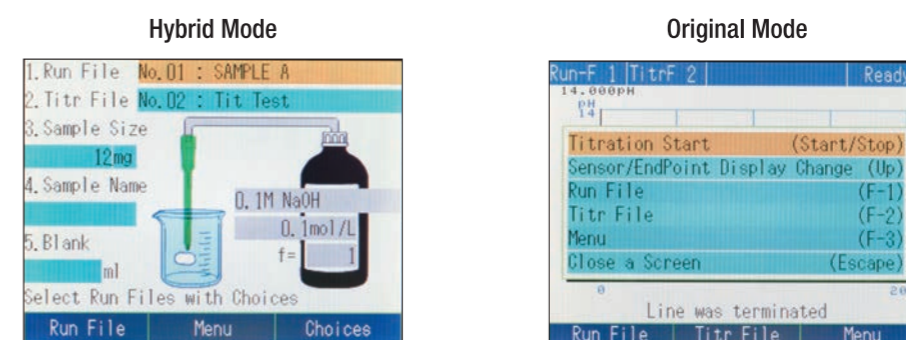
(distributor option, some wireless mice may not be applicable)

ONE PRESS TO GET RESULT

All information are displayed in one view, start titration by just pressing [start] for routine analysis. **5.7 inch COLOR LCD** increases visibility for clear and sure recognition of status.

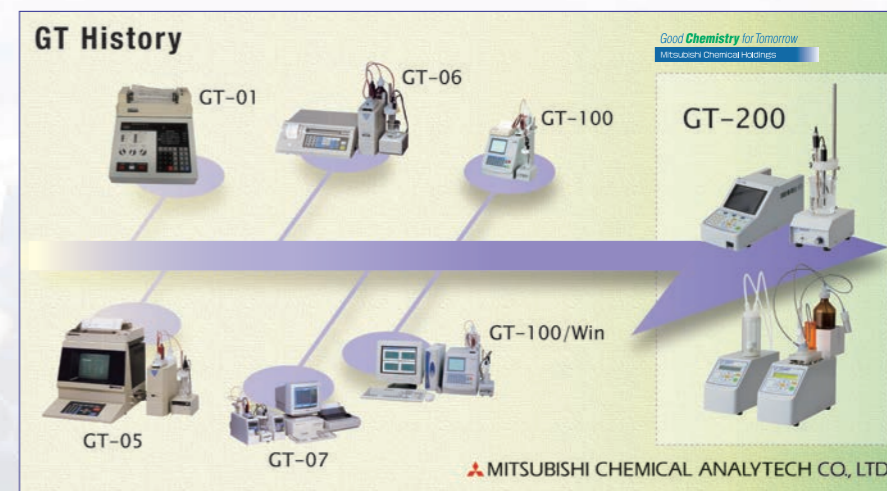


OTHER 2 MODES CAN BE SELECTED FOR EDITING METHOD



MORE THAN 30 YEARS KNOW- HOW, SMART END-POINT DETECTION

Unique algorithm S.E.D. (Smart End point Detection) enhanced end point recognition, which analyze not only inflection but also total curve. S.E.D. enables to start measurement without complicated setting of parameter.



DATA ACQUISITION AND VALIDATION

AUTOMATION, UPGRADES

GLP SUPPORT (standard in GT-200)

- **VALIDATION** (buret, detection, measurement)
- **HISTORICAL DISPLAY** of pH CALIBRATION.
- **3 LEVEL LOGIN.**

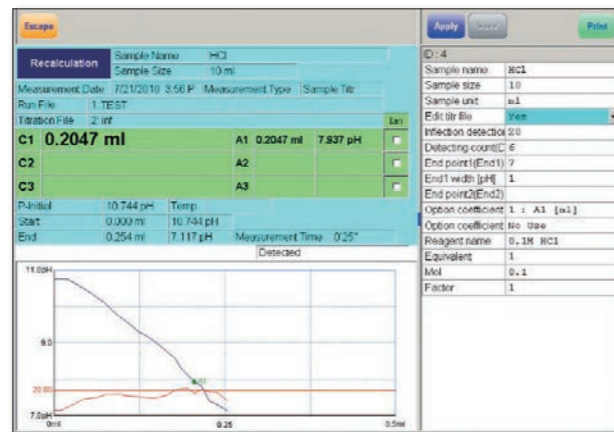
LIMS CONNECTIVITY (standard in GT-200)

- **Simultaneous data export via COM port.**

GT-200Win (OPTION)

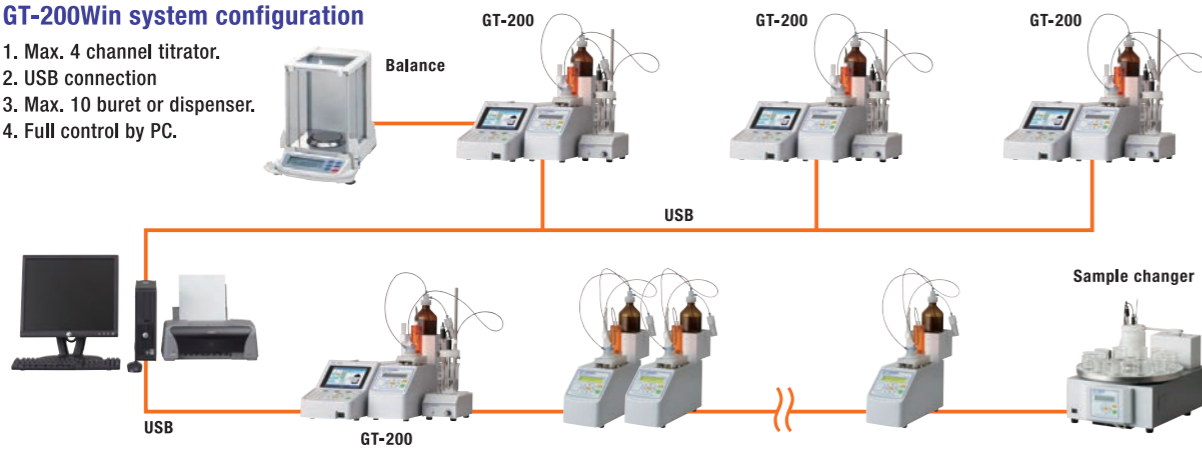
PC control software

- **All function controlled by PC.**
- **Maximum 4 unit control via USB port connection.**
- **Display both chart and parameter in one screen.**
- **Split display for multiple control.**
- **Easy operation and secured by 3 user level.**



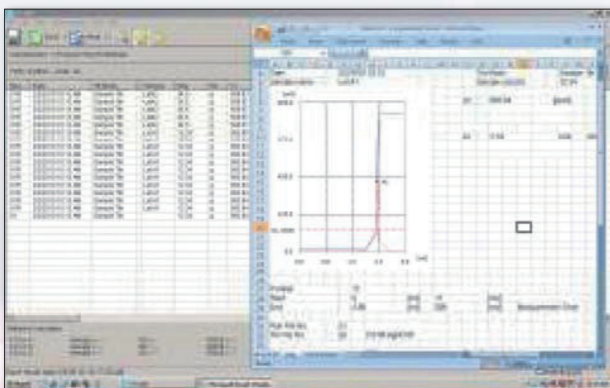
GT-200Win system configuration

1. Max. 4 channel titrator.
2. USB connection
3. Max. 10 buret or dispenser.
4. Full control by PC.



TV-200 Titration viewer (option)

- **Data acquisition, print and export (CSV/TXT)**

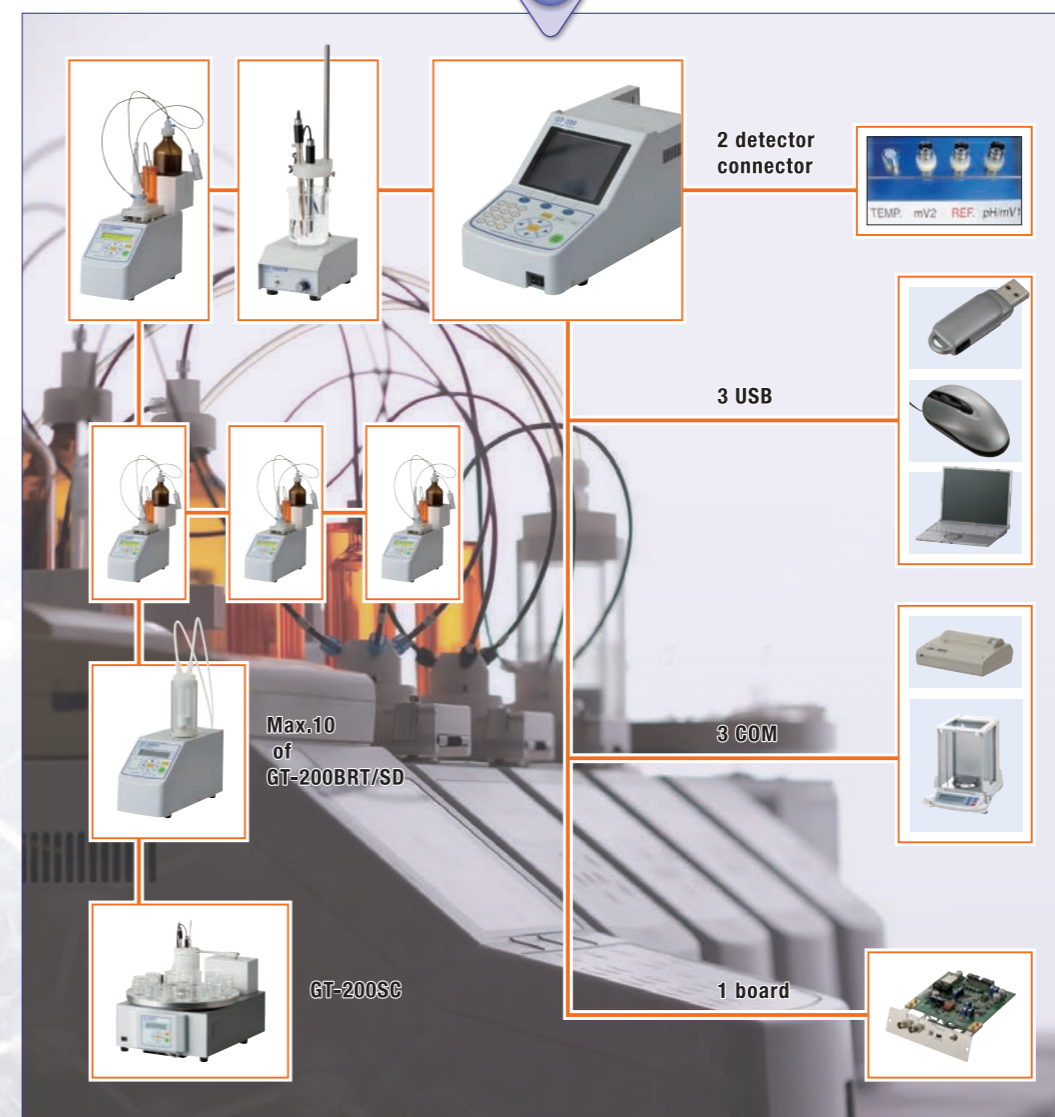


*TV-200 and GT-200 win software
Supplied by CD-ROM with one USB cable.
OS: Windows® XP/Vista/7 (32bit).
Microsoft® Office required for print: MS Office 2003,
2007, 2010 of Excel® and Word®.

SYSTEM UPGRADE

Full automation for lower running cost.

Dispensing indicators/solvents and cleaning electrodes can be fully automated by connecting optional burets and sample changers.



GT-200 can operate also series of options, GT-7BRT, GT-7SD, GT-100BRT, GT-100SD, GT-7SC.

GT-200BRT FEATURES

MANUALLY OPERATIVE BURET and DISPENSER

GT-200BRT/SD can be operated from the keypad of the unit with instruction for dispensing, filling/displacing reagent.

COMPACT DESIGN and FREE LAYOUT IN REMOTE USE

Autoburet and stirrer are stand alone. This allows them to be allocated inside a draft chamber. (extension cable optional)

Stirrer: can be used up to 1 liter volume.

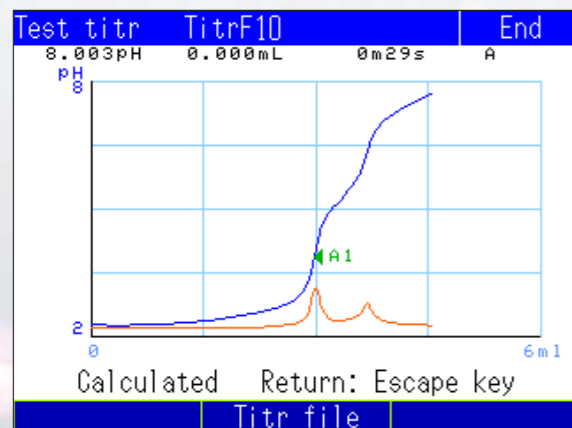


*beaker, stirrer bar is not included.

AUTOMATIC PARAMETER SETTING

Test titration mode can set suitable parameter automatically. Useful function for unknown sample.

Calculated after test titration



Automatically fix parameter

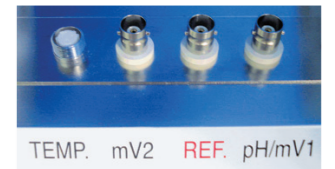
Show titr file No.10:		
Item	Set value	Unit
Mode	INF	
Detector	pH	
BRT No	1	
Reagent	11: NaOH	
WTint	10	sec
Vup	300	ul
Vlow	20	ul
Titration mode (Can not edit)		

VERSATILE AND USEFUL FUNCTIONS

COMBINATION TITRATION

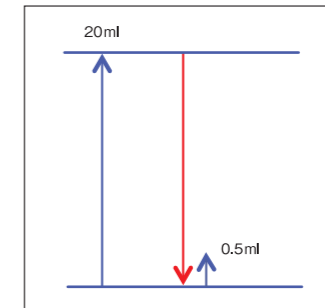
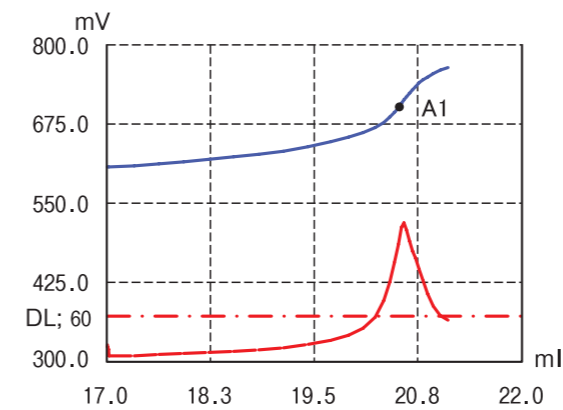
2 detector connector enables also to combine different types of titration in one sequential method.

- 1 pH adjustment preparation and neutralization.
- 2 Follow Acidity with Salinity in food.

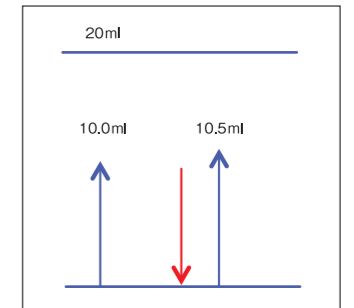


FLEXIBLE STROKE OF BURET

Titration chart near buret size, 20.5 ml End Point.



When using 20ml buret and you know End Point is around 20.5ml. Buret will refill reagent after 20ml dosed and will finish next 0.5ml dosed.



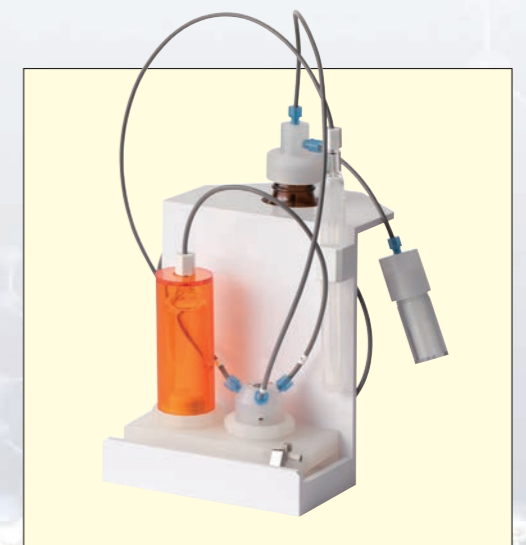
First Fill position to 50% (10ml). Buret will refill reagent after first 10ml dosed and will finish next 10.5ml dosed. You can avoid refilling action around End Point.

BURET CASSETTE AND HOLDER FOR QUICK CHANGE



Buret cassette	
Type	1ml, 10ml, 20ml,
Standard 20ml	Option: 1ml, 5ml, 10ml, 20ml with temp sensor, 20ml with internal coating.
Repeatability	+/- 0.01ml
Precision	1.000ml +/- 0.01ml 10.000ml +/- 0.02ml 20.000ml +/- 0.03ml
Dimension	69(W) x 121(D) x 131(H)mm

Cassette Holder	500ml bottle, 1000ml bottle,
-----------------	---------------------------------



<p>TEST titration</p> <p>Use if the parameters are unknown. Parameters will be calculated automatically.</p>	<p>Inflection point (INF)</p> <p>Inflection points are detected within preset potential ranges and recognized as end point. This is the most standard titration mode.</p>	<p>Setting potential (SET-P)</p> <p>Reaching a preset potential is regarded as end point and calculate total amount.</p>	<p>Inflection point/setting potential (INF/SP)</p> <p>End point will first be searched via inflection point. If not found, the preset potential will be regarded as end point.</p>
<p>Petroleum neutralization number - official method (OIL-A)</p> <p>TAN/TBN for petroleum. ISO 6619/3771, ASTM D664/D2896. Titration continues until potential change is small.</p>	<p>Petroleum neutralization number - common method (OIL-J)</p> <p>JIS K2501: Simplified method, enable to preset.</p>	<p>F intersection detection (CROSS-F)</p> <p>Recognize front intersection of potential change start (indicator color change start) as end point by indicator photometric titration method.</p>	<p>B intersection detection (CROSS-B)</p> <p>Recognize back intersection of potential change end (indicator color change end) as end point by indicator photometric titration method.</p>
<p>V intersection detection (CROSS-V)</p> <p>Method for obtaining tangent intersections of V-shaped titration curves by conductivity titration and amperometric titration.</p>	<p>Return time (R-TIME)</p> <p>End point is defined when a preset time passes after reaching a preset potential.</p>	<p>Stat (STAT)</p> <p>Method for using this unit as potentiostats. Titration continues while keeping the potential constant until preset time has passed.</p>	<p>Potential adjustment (ADJUST)</p> <p>Titrate until preset potential. Pretreatment for combination titration.</p>

Application and Selection Guide

Titration Method	Electrodes			Option	Application	
	Detection	Reference	Combined (det & ref)			
Potentiometry	Acid-Base	Glass, GTPH1B	GTRE10B GTRS10B	GTPC1B, GTPC1C	—	Acidity (Food), Isocyanate (Urethane), HF, HNO ₃ , CH ₃ COOH (Mixed Acid), Purity (Acid), H ₂ SO ₄ (Waste acid)
	Acid-Base (petro)	Glass, GTPH1B	GTRS10B	—	—	TAN/TBN (Petroleum),
	Redox	Pt, GTP1B	GTRE10B	GTPR1B, GTPR1C	—	Vitamine C (Juice), Iodine value (Edible oil, Biodiesel oil, fat), Fe (Plating), Peroxide value (Palm oil),
	Precipitation	Ag, GTAG1B Cl, GTC1B	GTRE10B	GTAC1B, GTAC1C	—	Halogen (Water), Salt (Food), Cl (Oil, Plating), NaCN (Plating), Cl ⁻ (Concrete)
	Cheletometric	Ion selective F, GTF1B Cu, GTDI1B Ag, GTAI1B Ca, GTE1B Pb, GTP1B	GTRE10B	—	—	Impurity metal in various plating bath (Ni, Cu, Pb, Zn), Hardness (Water), CaO, MgO (Cement),
	Surfactant	GTSS11B	—	—	—	Anion & Cation (Surfactant)
Amperometry	Polarization (Constant current)	Double Pt, GTWH10B	—	—	PS board	Bromine Index, Bromine Number (Oil), *Amperometry or Potentiometry depends on the testing method.
	Polarization (Constant voltage)	Double Pt, GTWH10B	—	—	PS board	
Conductivity	Acid-Base	Double Pt, GTWH10B	—	—	PS board	Basicity of Chemicals (Resin Solution etc.)
	Precipitation	Double Pt, GTWH10B	—	—	PS board	Methacrylic acid (Dye, potentiometry also applicable)
Photometry	Acid-Base	—	—	—	GTLDI	TAN/TBN (Oil), Acidity (Food), Isocyanate (Urethane), Purity (Acid).
	Cheletometric	—	—	—	GTLDI	Metal (Ni, Cu, Pb, Zn etc. Plating), Hardness (Water), CaO, MgO (Cement),

Dimensions of Electrodes

Temperature range: 0 – 60°C. Cable: 1500mm accompanied

<p>GTPH1B</p>	<p>GTRE10B aqueous</p>	<p>GTRS10B non aqueous sleeve type</p>	<p>GTPC1B GTPR1B GTAC1B</p>	<p>GTPC1C GTPR1C GTAC1C</p>	<p>GTAG1B GTPT1B</p>	<p>Ion Selective</p>
<p>GTSS11B</p> <p>cable: 1000mm</p>	<p>GTWH10B</p>	<p>Temp. Sensor</p>	<p>GTTS10D beaker</p> <p>pt: 100Ω</p>	<p>GTETSB buret</p> <p>pt: 100Ω</p>		

*tip of electrode may differ by part number

Options for versatile application, comprehensive function

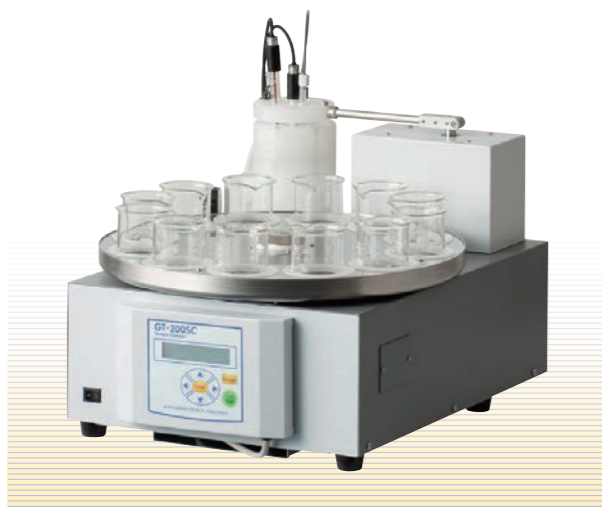
Auto Sample Changer GT-200SC

3 types of autosampler are available. GT-200SC can be operated from cable connected console.

TYPE 1 12 pos, 100ml beaker

TYPE 2 12 pos, 100/200ml beaker

TYPE 3 24 pos, 100/200ml beaker



*Beaker is not included

Max number of beaker	12 or 24
Size of beaker	100, 200ml
Max. number of sample configurable	72 samples (24 x 3 times)
Cleaning electrodes	water pump by standard (non-aqueous pump, optional)
Stirring	titration position dispensing position (option)
Operating Console	detachable with 400mm cable
Sensing	proximity switch
Power	AC100-240V 50/60Hz. 100VA (100/120V), 140VA (230/240V)
Dimension and mass	Type1: 414(W) x 489(D) x 310(H)mm, 19Kg Type2: 440(W) x 520(D) x 310(H)mm, 19Kg Type3: 475(W) x 590(D) x 310(H)mm, 20Kg

*Option 1: solvent pump for non-aq samples (GTESCP)

*Option 2: solvent dispenser kit (12, 24 pos)

Printer

Either thermal or impact type are available as option



Thermal Printer

Printing	thermal dot
Paper	width 112mm thermal paper
Speed	1 line per sec
Column	80
Power	AC100-240V 13VA
Dimension	160(W) x 170(D) x 67(H)mm
Mass	0.7 kg

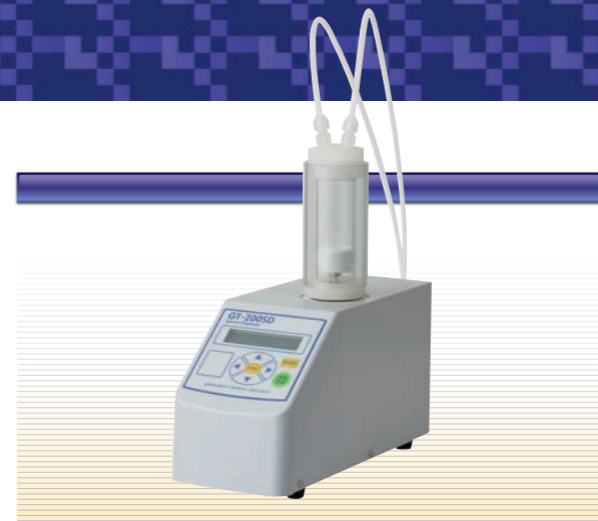
*special papers (long life or clean room) are also available.



Impact Printer

Printing	dot matrix
Paper	58mm width paper
Speed	2.5 line per sec
Column	24
Power	AC100-240V 13VA
Dimension	106(W) x 180(D) x 88(H)mm
Mass	0.47 kg

Solvent Dispenser GT-200SD



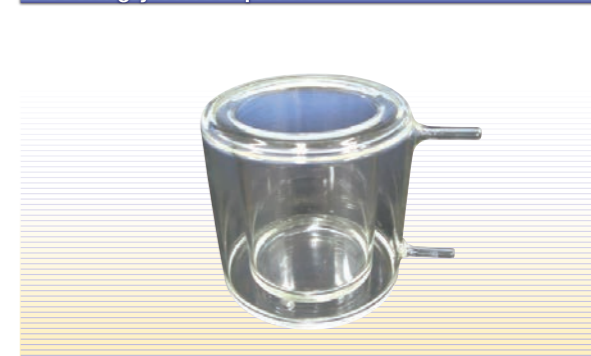
Dispense	automatic piston buret
Volume	50+/-2ml
Speed	100 to 5000µl/sec
Wetted part	Pyrex glass, PP, PE.
Flow	change by check valve
Tube	PE, 4/6 (mm, ID/OD)
Power	supply from main unit
Dimension	130(W) x 316(D) x 347(H)mm
Mass	4.5kg

Closed Cell set



Available for 100, 200ml with gas purge plug

Cooling jacket option



Cooling jacket for ball beaker

Photometric Detector GT-LDII



Detection	probe immersion of optical fiber
Light source	tungsten
Filter	530nm, 620 nm (other wavelength available)
Power	AC100/120/220/240V 10VA
Dimension	90(W) x 266(D) x 150(H)mm
Mass	2kg

Power Box



Power	AC100/120/220/240V 80VA
Dimension	110(W) x 172(D) x 84(H)mm
Mass	1.5kg

*For four or more burets/SD

PS Board



Option board for polarization titration (constant current and voltage), conductivity titration in one board