

## Automatic Titrator

Since 1965

# COM-A19



# COM-A19

## Automatic Titrator with flexibility for you.

problem

"I have nowhere to put it..."



Space-saving design

problem

"The screen is too small to read ..."



Large LCD



problem

"I don't know if it's measuring or not ..."



LED indication

problem

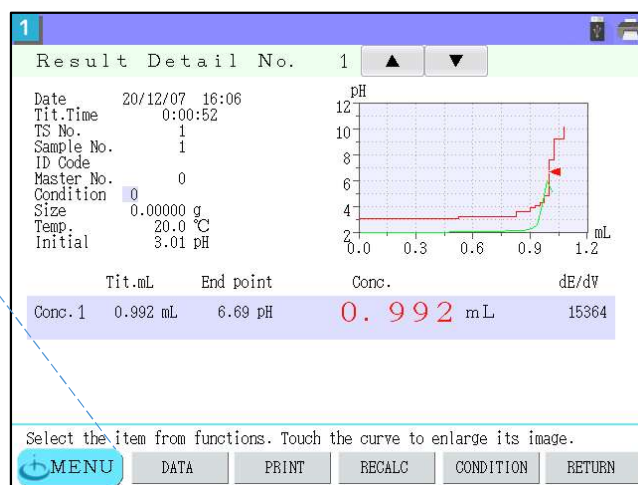
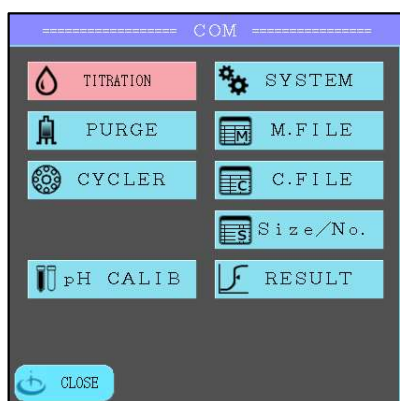
"I can't get the right angle for me..."



Monitor angle adjustment

## Large Color LCD Touch Panel

A large 8.4" touch panel screen enables the user to input text easily. Selecting functions from the menu can be operated intuitively. The protective film can be replaced to protect it from scratches and wear over the long term.



## LCD Display Adjustable in 16 Positions

Each user can adjust the angle as he/she likes. The position can be locked so that it will not move when the screen is pressed.



## Four Types of Titration in Parallel

By adding a titration station and stirrer, four types of titration can be carried out in parallel.

(Karl Fischer titrator can also be added)

Please refer to the configuration example on page 11.



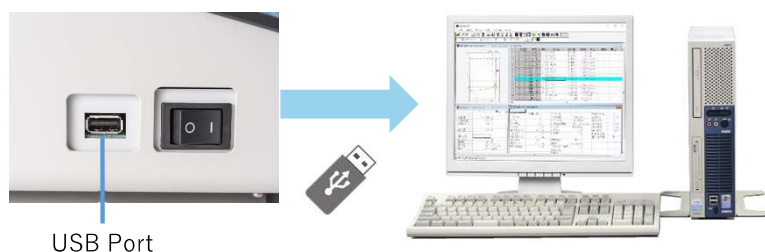
## Built-in Thermal Printer

Equipped with a built-in thermal printer with a paper roll 58-mm wide, which can be set up simply by inserting the paper roll and closing the cover.

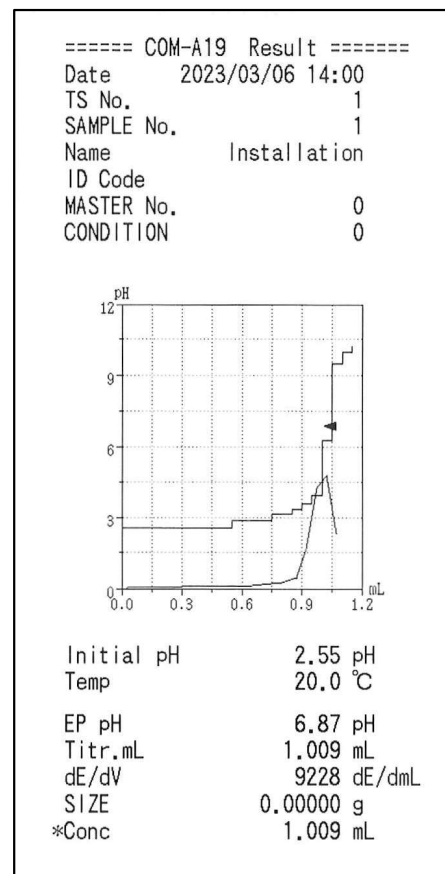


## USB / LAN Port

Approximately 9,900 results can be stored on a USB memory stick. With optional software, the user can view the data on a PC or use a recalculation function. With a LAN connection, the user can also view the data on a Web browser.

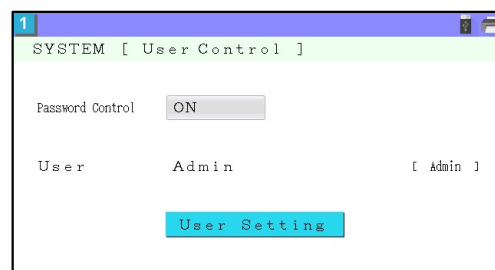


Example of measurement  
result printout



## User Authentication Settings

User restrictions enable the security improvement as well as the prevention of inadvertent changes to, for example, measurement conditions.



## Status Indicator with 3 LED Colors

Colored lights allow the user to confirm the status of operation from a distance. The user will also be alerted to unexpected problems right away.



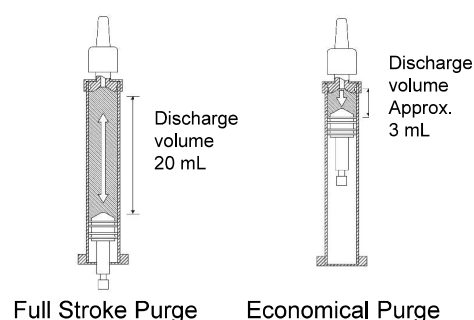
## Easy Replacement of Buret Head

Simply sliding toward the user, Buret Head can be removed together with the reagent bottom just with one hand. With multiple buret heads, the user can quickly manage different titrants simply by switching them.



## Economical Purge Function

Discharging/charging at the top end of the syringe is repeated. Reagents can be replaced automatically, which greatly reduces waste fluid. The number of economical purge cycles can be set from 1 to 99.



## Forty Rotation Speeds Can Be Set

Rotation can be adjusted manually in fine increments shown by LED bars—it is easy to see and understand. (Four increments per each bar)



## Two-color LED display of operating status

The operating status can be checked from a distant location.

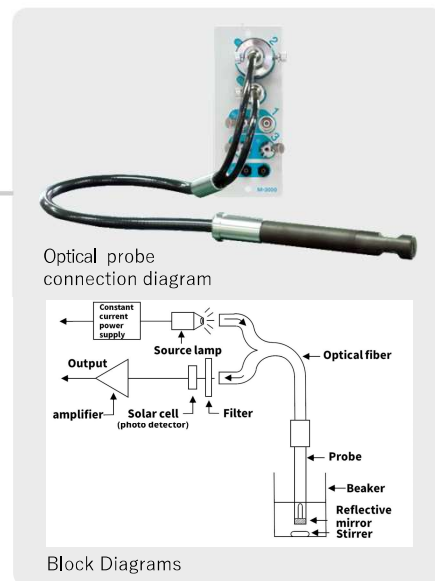
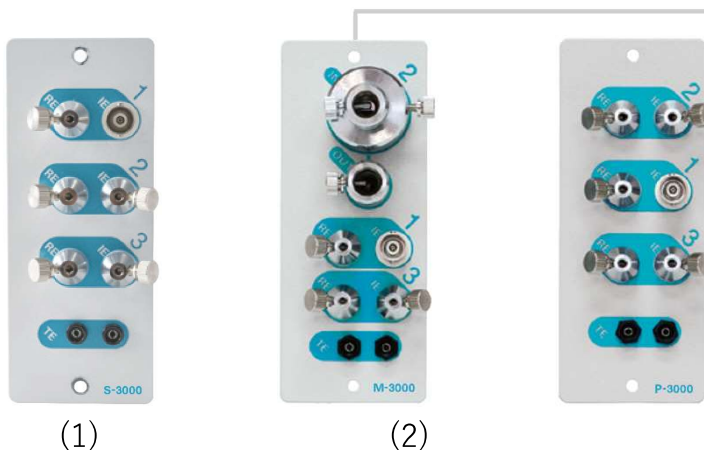


# OPTIONS for COM-A19

## Measurement Units

A wide variety of variations. Easy replacement.

One input for each titration + two inputs for potentiometric titration are standard specifications.



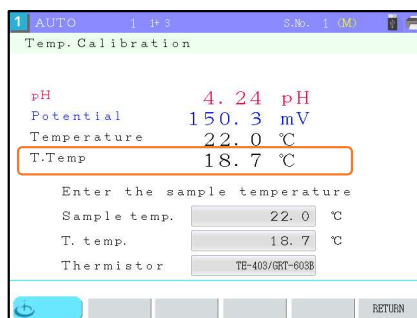
Model	Use	Specifications
(1) S-3000 Potentiometric Unit	<b>For general potentiometric titration</b> Acid/base, redox, precipitation, non-aqueous titrations	3 inputs [ pH (mV), mV, mV ] 0 ~ 14 pH, -2000 mV ~ +2000 mV, 0 ~ 100 °C
(2) M-3000 Photometric Unit	<b>For Photometric Titration</b> Chelatometric titration, acid/base, redox, precipitation, non-aqueous titrations	3 inputs [ T% (Abs), pH(mV), mV ] 0 ~ 100 T%, 0 ~ 14 pH, -2000 mV ~ +2000 mV, 0 ~ 100 °C (*1) includes : Photometric Probe, 530 nm/ 650 nm filters
(3) P-3000 Polarization Unit	<b>For Polarization Titration</b> Constant-current potentiometric titration, constant-voltage amperometric titration, acid/base, redox, precipitation, non-aqueous titrations	3 inputs [ mV (μA), pH(mV), mV ] 0 ~ 14 pH, -2000 mV ~ +2000 mV, -200 μA ~ +200 μA, 0 ~ 100 °C, Polarization voltage 0 ~ 1 V, Polarization current 1 ~ 5 μA (5-level switching) (*2) includes : Twin platinum electrode TPT-351

\*1: The operating temperature range of the Photometric probe is 0 ~ 80° C. \*2: The display unit is mV.

## Temperature sensor for titrant

Required for the temperature measurement function of titrant.

\* Measuring unit with temperature measurement of the titrant is required.



Example Display



## B-3000 Buret Drive / H-3000 Buret Head

B-3000 is a buret for COM-A19. Multiple units can be added according to the desired analysis.

The H-3000 is mounted on top of the B-3000. Syringes and reagent bottles can be exchanged together, making it convenient to have multiple H-3000 units when different titration solutions are used.

Various capacities are available. ( Standard 20 mL )

\* Economy purge function only for 10 mL and 20 mL



\*Reagent bottle not included.

ITEM	SPECIFICATIONS
Buret capacity	Standard: 20 mL transparent syringe (with UV light shield protective cover) Can be replaced with 1, 5, 10, 50 mL buret head (optional)
Forming system	Vacuum forming (1mL : Outer cylinder precision polishing)
Wetted part material	PTFE, hard glass, ceramic (*1)
Connecting tubes	φ 2 x φ 3 PTFE tube (brown)
Reagent bottle size	500 mL
Valve switching	Automatic switching by ceramic lapping
Discharge speed/ Absorption speed	Full stroke: minimum 50-second (min. 25-sec. for discharge or absorption) Can be set from 50 to 250 seconds in 25-second increments (with a 20-mL syringe)
Min. dispensing volume	0.00125 mL (with 20-mL syringe)
Buret accuracy	Relative accuracy: ±0.1% or less (with full capacity discharge from 20-mL syringe at factory settings (new)) Repeat accuracy: 0.01 mL or less (with full capacity discharge from 20-mL syringe, n=6 standard deviation)
Power supply	AC100-240 V±10 % 50/60 Hz 50 VA A power cable is not included in this product. (*2)
Dimensions / weight	100(W) × 250(D) × 180(H) mm / Approx. 4.5 kg (B-3000) 120(W) × 215(D) × 350(H) mm / Approx. 0.6 kg (H-3000-20)

\*1: Hydrogen fluoride cannot be used.

\*2: The power inlet of this product complies with IEC60320 C14. Please prepare a power cable that can be connected to this power inlet.

## D-3000 Dispenser


Peristaltic pump for reagent delivery.

For aqueous solution only.



ITEM	SPECIFICATIONS
Method	Tube pump system
Dispensing accuracy	Within approx. ±20 %
Dispense volume	30 mL/min (After Calibration)
Pump tube	φ 3.18×φ 6.35 PharMed tube
Connecting tube	φ 2.1×φ 2.9 JUNFLON tube
Power supply	DC 24V, Does not included AC/DC conversion adapter (*1)
Dimensions / weight	130(W) × 210(D) × 160(H) mm / Approx. 2 kg

\*1: Please prepare the following AC/DC conversion adapter.

- 1) AC Inlet : IEC60320 C14
- 2) DC output rated voltage : DC24V
- 3) DC output capacity : 36W or more (less than 100W)
- 4) Rated input voltage : AC 90V-240V (for the voltage of the place of use)
- 5) AC input frequency : 45~66Hz
- 6) Polarity symbols : Center positive (  )
- 7) DC plug shape : Inner diameter: 2.1mm, Outer diameter: 5.5mm, Length: 9.5mm
- 8) Certified standards : CE marking
- 9) AC CODE : Must be compatible with the adapter specifications to be connected

# OPTIONS for COM-A19

## C-1700 series Sample Changer



Example of COM-A19 and C-1712 configuration



C-1724



C-1748

## Automated pH calibration

After setting the pH calibration solution, electrode cleaning and pH calibration can be performed automatically.

## Electrode cleaning and activation

Electrode showering cleaning with solvent <sup>(\*1)</sup>, agitation cleaning with stirrer <sup>(\*2)</sup>, and electrode activation with pure water are available.

(\*1) PU-2000 Solvent pump unit is required. (\*2) Rinsing bath stirrer is required.

## Pre-dispensing function

Dispensing can be done before the titration position. Stirrer agitation is also possible <sup>(\*3)</sup>.

(\*3) Pre-stirrer and Pre-dispensing arm assembly are required.

## Simple separation of solvent and pure water effluents

When the PU-2000 solvent pump unit is used, solvent-based and pure water-based liquid waste can be separated into separate liquid waste tanks.



ITEM	C-1712	C-1724	C-1748
Number of containers	12	24	48
Container type	Standard beakers (100mL, 200mL), Tall beakers (100mL, 200mL) (*1)		
Electrode wash method	Shower in the rinsing bath with water or solvent* (*optional)		
Rinsing tank stirrer	(optional)	standard feature	
Stirring system	Magnetic stirrer		
Mounting on electrode holder	Electrodes(2), Thermistor electrode(1), Buret tip(3), Dispensing nozzles(2)		
Pre-stirrer, Pre-dispensing arm	(optional)	standard feature (*2)	
File	8 files		
pre-dispensing connections	B-3000: 1 unit    D-3000: 1 unit		
Beaker Sensor	(optional)	standard feature	
Setting the stop position	<ul style="list-style-type: none"><li>- Stop-pin</li><li>- Setting by Titrator</li><li>- Detection by beaker sensor (option)</li></ul>	<ul style="list-style-type: none"><li>- Setting by Titrator</li><li>- Detection by beaker sensor (standard feature)</li></ul>	
Control Method	- By control signal from Titrator    - One-step operation of each part by Operation switch box (optional)		
Power supply	AC100-240 V±10 % 50/60 Hz 50 VA (*3)	AC100 V±10 % 50/60 Hz 100 VA (*3)(*4)	
Dimensions	555(W) x 415(D) x 540(H) mm	720(W) x 585(D) x 540(H) mm	1055(W) x 665(D) x 540(H) mm
Weight	Approx. 19 kg	Approx. 55 kg	Approx. 60 kg

\*1: When using a 100 or 200 mL tall beaker, use a ring (optional) to ensure table installation.

\*2: The number of pre-dispensing positions attached to the dispensing arm is one burette tip and one dispensing nozzle.

\*3: The power inlet of this product complies with IEC60320 C14. Please prepare a power cable that can be connected to this power inlet.

\*4: If the power supply voltage is higher than 100 V, provide an appropriate step-down transformer.

## Configuration table

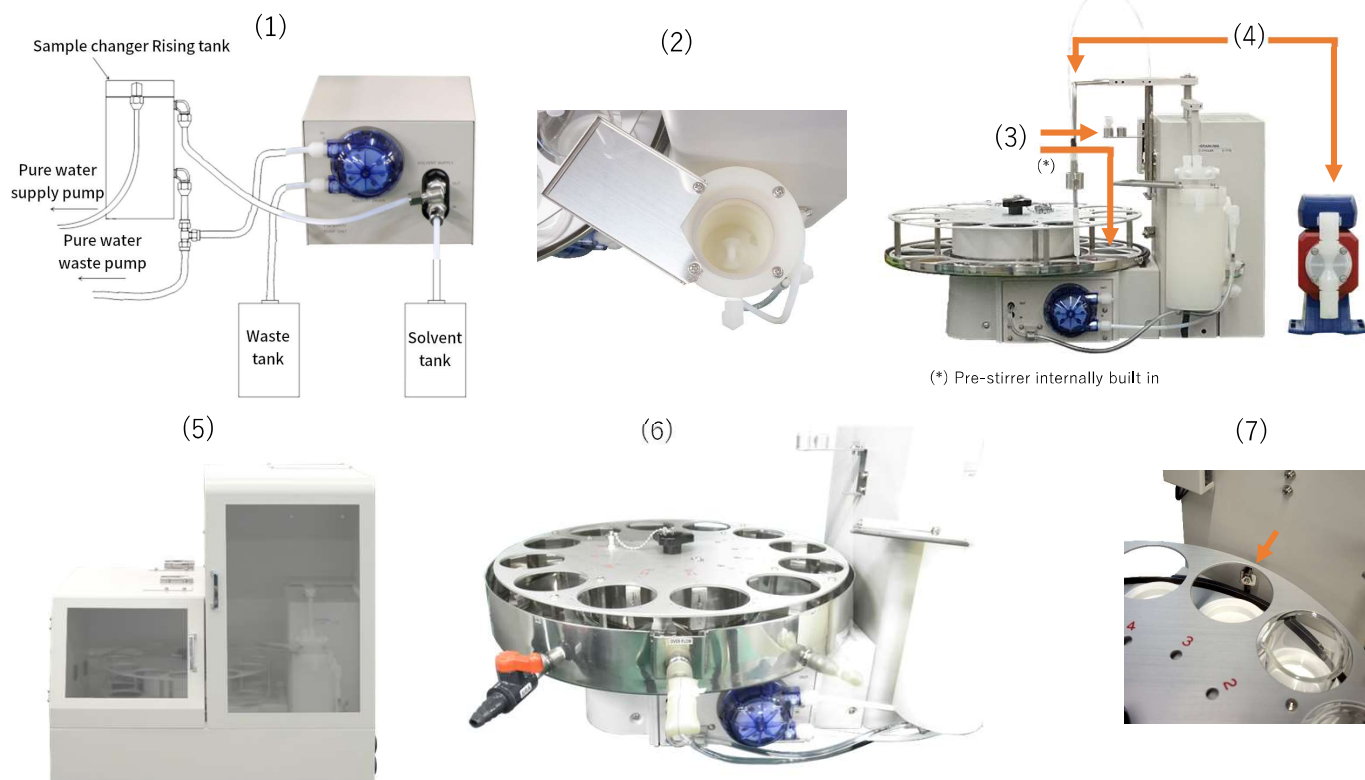
○: standard feature △: optional ×: unsupported

Model	Number of containers	Container	(1) PU-2000 Solvent pump unit	(2) Rinsing tank stirrer	(3) Pre-stirrer, Pre-dispensing arm assembly	(4) Automatic sample waste fluid drain pump unit	(5) Cabinet with fume extractor	(6) Turntable with temperature- controlled bath (Room temperature to 60 °C)	(7) Beaker Sensor
C-1712	12	100 mL 200 mL beakers	△	△	△	△	△	△	△
C-1724	24		△	○	○	△	×	×	○
C-1748	48		△	○	○	△	×	×	○

\* (2) to (7) can be installed only at the factory.

\* The beaker sensor cannot be attached to the thermostatic bath in (6).

\* (1), (4), and (5) are for 100 V only. If the power supply voltage is higher than 100V, provide an appropriate step-down transformer.



## Other Optional Accessories

- Operation switch box for C-1712 : To perform independent operation of sample changer. (Parts No.D332100-C)
- Ring : Fix 100mL or 200mL tall beakers. (Parts No.E261400-112 [ for 100 mL tall beakers] / E222090-112 [ for 200 mL tall beakers])

## Standard Specifications

### COM-A19 Automatic Titrator

ITEM	SPECIFICATIONS
Parallel measurement	Up to four titration stations are connectable. (with optional titration station (and stirrer))
Titration method	Potentiometric titration, Photometric titration, Polarization titration (depending on each measurement unit)
Measuring range	pH: 0 to 14, mV: -2000 to +2000 mV
Titration mode	Learn titration, Inflection-point detection, Set-point detection, Set point/Inflection-point detection, Cross-point (F, B, V1, V2) detection, Neutralization values in petroleum products (Oil1, 2) Other functions: pH-Stat (1, 2), pH measurement, Dispensing, Calculation, pKa measurement
Endpoint detection mode	Auto-detection using a second derivative (with smoothing function), Set-point detection, Cross-point detection
Number of endpoints detected	Up to 5 end points with a Learn titration file or linked method files
Display	8.4 inch color LCD touch panel
Displayed content	Titration conditions, Data per drop, Titration results, Titration curve, Differential curve, List of titration results, Statistics calculation results, Condition settings display, Real-time display of fluid temperature during titration (when thermistor electrode is connected)
Memory data capacity (Each titration station)	Built-in memory: 100 data points USB flash memory: (≥256MB) Maximum capacity approx. 9,900 data points
Settings input method	Key touch input (English guide displayed)
Sample data	Sample No.: 2 digits, ID code: 16 alphanumeric characters
Master file	Titration execution files: 51 files
Conditions file	51 files (method parameters, constant files, control mode files)
Number of linked condition file	9 files (up to 5 files in case of titration files linkage)
Titration control mode file	Standard files: 51; Neutralization value files in petroleum products: 51; Manufacturer settings modes (0–11), Blank modes (12–19), User setting mode (20–50)
Constant file (settings parameter of concentration calculation constant)	51 files K, L (constants), F (factors), M or N (molarity or normality), B (blank mL), S (sample size), T (temperature °C)
Sample files	99 files (Sample No., ID code, Master file and Sample size)
Auto input function	Function to automatically set titration results to constant parameters (blank, factor, etc.) . Condition files for automatic input can be designated.
Calculation function	Concentration calculation, Statistics calculations, pH automatic compensation
Branching function	After measuring the potential prior to titration, branching into maximum 2 condition files
GLP-compliant function	1) Buret precision check, 2) Electrode check, 3) Buret use frequency (display/print), 4) Electrode maintenance (display/print), 5) Reagent level display and alarm
Printer	Built-in thermal printer (Paper roll width: 58 mm)
External input/output	RS-232C: 1 port (For balance or computer connection), LAN: 1 port, USB flash memory stick: 1 port
Power supply	AC100-240 V±10 % 50/60 Hz 60 VA (MC-3000 only) A power cable is not included in this product. (*1)
Dimensions / weight	235(W) × 400(D) × 250(H) mm / Approx. 6.5 kg (MC-3000 only)

\*1: The power inlet of this product complies with IEC60320 C14. Please prepare a power cable that can be connected to this power inlet.

### TS-3000 Titration Station

ITEM	SPECIFICATIONS
Buret capacity	Standard: 20 mL transparent syringe (with UV light shield protective cover) Can be replaced with 1, 5, 10, 50 mL buret head (optional)
Forming system	Vacuum forming (1mL : Outer cylinder precision polishing)
Wetted part material	PTFE, hard glass, ceramic (*1)
Connecting tubes	φ 2 x φ 3 PTFE tube (brown)
Reagent bottle size	500 mL
Valve switching	Automatic switching by ceramic lapping
Discharge speed/ Absorption speed	Full stroke: minimum 50-second (min. 25-sec. for discharge or absorption) Can be set from 50 to 250 seconds in 25-second increments (with a 20-mL syringe)
Min. dispensing volume	0.00125 mL (with 20-mL syringe)
Buret accuracy	Relative accuracy: ±0.1% or less (with full capacity discharge from 20-mL syringe at factory settings (new)) Repeat accuracy: 0.01 mL or less (with full capacity discharge from 20-mL syringe, n=6 standard deviation)
Buret attachment	Up to four B-3000 burets can be attached simultaneously
Measurement unit attachment	S-3000, M-3000, P-3000, Only one of them can be connected
Power supply	AC100-240 V±10 % 50/60 Hz 70 VA A power cable is not included in this product. (*2)
Dimensions / weight	120(W) × 340(D) × 470(H) mm / Approx. 6.5 kg (*3)

\*1: Hydrogen fluoride cannot be used.

\*2: The power inlet of this product complies with IEC60320 C14. Please prepare a power cable that can be connected to this power inlet.

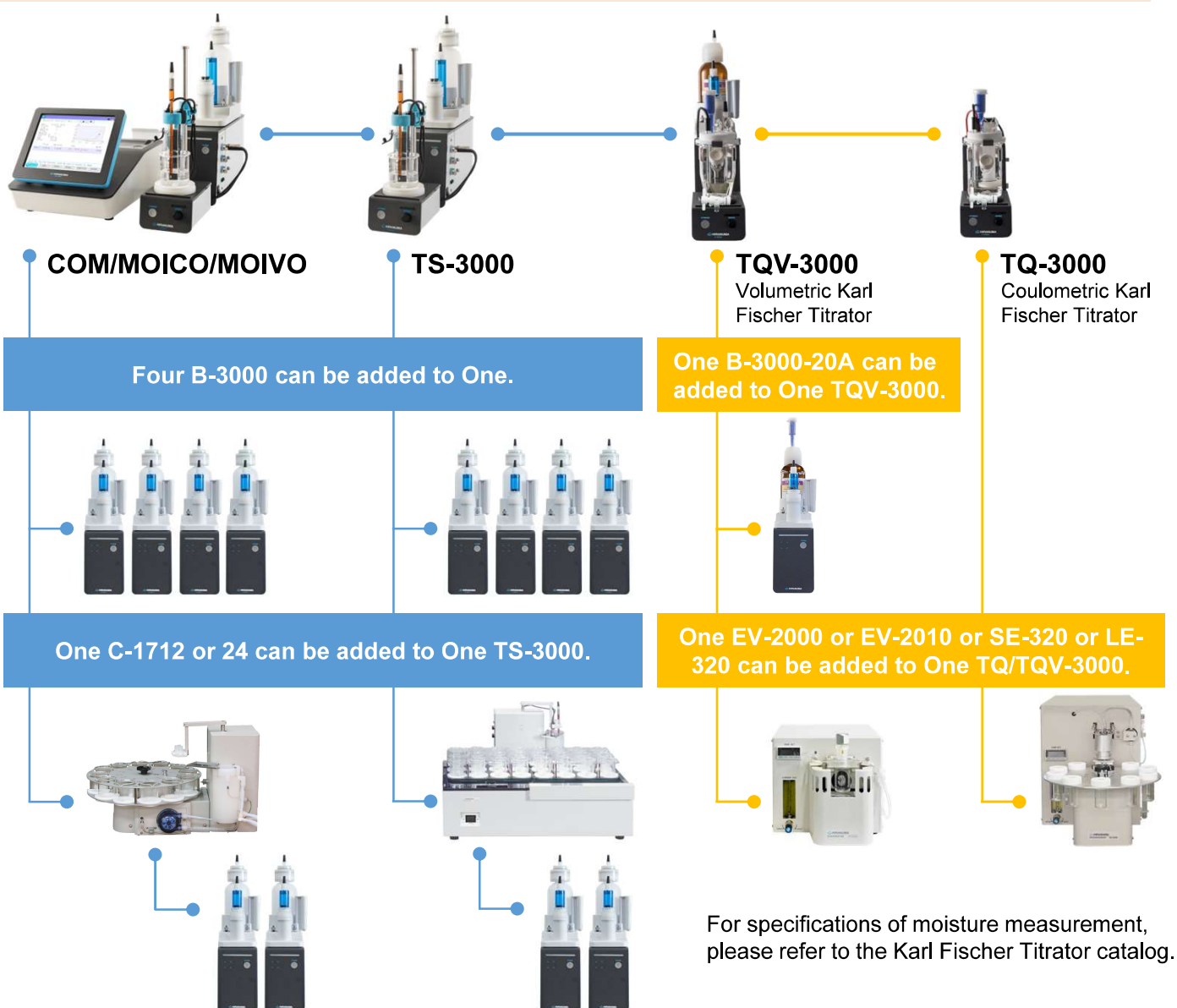
\*3: When measurement unit and burette head are attached.

## K-3000T Stirrer

ITEM	SPECIFICATIONS
Beaker size	Up to 500mL
Stirring system	Magnetic stirrer
Stirring bar	PTFE ( $\phi$ 8 x 30 mm): 1 included
Rotation speed setting	Adjustable Initial speed can be set on the main controller unit
Number of attachment to electrode holder	Electrodes: 2 Thermistor electrodes: 1 Buret tips: 3
Power supply	DC12 V (supplied by titration station)
Dimensions / weight	100(W) x 165(D) x 345(H) mm / Approx. 1.5 kg

### Maximum system configuration : COM / MOICO / MOIVO-A19

Up to three, TS or TQ or TQV-3000 (with Stirrer) can be added

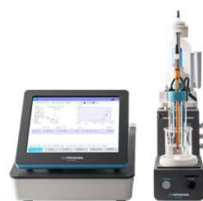


### Operating Requirements for Equipment

- Temperature: 5 to 35 °C
- Humidity: 45 to 85%, with no condensation
- Atmosphere: No presence of acid, alkali, organic solvent gas, or rare gas
- Other: No inordinately high amount of dust or particles.  
No equipment nearby that generates strong lines of magnetic force.

## ■ Configuration example

### [A11] Acid value measurement of juice



Glass electrode  
GE-101B

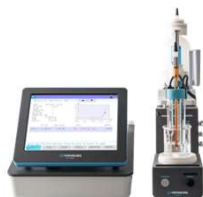


Reference electrode  
RE-201Z



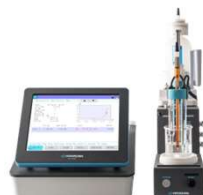
Thermistor electrode  
TE-403

### [D1] Quantitative determination of chloride ions



Silver-Reference combination electrode  
AGR-811Z

### [E11] Determination of copper in plating solution

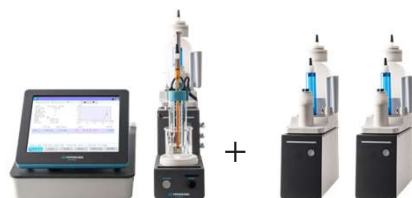


Platinum electrode  
PT-301



Reference electrode  
RE-201Z

### [A2] Successive measurement of acid and salt



Glass electrode  
GE-101B



Silver-Reference combination electrode  
AGR-811Z

Complete application data is available on the following web site:  
<https://www.hiranuma.com/english/app/app/>



Note: The color of the actual product may differ from what you see here due to printing-related issues.

Note: The appearance, specifications, and accessories may be changed without prior notice for the purpose of making improvements.

Caution regarding safety: Be sure to read the instructions before use, and use the equipment as intended.

## Sales

 **Hitachi High-Tech Science Corporation**

[www.hitachi-hightech.com/global/hhs/](http://www.hitachi-hightech.com/global/hhs/)

### Head Office

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1-17-1 Toranomon, Minato-ku, Tokyo 105-6409, Japan

## Manufacture

**HIRANUMA Co., Ltd.**

[www.hiranuma.com/english/index.html](http://www.hiranuma.com/english/index.html)

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