

# SPECIFICATION



## Thermo plus *Evo* II

High-temperature Differential Scanning Calorimeter

DSC 8270



Rigaku Corporation

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## 1. Outline

Thermo plus EVO II series is a thermal analysis instrument developed for the improvement of data stability, safety, operativeness, and fundamental performance. The thermal analysis equipment is a necessary and an indispensable tool to obtain basic data on the thermophysical property of materials and is used in various field such as new materials development and product evaluation; QC (quality control), etc.

The high sensitivity differential scanning calorimeter (DSC) is a differential scanning calorimeter that detects the change in thermal energy generated in the sample when the sample is heated or cooled, providing reproducible data even in comparatively small amount of sample.

Thermo plus EVO II DSC8270 is a high temperature type differential scanning calorimeter that has a maximum operation temperature of 1500°C and an industrial small-sized class DSC. High temperature analysis allows you to obtain a broad range of data in phenomena that difficult to be determined using the conventional type and extensively used in the analysis of materials in various fields such as ceramic and glass materials. The thermo plus EVO II station installed with the measurement software is available for controlling and analysis similar to the conventional Thermo plus EVO II DSC.

### ( 1 ) Wide-range temperature measurement

The DSC measurement is available from room temperature to 1500°C(\*1).

### ( 2 ) Easy maintenance

Deteriorated consumable parts such as the DSC sensor and the electric furnace can be replaced.

### ( 3 ) High performance temperature control

When holding at a constant temperature, the advance control function is installed as a standard which prevents the occurrence of temperature overshoot or undershoot.

### ( 4 ) Multifunctional software

The newly developed software intensively controlling the hardware controls functions such as the ON/OFF of the convection fan and ECO mode; and enables temperature program coupled with gas switching. The analysis software includes various functions such as automatic peak top analysis, glass-transition temperature analysis, calorimetric analysis function and easy-to-use multiple display of measurement data. Also, pasting the data in the Microsoft Word or Excel is possible for a convenient analytical data writing and report making.

### ( 5 ) Free environment

Because of its significantly reduced size, it can be easily transferred using an industrial light vehicle.

(\*1)The temperature limitation depends on the measurement condition.

## 2. Composition

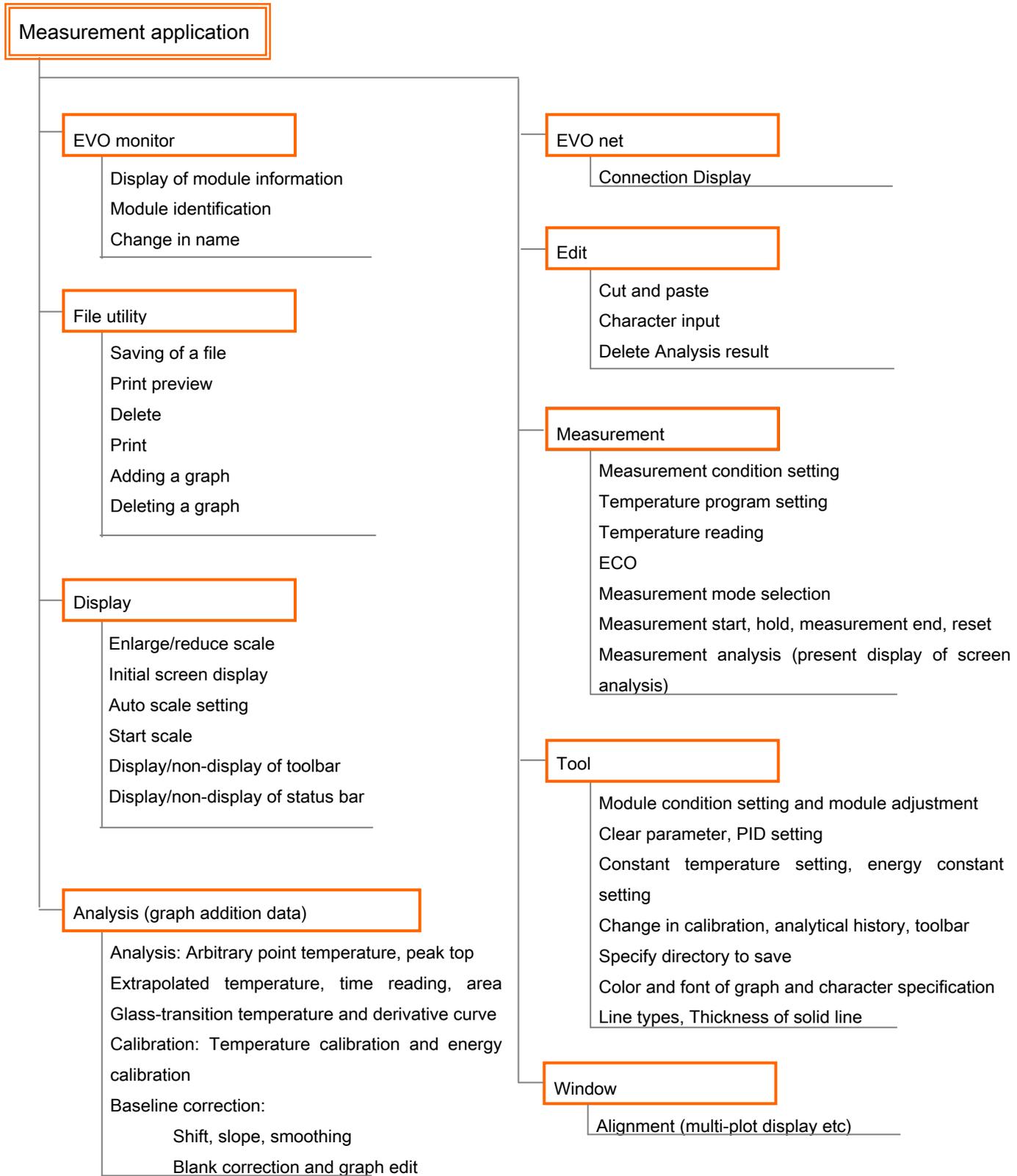
- |     |   |  |
|-----|---|--|
| 2.1 | Device type Thermo plus EVO II DSC8270  |  |
|     | 2.1.1 High-temperature type of compact-sized electric furnace   | Built-in in main unit                    |
|     | 2.1.2 High sensitivity sensor (integrated in the compact sized electric furnace).                             | Built-in in main unit                    |
|     | 2.1.3 High performance amplifier  | Built-in in main unit                    |
|     | 2.1.4 CPU circuit   | Built-in in main unit                    |
|     | 2.1.5 Communication cable   | Built-in in main unit                    |
|     | 2.1.6 Power supply cable  | 1  |
| 2.2 | Measurement control and analytical station  |  |
|     | 2.2.1 Measurement software and analysis software  | Measurement: 1 license<br>Analysis: free |
|     | 2.2.2 Windows PC (software pre-install)   | 1 unit                                   |
|     | 2.2.3 Liquid crystal display  | 1 unit                                   |
|     | 2.2.4 Colored ink jet printer   | 1 unit                                   |
|     | 2.2.5 Switching HUB   | 1 unit                                   |
| 2.3 | Standard accessory  |  |
|     | 2.3.1 Standard material (In, Sn, Pb)  | 5g each                                  |
|     | 2.3.2 Standard material (Au)  | 0.2g                                     |
|     | 2.3.3 Standard material ( $\alpha$ -Al <sub>2</sub> O <sub>3</sub> )  | 10g                                      |
|     | 2.3.4 Sample pan correction jig   | 1 set                                    |
|     | 2.3.5 Tube for gas introduction<br>(outer diameter $\phi$ 6, internal diameter $\phi$ 4, and 150mm in length) | 1pc                                      |
|     | 2.3.6 Tweezers  | 1pc                                      |
|     | 2.3.7 Microspatula  | 1pc                                      |
|     | 2.3.8 Pt sample pan ( $\phi$ 5, 2.5mmh with lid)  | 4 pairs                                  |
|     | 2.3.9 Al <sub>2</sub> O <sub>3</sub> sample pan ( $\phi$ 5, 2.5mmh with lid)                                  | 4 pairs                                  |
|     | 2.3.10 Al sample pan ( $\phi$ 5, 2.5mmh with lid)   | 200 pairs                                |
| 2.4 | Manual (manual for main unit, training guide, and standard data processing manual)                            | 1set                                     |

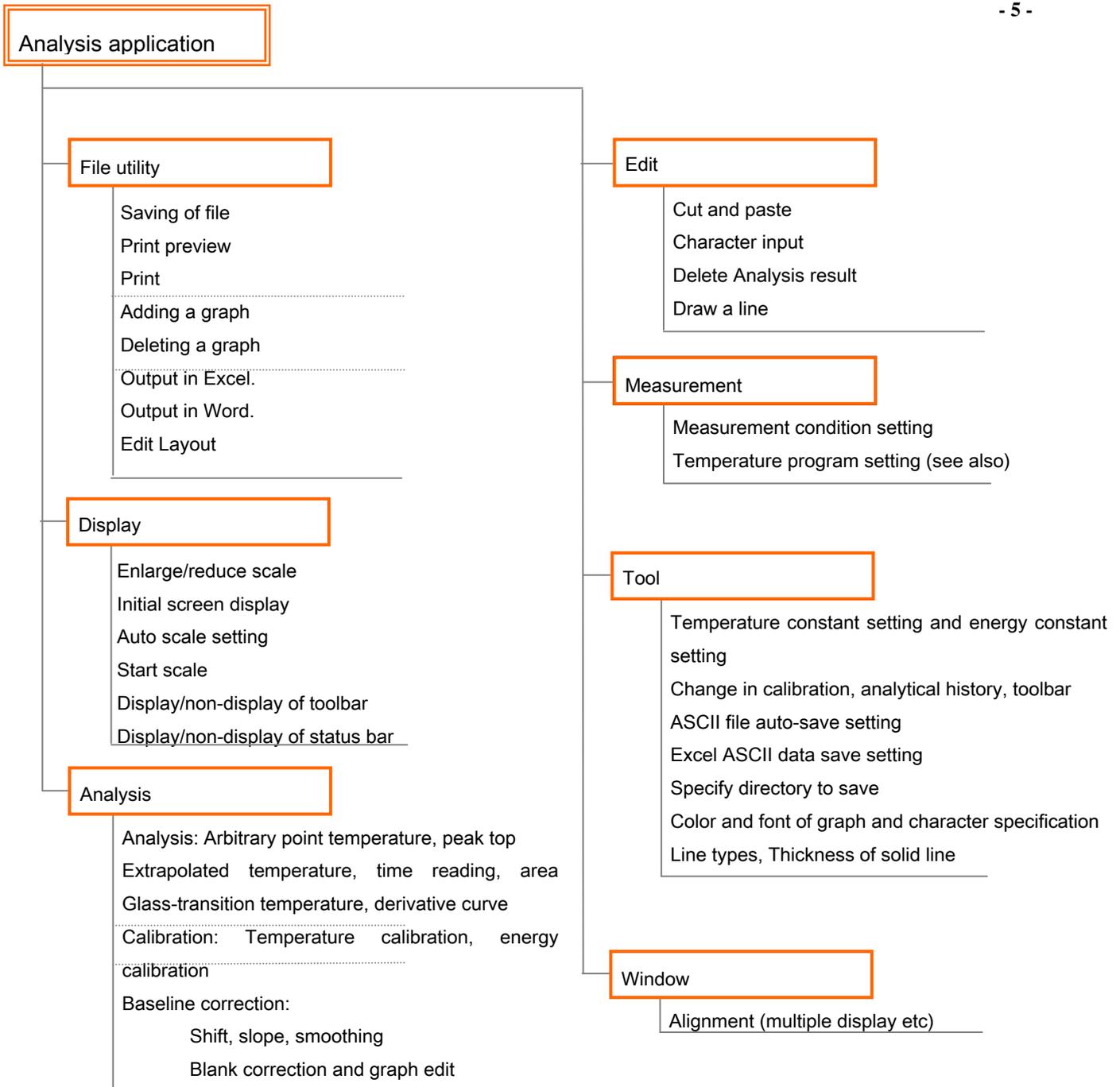
## 3. Specification

### 3.1 DSC main unit

- |   |   |   |
|---|---|---|
| (1) DSC principle                                     | : | Heat flux type  |
| (2) Sample pan  | : | 2.5mm in height , $\phi$ 5mm (standard attachment)  |
| (3) Measurement temperature<br>Range                  | : | Room temperature-1500°C   |
| (4) Heating and cooling<br>temperature rate (program) | : | 1°C/hour-20°C/min and keeping at a constant temperature.<br>Cooling is within natural cooling rate & the fast heating rate<br>is limited to the attainable temperature. |
| (5) Measurement full scale                            | : | $\pm 400\text{mW}$  |
| (6) Measurement atmosphere                            | : | Ambient atmosphere and inert gas (nitrogen etc.).<br>Possible to measure under air static or flow atmosphere.   |
| (7) Temperature program settings                      | : | Sets the measurement control and analytical station on the<br>PC screen   |

### 3.2 Measurement control and analytical station





ASCII conversion

Detailed setting (analytical result, derivative data, and thinning out etc)

Firmware download

Download/up-loading of device firmware program

## 4. Installation requirements

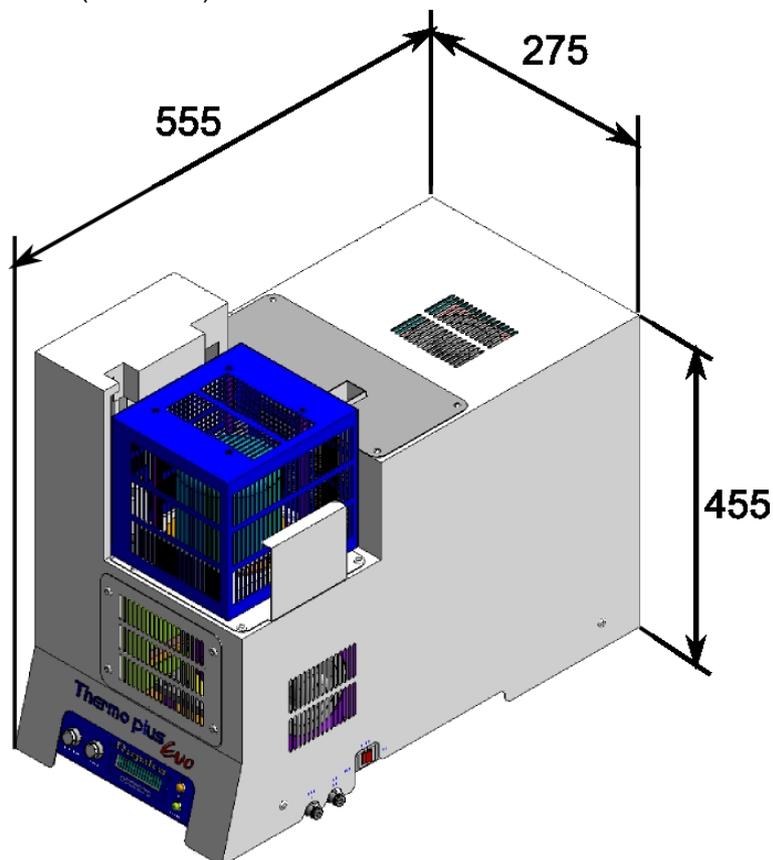
### 4.1 Installation space and weight

Type	Size (mm)			Weight (kg)
	Width	Depth	Height	
DSC8270 (Main Unit)	275	555	455	32
Thermo Plus EVOII station ( PC, monitor, printer, and five ports HUB are contained.)	900	600	440	19

\* Please refer to the utility specifications for details of all parts in the Thermo plus EVOII station.

\* Allow a space of 150mm or more between the rear of the device and the wall.

External dimensions (main unit)



## 4.2 Required power supply

Module name	Phase	Voltage (ACV, Hz)	Electric current	Grounding resistance
DSC8270 (Main body)	Single phase	100V±10% 50Hz/60Hz±1% (*)	15	100Ω or less
Thermo Plus EVO II Station (Includes PC, monitor, printer, and five ports HUB)	Single phase	100V±10% 50Hz/60Hz±1%	4	100Ω or less

※ However, there must no changes during measurement.

## 4.3 Cable length

Station		Module	
PC, monitor, and printer power supply	2m for each	Module power strip	3 m
Five ports switching HUB	1.5 m	LAN telecommunication cable	5 m
LAN telecommunication cable	3 m		
Printer telecommunication cable	1.5 m		

## 4.4 Temperature/moisture environment

15-30°C(±2°C in all temperatures). 40-70%RH (without dew condensation).

## 4.5 Various gases

Secondary pressure 20-50kPa (about 0.2-0.5kgf/cm<sup>2</sup>)

Gas inlet φ 6 one-touch fitting

## 4.6 Safety equipment

The gas detection system to detect gases such as the corrosive and toxic gases generated from the sample, exhaust duct and other leakage safety requirements must be prepared by the customer.

## 4.7 Other installation atmosphere

Please set up this module in an environment free from vibration, corrosive gases, dust, high frequency, and electromagnetic noise, etc. appropriate for the precise measurement. Avoid setting the module where sudden temperature changes near the opening of the room or direct sunshine and air conditioning etc. The module's instrument table will be provided by the customer and must be a vibration-proof table appropriate for the installation of precision instrument. Also, the installation stands such as PC racks will be prepared by the customer.

## 5. Delivery date

Decided by meeting.

Delivery place

Designated area

## 6. Receiving check

( 1 ) Device configuration and the number of checks based on this specifications

( 2 ) From our standard measurements, it is confirmed that values are within the default values.

We have confirmed that the above-mentioned parameters have been received and inspected.

## 7. Warranty

This module has a free warranty term of 14 months after installation or 12 months after inspection. Based on the company's specification and previously agreed upon emphasized conditions such as installation conditions and usage conditions, instruction manual and other documents that supplements it, replacement of parts or repairs of this module will be free of charge with respect to occurrence of breakdown or malfunction in the module's material or factory defects within the limits of normal use and within the above-mentioned warranty period.

However, trouble and the performance deterioration originating from the consumable parts such as the sample pan, thermal plate, and electric furnace even within the free warranty term will be replaced and repaired with a reasonable service charge. Charges will apply in all repairs or part replacements in an event of breakdown or malfunction after the free warranty term has ended. The following secondary damage: a delay of research and development, receiving inspection, acceptance testing etc. caused by instrument failure, is not covered by warranty.

## 8. Optional composition

### 8.1 Gas selector



Synchronizes with the measurement program, and allows gas flow within the furnace. It is possible to select from two kinds.

Composition	: Main body of gas selector	
	Two flow meter adhering (Please specify the gaseous species).	
Specification	: 2ch gas switching module	
	Gas flow	:200mL/min F.S. ~ 1000mL/min F.S.
	Standard gases	:Air, nitrogen, and argon helium
	Power supply	:AC100V 1.0A
	Dimension	:110W×325D×280H

### 8.2 Flow meter



Adjusts the gas flow within the furnace.

Composition	: Area flow meter with precise needle valve	
Specification	Gas flow	:200mL/min F.S. ~ 1000mL/min F.S.
	Standard gases	:Air and nitrogen

### 8.3 Mass flow unit



Synchronizes with the measurement program, and allows gas flow within the furnace. It is possible to select from two kinds. A mass flow controller is built-in within the unit and is available to set mass flow value by the temperature program.

Composition	: Main body of mass flow unit	
	Two mass flow meter built-in	
Specification	Gas flow	:Minimum 80mL/min F.S.
		Setup resolution 10mL/min
		1000mL/min F.S.
	Standard gases	:Air, nitrogen, and carbon dioxide
	Supply gas pressure	:0.1~0.2MPa

Channel number	:2 channel in 1 unit It is available to extend 6 channels in 3 units
Power supply	:DC24V(power feeding by AC adapterAC100, AC100V0.5A)
Dimension	:90W×300D×200H

**Rigaku**

**Rigaku Corporation**

Headquarters and factory

3-9-12 Matsubaracho Akishima-shi Tokyo Japan 196-8666

Telephone (042)545-8111

FAX (042)544-9795

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Tokyo branch	4-14-4 Sendagaya Shibuyaku Tokyo 〒151-0051	Tel (03)3479-6011	FAX (03)3479-6171
Osaka branch	14-8 Akaojimachi Takatsuki City Osaka 〒569-1146	Tel (0726)96-3387	FAX (0726)94-5852
Tohoku office	1-2-16 Omachi Aobaku Sendai City Miyagi 〒980-0804	Tel (022)264-0446	FAX (022)223-1977
Nagoya office	35-16 Daikancho Higashiku Nagoya City Aichi 〒461-0002	Tel (052)931-8441	FAX (052)931-2689
Kyushu office	2-1-1 Sakaicho Kokurakitaku Kitakyusyu City Fukuoka 〒802-0005	Tel (093)541-5111	FAX (093)541-5288