TECHNICAL GUIDANCE

RF-1000
Radiator air flow measurement system
RR-5000B Converter

OUTLINE

RF-1000 is the measurement system of the air flow going to an engine radiator.

The rotation frequency of vane anemometer (vane wheel sensor) is detected by an optical sensing system, and is converted into an air flow with the converter for radiator anemometers.

The converter is equipped with those functions as the air flow and frequency spectrum designation, the analog voltage output, and the communication function (with RS232 converter + "Wind1" software). And the air-flow data of a maximum of 64 channels can be collected with a personal computer by connecting two or more air flow converters to a RS232 converter.

The versatile functions are realized by the dedicated communication software "Wind1". Those are average calculation of air velocity, calculation of flow volume, setup functions of measurement times, measurement interval and data recording. Actual driving test can be conducted if whole system is loaded in vehicle.

FEATURES

❏ Compact sensors

The thin sensors with thickness of only 10mm can be installed at a tight space such as between a radiator and condenser.

❏ Accurate directional measurement

The vane wheel of the meter, its axis aligned parallel to the air flow direction, allows accurate measurement of the flow along the perpendicular to the radiator, neglecting the flow from the other directions. On the other hand, other types of sensor such as thermal type or pressure type tend to measure flow from all other directions.

❏ Low pressure loss

The pressure loss across the vane wheel is about 0.1kPa at the velocity of 20m/s. This value is very low compared to the pressure loss across the radiator itself.

❏ Resistant to measuring noise

The optical sensing system, by detecting optically the number of rotations of the vane wheel, is not influenced by the electromagnetic noises.

❏ Reverse flow measurement

Not only the air flow from the front of the vane wheel but the air flow from the back can be measured.

❏ Communication function

The RS232 converter can collect 64 channel data with RS-232C communication protocol.

RF-1000 SYSTEM SPECIFICATIONS

● **The converter for radiator anemometers**

1) RR-5000B

Power supply	DC12V ± 10%, Approx. 6VA
Display	Channel display: 7seg LED, 2digits Air flow and frequency display: 7seg LED, 5digits Indicator: 2
Operation key	ChUp, ChDown, Shift, Inc, Ent, and Move
Setting function	Low level cut-off, Moving average, Air-flow conversion factor, Full scale air flow, Start channel setting, End channel setting, Renewal cycle of indication, Instrument address, Selection of transmission, Voltage adjustment of analog output
Number of measuring channel	8ch
Analog output	DC-5 to 5V, 8ch (Negative voltage is outputted at the reverse flow.)
Accuracy	Frequency conversion accuracy: ±1Hz Analog output accuracy: ±0.6% of rdg ±0.01V (Based on display value)
Communication system	RS-485 communication (with RS232 converter + "Wind1" software)
Accessories	Power cable: 1 pc., 3m Analog output cable: 1 pc., 2.5m Cable for RS-485: 1 pc., 5m

● **Vane anemometer (Vane wheel sensor)**

1) RS-1050

Form	Dimension: Approx. 64mm (Projection portion included), Five vanes
Measuring range	0.4 to 30m/s
Accuracy	±1% of rdg + 0.05m/s (at the range of 0.4 to 20m/s)
Temperature range	0 to 120°C (Maximum continuous operating temperature is 100°C)

2) RS-1038

Form	Dimension: Approx. 40mm (Projection portion included), Eight vanes
Measuring range	0.5 to 30m/s
Accuracy	±1.5% of rdg+0.05m/s (at the range of 0.5 to 20m/s)
Temperature range	0 to 120°C (Maximum continuous operating temperature is 100°C)

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- **Fiber optic cable**

1) RC-3000

Size	Core diameter: φ 0.3mm, outer diameter: φ 2.0mm Length: 6m is the standard length. Between the length of 3 to 10m cable is delivered rounding off the number to the nearest integer at your request.

- **RS232 Converter**

1) RU-1000

Power supply	DC12V ± 10%, Approx.1VA
Connection	Between PC and RU-1000: RS-232C connection Between RU-1000 and RR-5000: RS-485 connection 8 sets of RR-5000B can connect to RU-1000.
Accessories	Power supply: 1 pc., 3m Cable for RS-232: 1 pc., 5m

- **Data collection software "Wind1"**

1) RW-1000

Hardware requirement	Windows98/2000/XP/7 More than Hardware requirement that each OS recommends
Communication	RS-232C
Function	The air flow data for each channel is collected. Data is measured one or more times (1 to 999) at a fixed interval (1 to 99 seconds), and the calculated data of air flow volume and average air flow are recorded on a CSV file.

MODEL CODE

- **Converter for radiator anemometer**

RR	- ☐☐☐☐☐	Contents
	5000B	When using reverse detection function: Max 8 pcs. of propeller sensor and max 16 pcs. of optical cable per unit are to be connected

- **Vane wheel sensors**

RS	- ☐☐☐☐	Contents
	1050	φ 50 Dimension: Approx. 64mm (Projection portion included), 0.4 to 30m/s
	1038	φ 30 Dimension: Approx. 40mm (Projection portion included), 0.5 to 30m/s

- **Fiber optic cable**

RC	- ☐☐	☐☐	Contents
	30	03 I 10	Core diameter: φ 0.3mm , outer diameter: φ 2.0mm 6m is the standard length. Between the length of 3 to 10m cable is delivered rounding off the number to the nearest integer at your request.

- **RS232 converter**
  (Optional items necessary when signal transmission via communication required as data acquisition system)
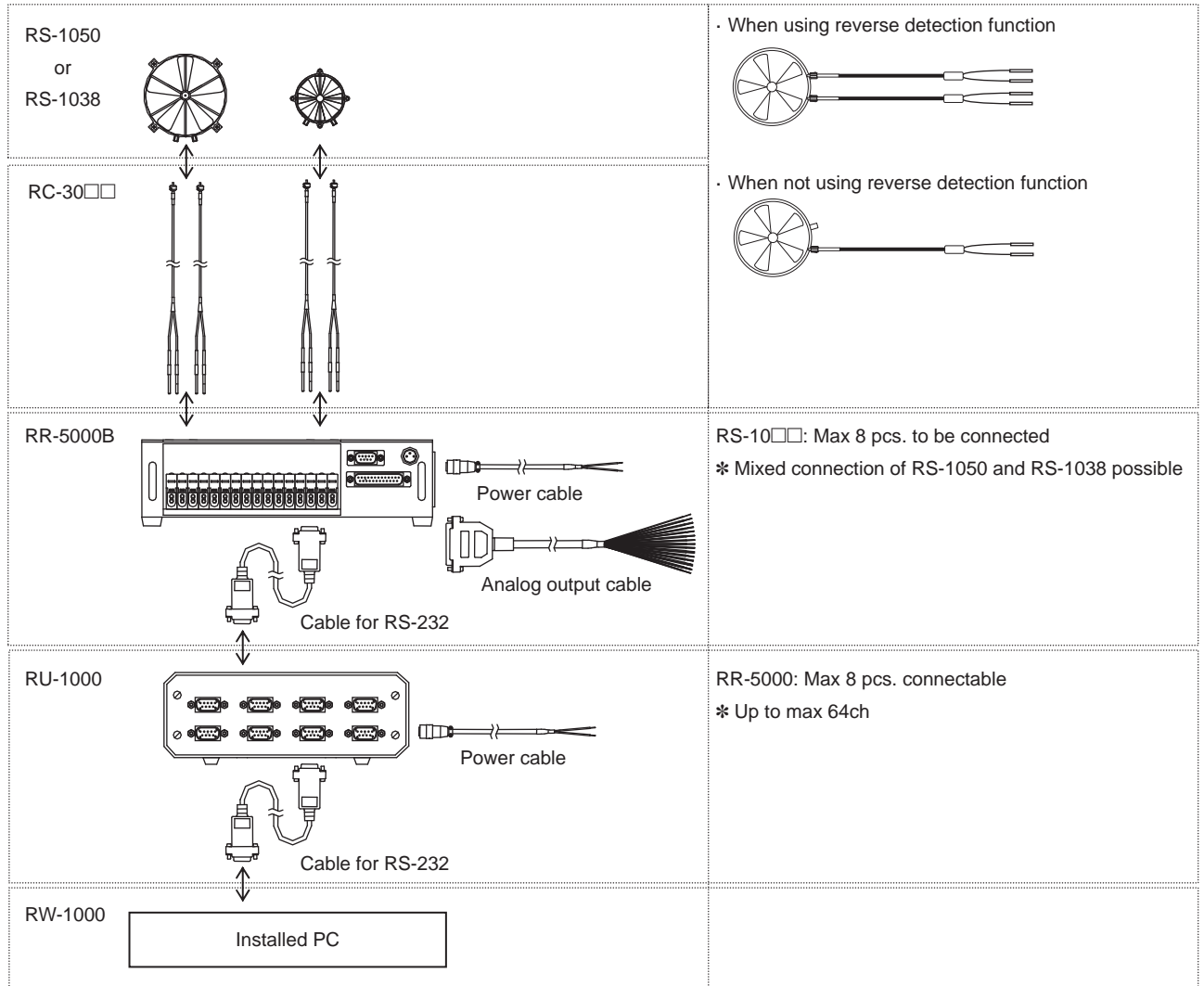
RU	- ☐☐☐☐	Contents
	1000	64 channels, 8 sets of RR-5000B can connect to RU-1000.

- **Radiator air flow data collection system**
  (Optional items necessary when signal transmission via communication is required as data acquisition system)
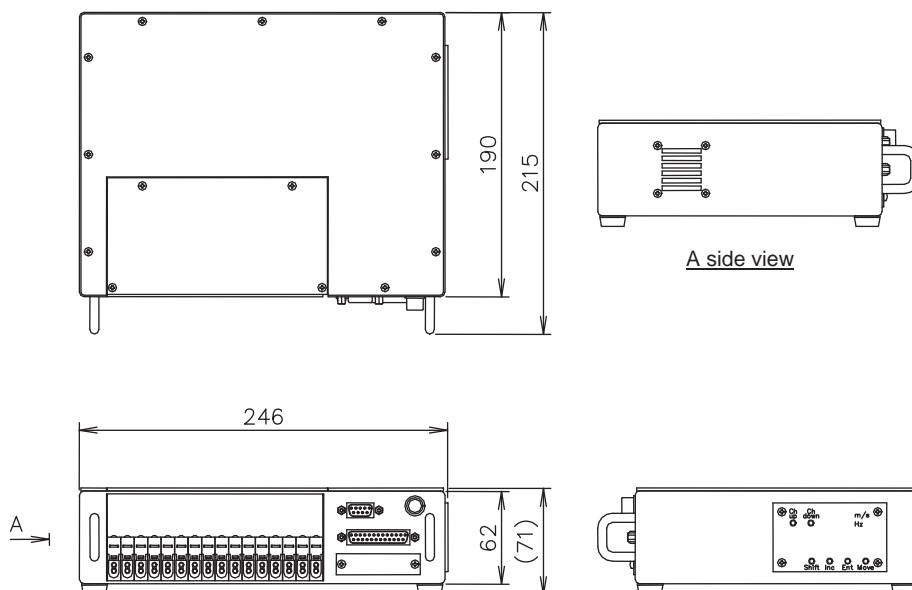
RW	- ☐☐☐☐	Contents
	1000	Collection software of air flow data

SYSTEM CONFIGURATION

RS-1050 or RS-1038	· When using reverse detection function
RC-30□□	· When not using reverse detection function
RR-5000B	RS-10□□: Max 8 pcs. to be connected
	∗ Mixed connection of RS-1050 and RS-1038 possible
Power cable	
Analog output cable	
Cable for RS-232	
RU-1000	RR-5000: Max 8 pcs. connectable
	∗ Up to max 64ch
Power cable	
Cable for RS-232	
RW-1000	Installed PC

DIMENSIONS

RR-5000B

190
215

A side view

246
62
(71)

A

RS-1050

RS-1038

RU-1000

A side view
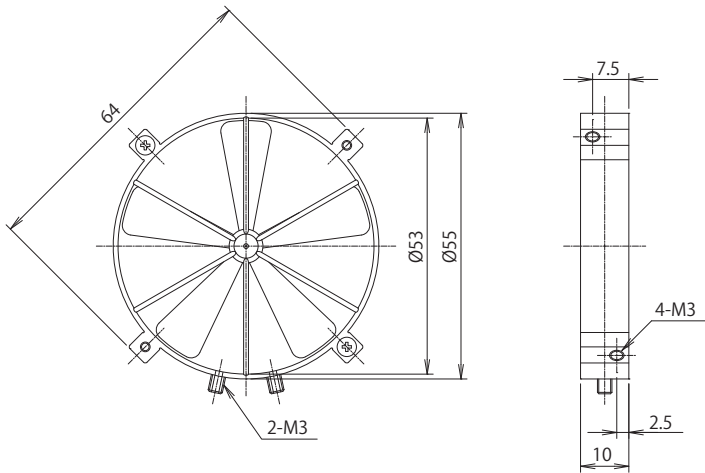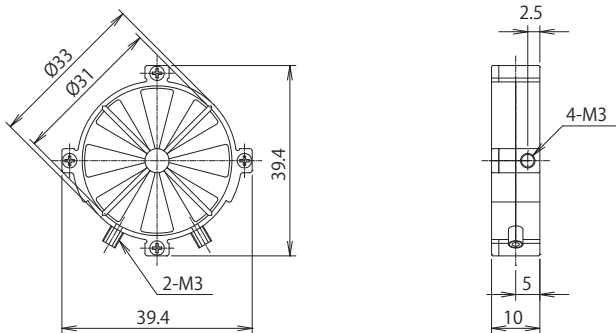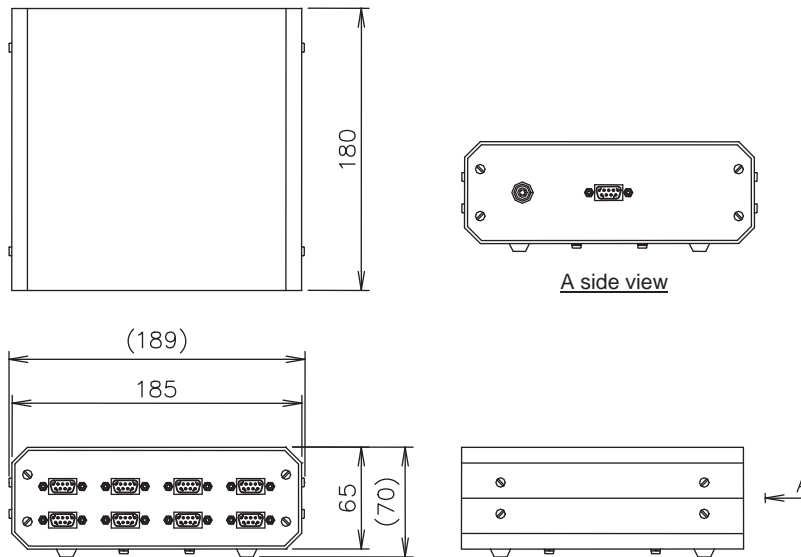
* Specification is subject to change without notice.

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