



KANOMAX
The Ultimate Measurements

Multi-Channel Anemomaster PRO

Model 1590•1591•1592

User's Manual

List of Components

■ Main Unit

Item	Model	Function
Multi-Channel Anemomaster PRO main unit	1590-0G	Measurement start and stop Measurement value display Data management
Multi-Channel Anemomaster PRO measurement software	1590-40	Measurement start and stop on PC Measured value display on PC Data management on PC
Multi-Channel Anemomaster PRO User's Manual	-	User's Manual for Multi-Channel Anemomaster PRO
USB cable	-	Connecting units
AC adapter (90W)	1580-1G	Exclusive AC adapter (90 W)
Stylus	-	For operating the touch panel.
Rubber cap	-	Dust protective cap for Connecting Connector

■ Hub Unit

Item	Model	Function
Multi-Channel Anemomaster PRO hub unit	1591-0G	Probe measuring data acquisition Measuring data transfer to the main unit
Hub unit setup guide	-	Introducing the process from setting up the unit to measurement.
Unit fixing clip	-	Clip to fix connected units (x 2)
Rubber cap	-	Dust protective cap for Connecting Connector (x2)

■ Analog Unit

Item	Model	Function
Multi-Channel Anemomaster PRO analog unit	1592-0G	Analog value output
Analog unit setup guide	-	Introducing the process from the unit setting to measurement.
Unit fixing clip	-	Clip to fix connected units (x 2)
Rubber cap	-	Dust protective cap for Connecting Connector (x2)
Dividing terminal block	-	Terminal block for analog output (x 3)

■ Probe

Item	Model	Function
UNI-directional air velocity probe (Flat)	0972-00	Digital output of air velocity values
UNI-directional air velocity probe (φ9)	0973-00	Digital output of air velocity values
Omni-directional air velocity probe (Needle)	0975-00	Digital output of air velocity values
Omni-directional air velocity probe (100 mm)	0975-09	Digital output of air velocity values
Omni-directional air velocity probe (410 mm)	0975-10	Digital output of air velocity values
Heat-resistant air velocity probe (Mini, straight type)	0976-03	Digital output of air velocity values
Heat-resistant air velocity probe (Mini, articulating type)	0976-04	Digital output of air velocity values
Heat-resistant air velocity probe (Mini, straight, temperature-compensation sensor independent type)	0976-07	Digital output of air velocity values
Heat-resistant air velocity probe VT (Mini, straight, temperature-compensation sensor independent type)	0976-05	Digital output of air velocity value and temperature
Air velocity probe (Mini, straight type)	0976-13	Digital output of air velocity values
Air velocity probe (Mini, articulating type)	0976-14	Digital output of air velocity values
Air velocity probe (Mini, straight, temperature-compensation sensor independent type)	0976-17	Digital output of air velocity values
Air velocity probe VT (Mini, straight, temperature-compensation sensor independent type)	0976-15	Digital output of air velocity value and temperature
Omni-directional air velocity probe VT	0975-21	Digital output of air velocity value and temperature
Omni-directional air velocity probe VTH	0975-31	Digital output of air velocity value, temperature, and humidity

■ Options

Item		Model	Function
Standard cable	0.5 m	1580-30	Connecting unit-to-unit or hub unit-to-probe
	2.0 m	1580-31	
	5.0 m	1580-32	
	10.0 m	1580-33	
	20.0 m	1580-34	
	40.0 m	1580-35	
AC adapter (90W)		1580-1G	Exclusive AC adapter (90W)
AC adapter (160W)		1590-1G	Exclusive AC adapter (160W)
DC power connection cable		1580-37	Exclusive cable for DC power supply
Unit fixing clip		-	Clip to fix connected units
Probe fixing jig		1580-90	For anchoring the probes (20 sets)
Double stick tape		1580-92	For mounting the probe with a base (Probe Model #0976-05, 0976-07, 0976-15 and 0976-17) 10 sheets (20 pcs per sheet)

Important Safety Information

The symbols for the warnings used in this manual are defined below:

Description of Symbols



Warning

Warnings in this classification indicate risks that may result in serious injury or death if not observed.



Caution

Warnings in this classification indicate risks that may result in injury or damage to the surrounding objects if not observed.

Notice

Warnings in this classification indicate risks of damage to the product that may void the product warranty if not observed.

Description of Symbols



This symbol indicates a condition that requires caution (including warning). The subject of each caution is illustrated inside the triangle (e.g. the high temperature caution symbol is shown on the left).



This symbol indicates a prohibition. Do not take the prohibited action shown inside or near this symbol (e.g. the disassembly prohibition symbol is shown on the left).



This symbol indicates a mandatory action. A specific action is given near the symbol.



Warning



(Forbidden) Do not use the AC adapter other than the provided one with the instrument.

Using an inappropriate adapter may damage the instrument.

It may generate heat and cause fire and/or an accident(s).



(Forbidden) Always keep the probe away from areas where flammable gas is present.

Failure to do so may cause fire and/or explosion because the air velocity sensor is heating.



(Proper Handling) Be sure to use the provided AC adaptor properly.

Handle the instrument properly in accordance with the instructions provided in this manual. Failure to do so may cause electric shock, fire, and/or the air velocity sensor damage.



(Caution) If abnormal noise, smell, or smoke is observed, or if liquid has entered the instrument, turn off the power immediately, remove the batteries or pull out the plug.

Failure to observe the above may cause electric shock, fire, and/or damage. Please contact your local distributor or Kanomax service center for repair.



Caution



(Proper Handling) Pull out the plug when the instrument is not in use.

Failure to do so may cause electric shock, fire hazard, and/or circuit damage.

Notice



(Forbidden) Do not use or keep the instrument in hot, humid, and/or dusty environment. Do not expose the instrument to direct sunlight for a prolonged period of time.

The instrument may not function properly out of the specified operational temperature range.



(Forbidden) Do not subject the instrument to strong impact.

Dropping and/or hitting the instrument may cause damage and malfunction.



(Forbidden) Do not wipe the instrument with volatile solvent.

The body may deform and/or deteriorate. Use soft dry cloth to remove stains. If stains persist, soak the cloth in neutral detergent and wipe the instrument with the cloth.



(Forbidden) Do not touch the LCD screen with a sharp-pointed object or with excessive pressure.

It may cause distortion of the screen or a malfunction.

A rapid temperature change may cause a malfunction of the screen.



(Forbidden) Do not dispose of the instrument as household waste.

Please note that the disposal of the instrument and the AC adapter should be in line with your local or national legislations. For details, please consult with your local distributor.



(Forbidden) This instrument is designed to be used in the clean air flow without dusts and/or foreign substances.

Touching or hitting the air velocity sensor with a foreign substance may cause damage to the sensor.

Dust and/or foreign substances adhered to the air velocity sensor can hinder accurate measurement.



(Forbidden) Do not apply any excessive force to the air velocity sensor.

If the air velocity sensor is deformed, not only maintaining the accuracy is impossible but also the sensor may be broken.



(Forbidden) Do not disassemble, modify, or attempt to repair the instrument.

Failure to observe the above may result in a short circuit and/or a malfunction.



(Forbidden) Do not allow static electrical discharge to the instrument.

Failure to observe the above may affect measurement values and cause damage to the instrument circuit.



(Proper Handling) Regularly check that the tip of the probe is clean.

Dust and/or foreign substances adhered to the air velocity sensor can hinder accurate measurement.

To remove dust, blow it off with a blower brush for cameras or lightly rinse with water and dry it well.

※Be sure to turn the power off to the main unit before cleaning the air velocity sensor.

※Never dry the probe by heat. (Failure to observe this may cause damage to the air velocity sensor.)



(Forbidden) If the instrument and the probe have been stored in a cold place, do not bring the instrument to a warm place to avoid a sudden temperature change.

Even when the instrument is used in the specified operating temperature and humidity, a sudden temperature change may cause condensation.

Condensation on the air velocity sensor may cause inaccurate measurement.

If condensation occurs on the metal part, it becomes rusty which may cause damage to the probe.



(Proper Handling) When storing the instrument, keep it in a place with an ambient temperature of -10 to 60°C and no condensation.

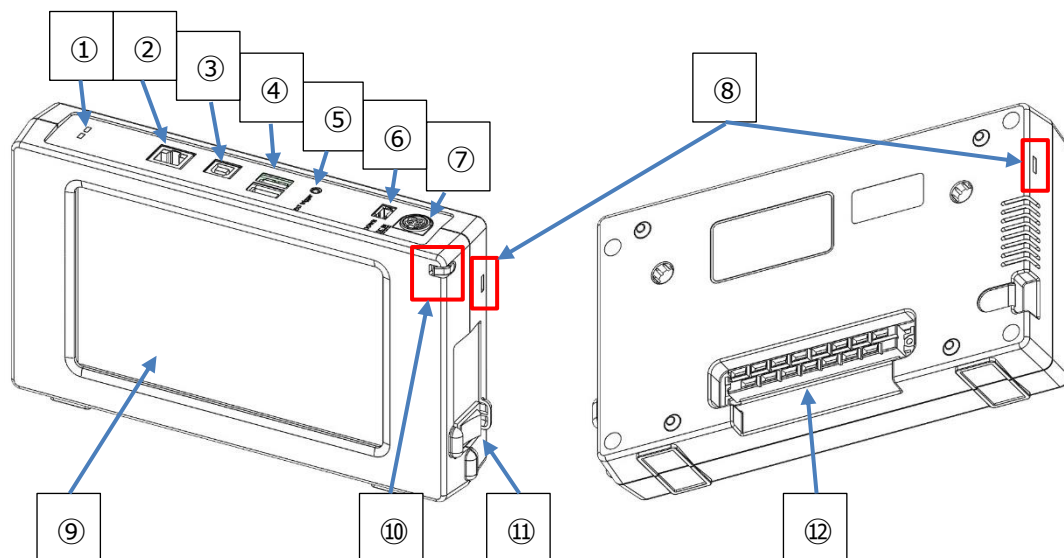
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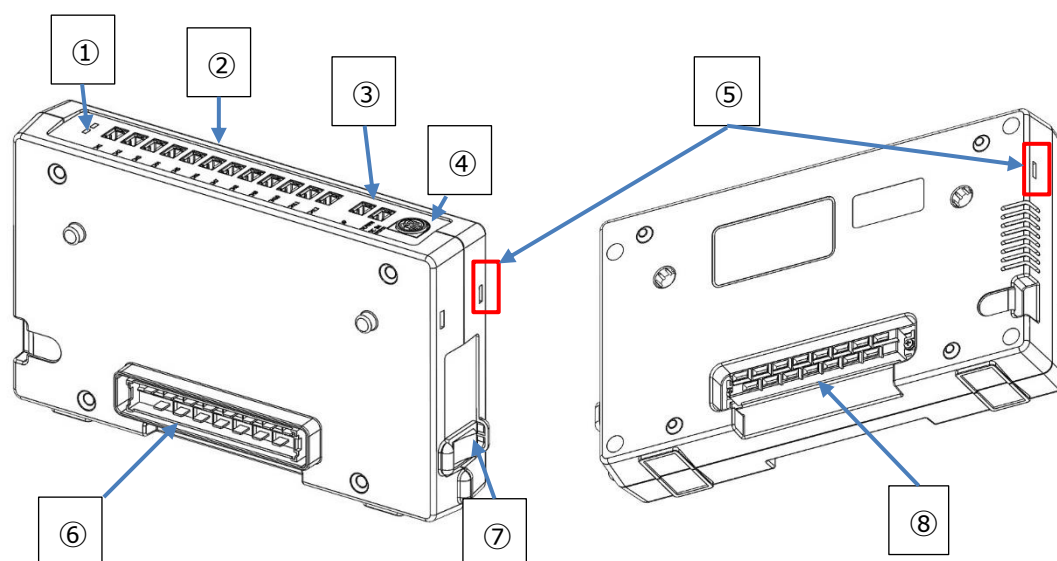
1. Part Names and Functions

1. Main Unit (Model 1590-0G)



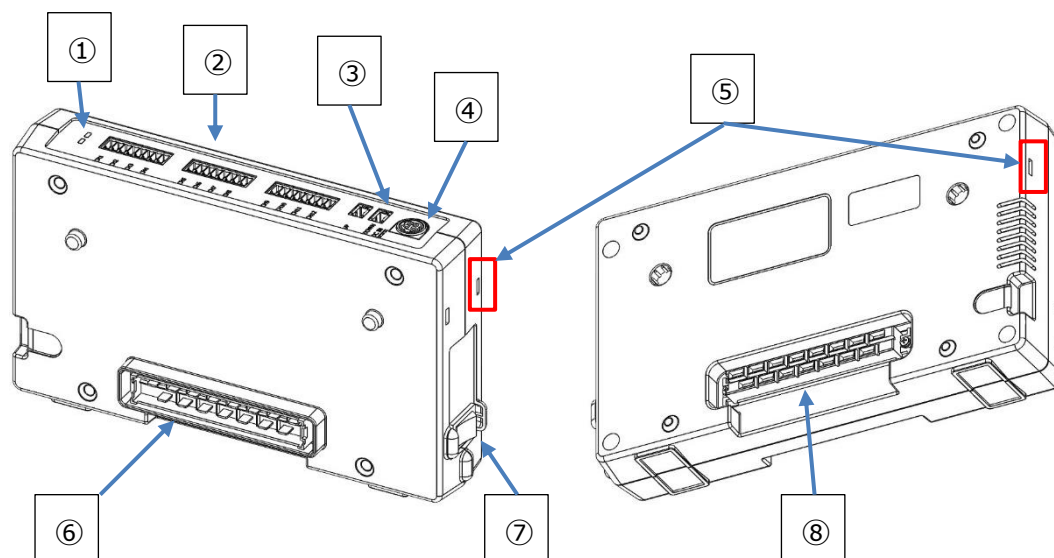
Name	Function
① LED (Blue/Red)	Displays the status of this unit
② LAN terminal	Communicates with the PC via Ethernet
③ USB terminal (for PC)	Connects to a PC with the USB cable
④ USB terminal (for USB memory) x 2	Copies results to the USB memory
⑤ External trigger terminal	Connects to the external trigger
⑥ Unit-to-unit communication terminal	Communicates with another unit
⑦ DC power supply terminal	Supplies power from the exclusive AC adapter
⑧ Insertion port for unit fixing clip	Insert the fixing clip into this port to connect the units
⑨ LCD	Displays GUI
⑩ Insertion port for stylus	Insert the stylus into this port to store the stylus
⑪ Power switch	Turns the power ON/OFF to the main unit
⑫ Connecting connector (Socket)	Communicates with another unit and supplies power

2. Hub Unit (Model 1591-0G)



Name	Function
① LED (Blue/Red)	Displays the status of this unit
② Probe-to-probe communication terminal (1 to 12 CH)	Communicates with another probe
③ Unit-to unit communication terminal (UP/DOWN)	Communicates with another unit
④ DC power supply terminal	Supplies power from the exclusive AC adapter
⑤ Insertion port for the unit fixing clip	Insert the fixing clip into the insertion port to connect the units
⑥ Connecting connector (Plug)	Communicates with another unit and supplies power
⑦ Power switch	Turns the power ON/OFF to the main unit
⑧ Connecting connector (Socket)	Communicates with another unit and supplies power

3. Analog Unit (Model 1592-0G)



Name	Function
① LED (Blue/Red)	Displays the status of this unit
② Analog output terminal (1 to 12 CH)	Outputs analog values to have been set in the main unit. Connects to CH to be used in the dividing terminal block (accessory), and wire to the output.
③ Unit-to unit communication terminal (UP/DOWN)	Communicates with another unit
④ DC power supply terminal	Supplies power from the exclusive AC adapter
⑤ Insertion port for the unit fixing clip	Insert the fixing clip into this port to connect the units
⑥ Connecting connector (Plug)	Communicates with another unit and supplies power
⑦ Power switch	Turns the power ON/OFF to the main unit
⑧ Connecting connector (Socket)	Communicates with another unit and supplies power

2. Getting Ready to Measure

System configuration

This system uses multiple units, cables and power supply devices combined as shown below. This chapter explains how to configure them to get ready to measurements.

- Main Unit

Displays measured values, starts/stops measurements, and sets measurement settings. At least one main unit has to be used.

- Hub Unit

Connects the probe and the main unit. Using multiple hub units is allowed to connect multiple probes.

- Analog unit

When outputting measurement data via analog voltage, connect to this analog unit. When not outputting via analog output, this connection doesn't necessary.

- Probe

The probes are equipped with the air velocity sensor to detect air velocity. Some probes are also possible to detect temperature and humidity.

- AC adapter

The 90W AC adapter (main unit accessory) and the 160W AC adapter (optionally available) are prepared. The adapters are used to supply power to the above units.

Aside from the AC adapter, power can be supplied using the DC power connection cable (optionally available).



Wrong connections can cause malfunction and/or damage. Prior to turn the power ON, read this User's Manual carefully, configure each instrument in the following sequence.

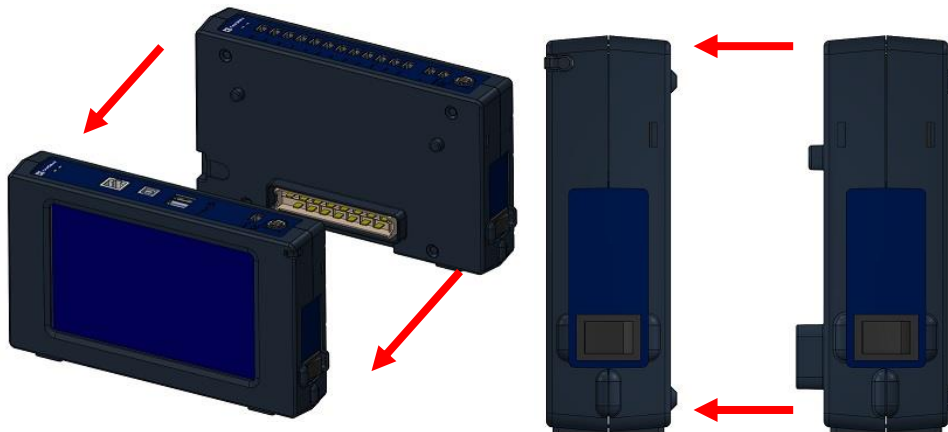
1. Connect the unit
2. Connect the power source
3. Connect the probe fixing jig
4. Connect the probe
5. Connect the analog output

Connecting the unit

- There are 2 ways of unit-to-unit connection—using **the connecting connector**, and **a standard cable (optionally available)**. When disconnecting the units, prior to disconnect each unit, be sure to turn off the power to each unit first and remove the AC adapter. Changing the connected unit while turning the power on may cause failure and/or breakage.

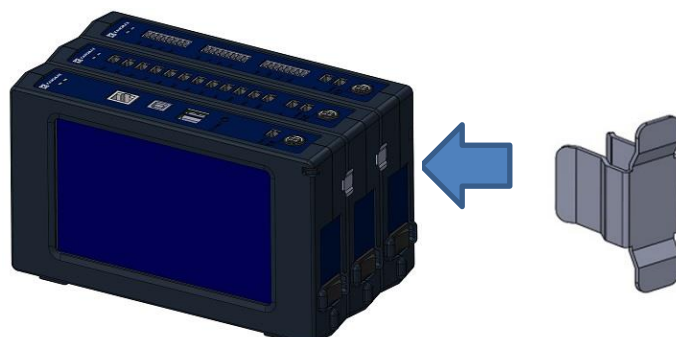
1. Connecting using the connecting connector

The main unit is equipped with the connecting connector (socket), the hub/analog units are equipped with the connecting connector (plug) and the connecting connector (socket) respectively as standard. Unit-to-unit communication is possible by connecting each socket and each plug. Be sure to insert each connector into each socket as far as it will go.

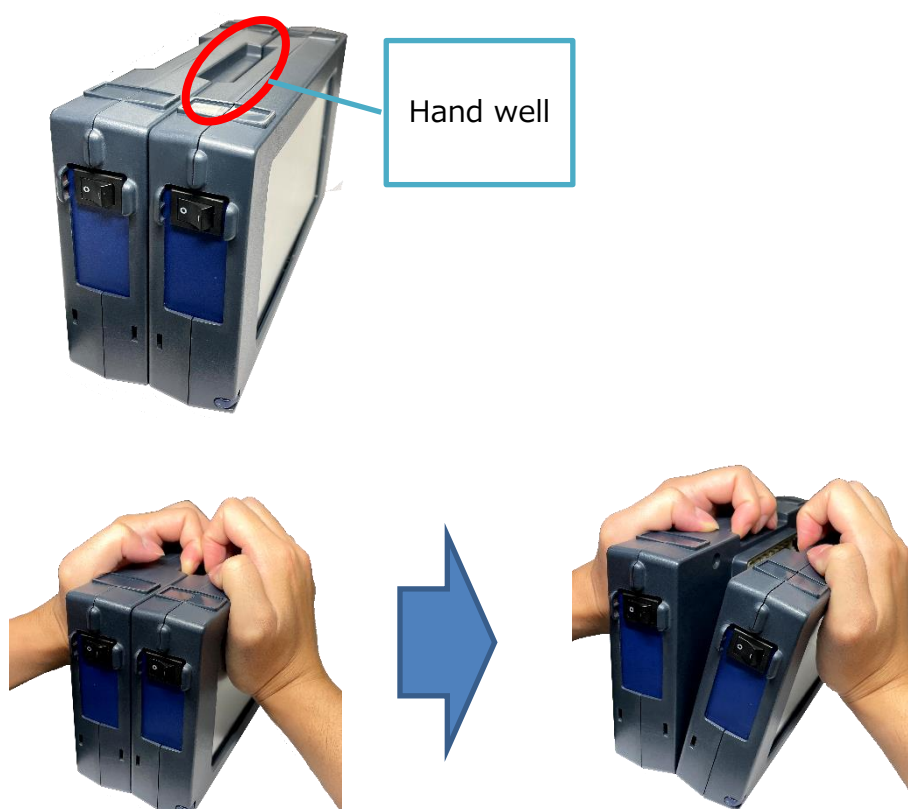


If you use the clip (optionally available), you can fix the units to connect. As the below figure shows, insert the clip into the insertion port of adjacent units to connect.

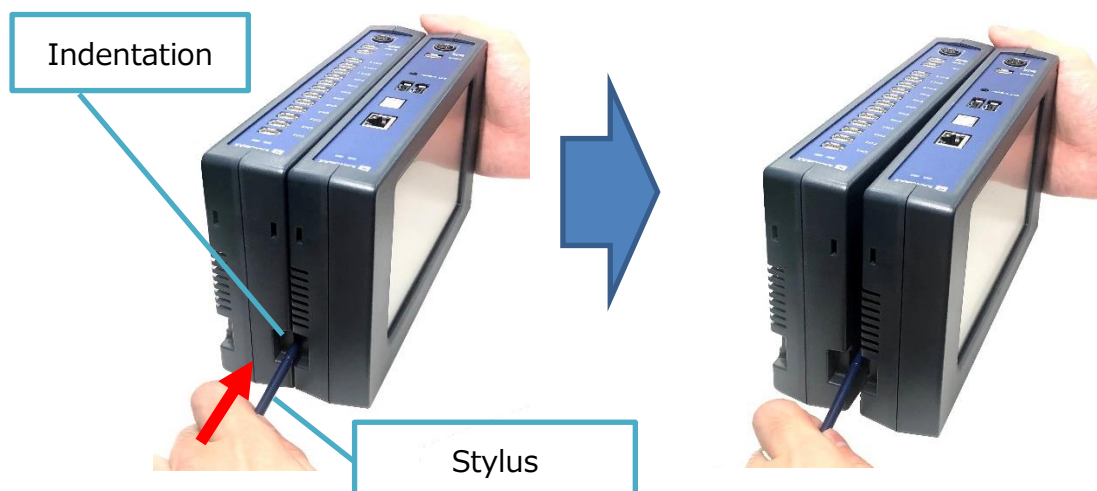
To disconnect the connected units, remove this clip first and disconnect.



To disconnect the connected units, put your fingers in the hand well at the bottom face of the units, and pull the units outward.

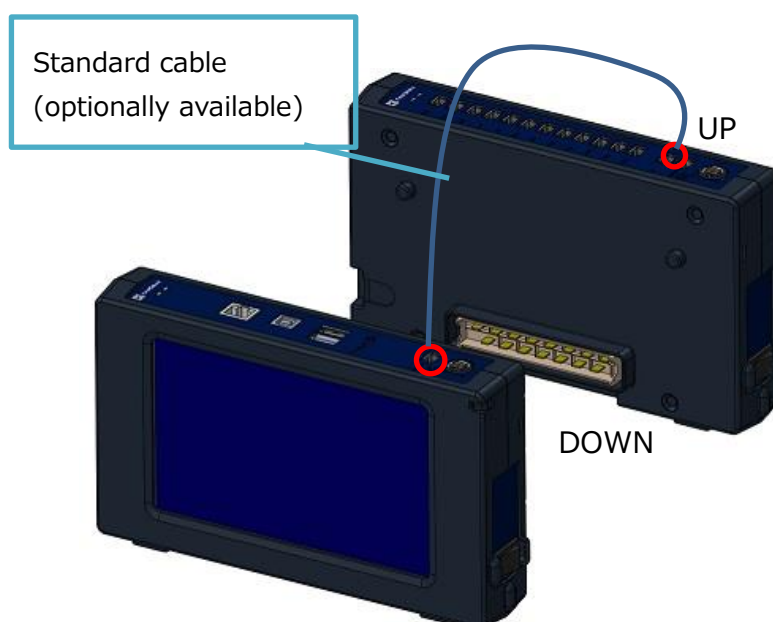


You can also remove the connected units by inserting the stylus (main unit accessory) into the indentation of the side of the units as far as it will go.

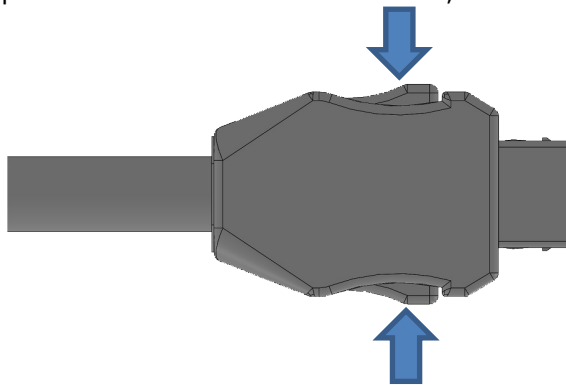


2. Connecting using a standard cable

The main unit is equipped with the **DOWN** connecting connector, and the hub/analog units are equipped with the **UP** connecting connector and the **DOWN** connecting connector respectively. Connect the **Down** connecting connector and the **UP** connecting connector to adjacent units with the standard cable (optionally available).



To disconnect the standard cable (optionally available), as the below figure shows, push and hold the release buttons, and remove the cable from the connector.

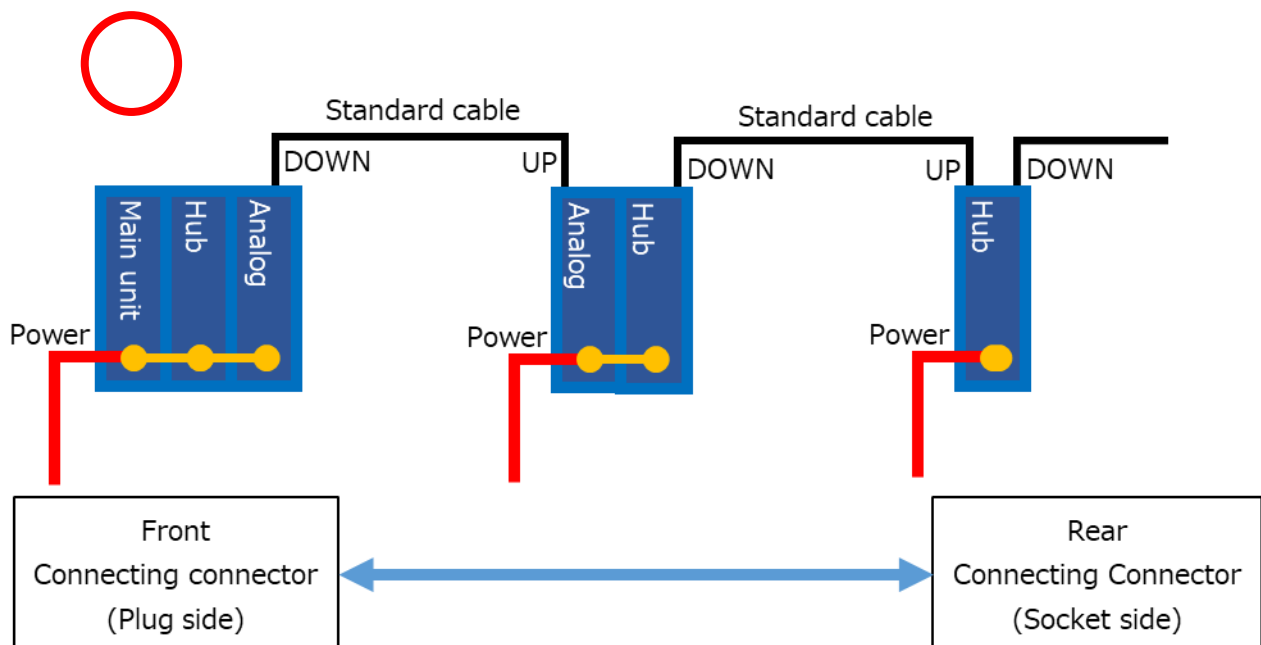


How to connect the units by the above two methods, refer to the below.

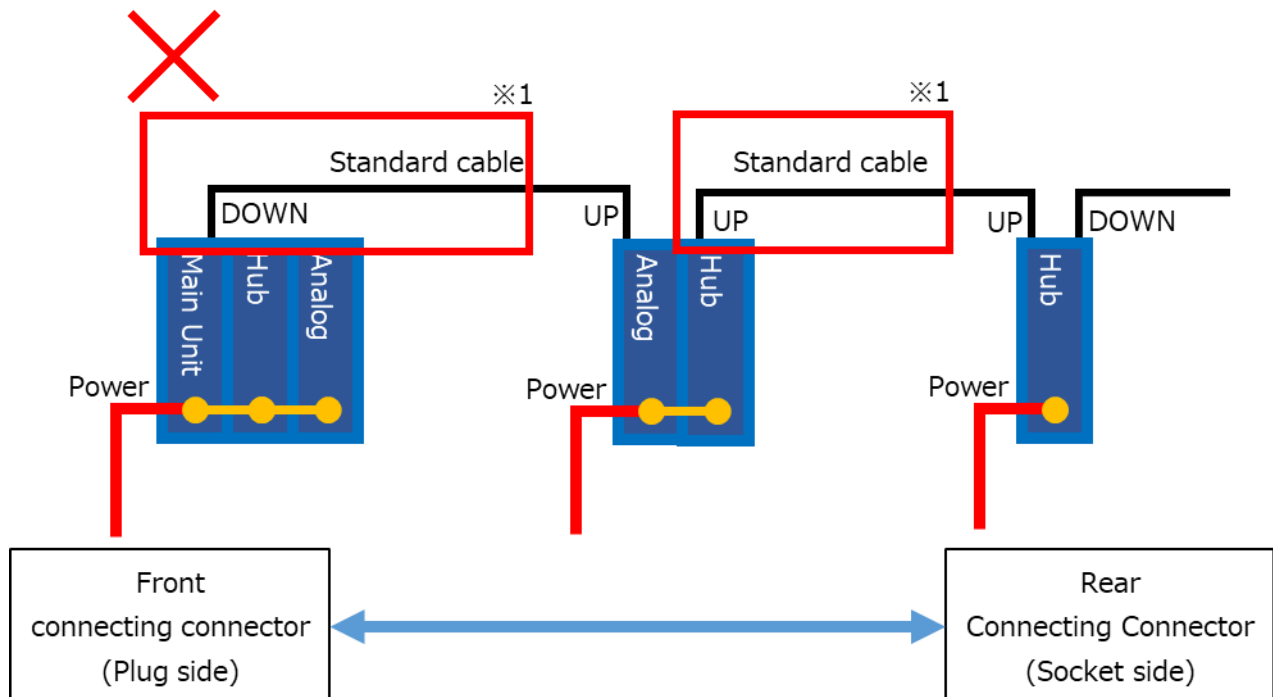
- Situate the main unit in the first row. When connecting another unit, situate another unit to the next of the first unit. When connecting another unit again, connect the unit to the last connected unit.

The connecting connector (plug) should be situated in the forward position, and the connecting connector (socket) should be situated in the backward position.

- When linking the connected-unit block (Ⓑ) to the connected-unit block (Ⓐ), using the standard cable, connect the communication terminal DOWN of the rearmost situated unit of the connected-unit block (Ⓐ) to the communication terminal UP of the foremost situated unit of the connected-unit block (Ⓑ).



- Do not connect the units as the following figure shows. With this connection, conducting accurate measurement is impossible.

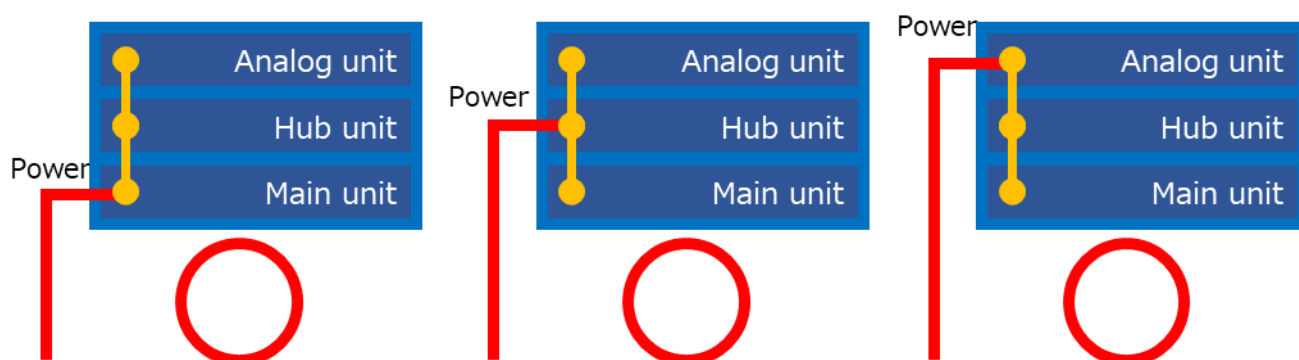


※1

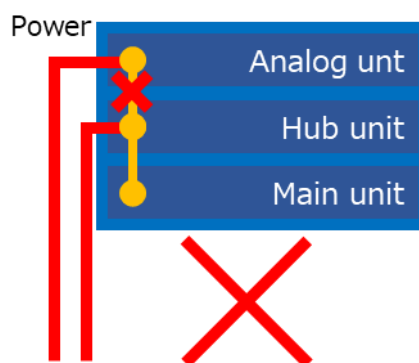
When adding another unit, using the standard cable, connect the communication terminal DOWN of the rearmost situated unit in the front block to the foremost situated unit in the rear block.

Connecting the power source

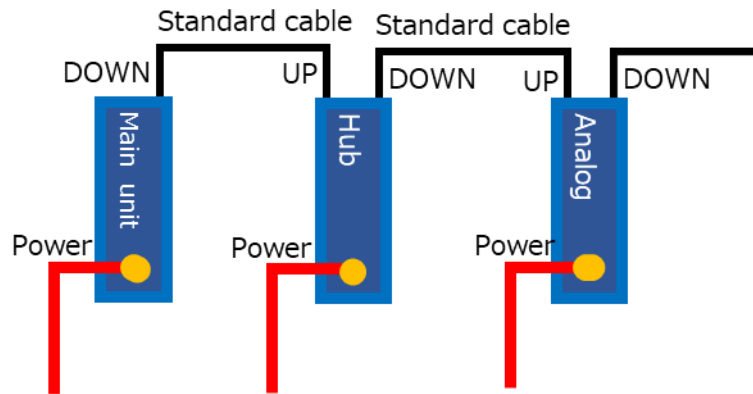
- The device is powered using the AC adapter (90W: main unit accessory, 160W: optionally available item) or the DC power connection cable (optionally available). Do not use any AC adapters or cables other than those specified. Failure to do so will result in failure or damage.
- When the units are connected with the connecting connector, power is also shared among the units. This means that power is supplied from every connected unit. Therefore, do not connect any other power connector to any other unit. Be sure to connect the power to the one unit only.



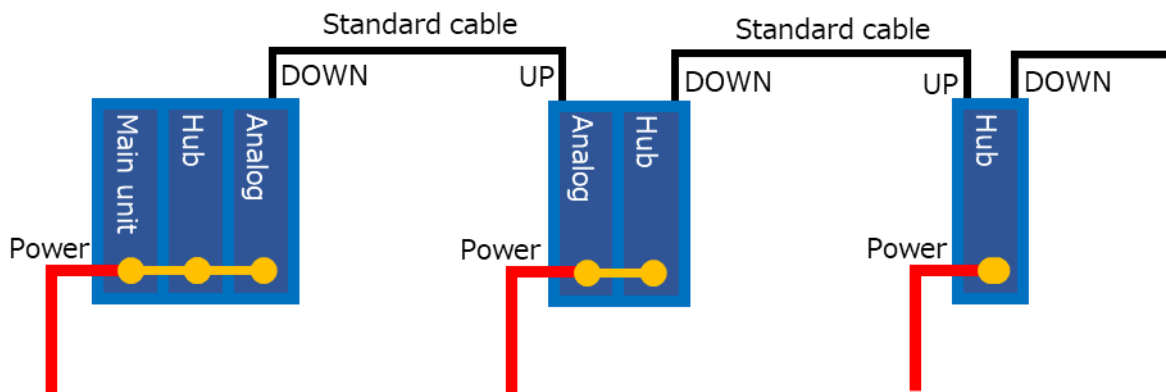
- If multiple units are supplied power simultaneously, electrical collision occurs inside the units. Malfunction and/or damage may occur not only in the unit, but also other connected power source devices. This is dangerous. Do not supply power to the multiple units.



- When the units are connected with the standard cable, power in each unit is not connecting each other. Therefore, power should be supplied to each unit.



- When the connected-unit block is linked to another block with the standard cable, as the below figure shows, connect the power source to each block.

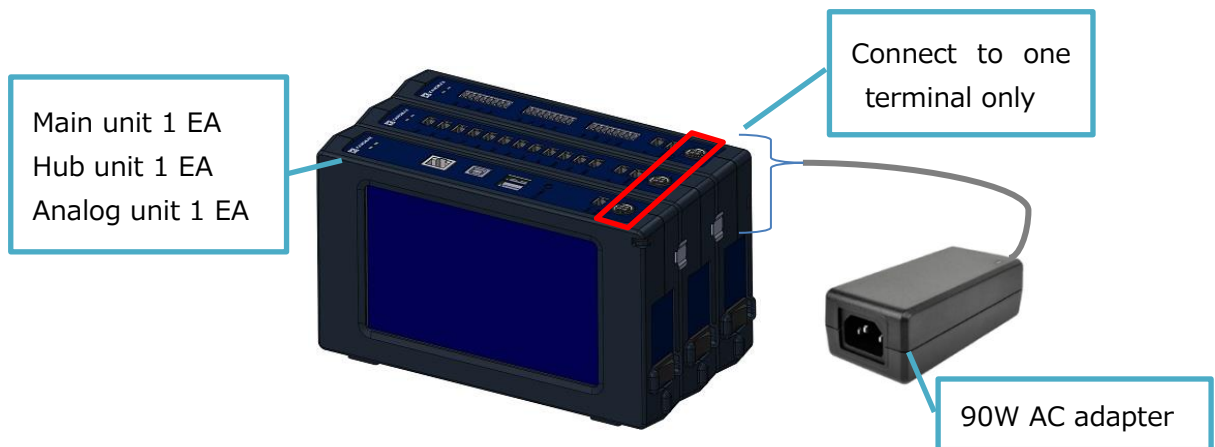


- The below list shows the number of connected unit capable to operate with the AC adapter.

Power supply	90W AC adapter	160W AC adapter
The maximum number of connected unit	Main unit 1 EA, Hub unit 1 EA, and Analog unit 1 EA	Main unit 1 EA, Hub unit 2 EA, and Analog unit 2 EA

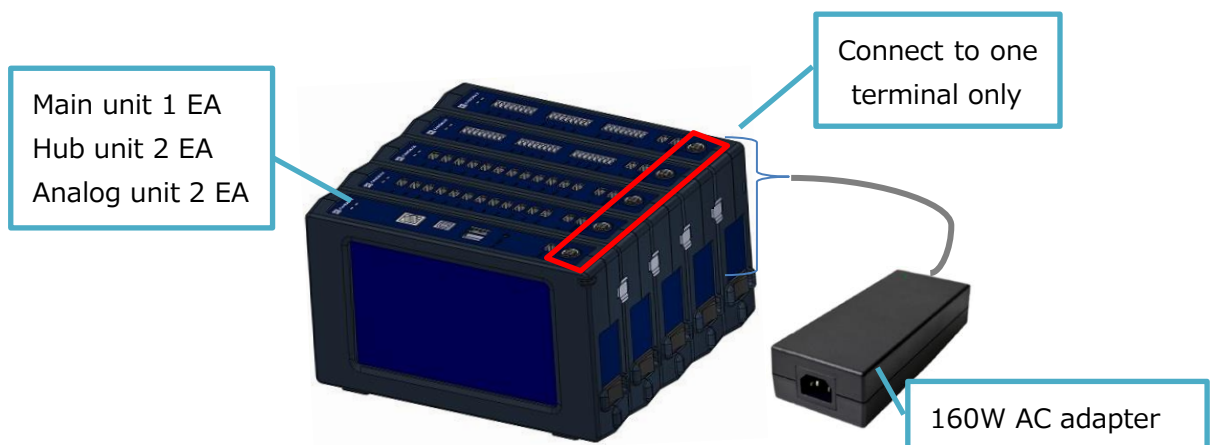
Using the 90W AC adapter (accessory), you can connect up to the main unit 1 EA + the Hub unit 1 EA + the analog unit 1 EA.

Note: Whether the analog unit is connected or not, the number of the hub unit you can connect is up to 1 EA.

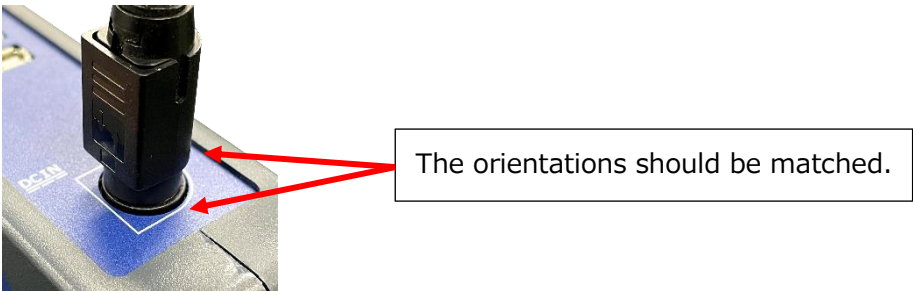


With the 160W AC adapter (optionally available), you can connect up to the main unit 1 EA + the hub unit 2 EA + the analog unit 2 EA.

Note: Whether the analog unit is connected or not, the number of the hub unit you can connect is up to 2 EA.



When connecting the AC adapter to the unit, as the figure shows below, the orientation of the AC adapter should be the same with the solid-lined figure of the DC power supply terminal on the unit. Be sure to insert the AC adapter in the right orientation until you feel a click.



- Supplying power using the DC power connection cable (optionally available)
Power can be supplied using the DC power connection cable (optionally available) if you don't use the AC adapter.
However, the DC power cable sold separately is needed to be prepared by a user.
(DC power: 12 to 24 V)
Each unit must be used not more than the total power as below and not more than a current of 6A.

Unit	Electric power consumption
Main unit (1590-0G)	10W
Hub unit (1591-0G)	50W
Analog unit (1592-0G)	10W

Example of connected unit number

Power supply voltage	12V (max. 72W)	24V (max. 144W)
Maximum number of connected unit	Main unit 1EA + Hub unit 1 EA ※+ Analog unit 1 EA (Total 70W)	Main unit 1 EA + Hub unit 2 EA ※+ Analog unit 3 EA (Total 140W)

* Despite the number of the connected analog unit(s), this is the maximum number of the hub unit(s) you can connect.



Connecting the probe fixing jig

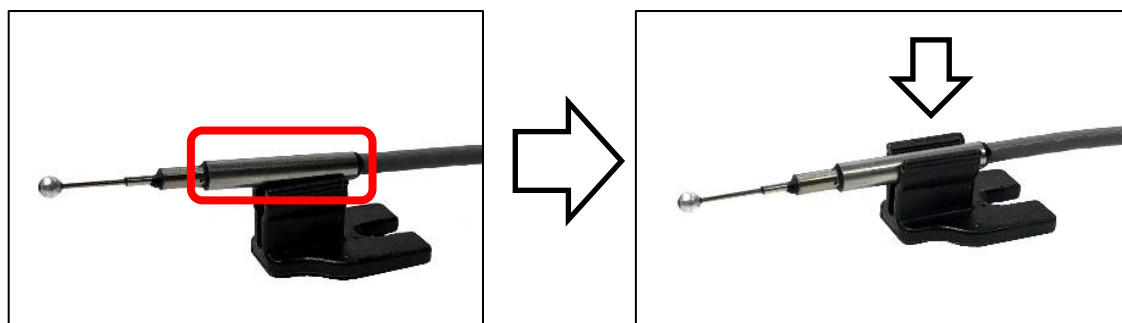
- Only the probes 0976-03 and 0976-04, 0976-13, 0976-14 can be used to anchor the probes with the optional probe fixing jig (Model: 1580-90 [in package of 20 sets]). Do not use any other probe. Otherwise, malfunction or damage may occur.

How to mount/remove the probe to/from the fixing jig, follow the procedure below.

When mounting/removing the probe, do not allow the sensor of the probe to touch the probe fixing jig or surrounding objects. Do not touch the air velocity sensor. Otherwise, malfunction or damage may occur.

■ Mounting the probe

Place the part of the probe, which is in the red frame as below figure, on the probe fixing jig and push the probe until you feel a click.

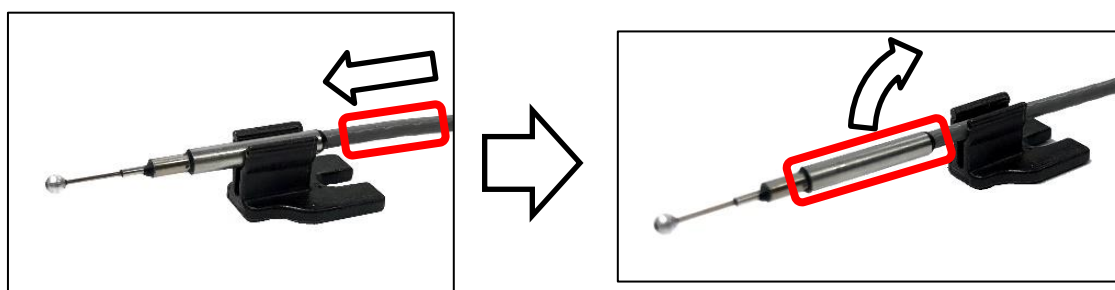


■ Removing the probe

As shown in the left photo below, move the cable near the probe fixing jig in the direction of the air velocity sensor. After that, hold the part of the probe, which is in the red frame in the right photo below, and pull up.

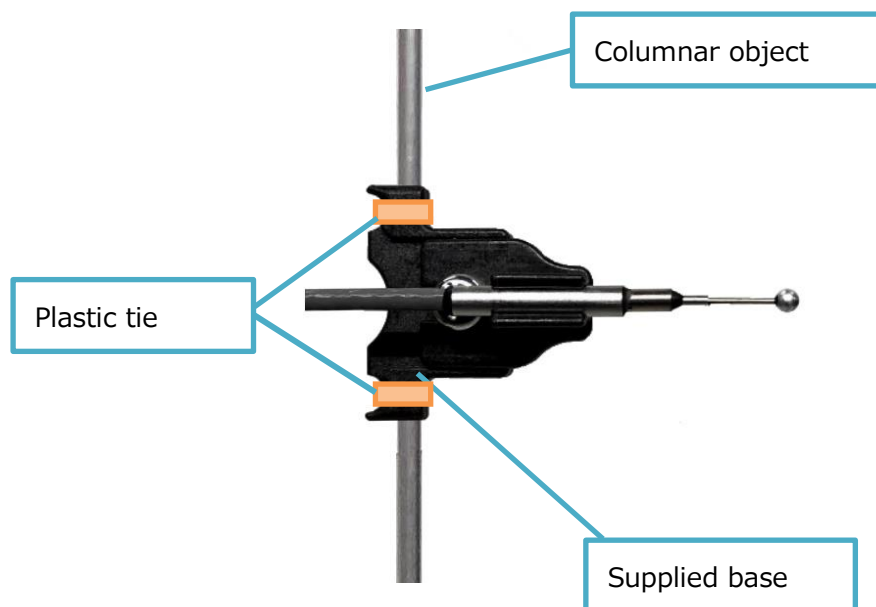
The mounting angle can change due to the probe tension.

If its angle changes, adjust the mounting angle if needed.



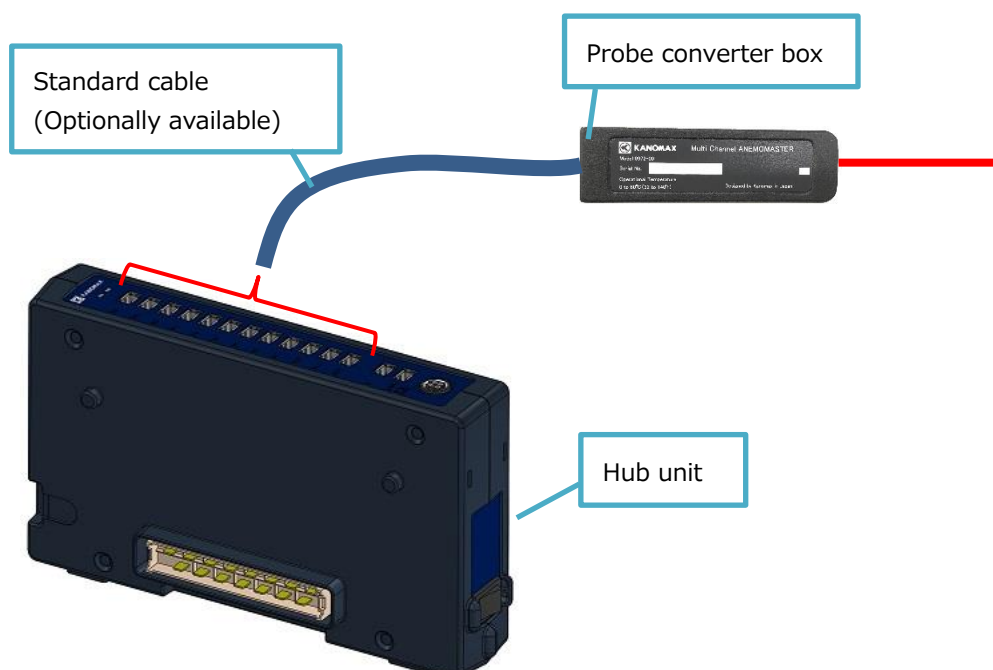
To mount the probe fixing jig to a setting place, use such an adhesion tape as a double-faced tape.

To mount the probe fixing jig to a columnar object, as the figure shows below, attach the supplied base to the probe fixing jig and fix them with such a band as a plastic tie.



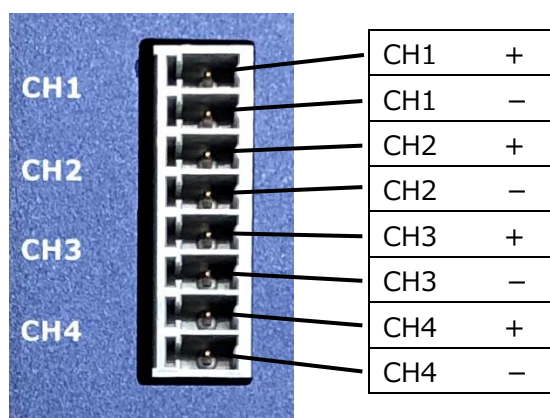
Connecting the probe

- For the probe-to-hub unit connection, connect the probe connector (CH1 to CH12) of the hub unit and the connector of the probe converter box with the standard cable (optionally available).



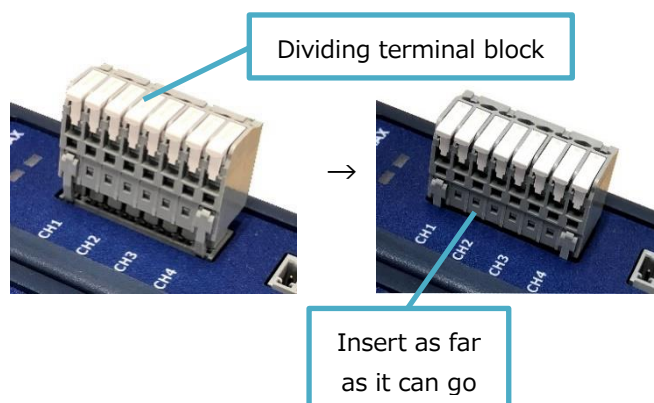
Connecting the analog unit

- As to connection between the analog unit and the output, connect the dividing terminal block (accessory) to the analog unit, and wire to the output. Be sure to turn off the power to the analog unit during this step. Otherwise, malfunction and/or damage may occur.
- As to the pin layout of each CH on the analog output terminal, refer to the figure below.



※ The pin layout for CH5 to 8 and CH9 to 12 are the same with the above.

- When connecting the dividing terminal block to the analog output terminal, be sure to insert the block as far as it can go.
Connect the dividing terminal block to the output such as a data logger.

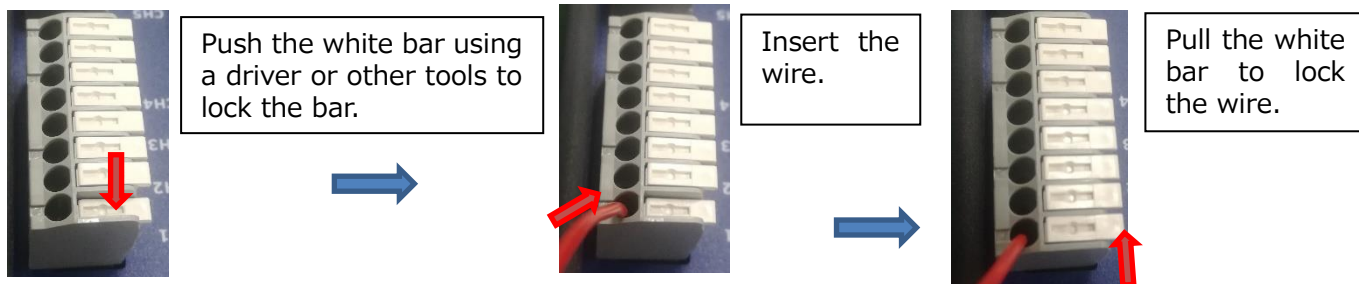


- To wire the dividing terminal block, refer to the photos below.

The allowed range of wires to use for wiring:

Stranded wire (element wire: $\phi 0.18$ mm or thicker): 0.2 mm² to 1.25 mm² (AWG24 to AWG16: 9 mm length of stripped wire)

Solid wire: $\phi 0.4$ mm to $\phi 1.2$ mm (AWG26 to AWG16: 9 mm length of stripped wire)



- Output value can be set on the analog setup screen of the main unit connected.
For details, refer to **4. User Interface > Main unit > analog setup screen.**
Output voltage range: 0 to 5 V
Output current range: 4 to 20 mA

3. Overall Flow

Measurement

- Turn the power on, and set and save each parameter on the measurement setup screen displayed.
- Tap the measurement start button on the measurement screen to start measurement.
- Once the measurement starts, measured values are displayed numerically on the measurement screen, and a graph drawing is displayed on the graph screen.
- To stop measuring, tap the measurement stop button or the measurement stops automatically.
- When the check box of the measurement data saving on the measurement setup screen has been selected in advance, the data file management of measured data is available on the file screen.

Error

- The self-diagnostic function can detect the following critical errors. If the error occurs, measurement cannot be started.

Source voltage error	Power voltage supplied to the connected unit is lower/higher than the specified value. For further information, please refer to <u>2. Getting Ready to Measure > Connecting the power source.</u>
The number of unit error	The number of units is higher than the specified number of unit or the hub unit is not connected. For further information, please refer to <u>2. Getting Ready to Measure > Connecting the unit.</u>

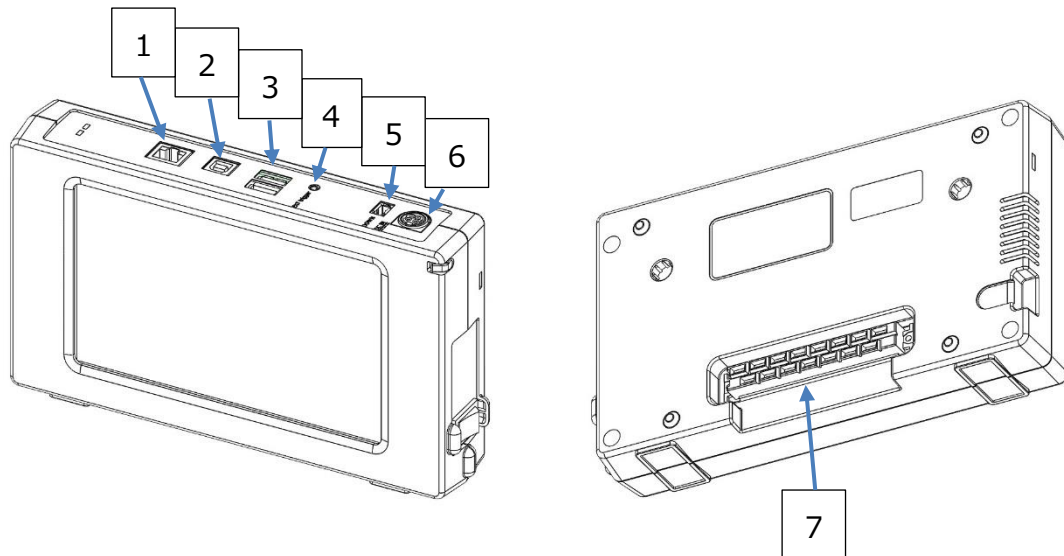
- The self-diagnostic function can detect the following partial error. Even if the error occurs, measurement can start, but accurate measurement data may not be obtained.

Probe connection error	No response from the probe connected to the hub unit. For further information, please refer to <u>4. User Interface > Hub Unit > LED display.</u>
Analog output error	Error found in the analog output in the analog unit. For further information, <u>4. User Interface > Analog Unit > LED display.</u>

4. User Interface

Main Unit

Connection



No.	Name	How to connect
1	LAN terminal	Connect this terminal to the LAN network that is the same one with the PC to be connected using a LAN cable.
2	USB terminal (for PC)	Connect this terminal to the PC to be connected using the USB cable supplied with the main unit or a USB cable 2.0 Type B.
3	USB terminal (for USB memory)	Use a USB memory 2.0 Type A.
4	External trigger terminal	Use an audio jack (φ2.5).
5	Unit-to-unit communication terminal	<p>Using the standard terminal (optionally available), connect this terminal to the unit-to-unit communication terminal (UP) of the unit to be connected. For details, refer to 2. Getting Ready to Measure > Connecting the units.</p> <p>The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m.</p> <p>If the connecting connector (socket) has already been used to connect to another unit, do not use this terminal.</p>
6	DC power supply terminal	<p>Insert the specified AC adapter into this terminal.</p> <p>The available AC adapter can be selected from the 90W AC adapter (main unit accessory) and the 160W AC adapter (optionally available).</p> <p>For details, refer to 2. Getting Ready to Measure > Connecting the power source.</p>

7	Connecting connector (Socket)	Connect this connector (socket) to the connecting connector (plug) of another unit. If the unit-to-unit communication terminal has already been used to connect to another unit, do not use this connector.
---	-------------------------------	--



Power ON/OFF

To turn the power ON/OFF, use the power switch on the side of the unit.

Prior to using the power switch, make sure that the AC adapter (90W/160W) is connected to the main unit, or to the connected units using the connecting connector. Otherwise, malfunction or damage may occur.

It does not matter the order in which you switch ON/OFF the units. The operation performance is not affected by any switching orders.

Regarding the power switch, refer to the list below.

Power switch	ON	OFF
Power switch status		

LED display

LED	Status	Description	Solution
LED (Blue)	ON	Normal operation	-
	OFF	When the LED (red) is ON, power voltage abnormality or any other abnormality occurred.	Check the connection method.
		When the LED (red) is ON, the power is OFF.	Turn the power ON.
LED (Red)	ON	Power voltage abnormality or any other abnormality occurred.	Check the connection method.
	Flashing	The connection with another unit was disconnected.	Turn the power OFF, and check the connection.
	OFF	When the LED (blue) is ON, operation is proper.	-
		When the LED (blue) is OFF, the power is turned OFF.	Turn the power ON.

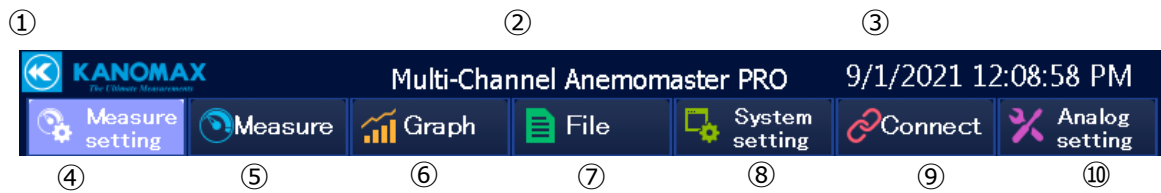
Title screen

When the power switch is turned on, the title screen appears. After a short period of time, the screen changes to the measurement setup screen automatically.



Common display icons

The following display icons indicate the same meaning on all screens.



No.	Name	Function
①	Logo	KANOMAX Logo is displayed.
②	Unit name	Indicates the measurement unit name.
③	Date/time	Indicates date and time
④	Measure setting button	Displays the measurement setup screen for various setting on measurement
⑤	Measure button	Displays the measurement screen for displaying measured values and starting/stopping measurement
⑥	Graph button	Displays the graph screen for displaying measured values in graph form.
⑦	File button	Displays the file screen for managing the saving measurement data.
⑧	System setting button	Displays the environment setup screen for setting the main unit
⑨	Connect button	Displays the connect screen for checking the connected probe information
⑩	AN button	Displays the analog setup screen for setting the analog unit output mode.

Measurement setup screen

The measurement setup screen appears when starting the main unit or tapping the **Measure setting** button.

On this screen, check/change various settings on measurement. Checking/changing the settings are not allowed during measurement.

Multi-Channel Anemomaster PRO 9/1/2021 12:08:58 PM

Measure setting Measure Graph File System setting Connect Analog setting

Sampling interval ⑬ ☐ Display remaining time in a negative value

Interval ① 0.1 ② x10Sec 1.0Sec

The number of times ③ 1 ④ x1000Cnt 1000Cnt

Time ⑤ 1000.0 ⑥ Sec 0.00:16:40.0

unit of air velocity ⑦ m/s ▲

unit of temperature ⑧ °C ▲

⑨ ☐ **Moving average** ⑩ 1 Count (Moving average)

⑪ ☒ **Save measurement data** ⑫ 7241.0 MB (Remaining capacity)

⑭ Load ⑮ Save

No.	Item	Description
①	Sampling interval	Set the updating interval of measurement data between 0.1 and 6553.5 seconds.
②	Unit of sampling interval	Set the units of sampling interval to [second], [x10 seconds], [x100 seconds] or [x1000 seconds].
③	Count of sampling	Set the obtaining count of sampling between 1 and 65535 counts.
④	Unit of count of sampling	Set the unit of count of sampling to [times], [x10 times], [x100 times] or [x1000 times].
⑤	Sampling time	Set the total measurement time to 0.1 and 429483622.5 seconds.
⑥	Unit of sampling time	Set/change the unit of sampling time to [second], [minute], [time] or [date].
⑦	Unit of air velocity	Set the unit of air velocity to [m/s] or [FPM].
⑧	Unit of temperature	Set the unit of temperature to [°C] or [°F].
⑨	Moving average	Set the moving average mode to ON/OFF.
⑩	Count of moving average	Set the count of moving average between 1 and 99 times when the moving average mode is ON,

⑪	Save measurement data	Set to save data after measurement automatically or not.
⑫	Remaining capacity	Displays the memory remaining capacity to save measurement data.
⑬	Remaining time display	Select [remaining time] or [elapsed time] as the display of measurement time.
⑭	Load button	Loads the saved measuring settings
⑮	Save button	Saves the settings

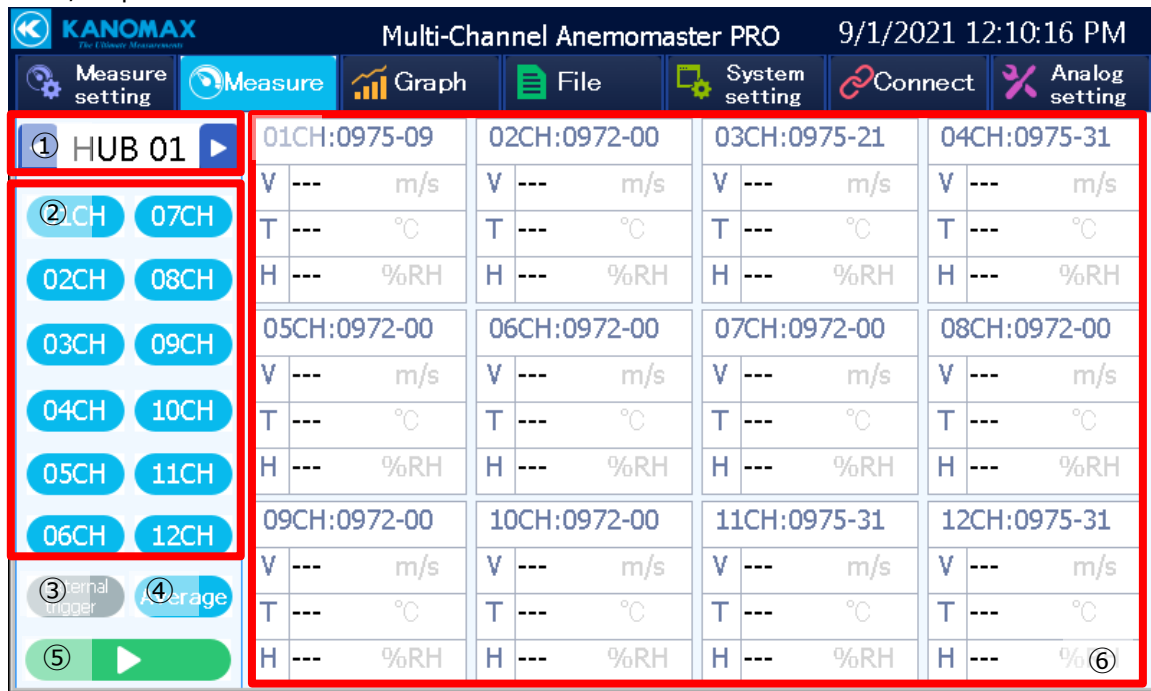
*If the sampling interval is set to 0.5 seconds or less in a system configuration that uses an analog unit, the data displayed on the measurement screen will not be updated.

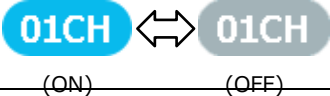
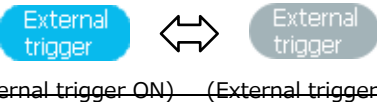
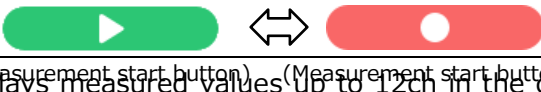
If measurement data saving is enabled, the measurement data will be saved.

Measurement screen

Tap the **Measure** button to display the measurement screen.

On this screen, set various display of measured values and select the measurement start/stop.



No.	Item	Description
①	Hub control	Select the hub unit(s) to display measurement values. You can select up to 12 units.
②	Channel button	Switch the measured value display between ON/OFF by channel. 
③	External trigger button	Switch the use of external trigger between ON/OFF. 
④	Average button	This button is to display each average of V/T/H displayed values in the dialog.
⑤	Measurement start/stop button	Switch measurement between start/stop. 
⑥	Measured value display	Displays measured values up to 12ch in the connected hub unit. If a reading is an abnormal value, please refer to <u>6. Troubleshooting.</u>

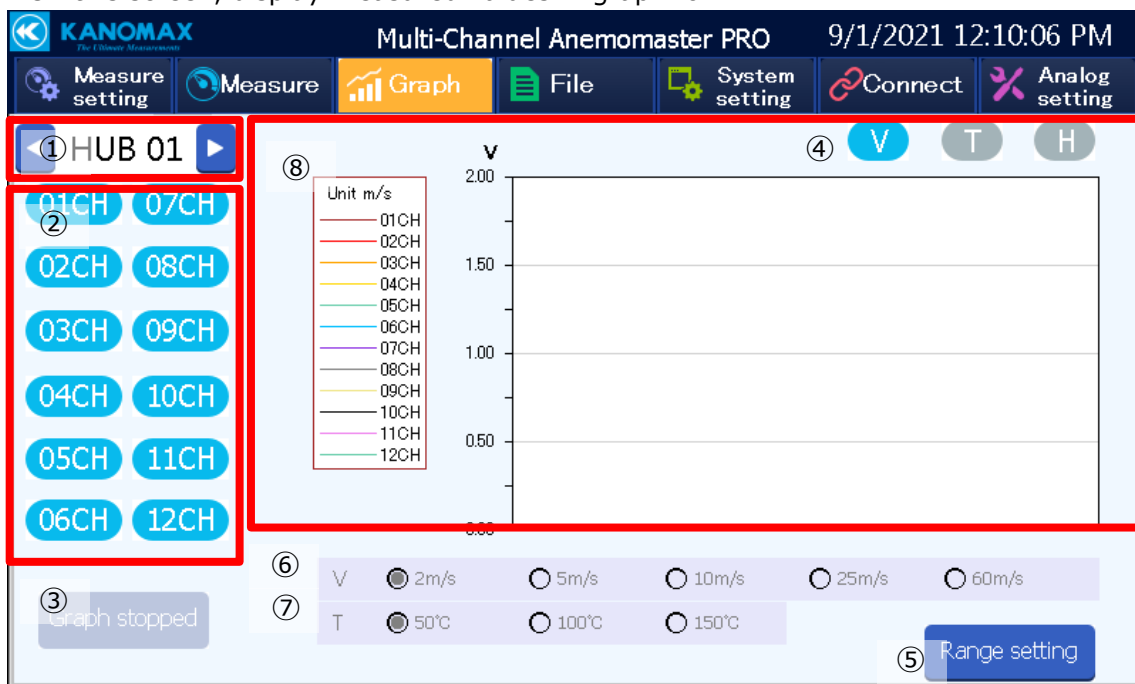
- ※ When the external trigger is TRIG input (the trigger detects a rising edge), measurement is conducted according to the settings in the measurement setup screen.
- ※ The external trigger (TRIG input) is non-voltage contact input.



Graph screen

Tap the **Graph** button to display the graph screen.

On this screen, display measured values in graph form.



No.	Item	Description
①	Hub control	Select the hub unit to display data in graph form. You can select up to 12 units.
②	Channel button	Switch the graph display between ON/OFF by channel.
③	Graph chart button	Start/stop the graph drawing.
④	Measuring item button	Select a measuring item to display in graph form from V (air velocity), T (Temperature) or H (Humidity). If a single CH is selected, setting is impossible.
⑤	Graph range setting button	Switch the graph range setting between [manually] and [automatically].
⑥	Air velocity range	Setting is possible only when the graph range setting is [manually]. Select from [2 m/s], [5 m/s], [10 m/s], [25 m/s] or [60 m/s].
⑦	Temperature range	Only when the graph range setting is [manually], setting is possible. Select from [50°C], [100°C] and [150°C].
⑧	Graph charting field	Display data in graph form.

*If the sampling interval is set to less than 1.0 second, the graph drawing button will show "Graph stopped."

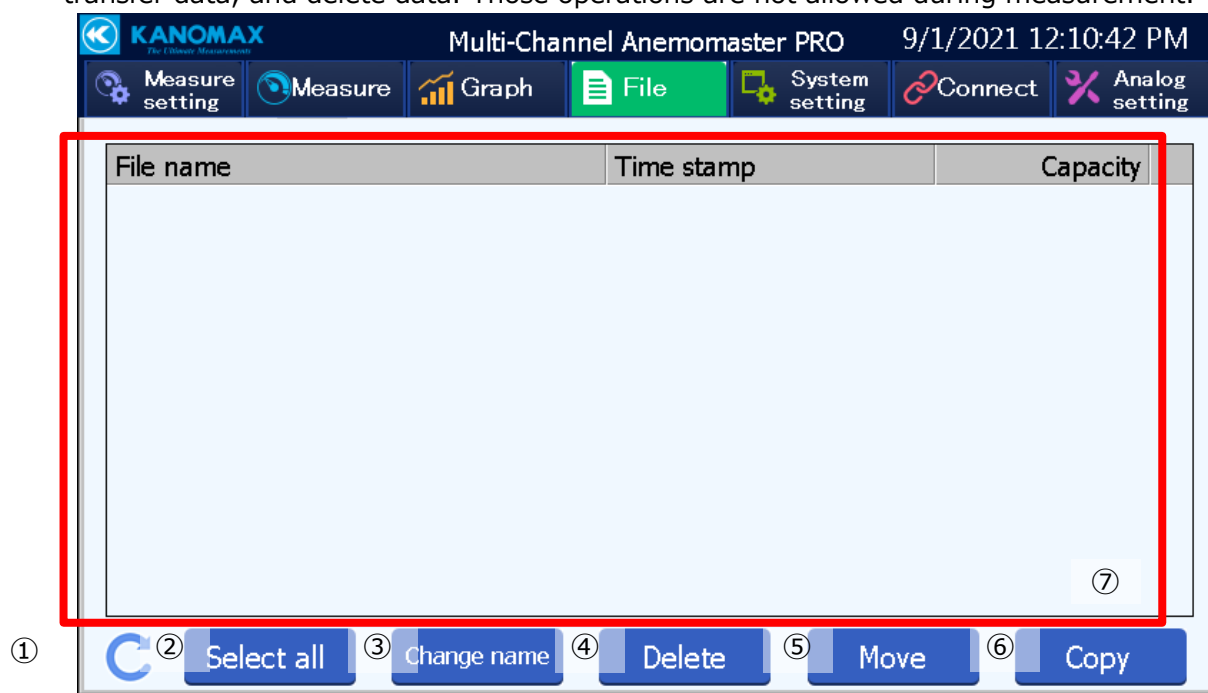
Tap the graph drawing button to start drawing.

If the sampling interval is 1.0 second or more, drawing will occur automatically.

File screen

Tap the **File** button to display the file screen.

On this screen, you can rename the saved measured data, copy data to a USB memory, transfer data, and delete data. Those operations are not allowed during measurement.



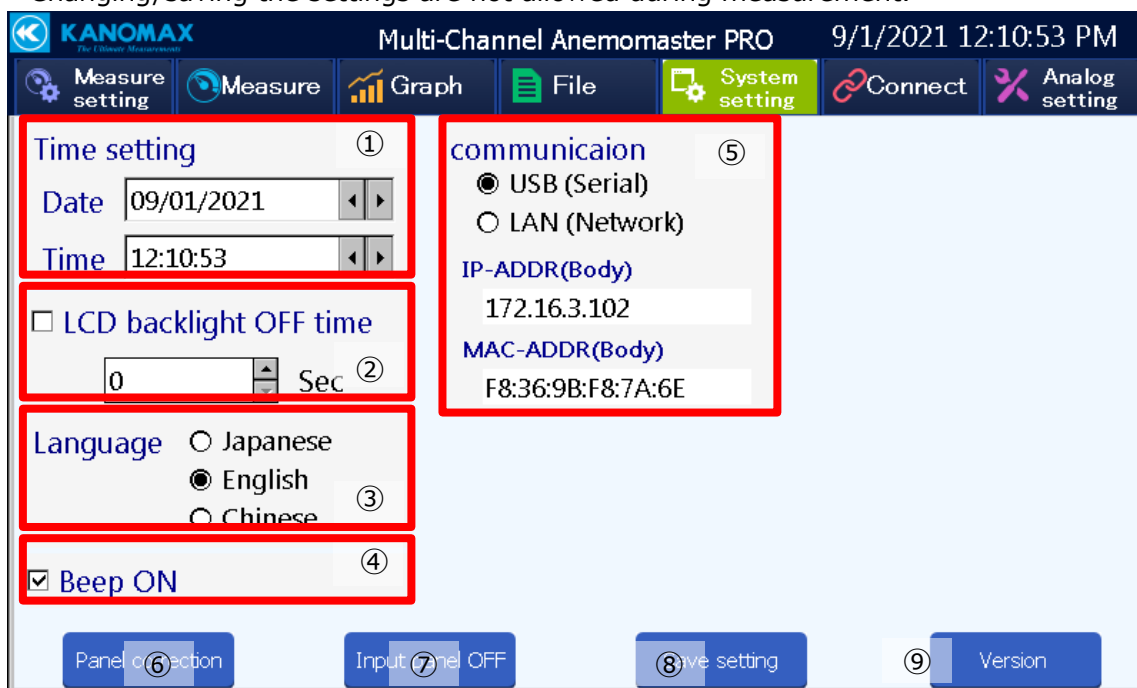
No.	Item	Description
①	Refresh button	Refreshes the file display field.
②	Select all button	Selects all files.
③	Change name button	Changes the file name selected. Only when a single file is selected, this is valid.
④	Delete button	Deletes a selected file.
⑤	Move button	Transfers a selected file to a connected memory. The execution file is deleted from the main unit.
⑥	Copy button	Selected file is copied to a connected USB memory.
⑦	File display field	The list of currently saved files are displayed.

Configuration screen

Tap the **Sys. setting** button to display the configuration screen.

On this screen, check/change the main unit settings.

Changing/saving the settings are not allowed during measurement.

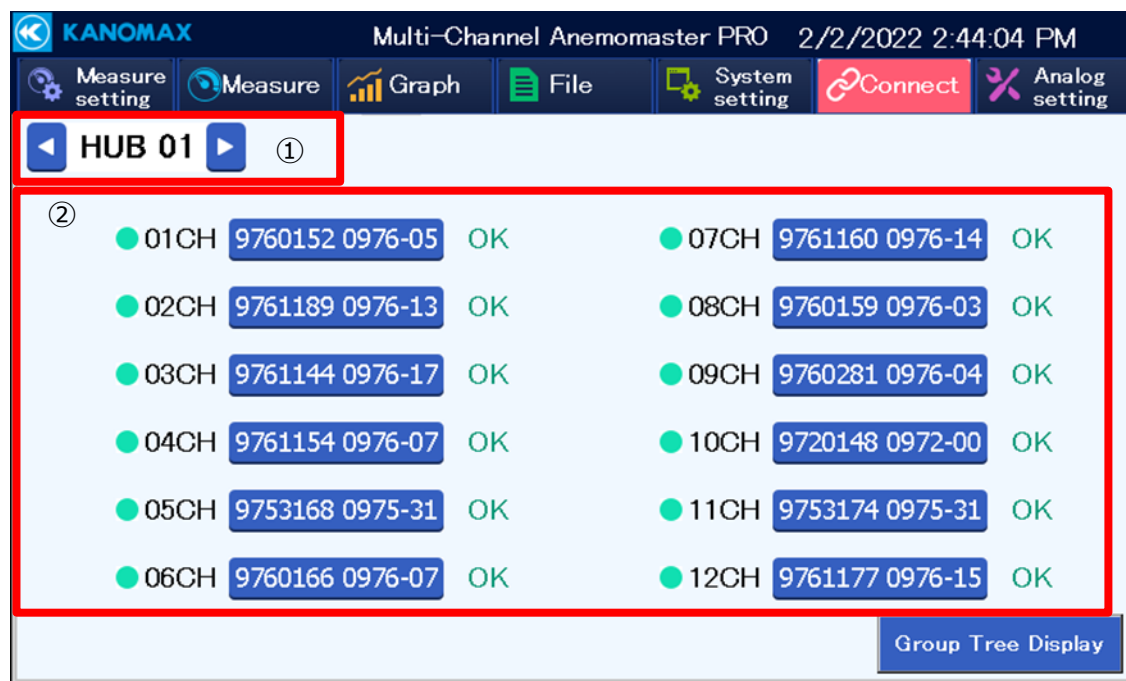


No.	Item	Description
①	Time setting	Set date/time for the internal clock.
②	LCD backlight OFF time	Switch the LCD backlight OFF function displaying elapsed times between ON/OFF. Set the remaining time until the backlight is turned off.
③	Language setting	Set language to be used on the display screen.
④	Beep ON	Check the check box to valid the beep tone.
⑤	PC communication method	Select the connection method to the PC from USB or LAN.
⑥	Touchpanel correction button	Displays the touch panel correction screen.
⑦	Input panel OFF button	Turns off the input keyboard display.
⑧	Save setting button	Saves the settings on this screen. When the selected language has been changed, the main unit restarts.
⑨	Version button	Displays the FW version of the main unit.

Connect screen

Tap the **Connect** button to display the connect screen.

On this screen, you can check the connection status of each connected probe, product No. and serial No.

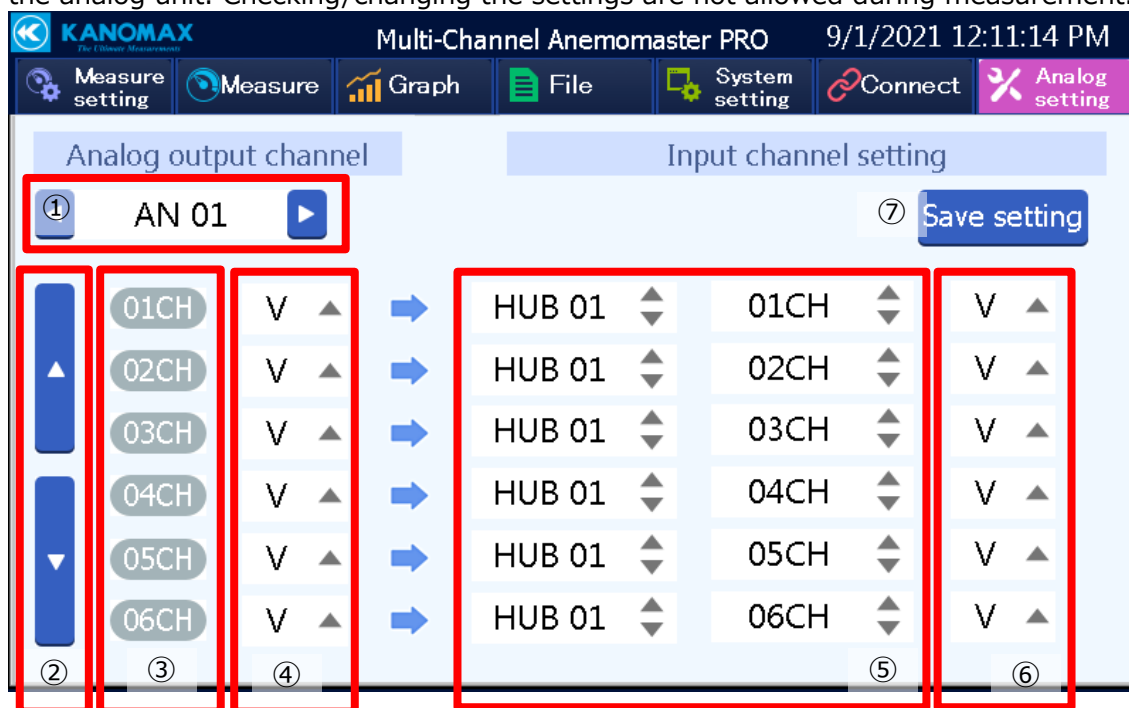


No.	Item	Description
①	Hub control	Select the hub unit(s) to display data in graph form. You can select up to 12 units.
②	Probe detail button	Tap this button to display the probe detail screen. Check the measuring items (V/T/H), probe's product No., serial No. and the latest calibration date.

Analog setup screen

Tap the **AN Setting** button to display the analog setup screen.

On this screen, you can select measured values of the probe outputting to the output CH of the analog unit. Checking/changing the settings are not allowed during measurement.

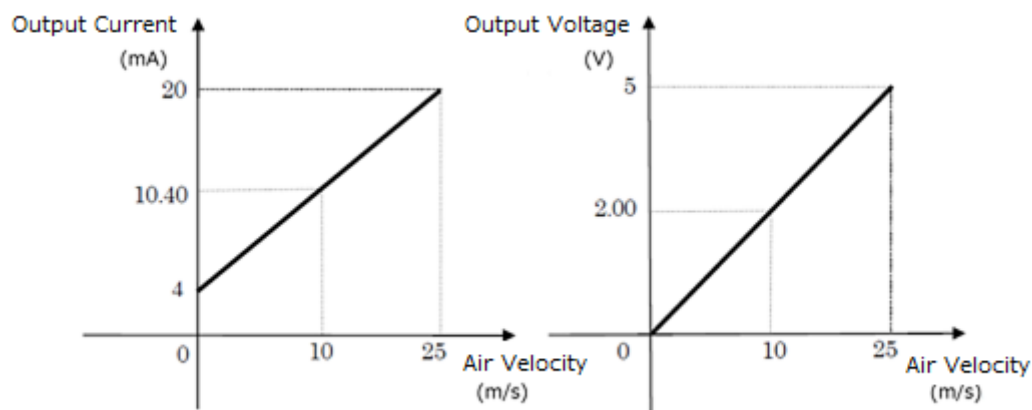


No.	Item	Description
①	Analog control	Select the analog unit to be set the analog output setting. You can select up to 12 units.
②	Page change button	Switch between the display of "01CH to 06CH" and "07CH to 12CH".
③	Channel button	Switch the each channel output of the analog unit between ON/OFF. <div style="text-align: center;"> 01CH ↔ 01CH <small>(ON) (OFF)</small> </div>
④	Voltage output/current output setup	Set the analog output method to current output (4 to 20 mA) or voltage output (0 to 5 V). (I: Current output, V: Voltage output)
⑤	Probe setup	Set each probe corresponding to each analog output by the hub number and CH.
⑥	Probe Measuring item setup	Set the measuring item of the probe. (V: Air velocity, T: Temperature, H: Humidity)
⑦	Save setting button	Saves the settings.

This shows the range relations among air velocity, current output and voltage output.

Connected probe	Air velocity range [m/s]	Current output range [mA]	Voltage output range [V]
0975-00, 0975-21, 0975-31	0 to 25.0	4 to 20	0 to 5
0976-03, 0976-04, 0976-05, 0976-07, 0976-13, 0976-14, 0976-15, 0976-17	0 to 30.0	4 to 20	0 to 5
0972-00, 0973-00, 0975-09, 0975-10	0 to 50.0	4 to 20	0 to 5

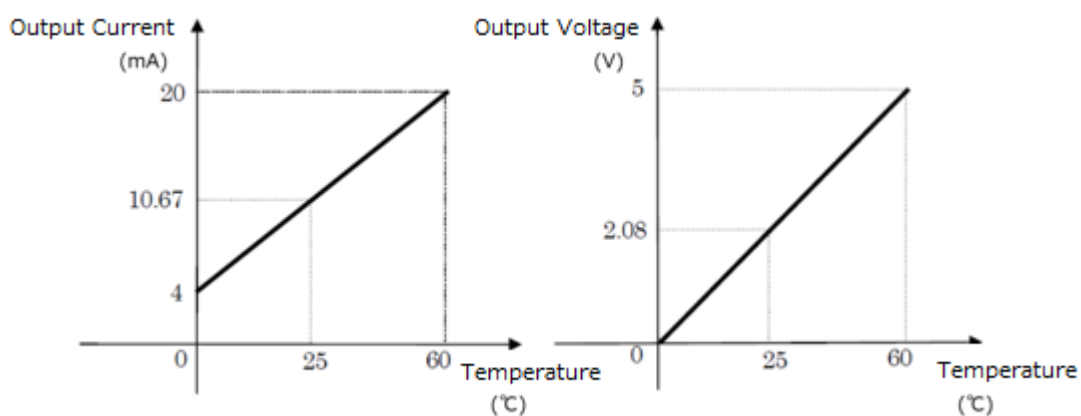
Example: Probe 0975-31 and air velocity 10 m/s



This shows the range relations among temperatures, current output and voltage output.

Connected probe	Temperature range [°C]	Current output range [mA]	Voltage output range [V]
0975-31	0 to 60	4 to 20	0 to 5
0975-21	0 to 100	4 to 20	0 to 5
0976-05	0 to 120	4 to 20	0 to 5

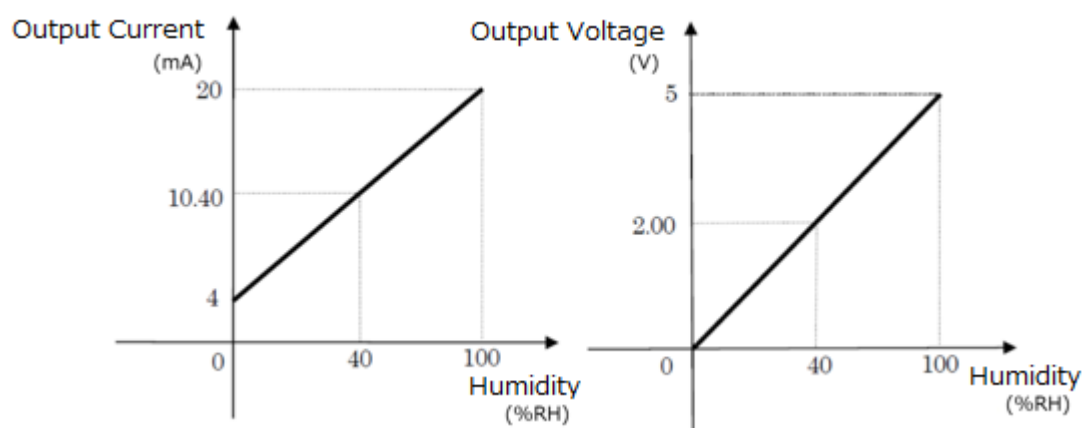
Example: Probe 0975-31 and temperature 25°C



This shows the range relations among humidity, current output and voltage output.

Connected probe	Humidity range [%RH]	Current output range [mA]	Voltage output Range [V]
0975-31	0 to 100	4 to 20	0 to 5

Example: Probe 0975-31 and humidity 40%RH



Number of connected hub units and sampling interval

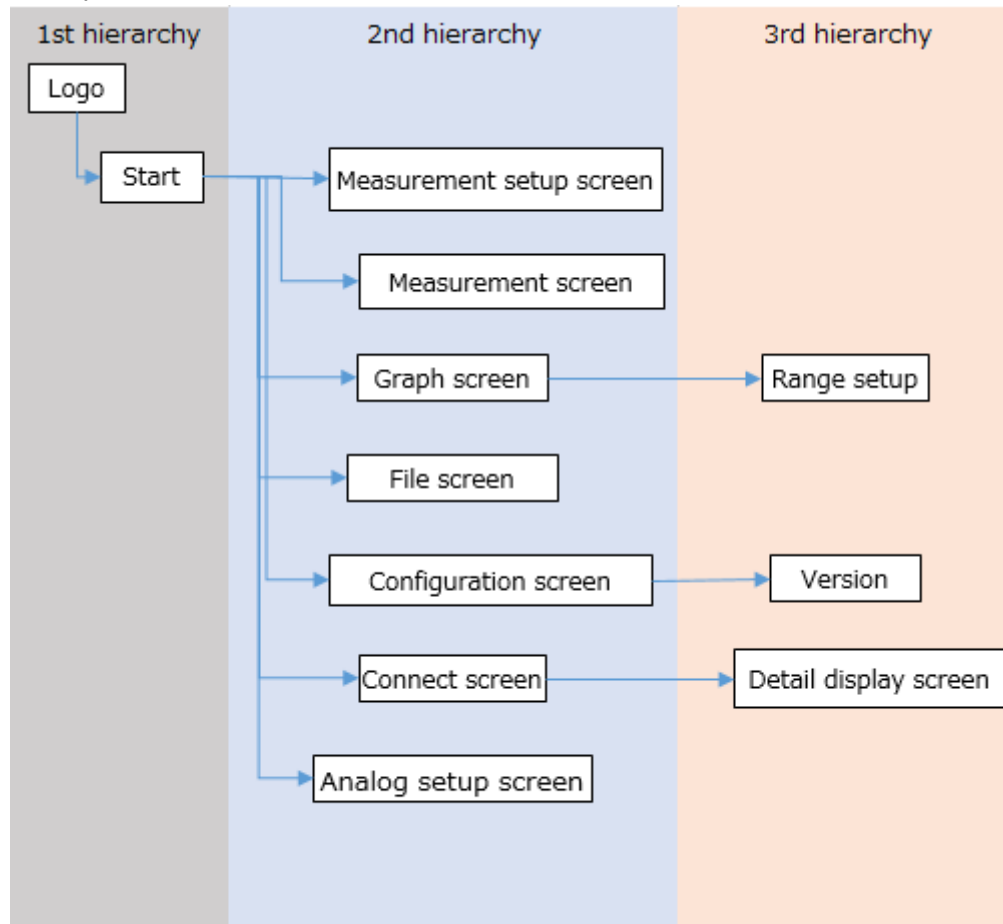
Depending on the number of connected hub units, setting the sampling interval to a short value may cause a delay in the analog output.

When using analog units, refer to the table below and set the sampling interval according to the number of connected hub units.

Number of hub connections	Sampling interval Minimum possible setting
1Unit(12CH)	0.1s
2Units(24CH)	0.1s
3Units(36CH)	0.1s
4Units(48CH)	0.6s
5Units(60CH)	0.6s
6Units(72CH)	0.6s
7Units(84CH)	1.0s
8Units(96CH)	1.0s
9Units(108CH)	1.0s
10Units(120CH)	1.0s
11Units(132CH)	1.0s
12Units(144CH)	1.0s

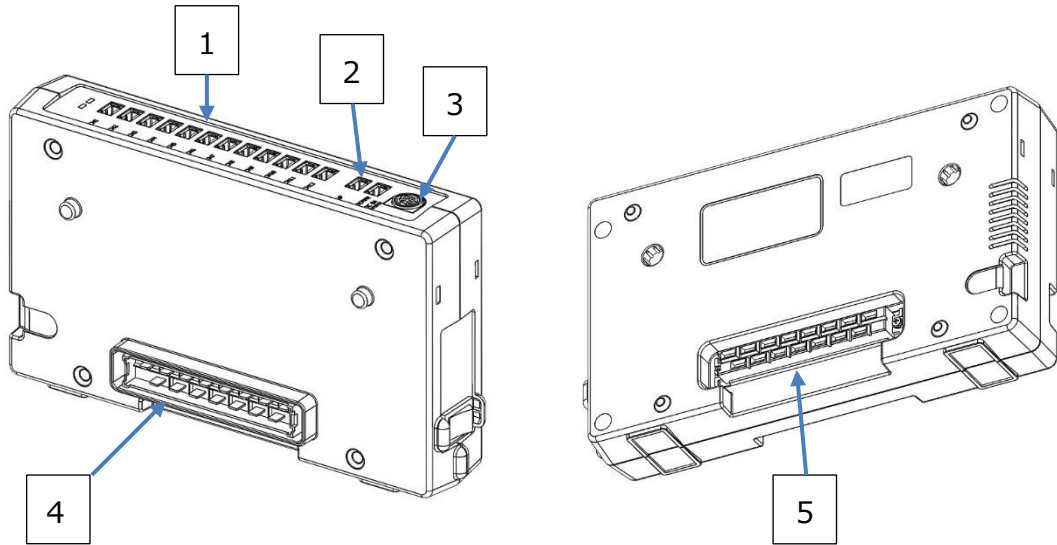
Screen transition diagram

The screen consists of a three-level hierarchy. Operations on second level or less are mainly used.



Hub Unit

Connection



No.	Name		How to connect
1	Probe-to-probe communication terminal (1 to 12 CH)		Connect this terminal to the probe converter box of the probe to be connected using the standard cable (optionally available). The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m.
2	Unit-to-unit communication terminal	UP	Using the standard cable (optionally available), connect this terminal (UP) to the unit-to-unit communication terminal (DOWN) of the unit to be connected. For details, refer to 2. Getting Ready to Measure > Connecting the units. The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m. If the connecting connector (plug) has already been used to connect to another unit, do not use this terminal.

		DOWN	<p>Using the standard cable (optionally available), connect this terminal (DOWN) to the unit-to-unit communication terminal (UP) of the unit to be connected. For details, refer to <u>2. Getting Ready to Measure > Connecting the units.</u></p> <p>The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m.</p> <p>If the connecting connector (socket) has already been used to connect to another unit, do not use this terminal.</p>
3	DC power supply terminal		<p>Insert the specified AC adapter into this terminal.</p> <p>The available AC adapter can be selected from the 90W AC adapter (main unit accessory) and the 160W AC adapter (optionally available).</p> <p>For details, refer to <u>2. Getting Ready to Measure > Connecting the power source.</u></p>
4	Connecting connector (Plug)		<p>Connect this connector (plug) to the connecting connector (socket) of another unit.</p> <p>If the unit-to-unit communication terminal (UP) has already been used to connect another unit, do not use this connector.</p>
5	Connecting connector (Socket)		<p>Connect this connector (socket) to the connecting connector (plug) of another unit.</p> <p>If the unit-to-unit communication terminal (DOWN) has already been used to connect another unit, do not use this connector.</p>



Power ON/OFF

To turn the power ON/OFF, use the power switch on the side of the unit.

Prior to using the power switch, make sure that the AC adapter (90W/160W) is connected to the main unit, or to the connected units using the connecting connector. Otherwise, malfunction and/or damage may occur.

It does not matter the order in which you switch ON/OFF the units. The operation performance is not affected by any switching orders.

Regarding the power switch, refer to the list below.

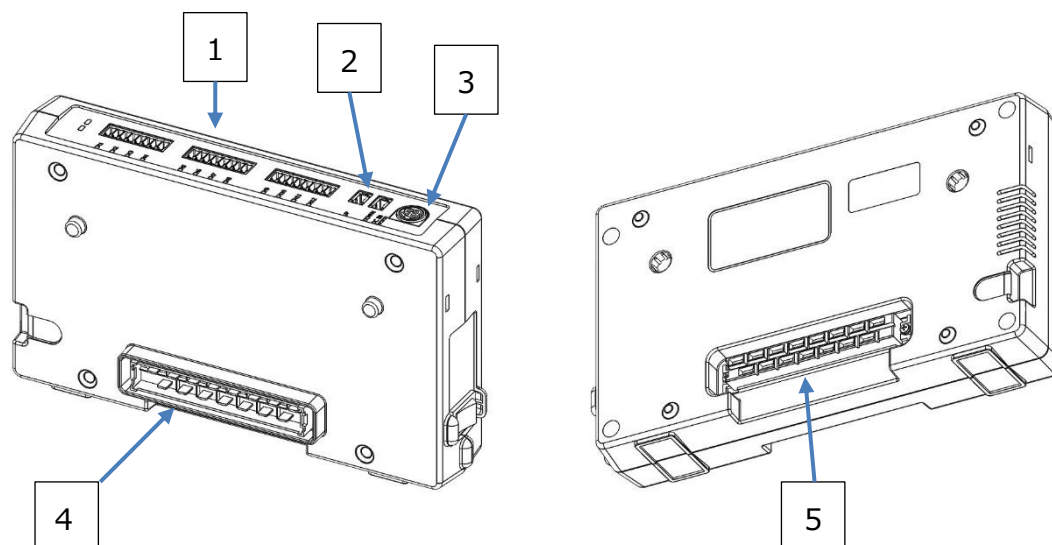
Power switch	ON	OFF
Power switch status		

LED display

LED	Status	Description	Solution
LED (Blue)	ON	Normal operation	-
	OFF	When the LED (red) is ON, power voltage abnormality or any abnormality occurred.	Check the connection method.
		When the LED (red) is OFF, the power is OFF.	Turn the power ON.
LED (Red)	ON	Power voltage abnormality or any abnormality occurred.	Check the connection method.
	Flashing fast	The connection with the probe was disconnected.	Turn the power OFF, and check the connection.
	Flashing slow	The connection with another unit was disconnected.	Turn the power OFF, and check the connection.
	OFF	When the LED (blue) is ON, operation is proper.	-
		When the LED (blue) is OFF, the power is turned OFF.	Turn the power ON.

Analog Unit

Connection



No.	Name		How to connect
1	Analog output terminal (1 to 12CH)		Using the dividing terminal block (accessory), connect this terminal to a device to be connected such as a data logger. For details, refer to <u>2. Getting Ready to Measure > Connecting the units.</u>
2	Unit-to unit communication terminal	UP	Using the standard cable (optionally available), connect this terminal (UP) to the unit-to-unit communication terminal (DOWN) of the unit to be connected. For details, refer to <u>2. Getting Ready to Measure > Connecting the units.</u> The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m. If the connecting connector (plug) has already been used to connect to another unit, do not use this terminal.

		DOWN	<p>Using the standard cable (optionally available), connect this terminal to the unit-to-unit communication terminal (UP) of the unit to be connected.</p> <p>For details, <u>2. Getting Ready to Measure > Connecting the units.</u></p> <p>The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m.</p> <p>If the connecting connector (socket) has already been used to connect to another unit, do not use this terminal.</p>
3	DC power source terminal		<p>Insert the specified AC adapter into this terminal.</p> <p>The available AC adapter can be selected from the 90W AC adapter (accessory) and the 160W AC adapter (optionally available). For details, refer to <u>2. Getting Ready to Measure > Connecting the power source.</u></p>
4	Connecting connector (Plug)		<p>Connect this connector to the connecting connector (socket) of another unit.</p> <p>If the unit-to-unit communication terminal (UP) has already been used to connect to another unit, do not use this connector.</p>
5	Connecting connector (Socket)		<p>Connect this connector to the connecting connector (plug) of another unit.</p> <p>If the unit-to-unit communication terminal (DOWN) has already been used to connect to another unit, do not use this connector.</p>


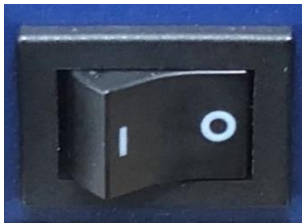
Power ON/OFF

To turn the power ON/OFF, use the power switch on the side of the unit.

Prior to using the power switch, make sure that the AC adapter (90W/160W) is connected to the main unit, or to the connected units using the connecting connector. Otherwise, malfunction or damage may occur.

It does not matter the order in which you switch ON/OFF the units. The operation performance is not affected by any switching orders.

Regarding the power switch, refer to the list below.

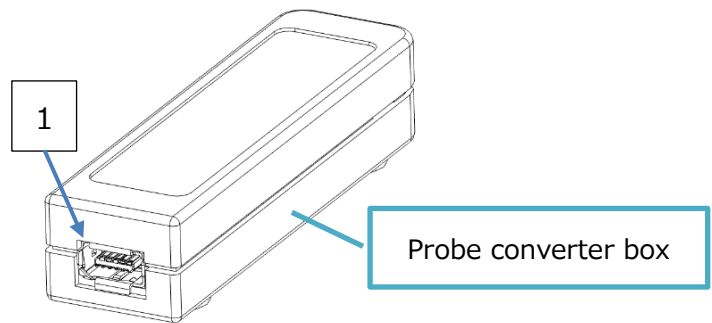
Power switch	ON	OFF
Power switch status		

LED display

LED status		Description	Solution
LED (Blue)	ON	Proper operation	-
	OFF	When the LED (red) is ON, power voltage abnormality or any abnormality occurred.	Check the connection method.
		When the LED (red) is OFF, the power is OFF.	Turn the power ON.
LED (Red)	ON	Power voltage abnormality or any abnormality occurred.	Check the connection method.
	Flashing fast	Error related to the analog output occurred.	Refer to <u>2. Getting Ready to Measure > Connecting the analog units.</u>
	Flashing slow	The unit connection with another unit is disconnected.	Turn the power OFF, and check the connection.
	OFF	When the LED (blue) is ON, operation is proper.	-
		When the LED (blue) is OFF, the power is turned OFF.	Turn the power ON.

Probe

Connection



No.	Name	How to connect
1	Hub unit-to-hub unit communication terminal	Using the standard cable (optionally available), connect this terminal to the probe-to-probe communication terminal of the hub unit to be connected. The available standard cable (optionally available) can be selected from 0.5 m, 2.0 m, 5.0 m, 10.0 m, 20.0 m and 40.0 m.

Power ON/OFF

Power is supplied from the connected hub unit.

Turn on the power to the main unit connected to the hub unit.

After a short period of time, the measurement setup screen appears, and the power of the probe is turned on.

The power of the probe is turned off when the power of the hub unit is turned off or the AC adapter of the power source is disconnected.

LED display

LED status		Description	Solution
LED (Green)	ON	Proper operation	-
	Flashing	Measurement range exceeds.	-
	OFF	The power is turned OFF.	Turn the power ON.
LED (Red)	ON	Error occurred in the built-in CPU.	Turn off the power, and turn on the power again. If LED (red) is still ON, please contact your distributor or KANOMAX service center.
	Flashing	Power voltage is decreasing.	Check the AC adapter (90W/160W) connected to the hub unit.
	OFF	When LED (green) is ON, operation is proper.	-
		When LED (green) is OFF, the power is turned OFF.	Turn the power ON.

Probe Cleaning

Dust such as fine/soot particles or machine oil adhered to the air flow element can change the heat dissipation (the amount of heat taken away). This can affect the reading of air velocity. Probes with a wire mesh or a filter cannot read an accurate measurement value when they are clogged with substances as dust.

Once the probe is used in a contaminated environment and the probe and the mesh became dirty, immediate cleaning of the probe and the mesh is recommended.

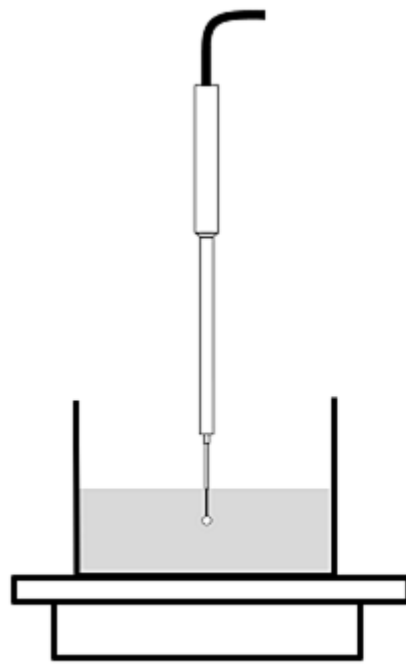
How to clean the probe

Clean the air flow sensor with an **ultrasonic cleaning machine for 10 to 20 seconds**. Soaking the probe element in the machine for too a long time may cause the breakage of the coating on the element.

Use normal water as cleaning liquid to clean the element. Another method of cleaning the element is that pour neutral detergent diluted with water into a container and gently wave the element in the liquid.

! Caution !

- !) Do not connect anything to the communication terminal of the hub-to-hub unit while cleaning.
- !) After cleaning, dry the element completely. Only when it is dried out, connect to the hub unit.
- !) Do not clean the probe equipped with the humidity sensor (Model 0975-31) using alcohol. The humidity sensor is susceptible to an organic solvent including alcohol, thus the sensor is broken easily if it is exposed to the solvent. Do not use alcohol. If the humidity sensor has been used in an alcohol atmosphere or soaked in alcohol, the sensor needs replacing. Even if the sensor works, the replacement is necessary. If condensation forms on the sensor or the sensor touches water, leave the sensor under an atmosphere of 40%RH or less at least one day to dry the sensor completely.
- !) Do not clean the temperature sensor and the temperature compensation sensor.



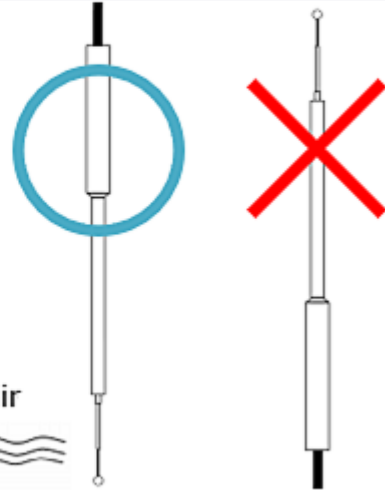
Clean the sensor part in an ultrasonic cleaning machine for 10 to 20 seconds.



Dry with cold air



Until the sensor is dried out,
do not turn up the sensor.
Failure to do so may cause damage
to the sensor because water droplet
comes into the sensor.



5. Specifications

■ Main Unit

Product name		Multi-Channel Anemomaster PRO main unit
Model		1590-0G
Display, Operation		7.0 inch color LCD with touch panel
Connectable unit		Multi-Channel Anemomaster PRO hub unit (Model 1591-0G) Multi-Channel Anemomaster PRO analog unit (Model 1592-0G)
Communication function	Data	Communication function
	Remote measurement	Modbus (Ethernet, USB serial)
	Unit to unit	Serial communication (Standard cable)
Recording medium	Medium	Recording medium
	Format	CSV format
	Recording capacity	8 GB (Approximately 24,500 measurements x 1,000 count-sampling interval measurement can be conducted by one hub unit.)
External trigger input		Non-voltage contact input Pin jack terminal ϕ 2.5 audio jack (Rising edge detection)
Language		Japanese, English, Chinese
Power source		90W AC adapter or 160W AC adapter (optionally available)
Operating environment		5 to 40°C, 0 to 85%RH with no condensation
Storage environment		-10 to 60°C, 0 to 90%RH with no condensation
Dimensions		W 220.0 × D 130.4 × H 40.8 mm
Weight		0.6 kg
Accessories		90W AC adapter, User's Manual, USB cable, Stylus, Rubber cap
Warranty period		One year from date of purchase

■ Hub Unit

Product name		Multi-Channel Anemomaster PRO hub unit
Model		1591-0G
Connectable unit		Multi-Channel Anemomaster PRO main unit (Model 1590-0G) Multi-Channel Anemomaster PRO hub unit (Model 1591-0G) Multi-Channel Anemomaster PRO analog unit (Model 1592-0G)
Connectable probe		Model 0972-00: UNI-directional air velocity probe (Flat) Model 0973-00: UNI-directional air velocity probe (φ9) Model 0975-00: Omni-directional air velocity probe (Needle) Model 0975-09: Omni-directional air velocity probe (100 mm) Model 0975-10: Omni-directional air velocity probe (410 mm) Model 0976-03: Heat-resistant air velocity probe (Mini, straight type) Model 0976-04: Heat-resistant air velocity probe (Mini, articulating type) Model 0976-07: Heat-resistant air velocity probe (Mini, straight, temperature-compensation-sensor independent type) Model 0976-05: Heat-resistant air velocity probe VT (Straight, temperature-compensation-sensor independent type) Model 0976-13: Air velocity probe (Mini, straight type) Model 0976-14: Air velocity probe (Mini, articulating type) Model 0976-17: Air velocity probe (Mini, straight, temperature-compensation-sensor independent type) Model 0976-15: Air velocity probe VT (Straight, temperature-compensation-sensor independent type) Model 0975-21: Omni-directional air velocity probe VT Model 0975-31: Omni-directional air velocity probe VTH
Communication function	Probe-to-probe	Serial communication (Standard cable)
	Unit-to-unit	Serial communication (Standard cable)
Power source		90W AC adapter (accessory) or 160W AC adapter (optionally available)
Operating environment		5 to 40℃, 0 to 85%RH with no condensation
Storage environment		-10 to 60℃, 0 to 90%RH with no condensation
Dimensions		W220.0 × D130.3 × H40.8 mm
Weight		0.46 kg
Accessories		Setup guide, Unit fixing clip (x 2), Rubber cap (x 2)
Warranty period		One year from date of purchase

■ Analog Unit

Product name			Multi-Channel Anemomaster PRO analog unit
Model			1592-0G
Connectable unit			Multi-Channel Anemomaster PRO main unit (Model 1590-0G) Multi-Channel Anemomaster PRO hub unit (Model 1591-0G) Multi-Channel Anemomaster PRO analog unit (Model 1592-0G)
Communication function	Unit-to-unit		Serial communication (Standard cable)
Analog output	Voltage output	Range	0 to 5 V
		Output resistance	1 kΩ
	Current output	Range	4 to 20 mA
		Load resistance	250 Ω
Power source			90W AC adapter (accessory) or 160W AC adapter (optionally available)
Operating environment			5 to 40℃, 0 to 85%RH with no condensation
Storage environment			-10 to 60℃, 0 to 90%RH with no condensation
Dimensions			W 220.0 × D 130.3 × H 40.8 mm
Weight			0.44 kg
Accessories			Setup guide, Unit fixing clip (x 2), Rubber cap (x 2), Dividing terminal block (x 3)
Warranty period			One year from date of purchase

■ Probe

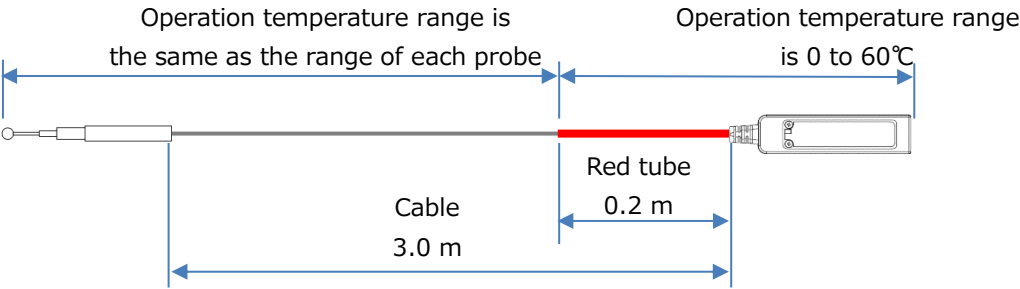
For all probes, warranty period is one year from date of purchase.

•Probe converter box

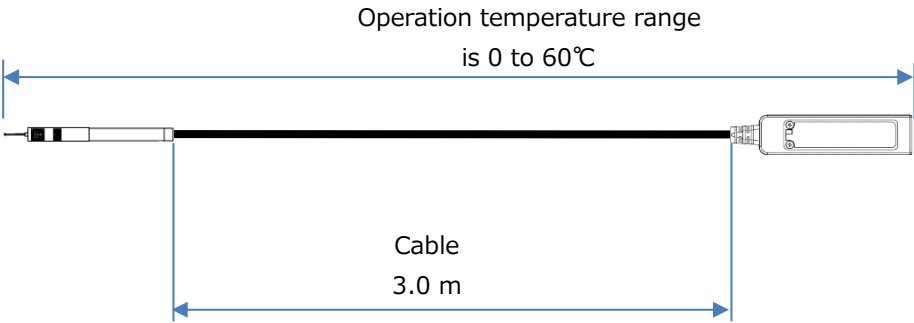
Operating environment	0 to 60℃, 5 to 95%RH with no condensation
Storage environment	-10 to 60℃, 0 to 90%RH with no condensation
Dimensions	W74.2mm × D20.2mm × H16mm
Cable length	3.0 m (including the 0.2m of the red tube)

- ※ The operation temperature ranges of the probe converter box and the red tube are up to 60℃. The range from the end of the red tube to the air velocity sensor is the same with the operation temperature range of each probe.
- ※ The operation temperature range of 0975-31 with the cable is up to 60℃, hence, there is no red tube.

- The figure below shows the operation temperature range for 0972-00, 0973-00, 0975-00, 0975-09, 0975-10, 0976-03, 0976-04, 0976-05, 0976-07, 0976-13, 0976-14, 0976-15, 0976-17, and 0975-21.



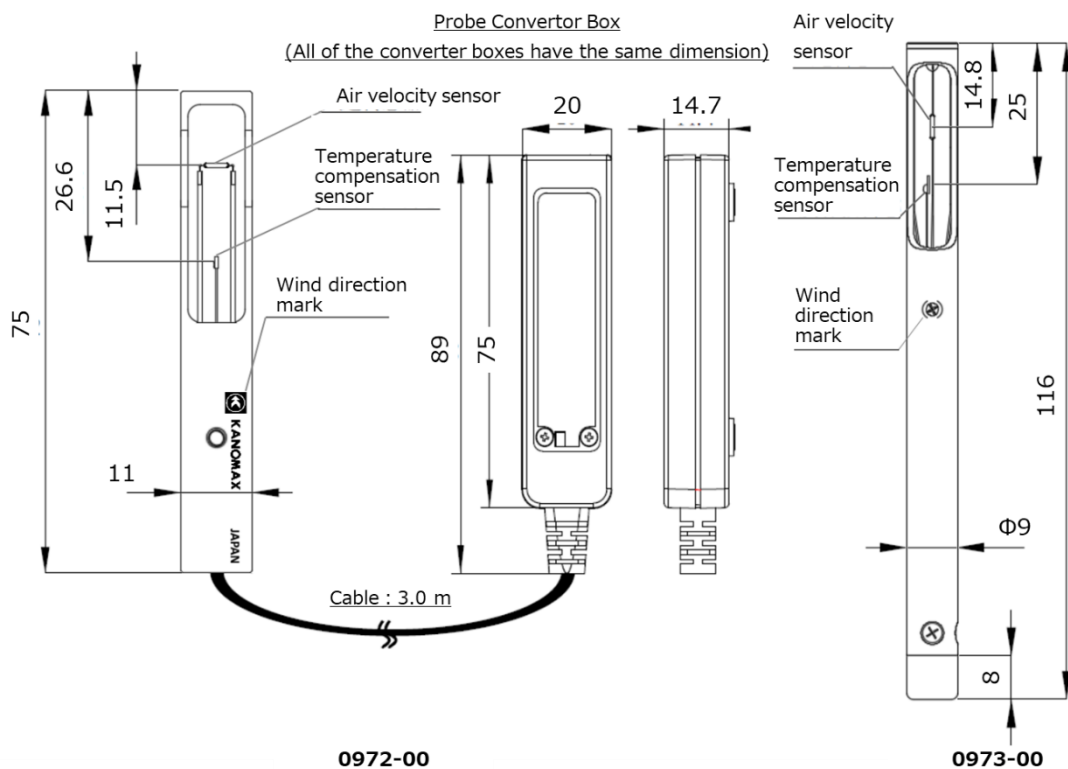
- For 0975-31



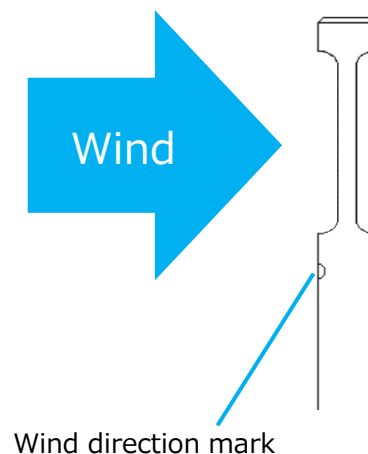
•Probe

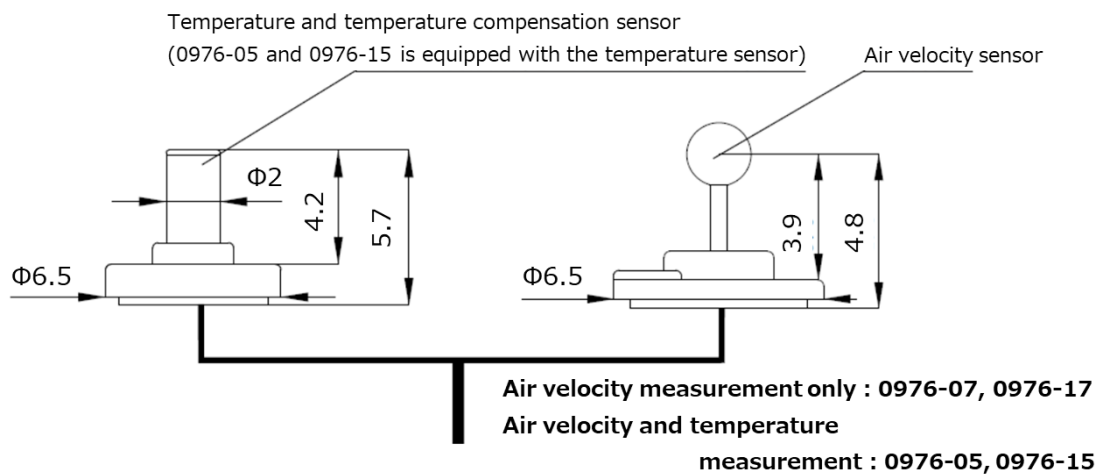
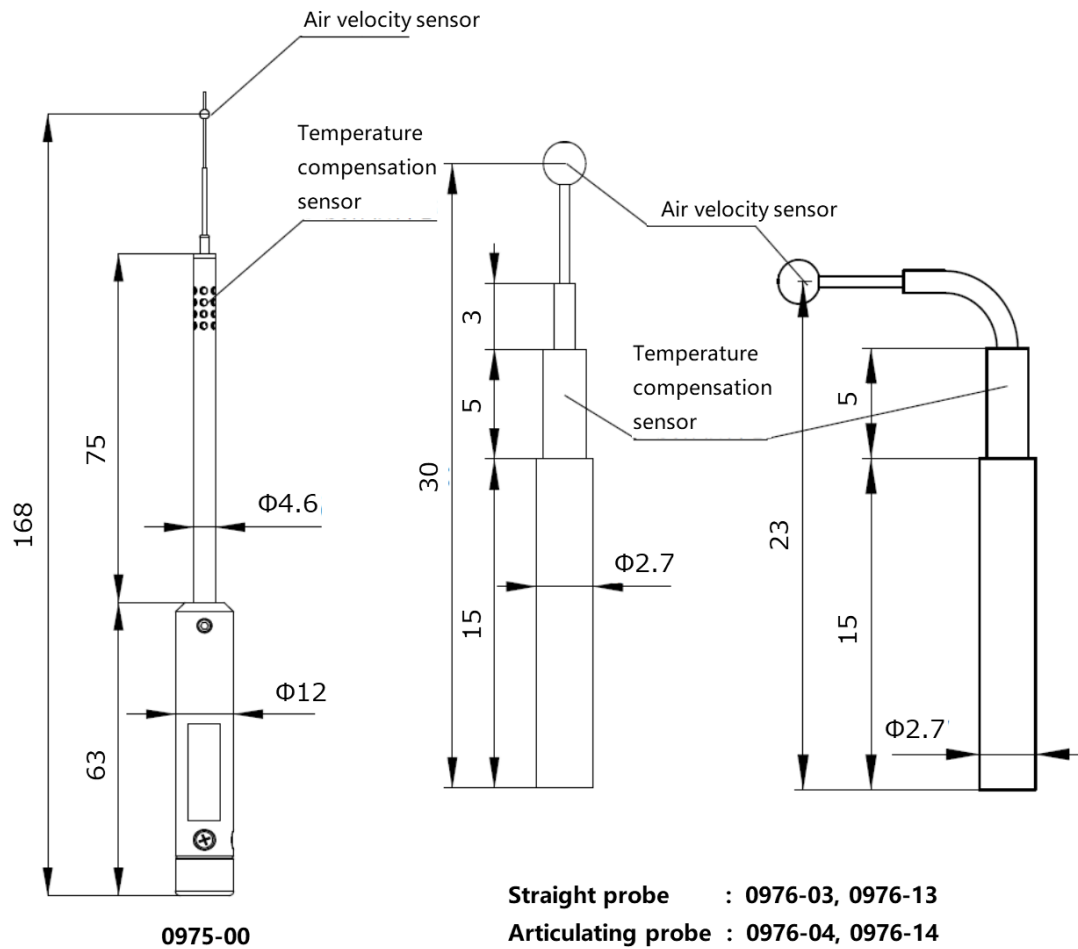
Model	Measurement range	Measurement accuracy	Operational temperature range	Temperature compensation range/accuracy
	Velocity/Temperature/Humidity	Velocity/Temperature/Humidity		
0972-00	0.01 to 50.0 [m/s]	(Velocity) ±2% of reading or ±0.02 m/s, whichever is the greater.	0 to 100℃	0 to 100℃ ±5% of reading
0973-00				
0975-00	0.01to 25.0 [m/s]			
0975-09	0.01 to 50.0 [m/s]			
0975-10				
0976-03	0.01 to 30.0 [m/s]	(Velocity) ±3% of reading or ±0.02 m/s, whichever is the greater.	0 to 120℃	0 to 120℃ ±5% of reading
0976-04				
0976-07				
0976-13		(Velocity) ±2% of reading or ±0.02 m/s, whichever is the greater.	0 to 100℃	0 to 100℃ ±5% of reading
0976-14				
0976-17				
0976-05	0.01 to 30.0 [m/s] 0 to 120 [℃]	(Velocity) ±3% of reading or ±0.02 m/s, whichever is the greater. (Temperature) ±0.5℃	0 to 120℃	0 to 120℃ ±5% of reading
0976-15	0.01 to 30.0 [m/s] 0 to 100 [℃]	(Velocity) ±2% of reading or ±0.02 m/s, whichever is the greater. (Temperature) ±0.5℃	0 to 100℃	0 to 100℃ ±5% of reading
0975-21	0.01 to 25.0 [m/s] 0 to 100 [℃]	(Velocity) ±2% of reading or ±0.02 m/s, whichever is the greater. (Temperature) ±0.5℃	0 to 100℃	0 to 100℃ ±5% of reading

0975-31	0.01 to 25.0 [m/s] 0 to 60 [°C] 5 to 95 [%RH]	(Velocity) $\pm 2\%$ of reading or ± 0.02 m/s, whichever is the greater (Temperature) $\pm 0.5^\circ\text{C}$ (Humidity) 5 to 80%RH: $\pm 3\%$ RH 80 to 95%RH: $\pm 5\%$ RH	0 to 60°C	0 to 60°C $\pm 5\%$ of reading
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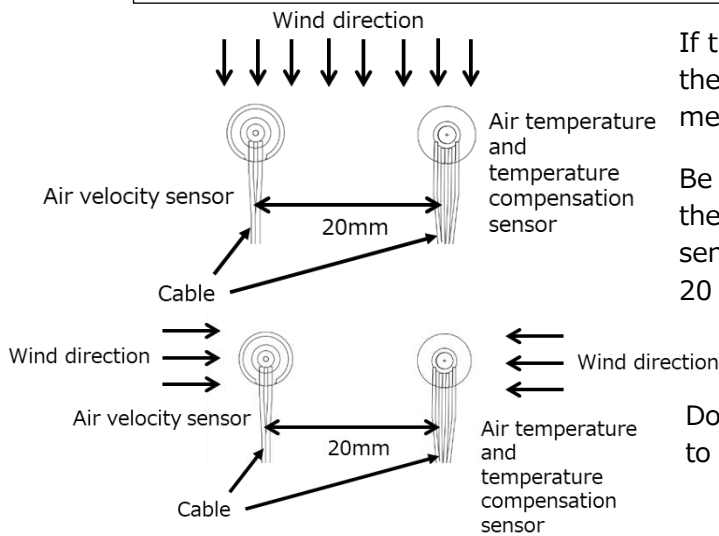


- ※ Model 0972-00/0973-00 probe is directional.
Be sure to aim the direction mark at windward.
If you are not able to find a correct airflow direction,
slowly rotate the probe and select a direction where
you have a maximum velocity reading, and perform
a measurement.





Setting, mounting and removing for Heat-resistant air velocity probe
(Mini, straight, temperature-compensation sensor independent type) of
0976-05, 0976-07, 0976-15 and 0976-17



If the cable is located on the leeward side to the wind direction, more accurate measurement will be achieved.

Be sure to install the air velocity sensor and the temperature/temperature compensation sensor in parallel with a distance of at least 20 mm between them.

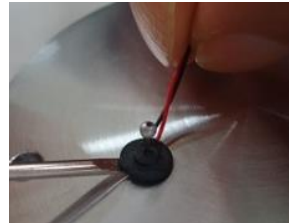
Do not arrange the probes in a straight line to the wind direction.

Mounting the Probe

Use the optional double stick tape (Model1580-92) to mount the probe with a base to a measuring point. Attach the double stick tapes on the bottom faces of the air velocity sensor and the temperature and temperature compensation sensor to mount the sensors to a measuring point. If a mounting surface is dusty or dirty, the adhesive strength may decrease. Before mounting the probe, clean a mounting surface of a measuring point. To firmly mount the probe, lightly press the base of the probe with a tool such as tweezers.



Mounting the probe



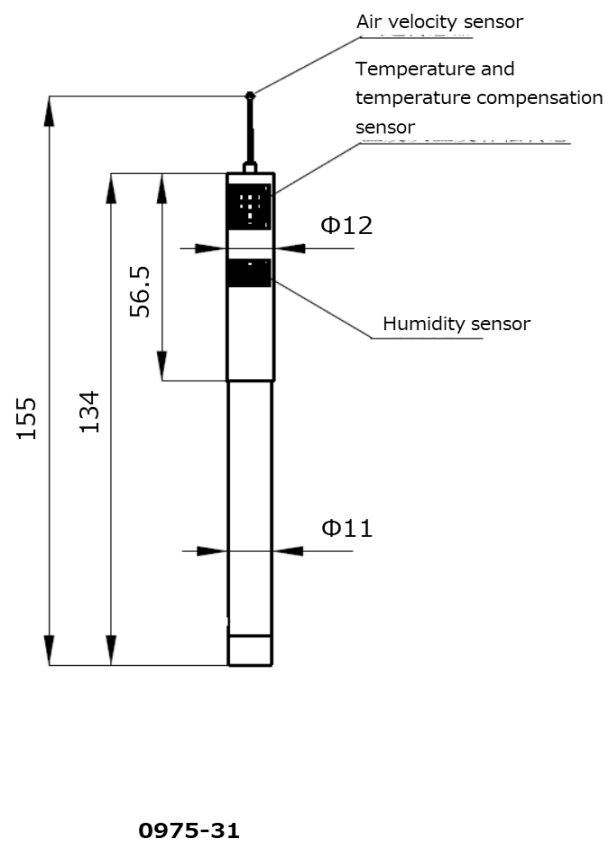
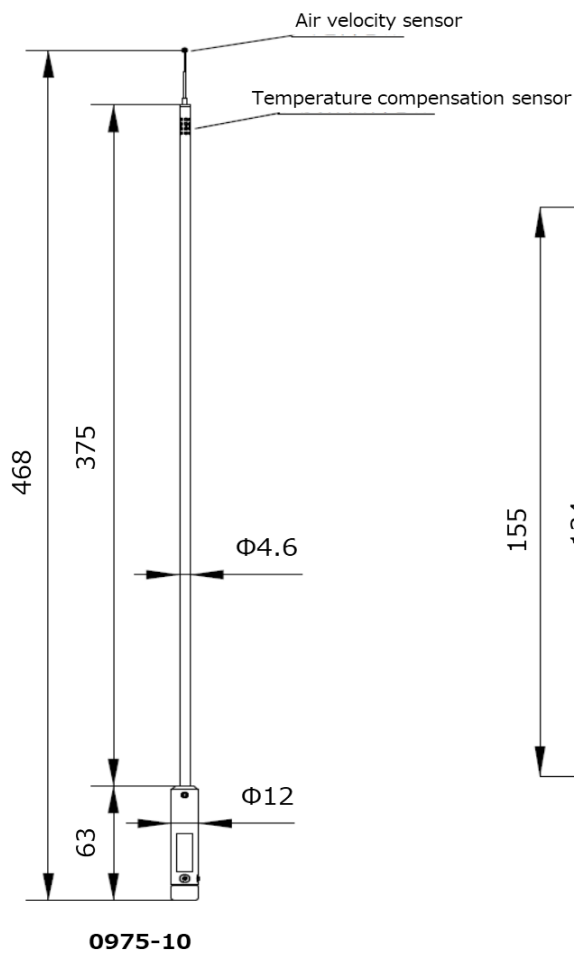
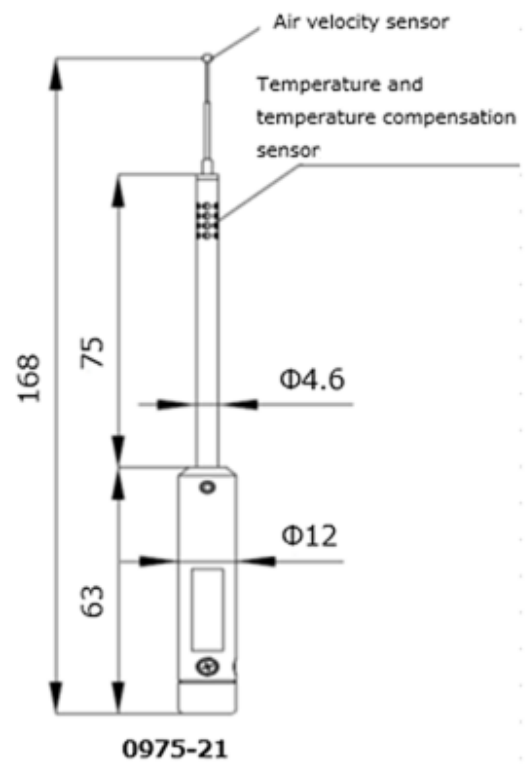
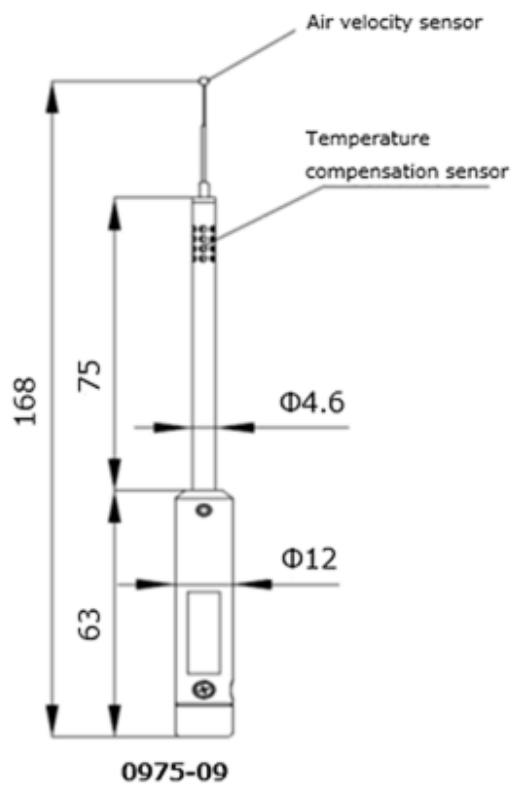
Removing the probe

Removing the Probe

To remove the probe, hold the wires between the thumb and index finger and insert a tool such as a flathead screwdriver between the probe base and a mounting surface. DO NOT pull the wires. If you pull the wires forcibly, a broken wire may occur. DO NOT touch the air velocity sensor (the metallic sphere) which is hot under energized conditions. After a measurement, remove the tapes. Use the new double stick tape for a new mounting. Do not reuse.

! Caution !

- !) When temperature is not uniform in a measuring place, place the air velocity and the temperature compensation sensor appropriately in order that temperature difference between them is small.
- !) Do not place the temperature compensation sensor on the windward side of the air velocity sensor. Air velocity values may be affected.
- !) If a distance between the temperature compensation sensor and the air velocity sensor is 20 mm or shorter (closer), air velocity values may be affected.



■ Standard Cable

Model	1580-30	1580-31	1580-32	1580-33	1580-34	1580-35
Length ± tolerances	0.5 m +0.05,-0	2.0 m +0.1,-0	5.0 m +0.2,-0	10.0 m +0.3,-0	20.0 m +0.5,-0	40.0 m +1.0,-0
Operating environment	0 to 60°C, 5 to 95%RH with no condensation					
Storage environment	-10 to 60°C, 0 to 95%RH with no condensation					
Connector type	IX61G-A-10P HIROSE One-touch connector with lock					
Warranty period	One year from date of purchase					

■ AC adapter

Model	1580-1G	1590-1G
Output power	90W	160W
Operating environment	5 to 40°C, 2 to 95%RH with no condensation	
Storage environment	-10 to 60°C, 0 to 90%RH with no condensation	
Warranty period	One year from date of purchase	

■ DC power connection cable

Model	1580-37
Length	2.0 m +50 mm, -0 mm
Supply voltage	12V to 24V
Current capacity	Maximum 6.25 A
Cable core wire size	0.5 mm ²
Operating environment	5 to 40°C, 2 to 95%RH with no condensation
Storage environment	-10 to 60°C, 0 to 90%RH with no condensation
Warranty period	One year from date of purchase

■ Probe Fixing Jig

Model	1580-90
Quantity	20 sets
Connectable probe	Model 0976-03: Heat-resistant air velocity probe (Mini, straight type) Model 0976-04: Heat-resistant air velocity probe (Mini, articulating type) Model 0976-13: Air velocity probe (Mini, straight type) Model 0976-14: Air velocity probe (Mini, articulating type)
Operating environment	0 to 150°C with no condensation
Storage environment	-10 to 60°C, 0 to 90%RH with no condensation
Warranty period	One year from date of purchasing

■ Double stick tape (for mounting the probe with a base)

Model	1580-92
Quantity	10 sheets (20 pcs per sheet)
Dimensions	φ 5 mm × 0.6 mm per pc
Connectable probe	<p>Model 0976-07: Heat-resistant air velocity probe (Mini, straight, temperature-compensation sensor independent type)</p> <p>Model 0976-05: Heat-resistant air velocity probe VT (Mini, straight, temperature-compensation sensor independent type)</p> <p>Model 0976-17: Air velocity probe (Mini, straight, temperature-compensation sensor independent type)</p> <p>Model 0976-15: Air velocity probe VT (Mini, straight, temperature-compensation sensor independent type)</p>
Operating environment	-30 to 150°C (with no condensation)
Warranty period	One year from date of purchase

6. Troubleshooting

Symptom	Possible cause(s)/Solution(s)	Reference page
The power is turned on, but the display is blank or power is not supplied.	The AC adapter may not be properly connected. → Check the AC adapter or the power cord.	P. 19
Data is not saved.	Data saving setting may be OFF. → Check the data saving setting.	P. 32
	Remaining memory area may be small. → Transfer data to a USB memory, or copy and delete.	P. 37
Reading is abnormal.	The probe element is dirty. → Clean the probe according to the instruction.	P. 52
	The probe is broken. → Contact your shop or KANOMAX services center for repair.	P. 67
No measured value appears.	The message "----" is displayed. → The probe or the hub unit is/are not connected properly. "----" is also displayed in CH for which the probe is not connected.	P. 12
	The reading of temperature or humidity is displayed as "----". → The connected probe is not likely to suitable. Check the connected probe and consider if the probe needs changing.	P. 57
	The error message "*****" is displayed. → The measurable range is exceeded. Check each connected probe and consider if the probe needs changing.	P. 57
	The error message " S-ERROR " is displayed. → The probe sensor is faulty. Please contact your local distributor or KANOMAX service center for repair.	P. 67
	The error message " H-ERROR " is displayed. → Hardware between the hub unit and the probe is faulty. Please contact your local distributor or KANOMAX service center for repair.	P. 67
	The error message " P-ERROR " is displayed. → Power supply to the probe is faulty. Please contact your local distributor or KANOMAX service center for repair.	P. 67
	Measurement values are not updated. :If an analog unit is used and the sampling interval is less than 0.5 seconds, it will not be displayed. Set the sampling interval to 0.6 seconds or more, or remove the analog unit.	P. 32
There is a delay in the analog output.	Please set the number of connected hub units or the sampling interval appropriately.	P. 42

7. Warranty and After-Sales Service

The limited warranty set below is given by KANOMAX JAPAN, Inc. (hereafter referred to as "KJI") with respect to this instrument, its attachment parts including standard accessories (hereafter referred to as "PRODUCT") that you have purchased. PRODUCT you have purchased shall be the only one that the limited warranty stated herein applies to.

Your PRODUCT, when delivered to you in new condition in its original container, is warranted against defects in materials or workmanship as follows: for a period of one (1) year from the date of original purchase, defective parts or a defective PRODUCT returned to KJI, as applicable, and proven to be defective upon inspection, will be exchanged for a new or comparable rebuilt parts, or a refurbished PRODUCT as determined by KJI. Warranty for such replacements shall not extend the original warranty period of the defective PRODUCT.

To obtain service under this warranty, you must notify KJI on or before the expiration of the warranty period to obtain directions for returning the defective product. You are responsible for all return shipping charges to the authorized KANOMAX service center.

This limited warranty covers all defects encountered in normal use of the PRODUCT, and does not apply to the following cases:

- (1) Use of parts or supplies other than the PRODUCT sold by KJI, which cause damage to the PRODUCT or cause abnormally frequent service calls or service problems.
- (2) If any PRODUCT has its serial number or date altered or removed.
- (3) Loss or damage to the PRODUCT due to abuse, mishandling, improper packaging by the owner, alteration, accident, electrical current fluctuations, failure to follow operating, maintenance or environmental instructions prescribed in the PRODUCT's instruction manual provided by KJI, or service performed by other than KJI.

NO IMPLIED WARRANTY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, APPLIES TO THE PRODUCT AFTER THE APPLICABLE PERIOD OF THE EXPRESS LIMITED WARRANTY STATED ABOVE, AND NO OTHER EXPRESS WARRANTY OR GUARANTY, EXCEPT AS MENTIONED ABOVE, GIVEN BY ANY PERSON OR ENTITY WITH RESPECT TO THE PRODUCT SHALL BIND KJI. KJI SHALL NOT BE LIABLE FOR LOSS OF STORAGE CHARGES, LOSS OR CORRUPTION OF DATA, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY THE USE OR MISUSE OF, OR INABILITY TO USE, THE PRODUCT, REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF KJI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL RECOVERY OF ANY KIND AGAINST KJI BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY KJI AND CAUSING THE ALLEGED DAMAGE. WITHOUT LIMITING THE FOREGOING, THE OWNER ASSUMES ALL RISK AND LIABILITY FOR LOSS, DAMAGE OF, OR INJURY TO THE OWNER AND THE OWNER'S PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF USE OR MISUSE OF, OR INABILITY TO USE, THE PRODUCT NOT CAUSED DIRECTLY BY THE NEGLIGENCE OF KJI. THIS LIMITED WARRANTY SHALL NOT EXTEND TO ANYONE OTHER THAN THE ORIGINAL PURCHASER OF THE PRODUCT, OR THE PERSON FOR WHOM IT WAS PURCHASED AS A GIFT, AND STATES THE PURCHASER'S EXCLUSIVE REMEDY.

8. Contact Information



If you have any questions or inquiries about this product, please check the contact information below, as it depends on the region where you purchased the product.

□ U.S.A.

KANOMAX USA, INC.

219 US Hwy 206, Andover, New Jersey 07821 U.S.A.

TEL: (800)-247-8887 / (973)-786-6386

FAX: (973)-786-7586

URL: <http://www.kanomax-usa.com/>

E-Mail: info@kanomax-usa.com

□ JAPAN

KANOMAX JAPAN INC.

2-1 Shimizu, Suita City, Osaka 565-0805, Japan

TEL: 81-6-6877-0183

FAX: 81-6-6879-5570

URL: <http://www.kanomax.co.jp>

E-Mail: sales@kanomax.co.jp

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The contents of this manual are subject to change without notice.

01002/2409

