M0011904 A

SanAce Airflow Tester

# 9AT2560 series

# Instruction Manual

SANYO DENKI

## Safety Precautions

Please read this instruction manual and its appendix carefully prior to installation, operation, maintenance or inspection and perform all tasks according to the instructions provided here.

A good understanding of this equipment, its safety information as well as all Warnings/Cautions is also necessary prior to operation.

Matters that require attention are ranked as “Danger”, “Warning”, and “Caution” in this document.

◆ Warning Symbols

| | |
|---|---|
|   | Denotes immediate hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|   | Denotes hazards which could cause bodily injury and product or property damage as a result of incorrect operation. |

  Even those hazards denoted by this symbol could lead to a serious accident. Make sure to strictly follow these safety precautions.

◆ Prohibited, Mandatory Symbols

| | |
|---|---|
|  | Indicates actions that must not be allowed to occur / prohibited actions. |
|  | Indicates actions that must be carried out / mandatory actions. |

## Safety Precautions

# ⚠Warning

<Operating Precautions>

- Avoid using the product in the presence of flammable, explosive, or corrosive gases, locations subjected to splashing water or oil, or near combustibles. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Turn off the power before performing any wiring, maintenance, or inspection. Once the power is off, remove the AC power cable, and confirm that the POWER LED is off before performing these tasks. Failure to do so may result in electric shock.
- Operate the product with dry hands. Failure to do so may result in electric shock.
- Never attempt to disassemble or alter the product in any way. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not damage the AC power cable. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- If the product emits unusual noise, odors, or smoke, or if water or other liquids enter the product, immediately turn off the power and disconnect the power cable. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Read the instruction manual carefully prior to using the product. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.
- Always use the supplied AC power cable if included. Using an AC power cable with inappropriate ratings may result in electric shock, bodily injury, fire, product failure, or damage.
- If an AC power cable is not included, please prepare a cable matching the specifications listed in section 9.2 "Specifications." Using an AC power cable with inappropriate ratings may result in electric shock, bodily injury, fire, product failure, or damage.
- Prior to turning on the power, be sure to ground the product by connecting it to a grounded outlet. Insufficient grounding may result in electric shock, bodily injury, fire, product failure, or damage.

## Safety Precautions

# ⚠Caution

<Operating Precautions>

- Avoid using the product near bodies of salt water or other locations susceptible to salt damage. Otherwise, it may result in product failure or damage caused by salt.
- Due to the internal power supply, certain sections of the product may experience an elevation in temperature that may cause a burn or bodily injury.
- Do not use the product outside its specifications. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not use the product if it is defective, damaged, or burnt out. Otherwise, it may result in electric shock, bodily injury, or fire.
- When not using the product, turn off the power and unplug the AC power cable. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.

<Transportation>

- Excess stacking may cause the load to collapse so follow the directions written on the outside box. Failure to do so may result in bodily injury or damage.
- Handle the product with care during transportation, as it is dangerous if dropped. Failure to do so may result in bodily injury.
- The product is heavy so handle with care. Failure to do so may result in bodily injury.

<Handling>

- Do not apply excessive stress or place heavy objects on the product. Otherwise, it may result in electric shock, bodily injury, product failure, or damage.
- Transport the product using the carrying handle. Failure to do so may result in bodily injury, product failure, or damage.
- Do not drop the product or subject it to excessive shock of any kind. Otherwise, it may result in product failure or damage.
- If the connection duct or tripod is attached to the main unit, make sure it does not tip over or drop while moving. Otherwise, it may result in bodily injury, product failure, or damage.
- Only use the product as specified in this instruction manual. Failure to do so may result in product failure or damage.
- Make sure that the intake and exhaust vents are free of debris and foreign matter. Otherwise, it may result in bodily injury, product failure, or damage.
- Mount the product on incombustible material below 60°C. Failure to do so may result in fire, product failure, or damage.

<Connecting the AC Power Cable>

- Connect the AC power cable as instructed by the instruction manual. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.

## Safety Precautions

# ⚠Caution

<Operation>

- Operate the product within the specified input-power voltage to maintain stability. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- The auxiliary fan rotates during operation. Make sure that the intake and exhaust vents are free of debris and foreign matter.
- Keep hands away from the exhaust vent. Failure to do so may result in bodily injury, fire, product failure, or damage.

<Maintenance and Inspection>

- Some parts of the product (fan motor, gasket, electrolytic condenser, sensor, LED, switches) can deteriorate with long-term use. As preventive maintenance, perform periodic maintenance and inspection to maintain measuring accuracy. For details on maintenance, inspection, and repair, please contact SANYO DENKI. Disassembly is not to be performed by the end-user. Disassembly may result in electric shock, bodily injury, fire, malfunction, product failure, or damage.

# ⃠Prohibited

<Handling>

- Do not scratch the connection duct with sharp objects as it may tear or damage the material.

<Operation>

- Applying voltage outside the input voltage range may result in electric shock, bodily injury, fire, product failure, or damage. Never use voltages outside of specification.
- Keep the USB serial adapter away from static electricity and high voltage. Failure to do so may result in failure or damage.
- Do not use a polarized grounding adapter with the product. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.

<Storage>

- Do not store the product where it could be exposed to rain, water, toxic gases, or other liquids. Failure to do so may result in product failure or damage.

<Maintenance and Inspection>

- Do not perform disassembly, inspection, or repairs. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not measure the insulation resistance or the pressure resistance. Otherwise, it may result in product failure or damage.
- Never unplug the AC power cable while the power is on as the resulting surge voltage may damage electronic components. Otherwise, it may result in electric shock, bodily injury, or fire.
- Do not remove the nameplate attached to the product. Doing so voids the warranty.
- Do not wipe the product with benzene, paint thinner, or other solvents. Otherwise, it may result in deformation, deterioration, discoloration, product failure, or damage.

## Safety Precautions

# Mandatory

<Operation>

- In the case of any irregular operation, stop the device immediately. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- As a provisional measure, ensure that the power can be turned off at any time. Inability to turn off the power may result in electric shock, bodily injury, fire, product failure, or damage.
- If an error occurs, eliminate the cause and ensure safety before resuming.
- Use the product within the specified temperature and humidity range. Failure to do so may result in product failure or damage.

  Temperature: 0°C to 40°C / Humidity 20 to 85% RH (non-condensing)
- Be sure to use the supplied AC power cable to prevent electric shock, bodily injury, fire, product failure, or damage.
- Be sure to prepare a cable matching the ratings listed in section 9.2 "Specifications" to prevent electric shock, bodily injury, fire, product failure, or damage.
- Prior to turning on the power, be sure to ground the product by connecting it to a grounded outlet to prevent electric shock, bodily injury, fire, product failure, or damage.

<Storage>

- Store the product in a location that is not exposed to direct sunlight, at a temperature and humidity within specifications. Failure to do so may result in product failure.
- If the product has been stored for a long period, contact SANYO DENKI. There is the possibility that components may have deteriorated and require maintenance.

<Disposal>

- When disposing of the product, treat it as industrial waste.

## Table of Contents

# 1. Before you start

### 1.1 Product overview

Thank you for purchasing the *San Ace Airflow Tester 9AT2560 series* (herein referred to as "the tester"). The *San Ace Airflow Tester* is a measuring device that provides the user the ability to measure system impedance, operating airflow, and airflow versus static pressure characteristics (P-Q performance). This instruction manual includes information on specifications, measurement, usage, warranty, and important safety precautions. Please read this manual thoroughly before using the tester to fully understand its functions. After thoroughly reading this manual, keep it handy for reference.

The tester also comes with our data viewer software *San Ace Airflow Tester Viewer*, for effectively using the measurement data. For details, please refer to the included operation manual for the *San Ace Airflow Tester Viewer*.

### 1.2 Features of the *San Ace Airflow Tester*

The *San Ace Airflow Tester* is a compact and portable measuring device that can accurately measure both system impedance and operating airflow. Here are a few of its features:

- Compact and portable! You can measure a device at virtually any location!
- The *Airflow Tester* lets you measure device system impedance and operating airflow quickly and easily!
- Convenient and accurate!

**Functions**

- Measures system impedance

  The tester measures the resistance to the flow of air within a device (ventilation resistance) and enables that measurement data to be plotted to a graph.

- Measures operating airflow

  It can also measure the actual airflow that passes through a device when a fan is mounted.

- Measures P-Q performance

  In addition, the tester can measure the airflow versus static pressure characteristics of a fan.

- Connection duct for flexible connection is supplied as standard

  The tester includes a connection duct enabling it to connect to devices of varying sizes and shapes.

  The duct is also foldable for easy storage.

### 1.3 Precautions related to these instructions

In order to fully understand the functions of this product, please read this instruction manual thoroughly before using the product.

After thoroughly reading this manual, keep it handy for reference.

Carefully and completely follow the safety instructions outlined in this manual.

Note that safety is not guaranteed for usage methods other than those specified in this manual.

The images contained within this manual may, in some cases, be abbreviated or generalized.

The contents of this manual may be modified without prior notice as revisions or additions are created regarding the usage method of the product.

Modifications are performed as per the revisions of this manual.

Although the manufacturer has taken all possible measures to ensure the veracity of the contents of this manual, should you notice any error or omission, please notify us using the contact information within this document.

This instruction manual was translated from Japanese. In the event of any inconsistency between the Japanese version and the translated version, the Japanese version shall prevail. However in 9.4 Applicable standards, the English version is the original.

### 1.4 Unpacking

When the tester arrives, please check for the following:

Did the tester come with all necessary parts and accessories? Was anything damaged during shipment? ☑ Please put a check mark in the box the next to the items below.

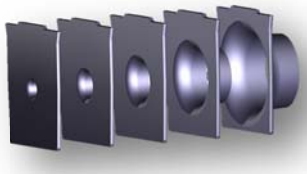
| Product name | Specifications | Model no. | Quantity |
|---|---|---|---|
| Main unit | See section 9.2, "Specifications." | 9AT2560 series | 1 |
| Measurement nozzles | 5 types | — | 1 each |
| Connection duct | Duct unit: 1<br>Poles: 4<br>Board holder: 1 | — | 1 |
| Plastic mounting boards | Size: 525 × 275 × 4 mm | 9AT2560–P001 | 5 |
| AC power cable | Cable length: 2.5 m | 9AT2560–K001 (North America / Japan)<br>or<br>9AT2560–K002 (Europe)<br>or<br>9AT2560–K003 (China) | 1 |
| Dedicated USB serial adapter | For connecting the main unit to a PC<br>(Includes CD for driver installation) | 9AT2560–U001 (Japan)<br>or<br>9AT2560–U002 (Excluding Japan) | 1 |
| Data viewer software<br>*San Ace Airflow Tester Viewer*<br>Instruction Manual | CD | — | 1 |
| Quick Start Guide | Japanese, English | — | 1 each |
| Certificate of Inspection | | — | 1 |

If any of the items are missing or damaged, contact your vendor immediately.

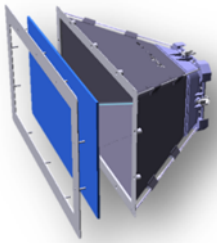
## Standard items

Main unit □

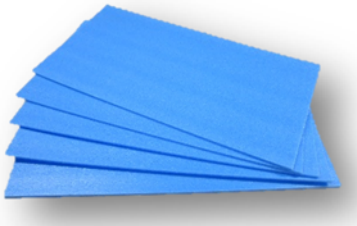
Measurement nozzles □



Connection duct □



Plastic mounting boards □



AC power cable □

USB serial adapter □

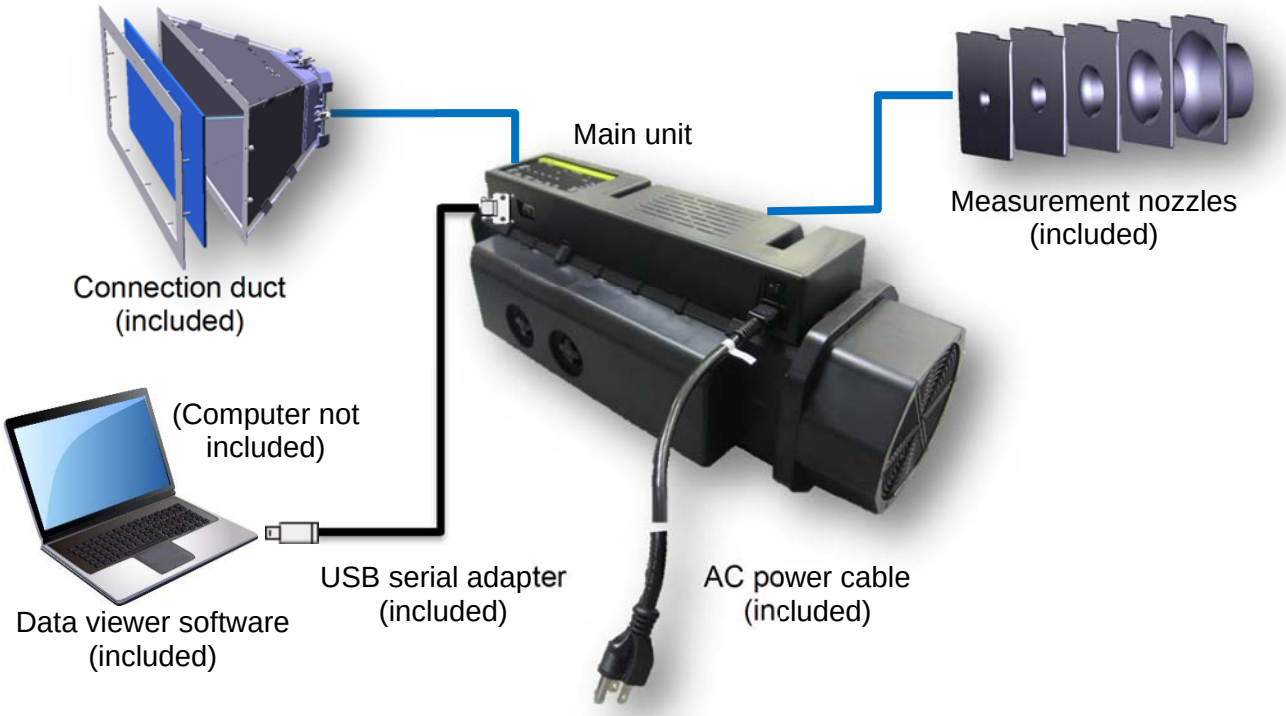
Instruction Manual and
Data viewer software □


Quick Start Guide □

Certificate of Inspection □

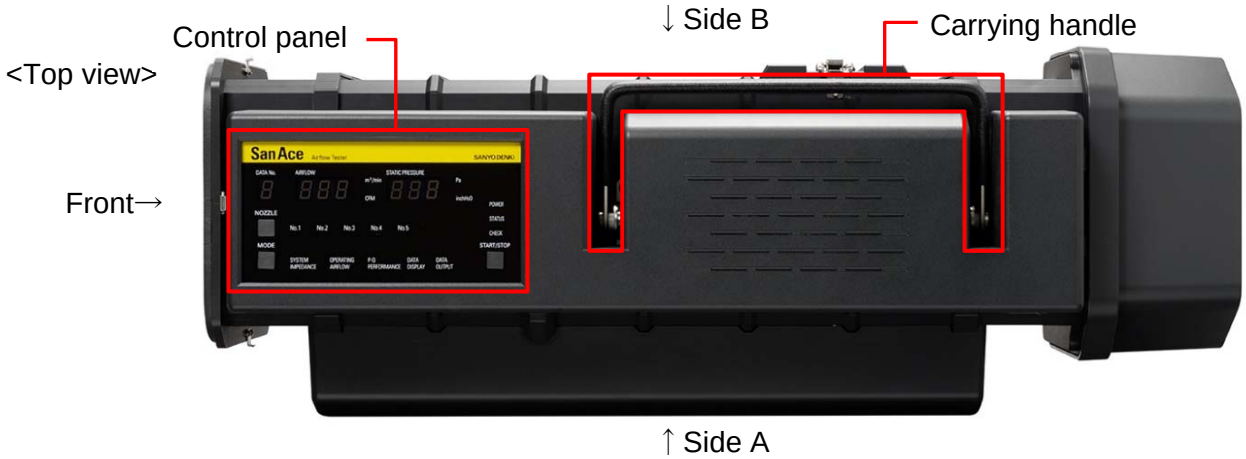
## 2. Part names

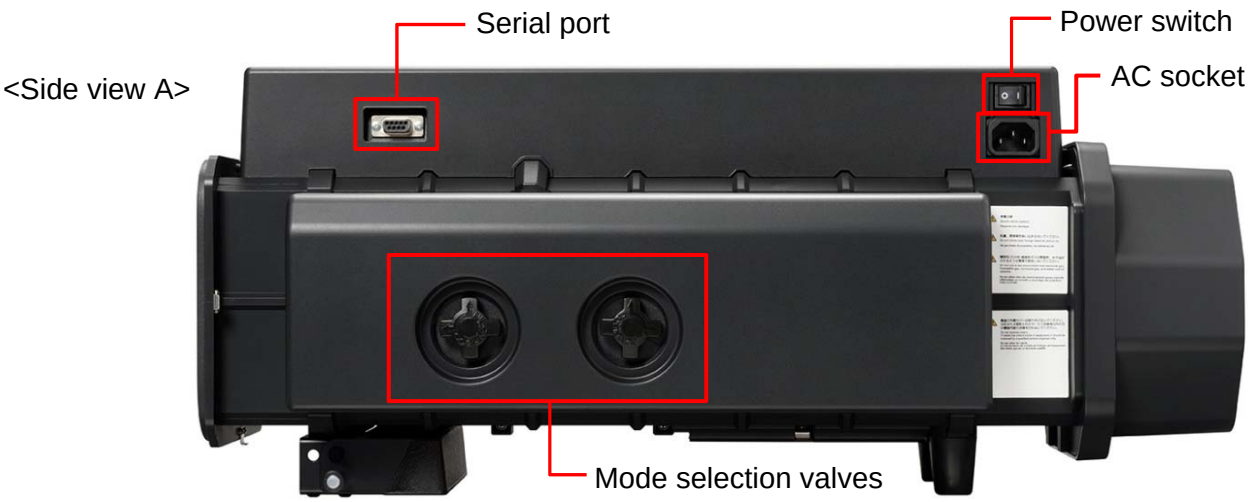
### 2.1 System components



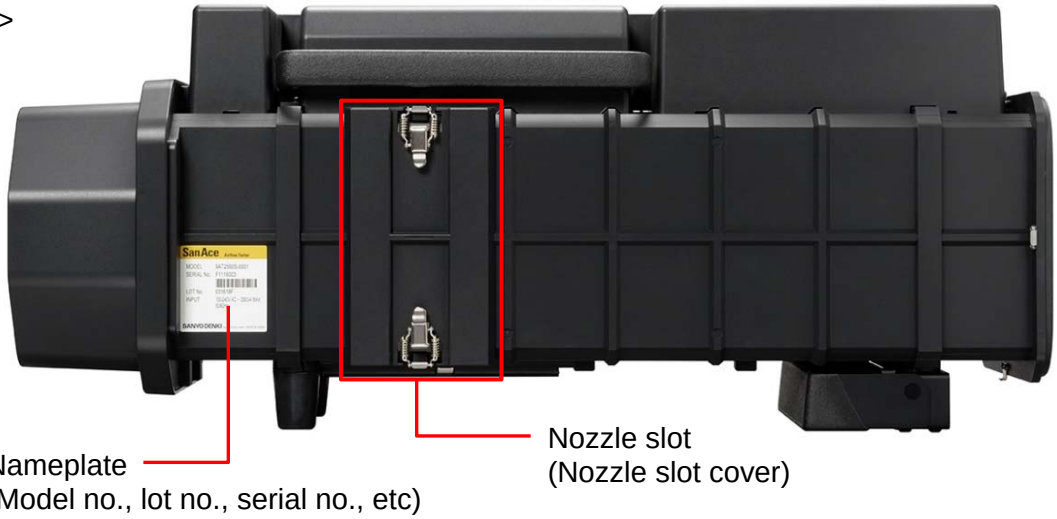

### 2.2. Part names

#### 2.2.1 Main unit

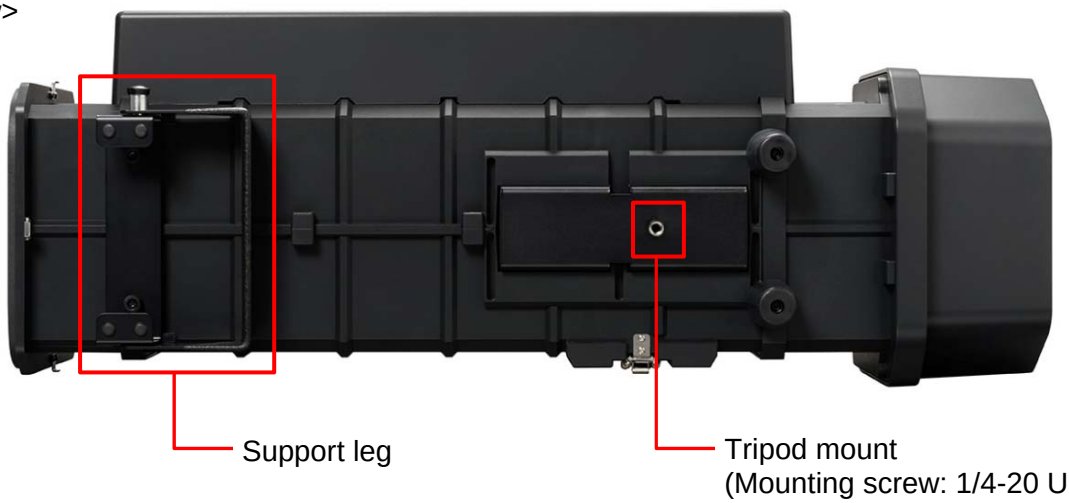


<Side view B>



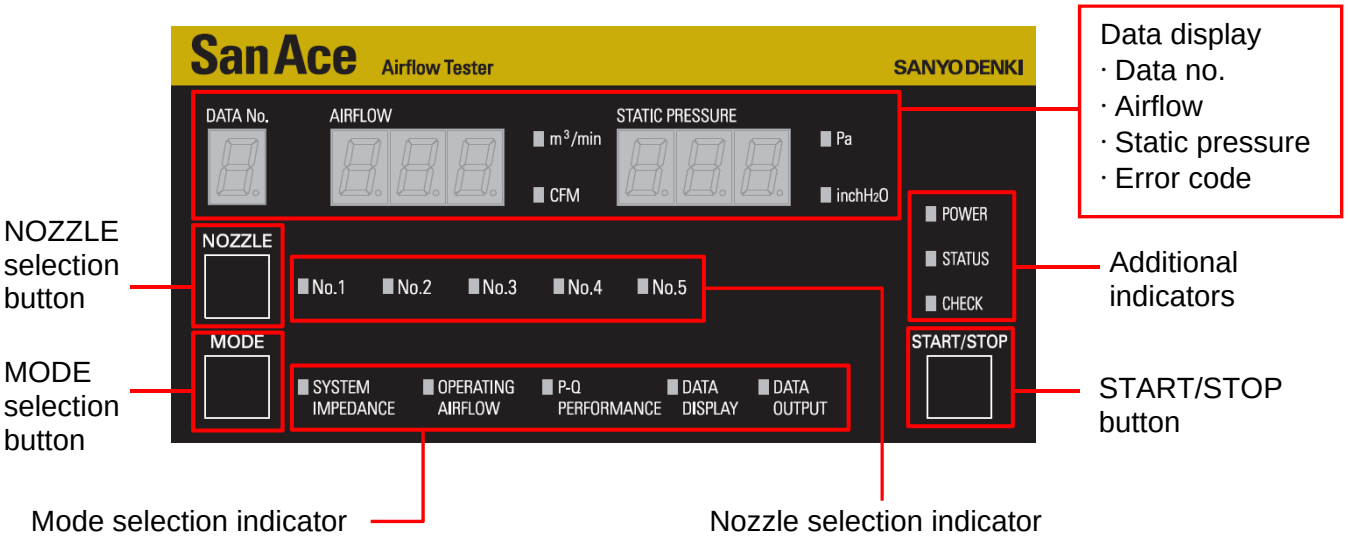

<Bottom view>




<Front view>


<Rear view>

### 2.2.2 Control panel




## 2.3 Glossary

This section discusses the terminology used throughout this manual.

- System impedance

  Component density and ventilation structure obstruct the flow of air and cause pressure loss within a device. This resistance to the flow of air within a device is known as system impedance. It is also referred to as ventilation or system resistance. This resistance and airflow rate can be plotted using a curve close to quadratic curve. This is known as a system impedance curve. The intersection of the P-Q performance curve and system impedance curve is known as the operating point.

- Operating airflow

  Refers to the actual airflow within a device while a fan is mounted.

- P-Q performance (airflow vs. static pressure characteristics)

  Expresses the relationship between airflow and static pressure of a fan.

- Connection duct

  Connects the measured device to the main unit. (Included)

- Measurement nozzles

  These nozzles are used to calculate airflow. Each nozzle has a different measuring range. For more details, see section 4.2, "Measuring range of the measurement nozzles." With the assistance of the automatic feedback control, change the nozzles to match the measured airflow range. For more details, see section 4.3, "Automatic feedback control of the measurement nozzles." The nozzles are inserted into the side of the main unit, dividing it into two chambers. Airflow is calculated by measuring the difference in static pressure in both chambers. Five sizes of nozzles are included to deliver accurate airflow measurement.

- Auxiliary fan

  The auxiliary fan is located at the rear of the main unit. It is used to create a pressure difference between the two chambers separated by the nozzle. The operation of this fan is automatically controlled during measurement.

- Mode selection valves

  These are two valves that are used to switch between measurement modes. Set the mode selection valves to match the measurement mode. For more details, see section 3.2, "Setting the mode selection valves."

# 3. Getting started

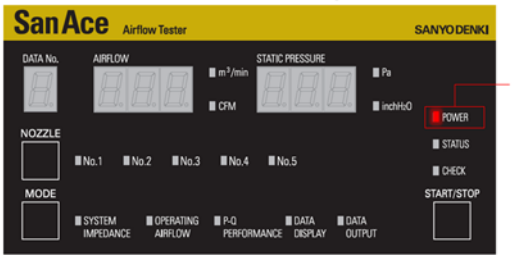
## 3.1 Preparing the main unit

Some preparation of the main unit is necessary for measurement.

① Connect the AC power cable to the main unit and insert it into an outlet.
(The POWER LED lights red when the main unit is receiving power.)

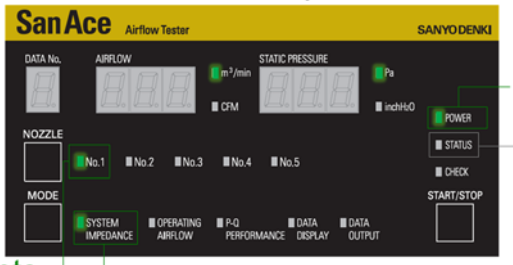
② Turn the power switch to the ON position.
When the power is turned on, all of the LEDs blink three times to confirm functionality.
After about five seconds, the control panel enters the start-up status (as shown on the right) and you may begin using the tester.
Check that the POWER LED lights green and the STATUS LED is off.
When the power is turned on, nozzle No.1 and SYSTEM IMPEDANCE are initially selected.

Connected to AC power




Lights red

At startup

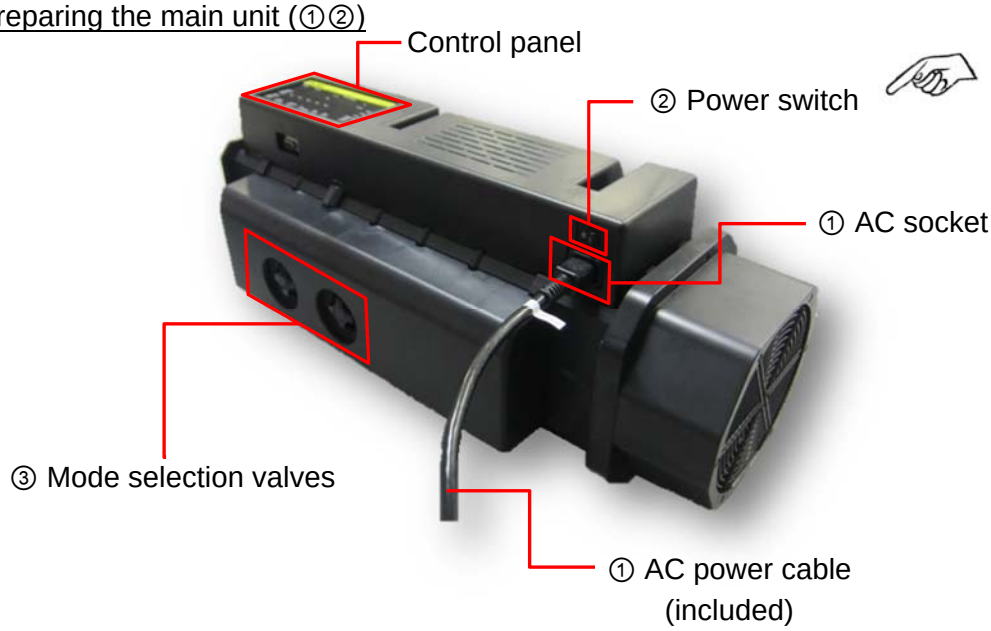



Lights green
Off

Lights green

**Note:** If there is a problem with the equipped sensors for temperature, humidity, or atmospheric pressure, the control panel displays an error code.
For further details, see section 7, "Troubleshooting." Follow the instructions corresponding to the error code.

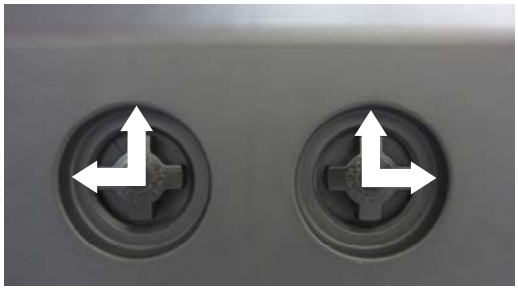
Preparing the main unit (①②)



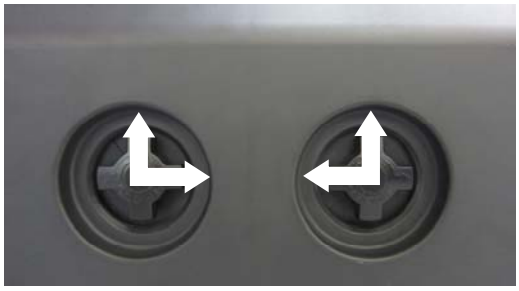
### 3.2. Setting the mode selection valves

On the side of the main unit, adjust the mode selection valves as shown in the diagram below.

Mode selection valve orientation (③)
**< system impedance measurement >**



Mode selection valve orientation (③)
**<operating airflow measurement>**
**and**
**<P-Q performance measurement>**

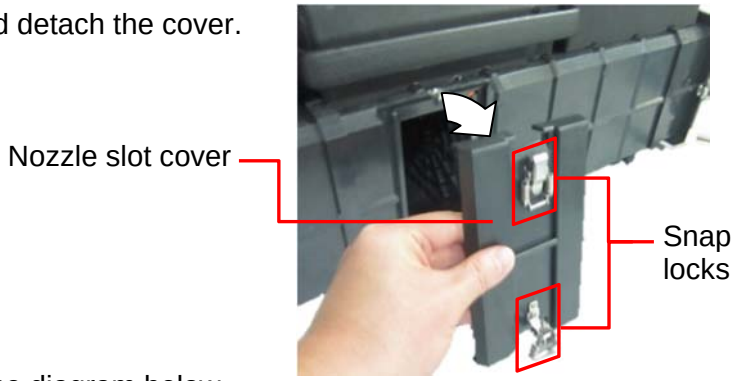


### 3.3 Inserting and exchanging the measurement nozzles

The measurement nozzles need to be replaced to measure different measuring ranges. For further details, see section 4.2, "Measuring range of the measurement nozzles." When inserting and replacing the measurement nozzles, follow the procedure provided below.

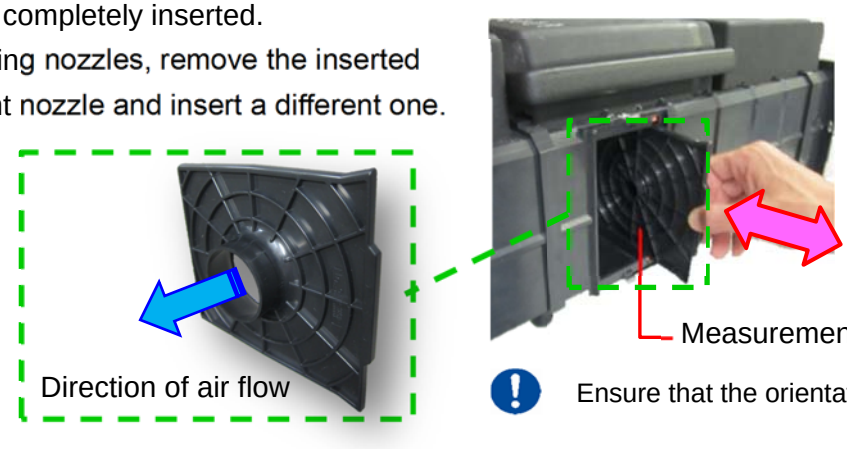
① Detach the nozzle slot cover from the main unit.
Release the two snap locks and detach the cover.

Detach the nozzle slot cover (①)




② Insert the nozzle as shown in the diagram below.
Firmly insert the nozzle along the groove within the nozzle slot.
The tester may not function properly if the nozzle is not completely inserted.
When replacing nozzles, remove the inserted measurement nozzle and insert a different one.

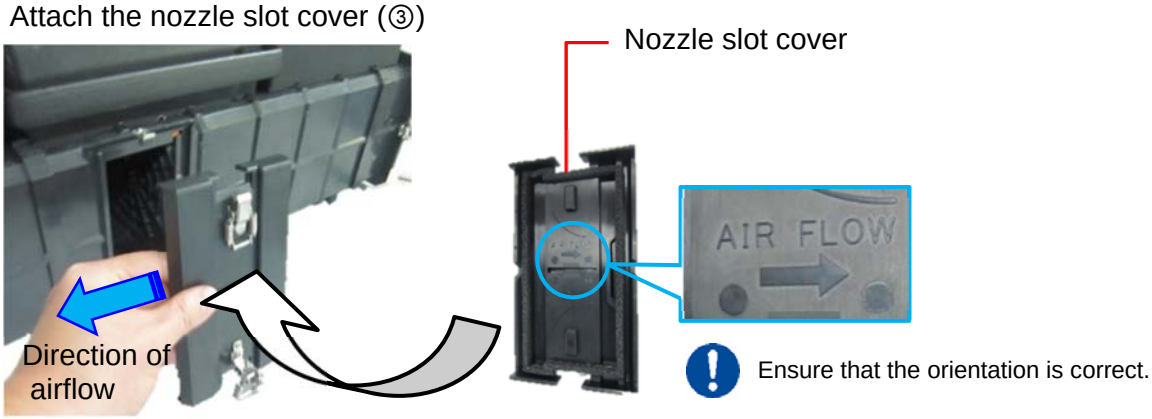
Remove or insert a measurement nozzle (②)




Ensure that the orientation is correct.

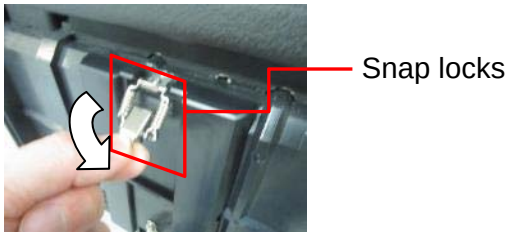
③ Attach the nozzle slot cover as shown in the diagram below.

Attach the nozzle slot cover (③)




④ Secure the two snap locks on the nozzle slot cover to the main unit.

Secure the snap locks (④)

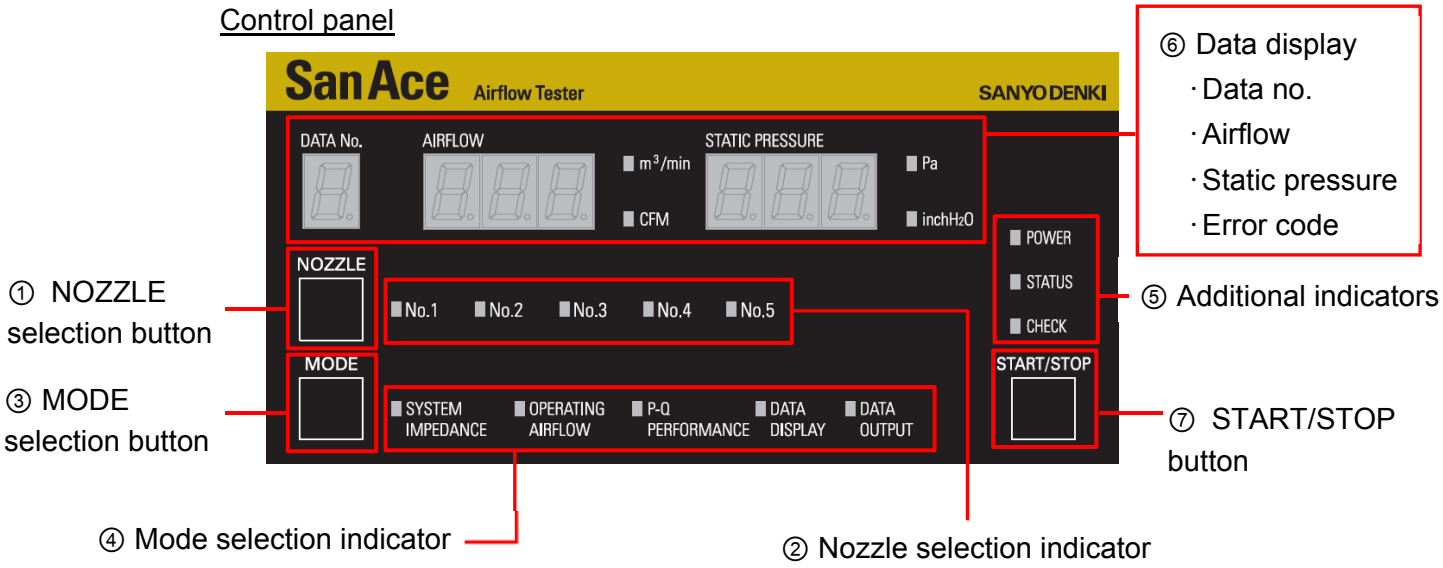


# 4. Measurement

## 4.1 Using the control panel

Details on how to use the control panel to select modes and check the operating status are explained below.

Control panel

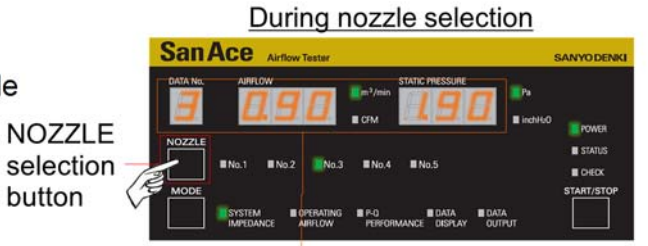



### ① NOZZLE selection button

Pushing NOZZLE cycles through each of the nozzle numbers in the following order:

No.1 → No.2 → No.3 → No.4 → No.5

During nozzle selection




Nozzle no. and measurable airflow range

[Ex.] Nozzle no. 3:

0.90 m³/min to 1.90 m³/min

When switching between nozzle numbers, the measurement range for the current nozzle briefly appears on the data display.

### ② Nozzle selection indicator

A green LED lights to indicate the currently selected nozzle number.

### ③ MODE selection button

Pushing MODE cycles through each of the modes in the following order:

SYSTEM IMPEDANCE → OPERATING AIRFLOW → P-Q PERFORMANCE→
→ DATA DISPLAY → DATA OUTPUT

### ④ Mode selection indicator

A green LED lights to indicate the currently selected mode.

### ⑤ Additional indicators

Indicates the status of the tester.

POWER: Status of the power supply input

Red LED on: AC power input available but power is off

Green LED on: Power is on

Blue LED flashes: Sleep mode

STATUS: Status of the tester

Green LED off: Standby mode

Green LED flashes: Preparing to measure

Green LED on: Measurement in progress

Red LED on: Error (then displays an error code)

CHECK: Automatically checks the status of the tester and its internal sensors.

Green LED flashes: Shifting to CHECK mode

Green LED on: CHECK mode

⑥ **Data display**

- Data no. : Displays the number of the measured point

  System impedance: Four points are measured so it displays 1 to 4.
  Operating airflow: One point is measured so it displays 1.
  P-Q performance: Six points are measured so it displays 1 to 6.
- Airflow: Displays the airflow of the measured point
- Static pressure: Displays the static pressure of the measured point
- Measuring range (only while selecting a nozzle): Displays the measuring range of the selected measurement nozzle
- Error code display: See section 7, "Troubleshooting."
- Units of measurement: $m^3$/min, CFM, Pa, inch$H_2O$

  Units are set prior to shipping and cannot be changed by the user.

⑦ **START/STOP button**

START: Begins measurement for all measurement modes

Used to begin manual measurements. Six measurements are taken during P-Q performance mode: three automatically and three manually.

STOP: Hold down for approximately four seconds to cancel measurement

Also cancels measurement for each measurement mode.

Hold down until the green STATUS LED turns off.

Length of time to hold the button may vary depending on the measurement status.

### 4.2 Measuring range of the measurement nozzles

Included are five sizes of measurement nozzles numbered 1 to 5. The numbers are stamped into the nozzles. Each measurement nozzle is specially designed to measure a particular airflow range.

Measuring range of the measurement nozzles

- No. 1: 0.20 $m^3$/min to 0.42 $m^3$/min
- No. 2: 0.42 $m^3$/min to 0.90 $m^3$/min
- No. 3: 0.90 $m^3$/min to 1.90 $m^3$/min
- No. 4: 1.90 $m^3$/min to 3.90 $m^3$/min
- No. 5: 3.90 $m^3$/min to 8.00 $m^3$/min

During measurement, the internal automatic feedback control determines the most appropriate nozzle for measurement.

### 4.3 Automatic feedback control of the measurement nozzles

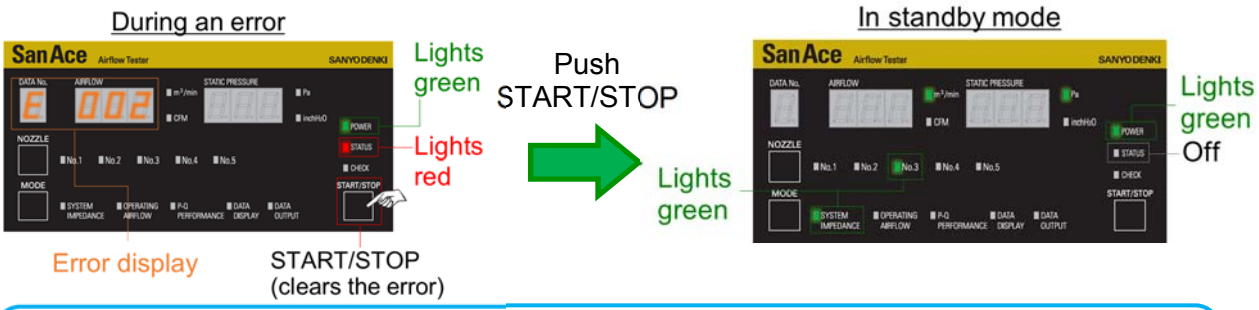
The *Airflow Tester* is equipped with an automatic feedback control to determine the correct nozzle for a measurement. The feedback control automatically judges whether or not the selected nozzle is appropriate for the current measurement.

If the nozzle is incorrect, an error code indicating to replace the nozzle appears on the data display, the STATUS LED lights red, and the measurement stops.

Replace the nozzle in accordance with the error code.

Push START/STOP to clear the error and return to standby mode.

Once in standby mode, the red STATUS LED turns off.




① If the current nozzle is too big:
Error code "E002" appears on the display so use a nozzle one size smaller.
[Ex] If you had used nozzle No. 3, replace it with nozzle No.2.

② If the current nozzle is too small:
Error code "E001" appears on the display so use a nozzle one size larger.
[Ex] If you had used nozzle No. 3, replace it with nozzle No.4.

**Note:** For further details, see section 3.2, "Inserting and replacing the measurement nozzles."

### 4.4 Checking the status of the main unit (CHECK mode)

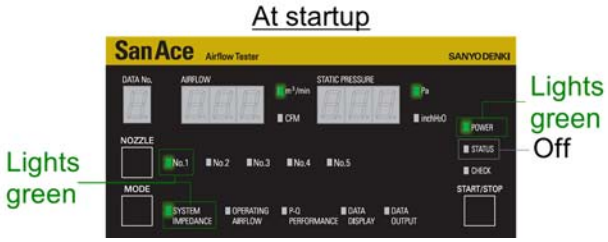
This tester has a function that automatically checks the status of the internal sensors.

The procedure for using CHECK mode is explained below.

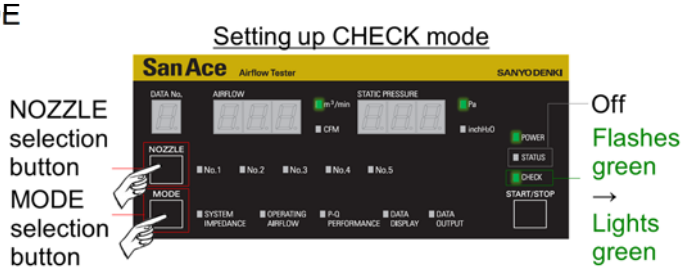
In CHECK mode, nozzles are optional. (Selecting a nozzle is unnecessary.)

Perform the following checks after detaching the duct from the main unit.

① Turn on the power, then check on the control panel that the POWER LED lights green and the STATUS LED is off.

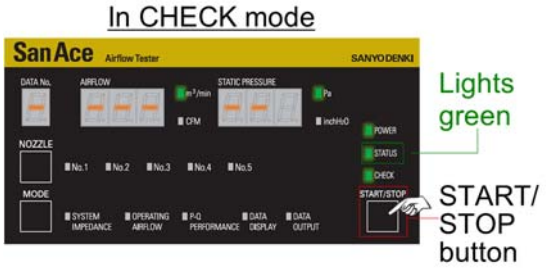



② Simultaneously hold down NOZZLE and MODE and the CHECK LED flashes green.
When the LED lights green,
CHECK mode is enabled.



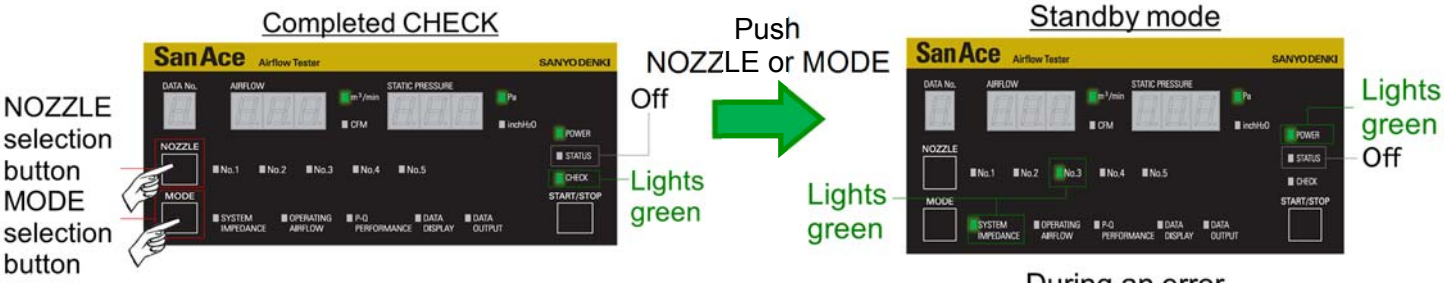
③ Set the mode selection valves to any measurement orientation.

④ Push START to begin a CHECK.
During a CHECK, the STATUS LED lights green.
"- - - - - - - -" appears on the data display to indicate that a CHECK is in progress.

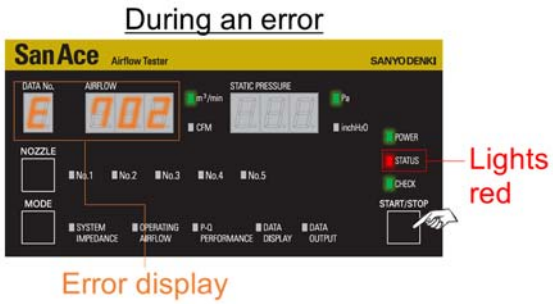



⑤ If there are no issues with the results of the CHECK, the STATUS LED turns off and the CHECK completes.

⑥ Push NOZZLE or MODE to switch to other modes.




If an error is discovered, an error code appears on the data display, the STATUS LED lights red, and CHECK stops. For further details, see section 7, "Troubleshooting," and follow the instructions corresponding to the error code.




### 4.5 Measurement modes

It is possible to do measurements using just the main unit when measuring a device smaller than the air inlet (140 x 140 mm) of the main unit.

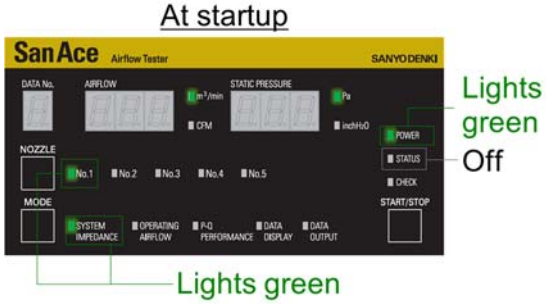
However, attach the connection duct when measuring a device larger than the air inlet. For further details, see section 5, "Connection duct," and section 6, "Attaching the measured device to the connection duct." When measuring a device larger than the inlet of the connection duct, please arrange your own duct. Be sure to maintain a tight seal to avoid air leakage when attaching the measured device to the tester.

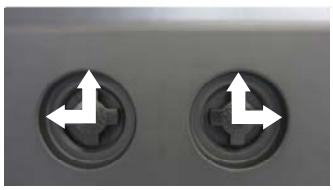
#### 4.5.1 Measuring system impedance

The procedure for measuring system impedance is explained below.

① Turn on the power, then check on the control panel that the POWER LED lights green and the STATUS LED is off.

② Set the mode selection valves to <system impedance measurement>.

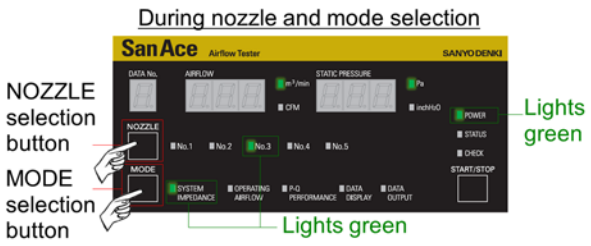


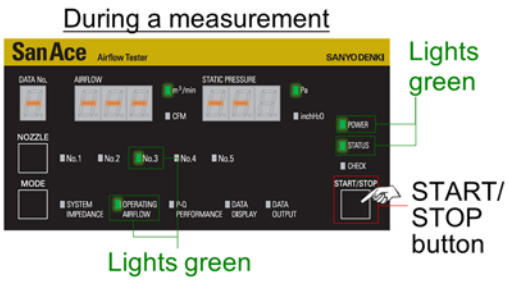
Mode selection valve orientation (②)
<system impedance measurement>

③ On the control panel, push MODE to select SYSTEM IMPEDANCE.

④ Push NOZZLE to select the number of the inserted nozzle.




⑤ Push START to begin measurement. During measurement, the STATUS LED lights green. "- - - - - - - -" appears on the data display to indicate that a measurement is in progress.



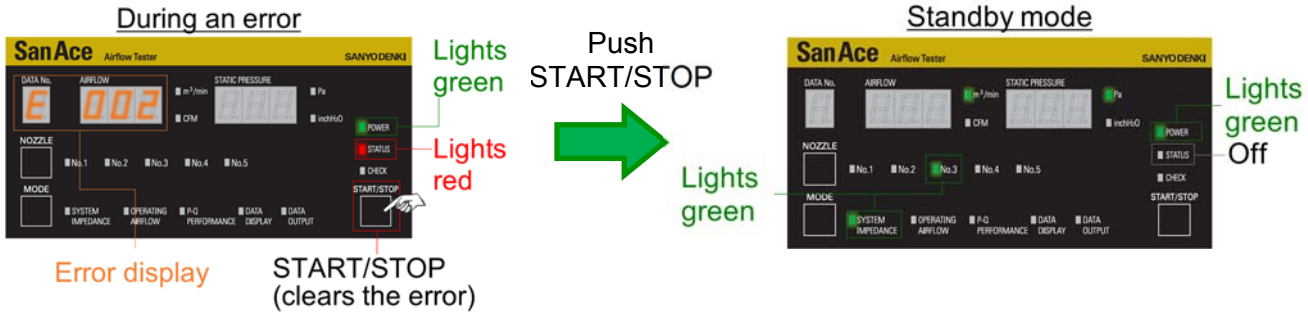

⑥ If the correct nozzle was inserted, the measurement completes after taking four measurements.

⑦ After the measurement completes, the STATUS LED turns off, and the control panel returns to standby mode.

⑧ For details on how to check the measurement data, see section 4.6, "Checking measurement data."

If the nozzle is incorrect, an error code appears on the data display, the STATUS LED lights red, and the measurement stops. For further details, see section 4.3, "Automatic feedback control of the measurement nozzles."

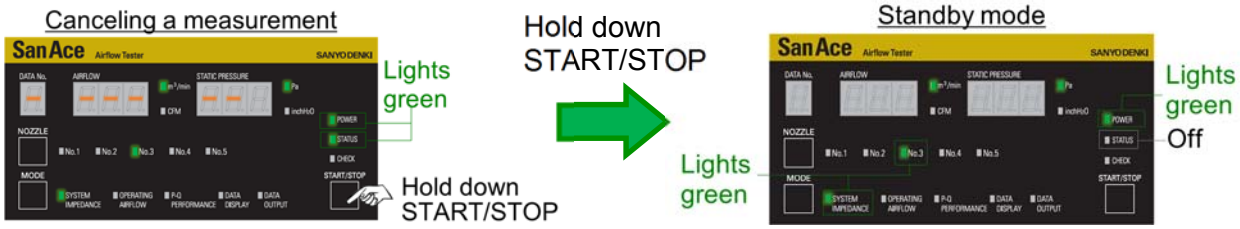
Push START/STOP to clear the error and return to standby mode. Once in standby mode, the red STATUS LED turns off.




Replace the nozzle in accordance with the error code and restart measurement.

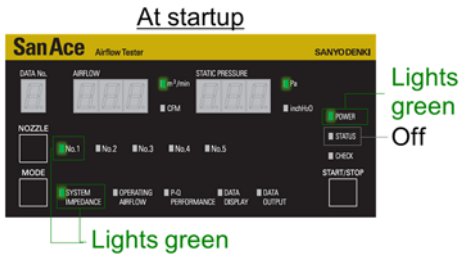
- If the current nozzle is too big:
  Error code "E002" appears. Use a nozzle one size smaller and repeat steps ① through ⑥.
  If "E002" appears again, use a nozzle an additional size smaller and repeat steps ① through ⑥.
- If the current nozzle is too small:
  Error code "E001" appears. Use a nozzle one size larger and repeat steps ① through ⑥.
  If "E001" appears again, use a nozzle an additional size larger and repeat steps ① through ⑥.

To cancel a measurement, hold down STOP until the green STATUS LED turns off. Returns to standby mode.




### 4.5.2 Measuring operating airflow

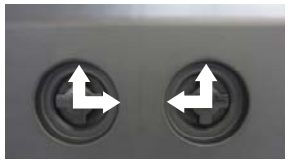
The procedure for measuring the operating airflow of a device is explained below.




① Turn on the power, then check on the control panel that the POWER LED lights green and the STATUS LED is off.

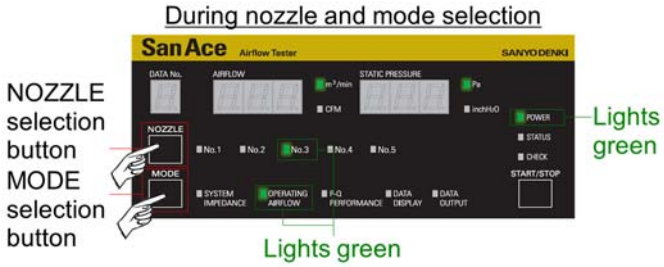
② Set the mode selection valves to <operating airflow measurement>.

Mode selection valve orientation (②)
<operating airflow measurement>

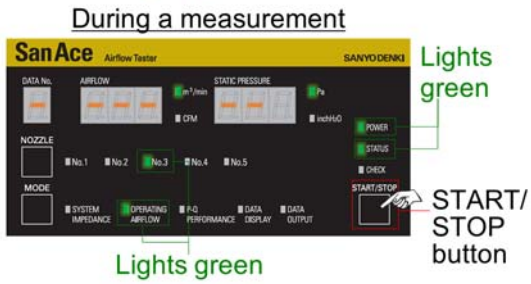


③ On the control panel, push MODE to select OPERATING AIRFLOW.

④ Push NOZZLE to select the number of the inserted nozzle.




⑤ Push START to begin measurement. During measurement, the STATUS LED lights green. "- - - - - - - -" appears on the data display to indicate that a measurement is in progress.



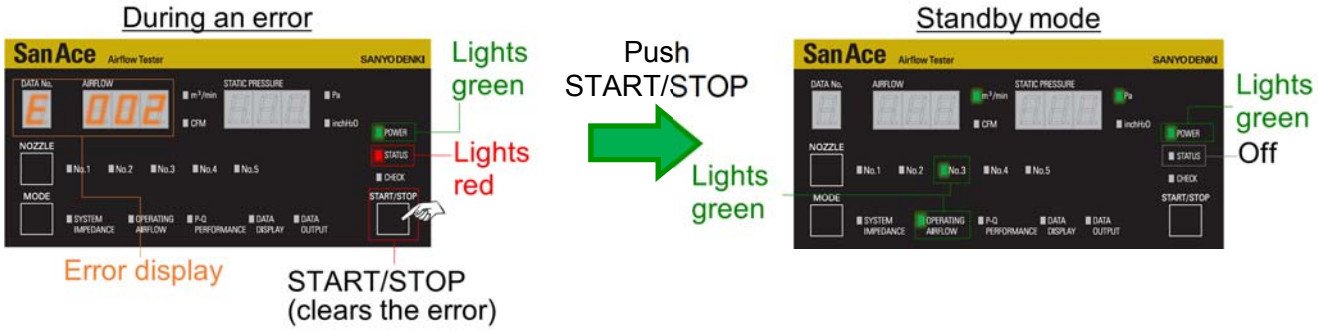

⑥ If the correct nozzle was inserted, the measurement completes after measuring the operating airflow.

⑦ After the measurement completes, the STATUS LED turns off, and the control panel returns to standby mode.

⑧ For details on how to check the measurement data, see section 4.6, "Checking measurement data."

If the nozzle is incorrect, an error code appears on the data display, the STATUS LED lights red, and the measurement stops. For further details, see section 4.3, "Automatic feedback control of the measurement nozzles."

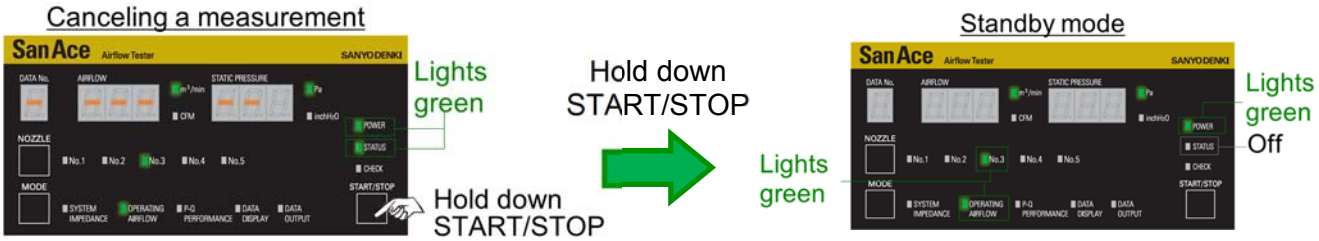
Push START/STOP to clear the error and return to standby mode. Once in standby mode, the red STATUS LED turns off.




Replace the nozzle in accordance with the error code and restart measurement.

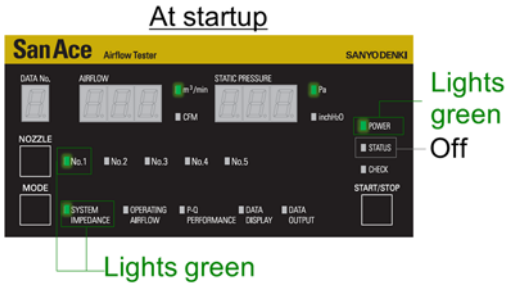
- ◆ If the current nozzle is too big:
  Error code "E002" appears. Use a nozzle one size smaller and repeat steps ① through ⑥.
  If "E002" appears again, use a nozzle an additional size smaller and repeat steps ① through ⑥.
- ◆ If the current nozzle is too small:
  Error code "E001" appears. Use a nozzle one size larger and repeat steps ① through ⑥.
  If "E001" appears again, use a nozzle an additional size larger and repeat steps ① through ⑥.

To interrupt the measurement process, hold down START/STOP until the green STATUS LED turns off. Returns to standby mode.



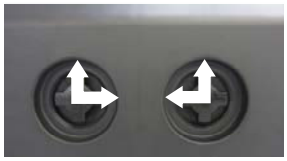

### 4.5.3 Measuring P-Q performance

The procedure for measuring the P-Q performance of a fan is explained below.




① Turn on the power, then check on the control panel that the POWER LED lights green and the STATUS LED is off.

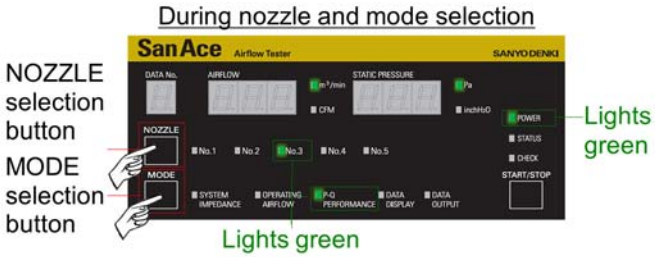
② Set the mode selection valves to <P-Q performance measurement>.



Mode selection valve orientation (②)
<P-Q performance measurement>

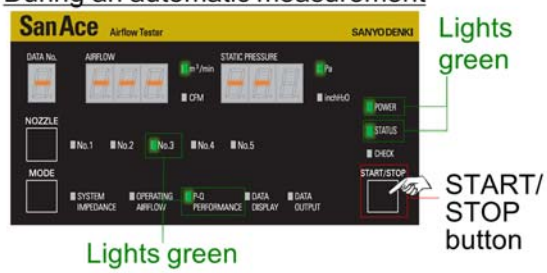
③ On the control panel, push MODE to select P-Q PERFORMANCE.

④ Push NOZZLE to select the number of the inserted nozzle.



⑤ Push START to begin measurement. During measurement, the STATUS LED lights green. "- - - - - - - -" appears on the data display to indicate that a measurement is in progress.

During an automatic measurement

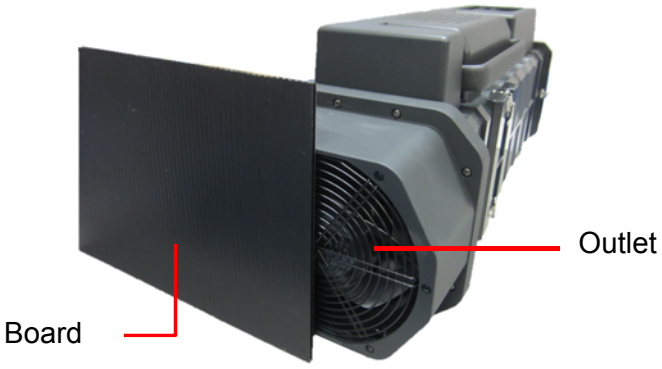



⑥ In P-Q PERFORMANCE measurement mode, three measurements are taken automatically, followed by three manual measurements. (Total of six measurements.)

If the correct nozzle was inserted, three measurements are taken automatically.

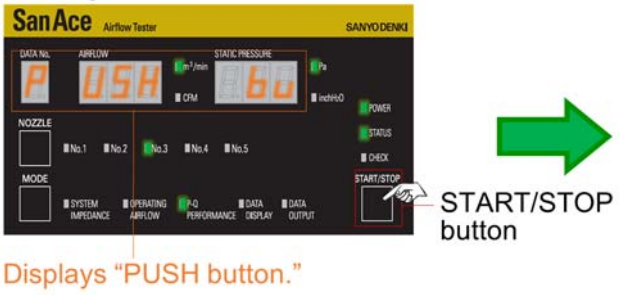
⑦ Procedure for manual measurement:

- ◆ After the automatic measurement completes, "PUSH button" appears on the data display.
- ◆ Then place a piece of flat PVC or board over the outlet of the auxiliary fan at the rear of the main unit. The board acts as a blast gate for blocking the ventilation of the outlet.




- ◆ When ready, push START to measure airflow and static pressure at that point and status.

During a manual measurement




Measures the airflow and static pressure at the moment you push START.

- ◆ After the first manual measurement completes, "PUSH button" appears on the data display indicating to proceed with the second measurement.
- ◆ Following the same procedure, do manual measurements a total of three times to complete the measurement process.

**Note**: Pushing START for too long may cancel the measurement.

<Example procedure>

After the automatic measurement completes, "PUSH button" appears on the data display. Place the board so that it blocks *half* of the outlet at the rear of the main unit, and then push START.

The second time "PUSH button" appears, place the board so that it blocks *three-quarters* of the outlet, and then push START.

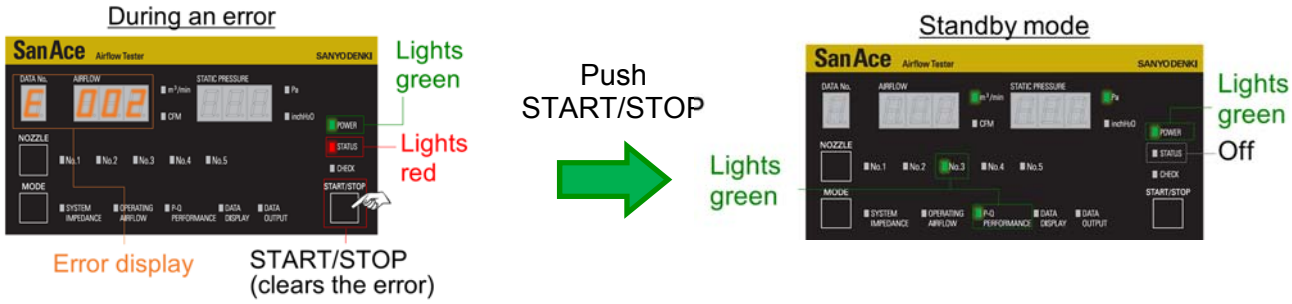
The third time "PUSH button" appears, place the board so that it *completely* blocks the outlet, and then push START.

⑧ After the measurement completes, the STATUS LED turns off, and the control panel returns to standby mode.

⑨ For details on how to check the measurement data, see section 4.6, "Checking measurement data."

If the nozzle is incorrect, an error code appears on the data display, the STATUS LED lights red, and the measurement stops. For further details, see section 4.3, "Automatic feedback control of the measurement nozzles."

Push START/STOP to clear the error and return to standby mode. Once in standby mode, the red STATUS LED turns off.




Replace the nozzle in accordance with the error code and restart measurement.

◆ If the current nozzle is too big:

Error code "E002" appears. Use a nozzle one size smaller and repeat steps ① through ⑥.

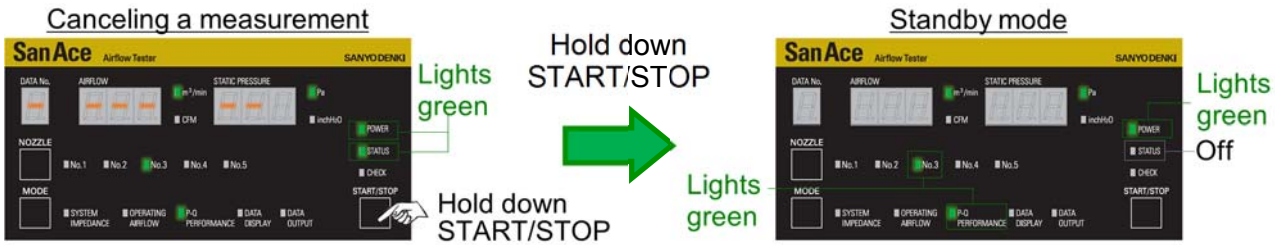
If "E002" appears again, use a nozzle an additional size smaller and repeat steps ① through ⑥.

◆ If the current nozzle is too small:

Error code "E001" appears. Use a nozzle one size larger and repeat steps ① through ⑥.

If "E001" appears again, use a nozzle an additional size larger and repeat steps ① through ⑥.

To cancel the measurement process, hold down STOP until the green STATUS LED turns off. Returns to standby mode.

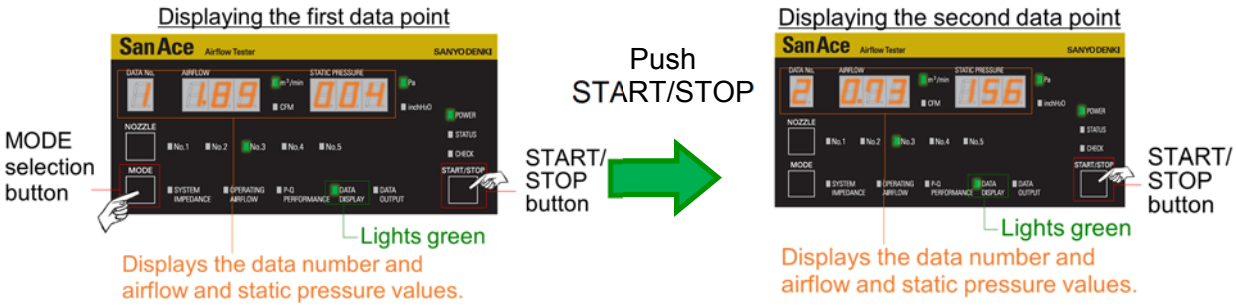


### 4.6 Checking measurement data

The procedure for checking measurement data after the measurement completes is explained below.

① On the control panel, push MODE to select DATA DISPLAY.
This mode allows you to check the data from the last measurement.

② Values for airflow and static pressure appear on the data display.
Press START to cycle through each measurement in order.




- For system impedance, four points are displayed in order.
- For operating airflow, one measurement is displayed.
- For P-Q performance, six points are displayed in order.

**Note:** Only the data from the most recent measurement is saved to the main unit. Data for a new measurement overwrites all previous data and cannot be recovered. Even if the tester is turned off, data from the single most recent measurement is saved.

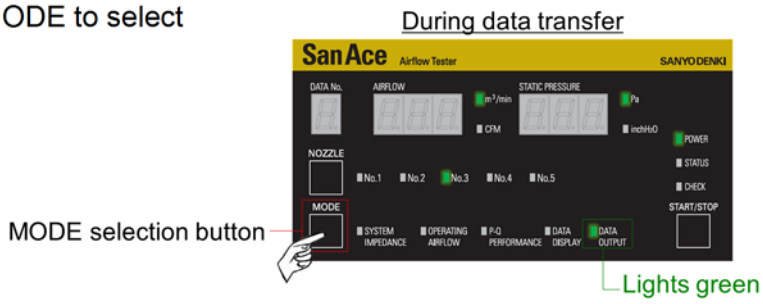
### 4.7 Transferring data to the data viewer software *San Ace Airflow Tester Viewer*

After the measurement completes, data can be transferred to the data viewer software, *San Ace Airflow Tester Viewer*.

The procedure for transferring data is explained below.

① Connect the included USB serial adapter from the serial port on the main unit to a PC.

② On the control panel, push MODE to select DATA OUTPUT**.**




③ Launch *San Ace Airflow Tester Viewer* and click "**DATA INPUT".**

④ Data from the main unit is imported to the PC.

For further details, see "Data Viewer Software: San Ace Airflow Tester Viewer - Instruction Manual."

### 4.8 Measurement data

The following types of measurement data can be checked.

On the main unit display:

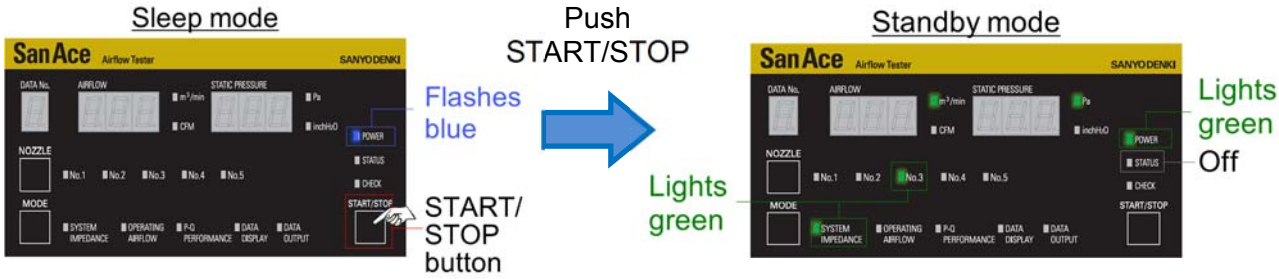
1. Airflow
2. Static pressure (Standard atmosphere: 20ºC, 1013 hPa)

With *San Ace Airflow Tester Viewer*:

1. Airflow
2. Static pressure (Standard atmosphere: 20ºC, 1013 hPa)
3. Atmospheric pressure
4. Ambient temperature
5. Humidity

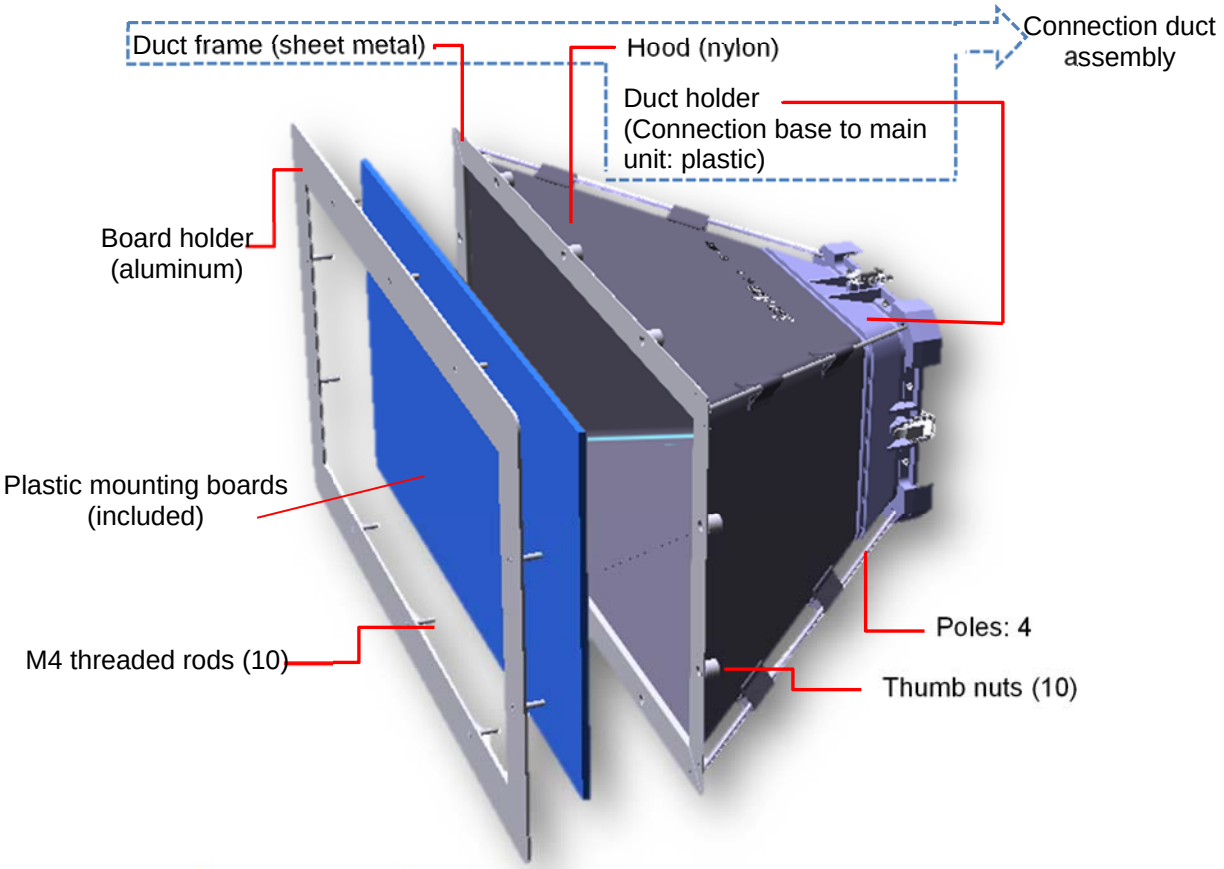
### 4.9 Additional functions

- To increase measurement accuracy, the auxiliary fan of this model is equipped with a brake function.
  The brake function may cause the fan to stop rotating.
  When this happens, a braking sound may come from the fan but this does not indicate that it is damaged.
- In addition, this model is equipped with a sleep mode. After about three minutes of inactivity, the unit enters sleep mode, turning off the display on the control panel. (The POWER LED flashes blue.)
  Press START to exit sleep mode and return to standby mode.



# 5. Connection duct

## 5.1 Components of the connection duct




## 5.2 Assembling the connection duct

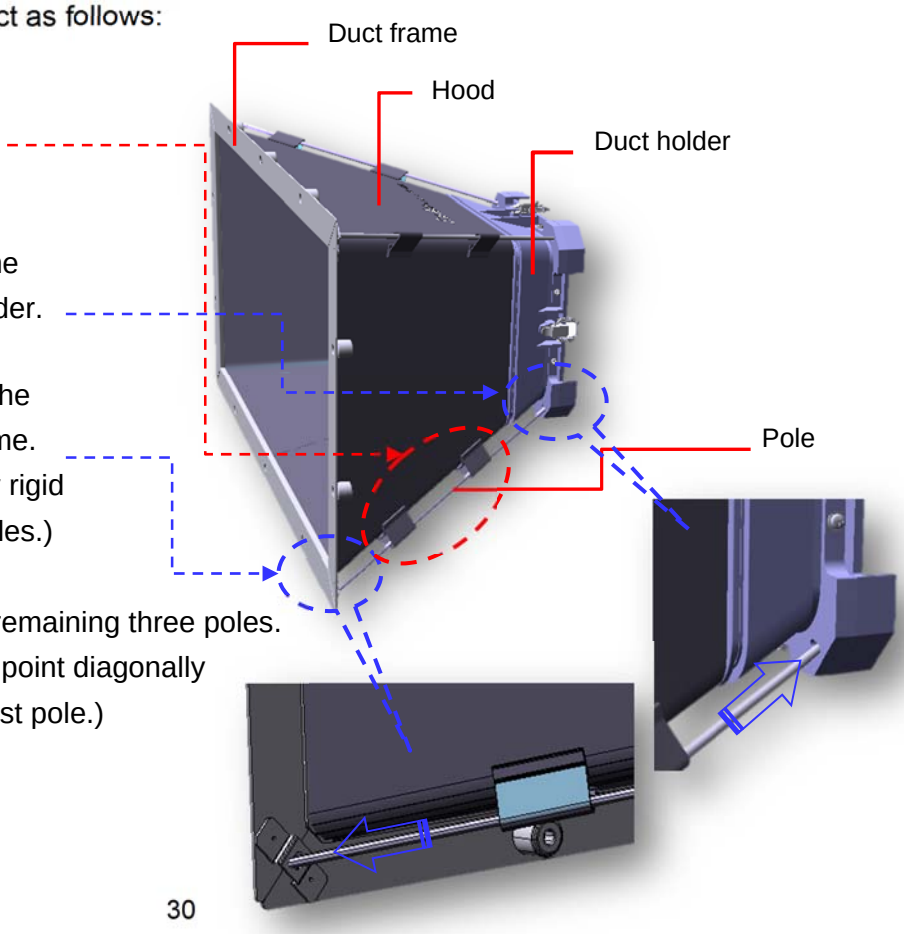
Assemble the connection duct as follows:

① Take one pole and feed it through two of the sleeves

② Insert the tip of the pole into the mounting hole on the duct holder.

③ Then, insert the other tip into the mounting hole on the duct frame. (The hood should be relatively rigid due to the tension from the poles.)

④ Repeat this procedure for the remaining three poles. (Attach the second pole to the point diagonally opposite of that used for the first pole.)



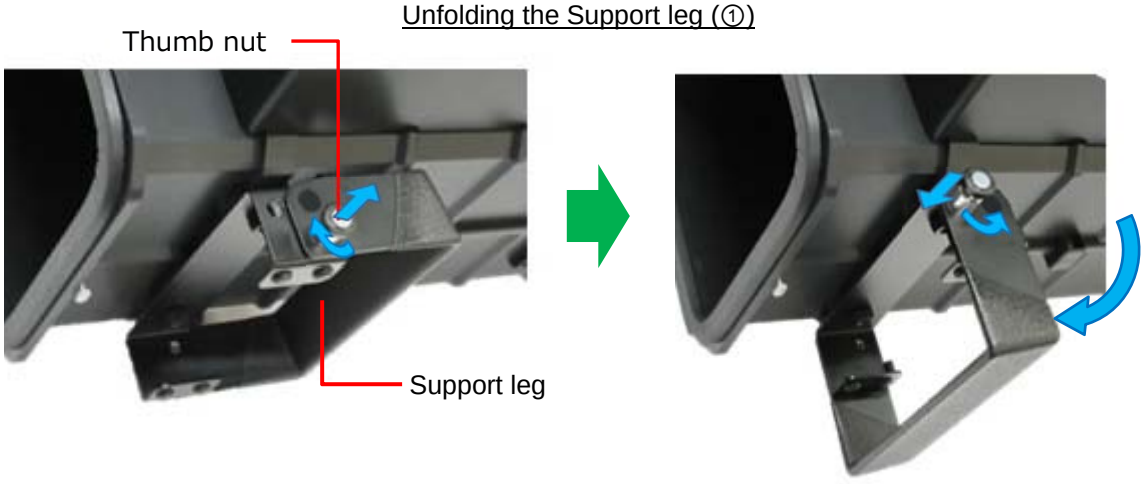
### 5.3 Attaching the connection duct to the main unit

To attach the connection duct to the main unit:

① On the underside of the main unit, pull and slightly turn the thumb nut to unlock the support leg as shown below.
Unfold the support leg until it is perpendicular to the main unit.
To secure the support leg, slightly turn the thumb nut until it locks into place.
Follow the same steps in reverse order to collapse the support leg.

⚠Caution Check that the support legs are securely locked as an unlocked support leg may accidentally collapse.

Unfolding the Support leg (①)

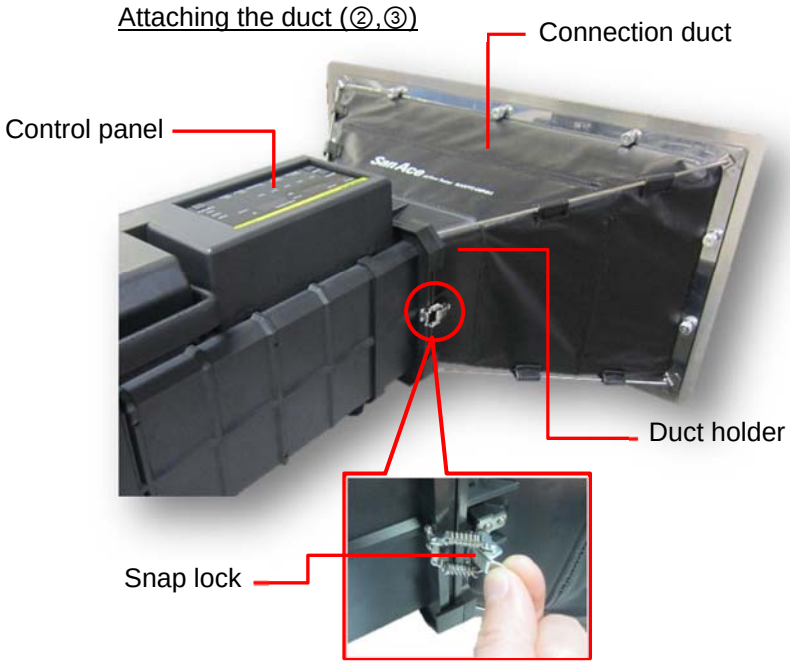



② Align the duct holder of the connection duct with the inlet on the main unit as shown below. Make sure that the connection duct does not tip or fall.

⚠Caution Otherwise, it may result in damage to the connection duct.

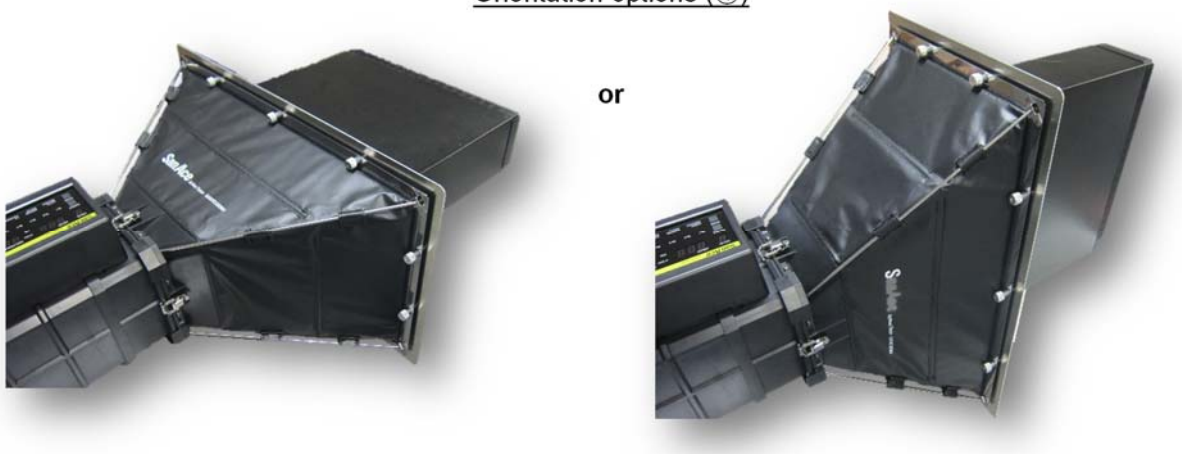
③ Secure the snap locks on the duct holder to the metal latches on the main unit.
To reduce the risk of the connection duct falling, secure the top snap lock first.
Be sure to secure all four snap locks.

Attaching the duct (②,③)



④ The connection duct can also be connected at a 90-degree angle as shown below. However, the support leg can only be used with orientation A.  With B, the stress of the weight of the main unit may damage the connection duct. Place a stand underneath the main unit to match it to the height of the connection duct.

Orientation options (④)




⚠Caution Be sure to use the support leg when using the connection duct and main unit assembly on a flat surface. Failure to do so may result in damage the connection duct due to the stress of the weight from the main unit.

# 6. Connecting the measured device to the connection duct

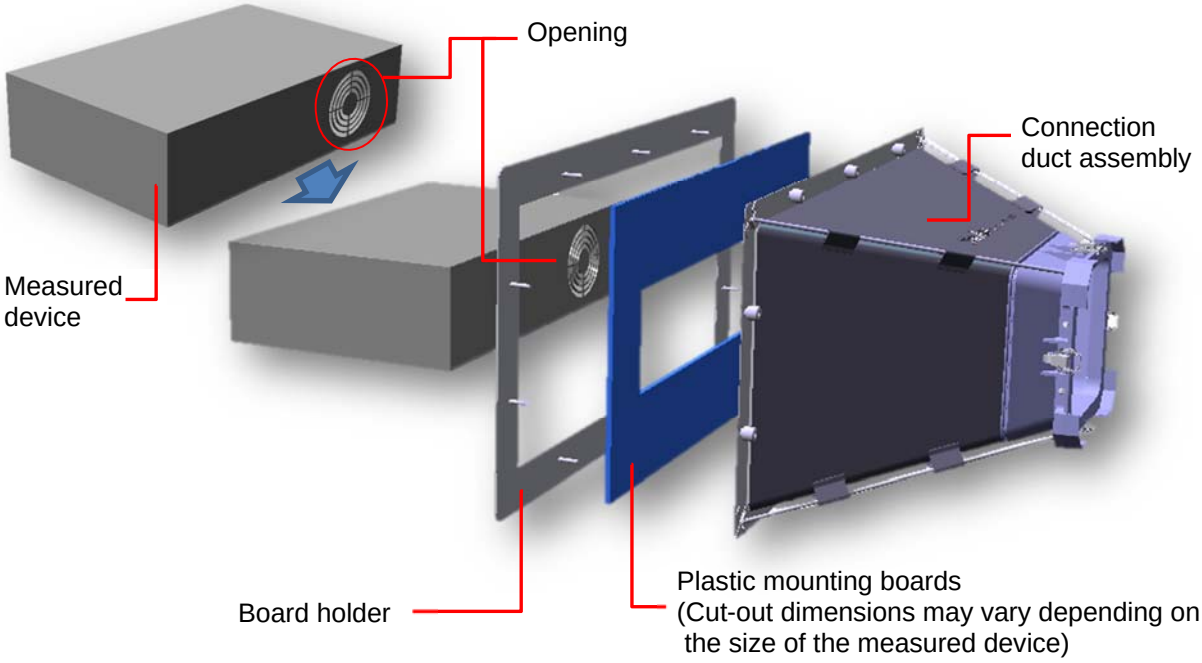
The *Airflow Tester* can perform measurement using only the main unit.
Completely seal the air inlet of the main unit to the measured device to prevent an air leak.

The tester may not function properly if there is an air leak.

The procedure for using the connection duct is explained below.

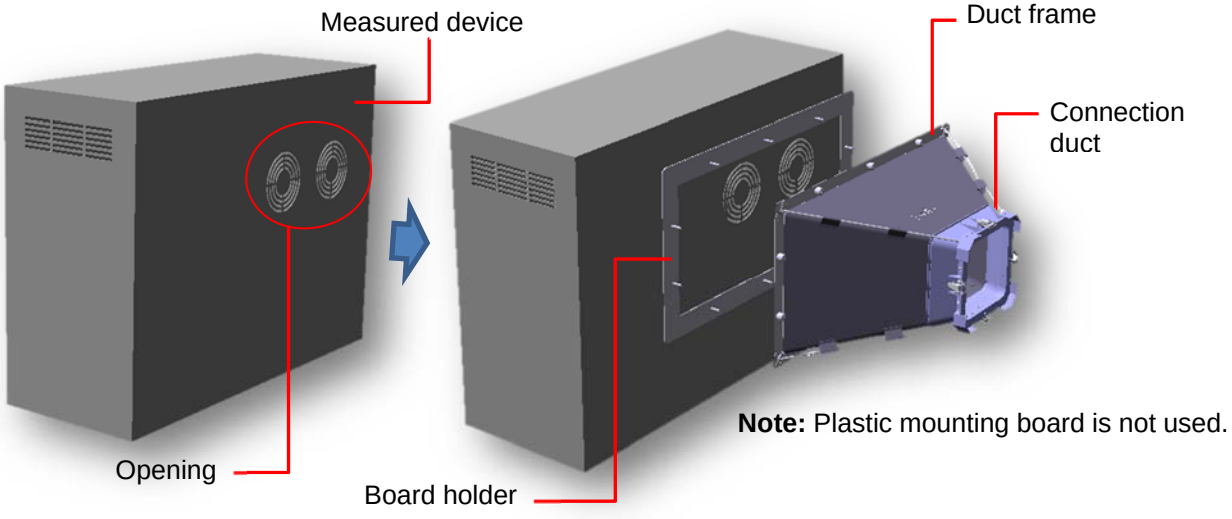
## 6.1. Attaching the measured device to the connection duct (image)

### 6.1.1 When the measured device is smaller than the duct frame




### 6.1.2 When the measured device is larger than the duct frame

Attach the board holder to the duct frame without using the plastic mounting boards.
Use masking tape or the like to seal the outer circumference of the board holder.

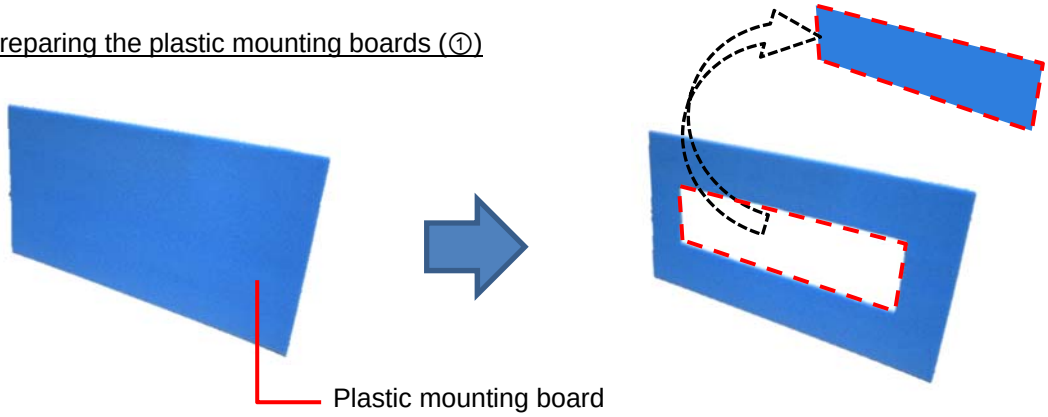


### 6.2 Securing the measured device to the mounting board

① Cut out a hole in the mounting board matching the shape of the measured device.
The plastic mounting boards are relatively soft, and can be cut using a utility knife.

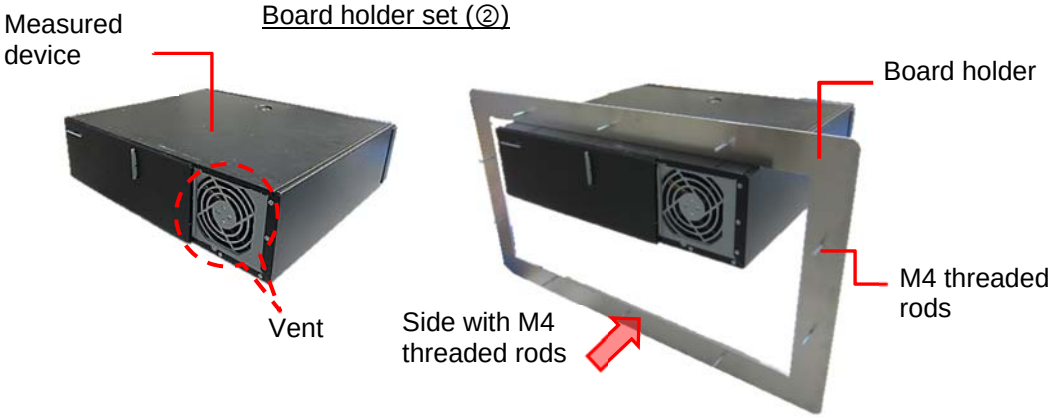
⚠Caution Use caution when working with sharp objects.

Preparing the plastic mounting boards (①)



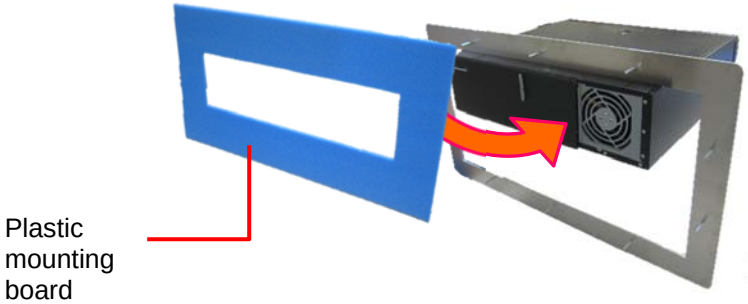

② Pass the measured device through the board holder.
The vents on the measured device and the M4 threaded rods on the board holder should be facing towards you.

Board holder set (②)



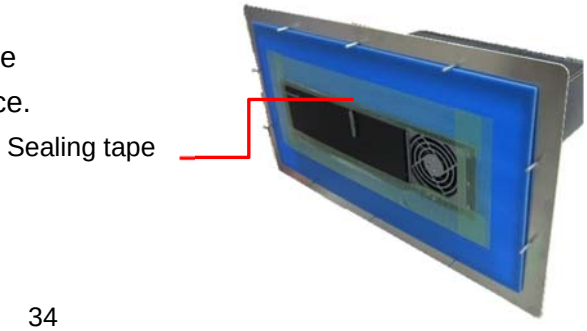

③ Insert the measured device through the plastic mounting board.

Plastic mounting board set (③)




④ Use tape to seal the gap between the mounting board and measured device.

Taping (④)



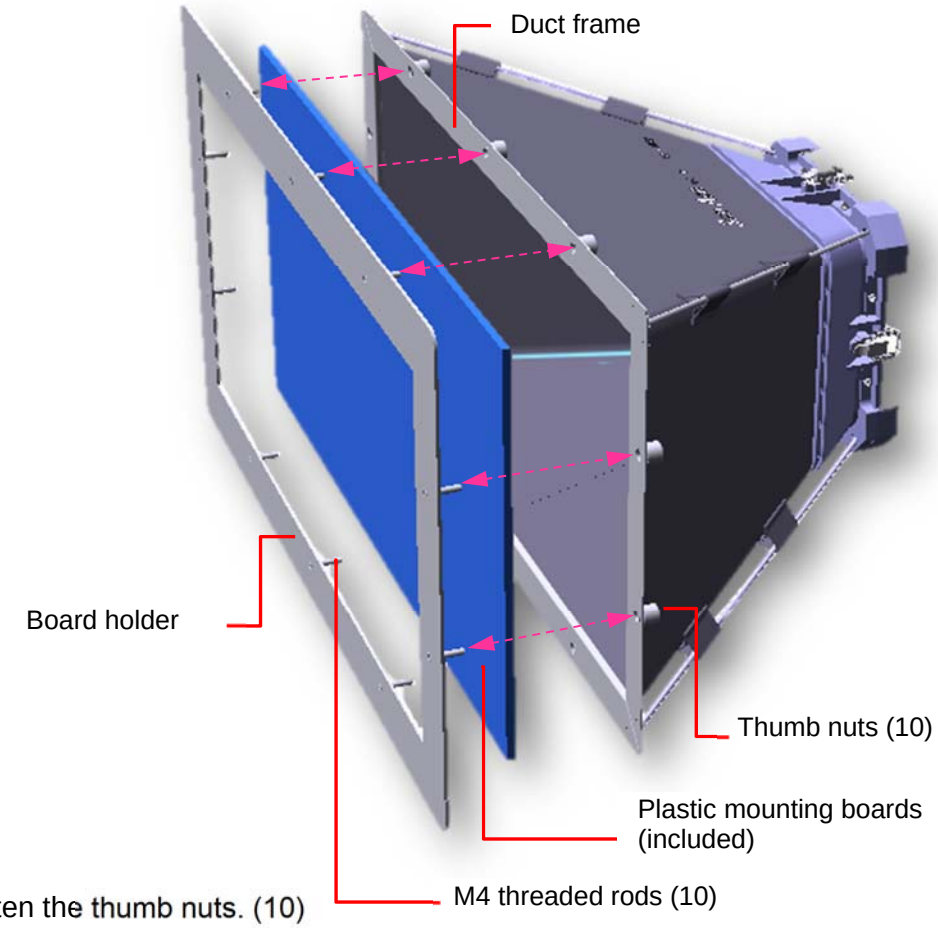
### 6.3 Attaching the mounting board and connection duct

Secure the mounting board between the board holder and duct frame.

① Set the mounting board between the board holder and duct frame.

② Align the positions of the thumb nuts on the duct frame to the threaded rods on the board holder.

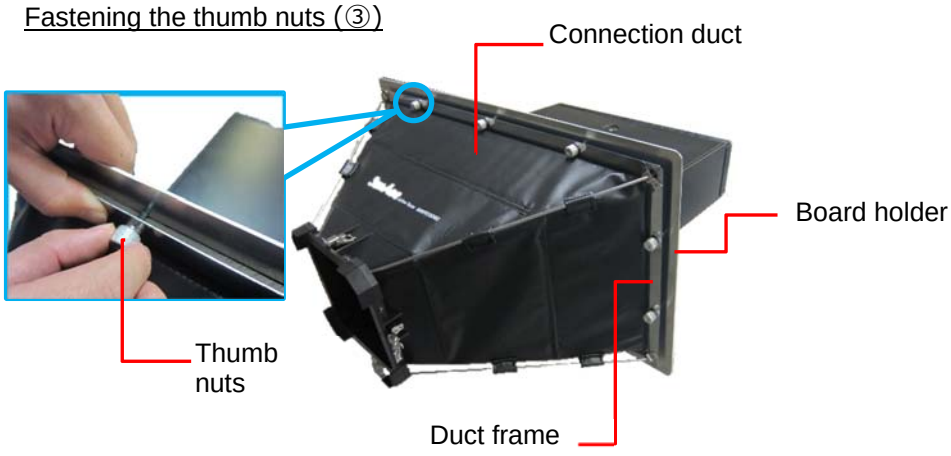
Alignment image (①②)




③ Fasten the thumb nuts. (10)

Tightly fasten the thumb nuts so that there is even contact between the duct frame and the mounting board.

Fastening the thumb nuts (③)



# 7. Troubleshooting

If the product is not functioning properly, check the following before contacting us for assistance.

### 7.1 Error codes

If an error occurs, the operation stops and one of the following error codes appears on the data display.

For the causes of and solutions to error codes, refer to the tables listed below.

For error codes E001 to E004, first clear the error then check the following:
(Push START/STOP to clear the error and return to standby mode)

- Measurement nozzle:
  Check that the number of the inserted nozzle matches the selected nozzle number.
- Mode selection valves:
  Check that the orientation is correct and matches the selected measurement mode.
  For further details, see section 3.2, "Setting the mode selection valves."
- Measurement mode:
  Check that the selected measurement mode is correct and matches the orientation of the mode selection valves.

Table 1: Setting and selection errors

| Error code | Cause | Solution |
|---|---|---|
| E001 | Incorrect measurement nozzle | Replace with a larger nozzle<br>For further details, see section 3.3, "Inserting and replacing the measurement nozzles." |
| E002 | Incorrect measurement nozzle | Replace with a smaller nozzle<br>For further details, see section 3.3, "Inserting and replacing the measurement nozzles." |
| E003 | Exceeds measuring range | Cannot perform measurement when the measured value is outside of measurement range. |
| E004 | Incorrect configuration of the mode selection valves | Check that the orientation of the mode selection valves are correct.<br>For further details, see section 3.2, "Setting the mode selection valves." |

**Note:** To clear error codes E001 to E004, press START/STOP. Returns to standby.

If the problem continues, turn off the power and restart the unit. Enter CHECK mode to check the status of the tester.
If this does not resolve the issue, please contact the "Customer Support Desk."

Table 2: Main unit errors

| Error code | Cause | Solution |
|---|---|---|
| E701 | CHECK error | Turn off the power and restart the unit. Recheck the status of the tester from CHECK mode.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |
| E901 | Atmospheric pressure sensor error | Turn off the power and restart the unit.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |
| E902 | Temperature and humidity sensor error | |
| E903 | Auxiliary fan operation error | Turn off the power, restart the unit, and then restart measurement.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |

**Note:** To clear E701, press START/STOP. Returns to standby.

Error codes E901 to E903 cannot be cleared. Turn off the power and restart the unit.

### 7.2 Checking operation

If any of the following conditions occur, check the information in the table below.

| Condition | Causes and Corrective Actions |
|---|---|
| LEDs on the control panel do not light when power is turned on. | Turn off the power, then check that the POWER LED lights red. If the LEDs still do not light, check that the AC power cable is properly connected. Or, check if there is a problem with the outlet.<br>If the POWER LED lights red, turn on the power again.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |
| The display panel is blank. | Turn off the power and restart the unit.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |
| LEDs do not change even when NOZZLE or MODE is pressed. | |
| Measurement does not begin even when START/STOP is pressed. | |
| Measurement begins but it does not complete. | Hold down STOP to interrupt the measurement.<br>If this does not stop the measurement, turn off the power. Restart, then enter CHECK mode to check the status of the tester.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |

| Condition | Causes and Corrective Actions |
|---|---|
| Auxiliary fan does not rotate when measurement begins. (Error code: E903) | Turn off the power, restart the unit, and restart measurement.<br>If this does not resolve the issue, please contact the "Customer Support Desk." |
| Abnormal sound occurs. | Fan has reached the end of its service life or has been damaged.<br>Please contact the "Customer Support Desk." |
| Cannot transfer data to a computer. | <On the computer><br>Is the driver software properly installed?<br>Restart the data viewer software.<br>If an error occurs when the software launches, see the instruction manual for the data viewer software.<br><On the tester><br>Turn off the power and restart the unit.<br>Is DATA OUTPUT mode selected?<br><Connection or USB serial adapter><br>Is the USB serial adapter properly connected?<br>USB serial adapter may malfunction due to electrical noise generated by nearby radios, TVs, or audio equipment.<br><br>If this does not resolve the issue, please contact the "Customer Support Desk." |

### 7.3 Additional information

- If the main unit is operating unstably, turn off the power and restart the unit.
- Even when the power is OFF, the unit still holds a small amount of electricity.
- While the POWER LED lights red (about 30 seconds), there is risk of electric shock so handle with care.

# 8. Product warranty and maintenance

### 8.1 Product warranty

A product warranty in document form is not issued. In place of this document, complete an online user registration on the SANYO DENKI homepage:

**http://www.sanyodenki.com**

<Required information>

① Name of customer ② Company or department name ③ Telephone no.

④ E-mail address ⑤ Product model no. ⑥ Serial no.

Under some situations an unregistered product may not be covered under warranty. Please register your product promptly.

## Product warranty

**Warranty Period: 1 Year**

1. This warranty covers damage caused by defects in production and materials for a specified period from the date of delivery.
2. When damage is caused by a defect in production or in the material of a component or the main unit that is recognized by SANYO DENKI, we will repair or replace the affected device free of charge.
3. This warranty does not apply when products furnished by SANYO DENKI have been modified or altered other than by SANYO DENKI.
4. This warranty does not apply when products supplied by SANYO DENKI are not used in their prescribed manner, nor when products are not used in accordance with the instruction manual.
5. This warranty does not apply to decreased measurement accuracy caused by regular use.
6. This warranty does not apply to damages resulting from accident, misuse, or abuse.
7. This warranty does not apply to damage resulting from natural disasters such as fire, earthquake, wind, flood, and lightning, from pollution, salt, or gas (sulfuric gas, etc.), or damage or breakdown caused by use on improper voltage or current.
8. This warranty does not apply to damage or product failure from being dropped during transportation by the customer, from impact, or from improper handling.
9. This warranty period only covers devices specified by SANYO DENKI, and does not apply to devices not specified.
10. SANYO DENKI does not assume any liability for damage to software or loss of data in connected devices, nor for any loss of profits or opportunities.

### 8.2 Calibration, maintenance, and repair

We recommend yearly calibration and biannual scheduled maintenance, although this may vary depending on usage environment and measurement frequency.
If the product is not working properly, first confirm the contents of section 7, “Troubleshooting.” If damage is suspected after checking, see “Contact information for product related inquiries,” on page 48.

Repairs within warranty period

We will repair at no charge products with defects in material or workmanship recognized by SANYO DENKI.

Repairs and maintenance outside of warranty period

Upon request, we will repair the device at the customer’s expense, if the instrument’s performance and accuracy can be maintained through these repairs.
When requesting repair or maintenance, please see “Contact information for product related inquiries,” on page 48.
We will present an estimate of costs before repairing the device at the customer’s expense.

Please provide the following information when making an inquiry.

| | |
|---|---|
| Model name | San Ace Airflow Tester |
| Model no. | 9AT2560＊－＊＊＊＊ |
| Serial no. | ＊＊＊＊＊＊ |
| Purchaser | ＊＊＊＊＊＊ |
| Date purchased | 20＊＊(YY)＊＊(MM)＊＊(DD) |
| Damage status | Please thoroughly describe the situation.<br>Ex. Status of check based on section 7, “Troubleshooting.”<br>・ What conditions, contents, and information did you check?<br>・ Was there an error code?<br>Etc. |

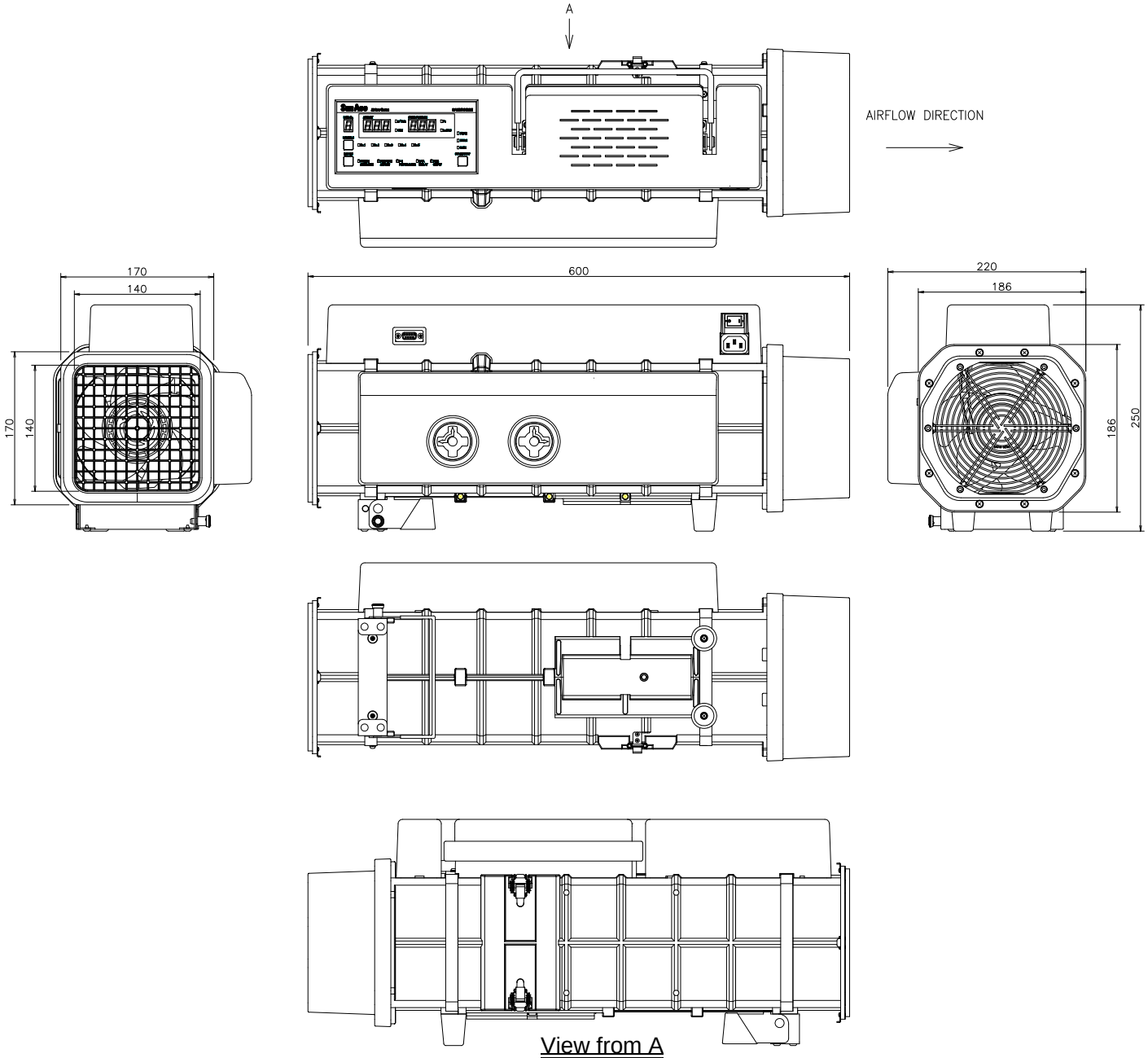
### 8.3 For questions concerning this product

If you are unclear on product usage and operation after thoroughly reading this manual, please see “Contact information for product related inquiries,” on page 48.

# 9. Appendix

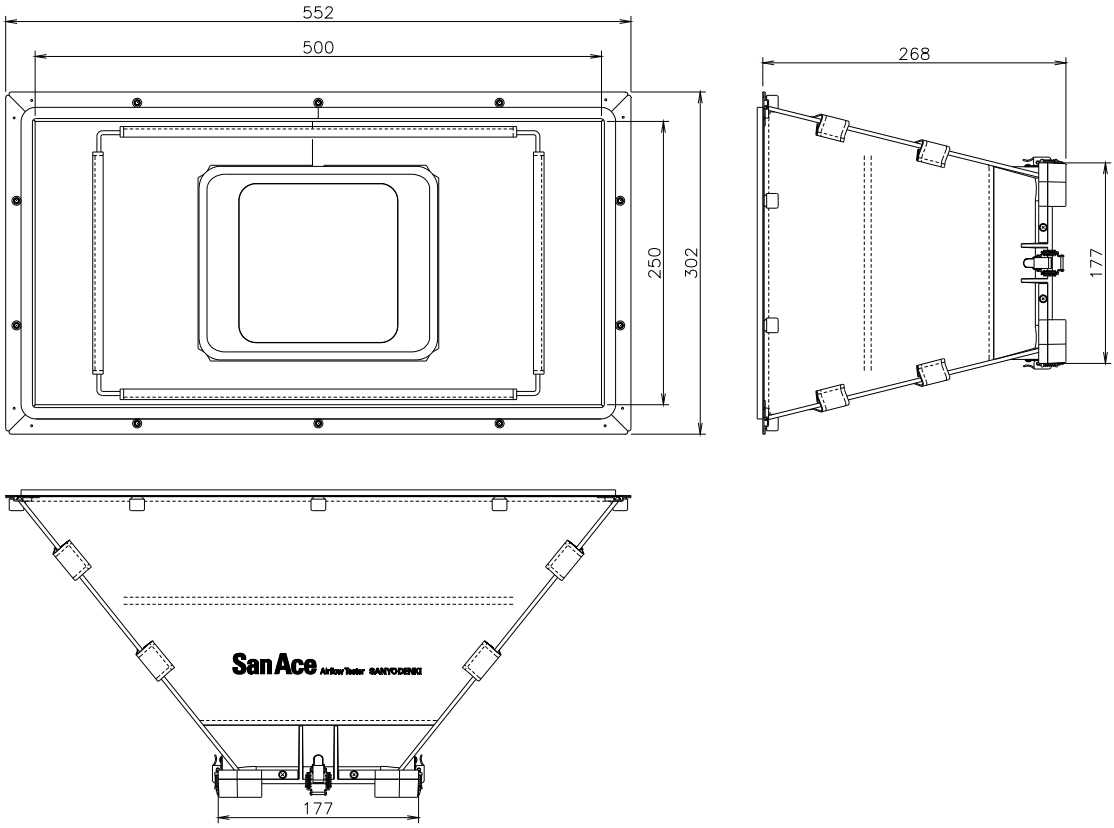
## 9.1 Dimensions

Main unit



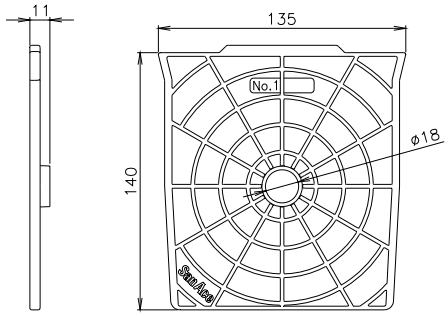

View from A

## Connection duct (assembled)

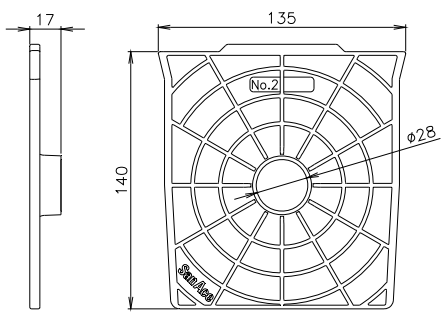



## Measurement nozzles

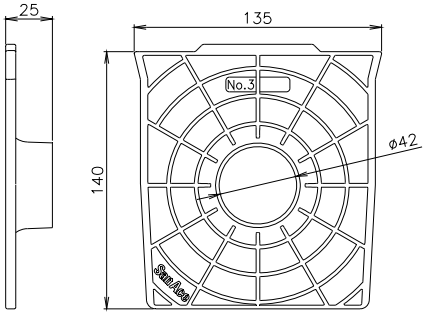
<NOZZLE No.1>



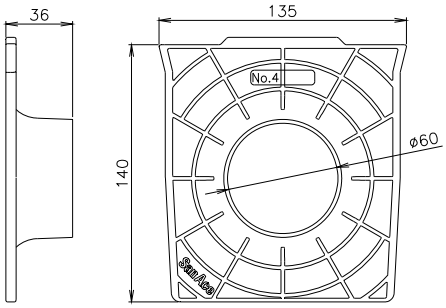

<NOZZLE No.2>



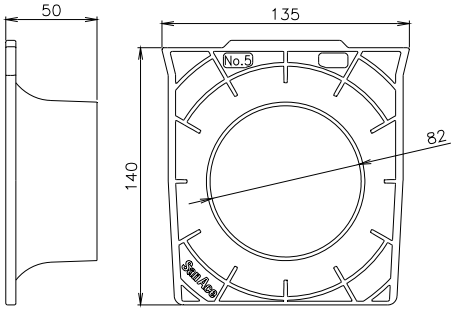

<NOZZLE No.3>




<NOZZLE No.4>




<NOZZLE No.5>



## 9.2 Specifications

<table>
<tr><td colspan="2">Product name</td><td>Airflow Tester</td></tr>
<tr><td colspan="2">Model no.</td><td>9AT2560＊- □□□□
<table>
<tr><th>"＊" denotes</th><th>Airflow unit</th><th>Static pressure unit</th><th>Remarks</th></tr>
<tr><td>S</td><td>$m^3$/min</td><td>Pa</td><td>SI units (International System of Units)</td></tr>
<tr><td>A</td><td>CFM</td><td>inch$H_2O$</td><td>USCS (US customary units)</td></tr>
<tr><td>C</td><td>CFM</td><td>Pa</td><td>-</td></tr>
</table></td></tr>
<tr><td colspan="2">Measurement functions</td><td>① System impedance ② Operating airflow<br>③ P-Q performance</td></tr>
<tr><td rowspan="2">Measuring range</td><td>Airflow</td><td>0.2 to 8 $m^3$/min (7 to 282 CFM)</td></tr>
<tr><td>Static pressure</td><td>0 to 1,000 Pa (0 to 4.01 inch$H_2O$)</td></tr>
<tr><td rowspan="3">Measurement accuracy(Note:1) (Differential pressure sensor)</td><td>Airflow</td><td>Max. airflow of each nozzle: ±7%</td></tr>
<tr><td rowspan="2">Static pressure</td><td>Measurement results under 200 Pa: ±10 Pa</td></tr>
<tr><td>Measurement results over 200 Pa: ±50 Pa</td></tr>
<tr><td rowspan="2">Display / output data</td><td>Main unit display</td><td>① Airflow<br>② Static pressure (Standard atmosphere: 20ºC, 1013 hPa)</td></tr>
<tr><td>DATA OUTPUT (With dedicated software)</td><td>① Airflow<br>② Static pressure (Standard atmosphere: 20ºC, 1013 hPa)<br>③ Atmospheric pressure ④ Ambient temperature ⑤ Humidity</td></tr>
<tr><td rowspan="2">Environment</td><td>Ambient temperature</td><td>0 to 40ºC</td></tr>
<tr><td>Humidity</td><td>20 to 85% RH (non-condensing)</td></tr>
<tr><td colspan="2">Display functions</td><td>① Data no. ② Measurement values (airflow, static pressure)<br>③ Measurement status ④ Nozzle selection ⑤ Measurement mode</td></tr>
<tr><td colspan="2">Interface</td><td>Digital output: Dedicated USB serial adapter</td></tr>
</table>

| | | |
|---|---|---|
| Power supply | Input voltage | 100 to 240 VAC, 50/60 Hz |
| | Power consumption | 260 VA max. |
| Dimensions | | Main unit: 600(W) × 250(H) × 250(D) mm |
| Duct opening size | | 500 × 250 mm |
| Mass | | Main unit: Approx. 6 kg<br>Connection duct (including Board holder): Approx. 1.5 kg |
| Material | | Main unit, measurement nozzles, duct holder: Plastic<br>Board holder: Aluminum<br>Duct frame: Sheet metal<br>Poles, finger guard: Metal |

Note1: Including performance loss under the electromagnetic immunity conditions.(EN61326-1)

### 9.3 Optional parts and commercial goods

Optional parts list (Available from SANYO DENKI)

| Product name | Specifications | Model | Qty. |
|---|---|---|---|
| Plastic mounting board | Size: 525 × 275 × 4 mm | 9AT2560–P001 | 5 |
| AC power cable | Three types available: North America / Japan, Europe, and China<br>Cable length: 2.5 m | 9AT2560–K001 (North America / Japan)<br>9AT2560–K002 (Europe)<br>9AT2560–K003 (China) | 1 |
| Carrying case | Storage for the tester or its accessories<br>Includes measurement nozzle case<br>Size: 705 × 415 × 385 mm | 9AT2560–B001 | 1 |
| Measurement nozzle case | Plastic case<br>Storage for the five types of measurement nozzles<br>Size: 270 × 230 × 80 mm | 9AT2560–B002 | 1 |
| USB serial adapter | For connecting the main unit to a PC<br>*Same specifications as the standard item | 9AT2560–U001 (Japan)<br>9AT2560–U002 (Excluding Japan) | 1 |

**Plastic mounting boards**

**AC power cable**
(Cable for North America / Japan shown)

**Carrying case**

**Measurement nozzle case**
(Measurement nozzles not included)

**USB serial adapter**

Compatible commercial goods

| Product | Model name | Specifications | Remarks |
|---|---|---|---|
| Tripod | SLIK - The Professional II Series | Load capacity: 10 kg<br>Mounting screw:<br>1/4-20 UNC | The tester can be used with a tripod.<br><br>Use a tripod system with a load capacity of 10 kg or greater. Using a tripod with a low load capacity or mounting the tester in an insecure or unstable manner may cause the tester to fall. Falling may result in injury, damage to the device, or product failure. |
| USB serial adapter | RATOC Systems<br>USB to serial converter<br>REX-USB60F-25 (Japan)<br>REX-USB60F (Excluding Japan) | - | Same specifications as the standard cable. Compatible with this tester. (February 2016)<br>Specifications are subject to change without notice. |

## 9.4 Applicable Standards (Note:6)

| Item | | Applicable Standards |
|---|---|---|
| Safety | | IEC/EN61010-1<br>-Pollution degree : II<br>-Overvoltage Category : II<br>-Protection Class : I |
| EMC | Emission | EN 61326-1 Class A (Industrial electromagnetic environment)<br>- EN 55011 Group1，Class A(Note: 2)<br>IEC 61326-1 Class A<br>- CISPR 11 Group1，Class A(Note: 2)<br>FCC Part15 Class A(Note: 3,4,5)<br>ICES-003 Class A<br>- CAN ICES-3(A)/NMB-3(A)<br><br>Cable Condition<br>(1)USB Serial adapter：9AT2560-U001，-U002<br>Cable length: 3m or less (with shield)<br>(2)AC power cable：9AT2560-K002<br>Cable length: 2.5m (without shield) |
| | Immunity | EN/IEC 61326-1 (Industrial electromagnetic environment)<br>EN/IEC 61000-4-2<br>EN/IEC 61000-4-3<br>EN/IEC 61000-4-4<br>EN/IEC 61000-4-5<br>EN/IEC 61000-4-6<br>EN/IEC 61000-4-8<br>EN/IEC 61000-4-11<br><br>Cable Condition<br>(1)USB Serial adapter：9AT2560-U001，-U002<br>Cable length: 3m or less (with shield)<br>(2)AC power cable：9AT2560-K002<br>Cable length: 2.5m (without shield) |

Note:

1: This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

2: This is a group 1, class A product according to EN 55011/CISPR 11. This means that this product does not generate and/or intentionally use radio-frequency energy, in the form of electromagnetic radiation, and/or inductive/capacitive coupling, for the treatment of material or for inspection/ analysis purpose and that it is suitable for use in all establishments other than domestic and non-domestic directly connected to a low voltage power supply network for domestic purposes.
There may be potential difficulties in ensuring electromagnetic compatibility in other than industrial environments, due to conducted as well as radiated disturbances.

3: This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1)this product may not cause harmful interference, and
(2)this product must accept any interference received, including interference that may cause undesired operation.

4: This product has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

5: Changes and modifications to this product not expressly approved by the party responsible for compliance could void the user’s authority to operate the product.

6: Applies to products bearing CE marking produced from December 2016.

**Contact information for product related inquiries** e-mail：cs@sanyodenki.com

## Global Network

http://www.sanyodenki.com


**SANYO DENKI CO., LTD Customer Support Desk (Japanese)**
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