SINCE 1889

Yamato

Hood

My Hood

MV

Instruction Manual

First Edition

Model

MV-90C

- **Thank you very much for purchasing this Yamato MV series hood.**
- **Please read the *Instruction Manual* and *Warranty* before using this unit to assure proper operation. After reading these documents, be sure to store them securely together in a handy place for future reference.**

⚠Warning: Before using the unit, be sure to read carefully and fully understand important warnings in the *Instruction Manual*.

Yamato Scientific America Inc.

Table of Contents

1. Safety precautions

Explanation of pictograms

About pictograms

A variety of pictograms are indicated in this instruction manual and on products to assure safe operation. Possible results from improper operation or disregard for these warnings is listed below.
Be sure to fully understand the descriptions below before proceeding to the text.

⚠ Warning	Indicates a situation which may result in death or serious injury (Note 1)
⚠ Caution	Indicates a situation which may result in minor injury (Note 2) and property damage (Note 3).

(Note 1) Serious injury means a wound, an electrical shock, a bone fracture or intoxication that may leave after effects or require hospitalization or outpatient visits for a long time.

(Note 2) Minor injury means a wound or an electrical shock that does not require hospitalization or outpatient visits for a long time.

(Note 3) Property damage means damage to facilities, devices and buildings or other properties.

Meanings of pictograms

This pictogram indicates a matter that encourages the user to adhere to warning (“caution” included).
Specific description of warning is indicated near this pictogram.

This pictogram indicates prohibitions
Specific prohibition is indicated near this pictogram.

This pictogram indicates matters that the user must perform.
Specific instruction is indicated near this pictogram.

1. Safety precautions

List of symbols

Warning

General warnings

Danger!:
High voltage

Danger!:
High temperature

Danger!:
Moving part

Danger!: Hazard of explosion

Caution

General cautions

Electrical shock!

Burning!

Caution for no liquid heating!

Caution for water leak!

For water only

Poisonous material

Prohibitions

General Prohibition

Fire Prohibited

Do not disassemble

Do not touch

Compulsions

General compulsions

Connect ground wire

Install levelly

Pull out the power plug

Regular inspection

1. Safety precautions

Warning・Cautions

⚠ Warning

Never operate the unit in an atmosphere containing flammable or explosive gas

Because the unit is not explosion-proof, never operate the unit in an atmosphere containing flammable or explosive gas.

Never use the unit under high-temperature environment

・The heat-resistance temperature of exhaust fan, made from hard chloroethylene or FRP, is around 50℃. If use it under high-temperature environment, it may cause the deforming of fan blades, reduce the capacity of exhaust and increase the noise.
・If the working face is hard chloroethylene, do not use the unit near a fire or under high-temperature environment, which may damage the working face.
・The operating temperature of this unit is 5～35℃. Please set this unit at a place with the temperature of 5～35℃.

Do not use this unit for perchloric acid experiment

If use perchloric acid, it will result in explosion due to exterior and interior corrosion.

Do not use radioactive substance

This unit cannot be used to treat radioactive substance.

Do not use for organism

This unit cannot be used to treat organism (especially Pathogenicity material).

When there's a fire

Setting near a flame damper, the hood cannot exhaust if operating the flame damper when there's a fire.

Be sure to connect the ground wire

Be sure to connect the ground wire correctly. Otherwise, electrical leak may result and cause an electrical shock or a fire.

Never use electrical power cords bundled

When these are used bundled, they might overheat causing a fire.

Take care not to damage electrical power cords

Avoid tightly bending, pulling with a strong force or twisting to prevent electrical power cords from damage. A fire or an electrical shock may result.

1. Safety precautions

Warning・Cautions

⚠ Warning

Never alter the switchboard

Do not have any alteration on replacing internal parts and wires of the switchboard, or else may result in damage of its function or fire. Because it connects with power, do not contact it with wet hand, which may result in electric shock.

Regularly check the steel wire ropes of glass door

It uses a balance way to open and close the glass door which is hoisted by the steel wire ropes. The working life of the ropes is expected to be 3 years, while they might break off according to the using situation. Therefore, please check the ropes regularly.

Open or close the door with two hands

When open or close the door, please use two hands.

Never block the exhaust port

The exhaust port is designed concerning airflow distribution and air exhaust. If the exhaust port is blocked, it will influence the exhaust effect or the exhausted air backflow will hurt human.

Stop the experiment when the exhaust fan doesn't work

Stop the experiment when the exhaust fan doesn't work due to motor fault or power cut. Cut off the main power and go to a clean area.

Never adjust the exhaust damper

The damper has already been adjusted before shipping. Adjusting the damper casually might reduce the exhaust capacity and break the balance of air supply and exhaust, which is harmful for the human body.

Please avoid the electric shock of socket

This unit is attached with socket in the front. The electric shock will occur if touch the socket with wet hand or block the socket with high-electric conductivity substance.

Please avoid the electric leakage of socket

When use the attached socket in the front, connect the experiment machine whose resistance is proper, otherwise might result in electric leakage or fire.

1. Safety precautions

Warning・Cautions

Warning

Please avoid impact on the glass door

Although it's toughened glass, the strong impact on the glass will result in glass breaking and hurt people.

Caution

During a thunder storm

During a thunderstorm, turn off the power immediately, otherwise fire or electric shock may be caused.

Do not use this unit for fluorhydric acid experiment

The window and protective cover are made of glass. If use fluorhydric acid, the glass will be corroded and the interior of the unit is invisible due to fogging.

No open flame close to the glass door

No open flame close to the glass door. The glass door will break after grilling and hurt people.

Have the heat source in the center of groove

Use the heat source, like burner and heater, in the center of groove when doing experiment.

Do not wash off the high-concentration drugs in the groove

Exhaust the high-concentration drugs after diluting. Exhaust way should comply with the regulations of your company.

Please prepare fire extinguisher

Please prepare fire extinguisher near the cover to avoid the risk of fire.

1. Safety precautions

Warning・Cautions

Caution

About the unit body

- The exterior coating of the unit is chemical proofing. The coating will peel off if scratched and then result in corrosion.
- A lot of gas generated during experiment will adhere to the interior and working face. Clean it with water regularly.

About working face

- The working face is leveled. Please do liquid treatment nearby the water exhaust port.
- Do not put corrosive or incendive drugs in the groove for a long time.

Cleaning of handle

Handle and handle installing part are made from ABS resin. Use neutral detergent to clean them. Do not use organic solvent which will damage the handle.

1. Safety precautions

Warning・Cautions

⚠ Caution

Choose a proper place for installation

● Air supply

・ The air supply corresponded with hood air displacement is necessary. If the air supply is not enough, the designed air volume of hood cannot be assured. Corresponding air supply countermeasures should be adopted for this situation.

● Cross flow

If the hood is installed at the following places, the cross flow (outer turbulence flow) will occur. In different situations, corresponding countermeasures about cross flow should be adopted. The air speed of cross flow must be less than 20% of it in front of hood.

・Close to entrance door

Influenced by the air flow generated from door open and close or people going in and out.

・Corridor

The air flow generated from people walking. (Suppose the walking speed of people is 4km/h, it will generate air flow at 1.1m/s)

・Air conditioner at the ceiling・nearby the air exhaust port

According to the shapes of air exhaust port, the air speed is about 4～6m/s. If get far away from the air exhaust port, the speed of air flow will reduce, but the air flow sensed by the hood will directly flow into the opening part of hood. It will turn to be downdraft when meeting the air flow in front of the hood, therefore might flow into the opening part.

・Air conditioner at the ceiling or on the wall・nearby the air inlet port

The air speed of air inlet port is about 2～4m/s and the exhaust air speed is slower. Because far away from the inlet port, the air speed reduces quite a lot. Therefore, the cross flow might generate nearby according to different situations.

・In front of or at the side of bed-set type straight blow vessel

If set at the side, the side or front air flow meeting the drug shelf or other obstacles cause changing of air flow direction, might influenced by the second air flow.

・Close to ventilating fan or pressure fan

The air speed of ventilating fan or pressure fan, like household fan, is very fast, which will influence seriously.

・Open window or door

The blowing-in and - out air from the window might generate cross flow.

2. Before using the unit

Installation procedures and preparation before operating

1. Confirm the model

Please confirm whether the unit ordered by your company is arrived. Refer to the table below to confirm the model, and then conduct installation.

Model	Interior	Working face
MS-90C	Stainless steel	Stainless steel
MV-90C	Hard chloroethylene	Hard chloroethylene
MS-90TC (desktop)	Stainless steel	
MV-90TC (desktop)	Hard chloroethylene	

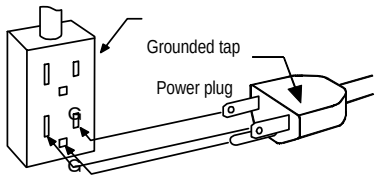
2. Damage

If the product is damaged due to the accident in shipping, contact with the logistics company immediately to confirm.

3. Always ground this unit

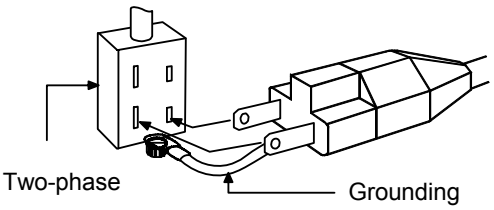
- When need to do grounding, consult with the dealer or the Business Department of YAMATO.
- Confirm connecting with switchboard or socket.

Please use grounding socket



Grounding socket
Power plug

When use two-phase socket



Insert the grounding connector into plug, confirm the polarity of socket and connect them. The grounding wire (green) of grounding connector is connected with the grounding terminal of power unit.

If no grounding terminal

- When need to do grounding, consult with the dealer or the Business Department of YAMATO.

The grounding wire cannot be connected with air or water pipe, which might cause accident, such as fire.

2. Before using the unit

Installation procedures and preparation before operating

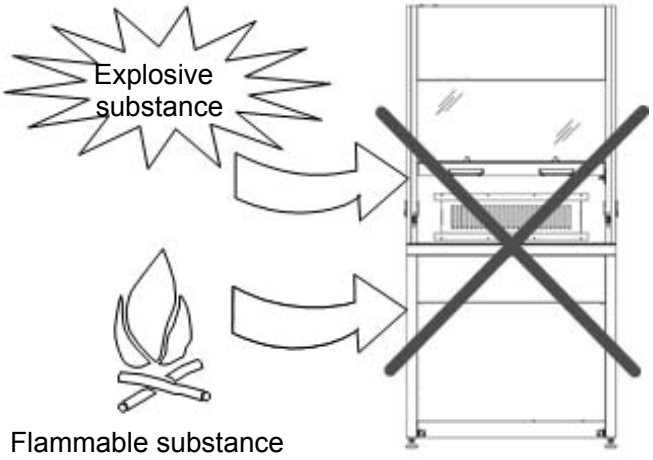
4. Choose a proper place for installation

Do not install the unit at following places or outdoor

- Rough or dirty surface
- Flammable gas or corrosive gas is generated
- Ambient temperature is above 35℃
- Ambient temperature fluctuates violently
- There is excessive humidity and dust
- There is a constant vibration

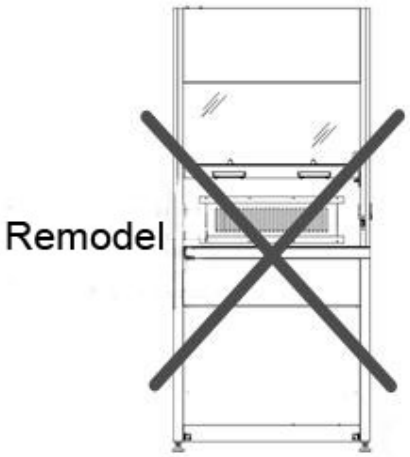
5. Do not use this unit in an area where there is flammable or explosive gas

●Never use this unit in an area where there is flammable or explosive gas. This unit is not explosion-proof. An arc may be generated when the power switch is turned ON or OFF, and fire/explosion may result.



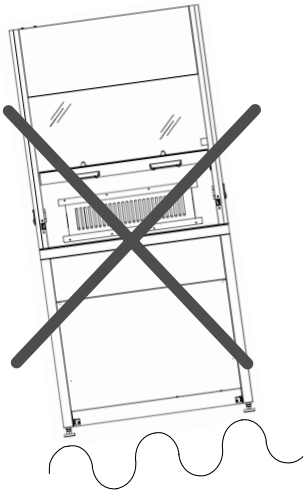
6. Do not modify

●Modification of this unit is strictly prohibited. This could cause a failure.



7. Do not topple or tilt this unit

●Set this unit to the flattest place. Setting this unit on rough or slope place could cause the unexpectable trouble or malfunction.



2. Before using the unit

Installation procedures and preparation before operating

8. Installation

●Unexpectable earthquake or impact might have the unit topple down or move, which might damage the unit.

Set away from places where people go by frequently, and do the security measures well.

9. Handling of power code

●Do not entangle the power cord. This will cause overheating and possibly a fire.

●Do not bend or twist the power cord, or apply excessive tension to it. This may cause a fire and electrical shock.

●Do not lay the power cord under a desk or chair, and do not allow it to be pinched in order to prevent it from being damaged and to avoid a fire or electrical shock

●Keep the power cord away from any heating equipment such as a room heater. The cord's insulation may melt and cause a fire or electrical shock

●If the power cord becomes damaged (wire core exposes, breakage, etc.), immediately turn off ELB and main power, and then contact your dealer for replacement of the power cord.

●Connect the power plug to the socket which is supplied appropriate power and voltage

10. The capacity of socket is specified (optional)

●Confirm the socket capacity and connect with appropriate plug. Use it within specified electric capacity.

Electric capacity of socket: single phase AC115V 15A

11. Choose a specified switchboard or socket

Choose a switchboard or socket matching the electric capacity.

Electric capacity: AC115V 15A (standard)

* There could be the case that the unit does not run even after turning ON the power. Inspect whether the voltage of the main power is lowered than the specified value, or whether other device(s) uses the same power line of this unit. If the phenomena might be found, change the power line of this unit to the other power line.
If use branch line socket to conduct multipoint socket wiring or coiling, the power pressure will turn to be lower and reduce the air speed, which cause failure.

Do not connect with other stuff except the grounding terminal, like air pipe, water pipe, telephone line, etc., which might cause accident or failure.

・Installation procedures of MS/MV-90C (with stand)

This product consists of hood and stand. Please install it as per the following procedures.

⚠ Installing optional parts and moving the unit are prohibited before the upper and lower units fixed by bolts.

◆ Standard type:

① Put away the stand at a temporary place, and then disassemble 2 fittings used for transport. If put at an inconvenient place stacked with hood, please install the hood first and then move the whole unit to the proper place.

② Disassemble 2 transporting fittings which fix the two sideboards of hood. (fittings are fixed by 4 downside M8 bolts)

③ After disassembling fittings, move the hood on the stand.

⚠ Caution	•The hood should be moved by more than 4 people. •When moving the hood, be level or else result in damage of interior materials.

※When installing the tap, the tap base is installed on working face, so be careful when installing the hood.

④ Use accessorial M8 screws to fix the hood and stand (4 points) (refer to diagram 2-1). When installing, please measure the out dimension of pillars in the front of hood, which should match the dimension on page 43 [10. specifications]. (the door cannot be operated well if the dimensions not match)

⑤ Confirm the working face is level or not after fixing. If not level, please adjust the adjusting foot. After adjusting, lock the locknut of adjusting foot tightly (refer to diagram 2-2).

※When tools are not on hand, please use the accessorial simple wrench of product.

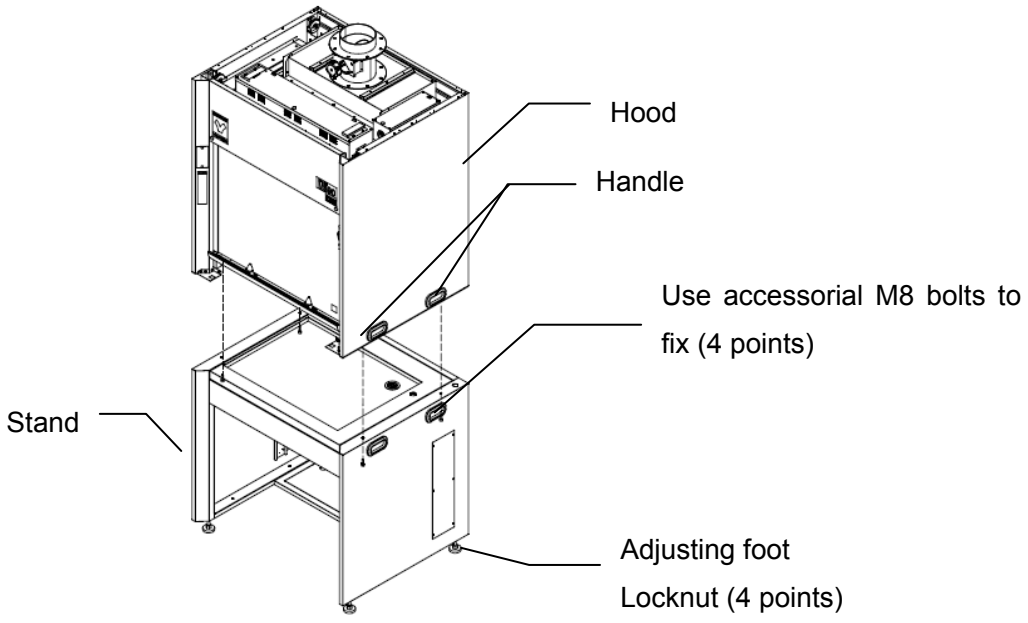


Diagram 2-1 (installation)

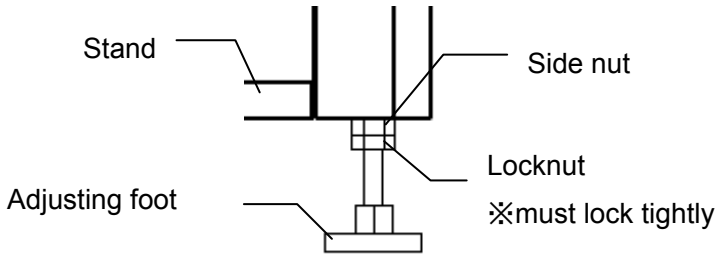


Diagram 2-2 (enlarged drawing of adjusting foot)

◆ With movable caster (optional)

① Put away the stand at a temporary place. Fix the stand with adjusting feet.
Because it's movable, do not use casters when installing and using the hood.
※The stand (working face) is 875mm high（standard height 875mm）。

②～⑤ are the same with the procedures of standard type.

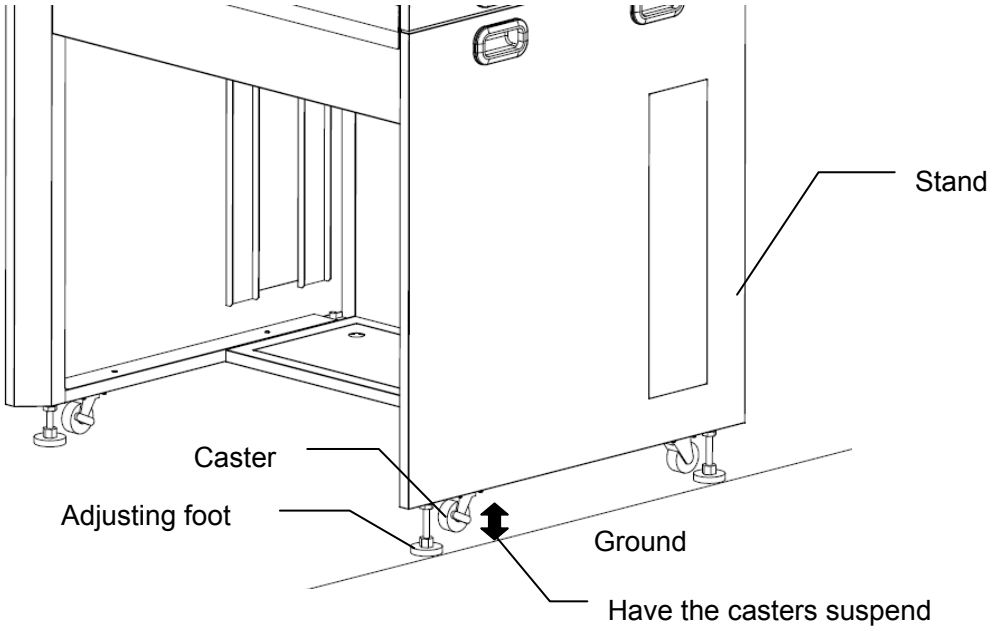


Diagram 2-3 (movable caster)

・Installation procedures of MS/MV-90TC (desktop)

Install the desktop unit as per the following procedures.

① Disassemble 2 transporting fittings which fix the two sideboards of hood. (fittings are fixed by 4 downside M8 screws)

② Secondly, about laying the stand

- Please confirm whether there is other stuff or bumps.
- Please confirm whether it's level. (if not level, adjust first)
- Please confirm whether the stand has enough weight capacity.

③ Before stacking the hood, cover the front setting places of stand with towels. Put up the hood, lay on the towels and then move to proper place. After laying hood properly, take away the towels.

⚠ Caution

- The hood should be moved by more than 4 people.
- When moving the hood, be level or else result in damage of interior materials.

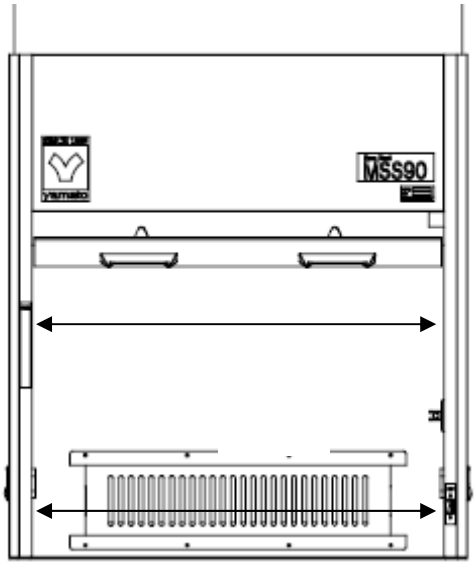


Diagram 2-4（dimension adjusting）

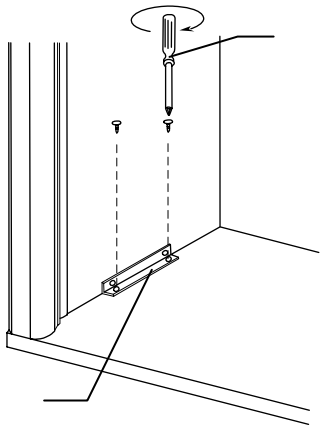


Diagram 2-5（fixing way）

④ Measure the inner dimension of pillars in the front of hood (Diagram 2-4) and have the upper and lower dimensions the same (the door cannot be operated well if the dimensions not match).

⑤ Use screws to fix the hood and stand with accessorial fixing fittings（Diagram 2-5）.

· Installation procedures of accessories

◆ Cover of water outlet

① If not use the water outlet on the working face, please cover it with accessorial cover.

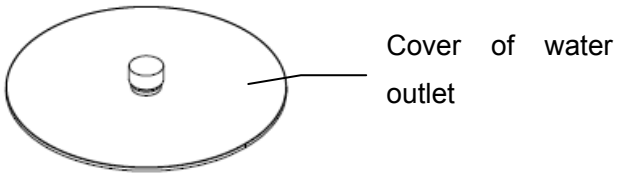


Diagram 2-6（cover of water outlet）

◆ Front operation panel

① Use screws to fix accessorial front operation panel to left and right side boards.

② Hang the hooks of front operation panel to the holes and fix it with screws.

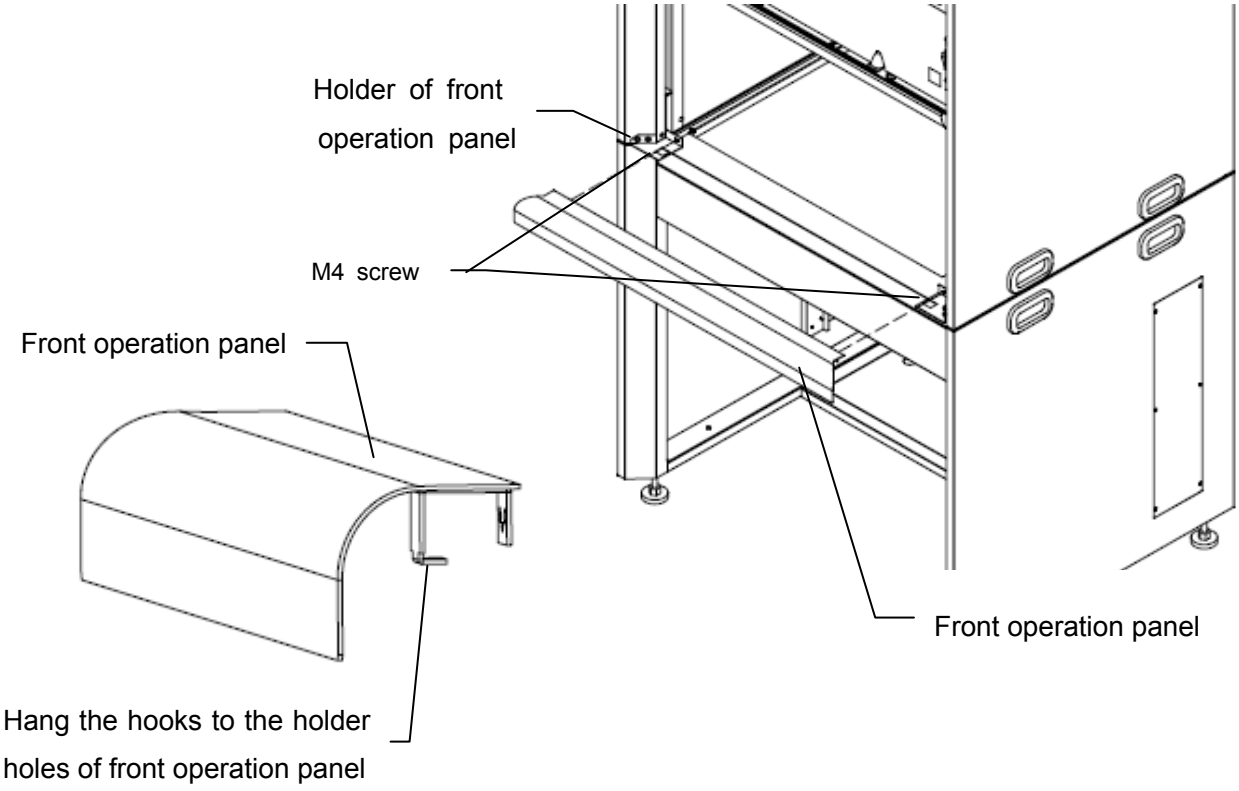


Diagram 2-7 (installation of front operation panel)

2. Before using the unit

Installation procedures

◆ Wall and ground fixing fittings

① Prepare the staybolts, fix the fixing fittings of adjusting foot and wall to the ground and wall.

※ It's easier to install socket before fixing to the ground and wall.

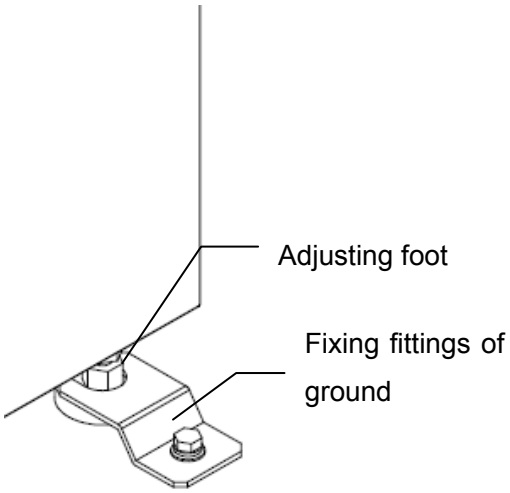


Diagram 2-8 (Ground fixing)

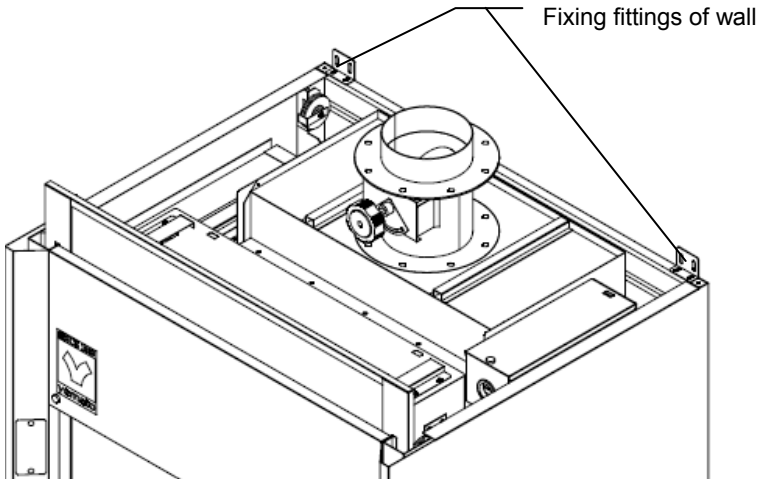


Diagram 2-9 (Wall fixing)

▪ Installation procedures of optional parts

◆ Exhaust fan

① The anti-vibration pipe is installed at the connecting part of exhaust pipe, where the exhaust fan is installed and fixed. Fix the thread part of anti-vibration rubber also.

② Fix the exhaust damper on the exhaust port flange in order to have the handle be front.

③ Please install fixing plate to support the exhaust damper.

④ Please install the exhaust damper when using flange.

※ Please use accessorial screws, bolts and nuts to fix.

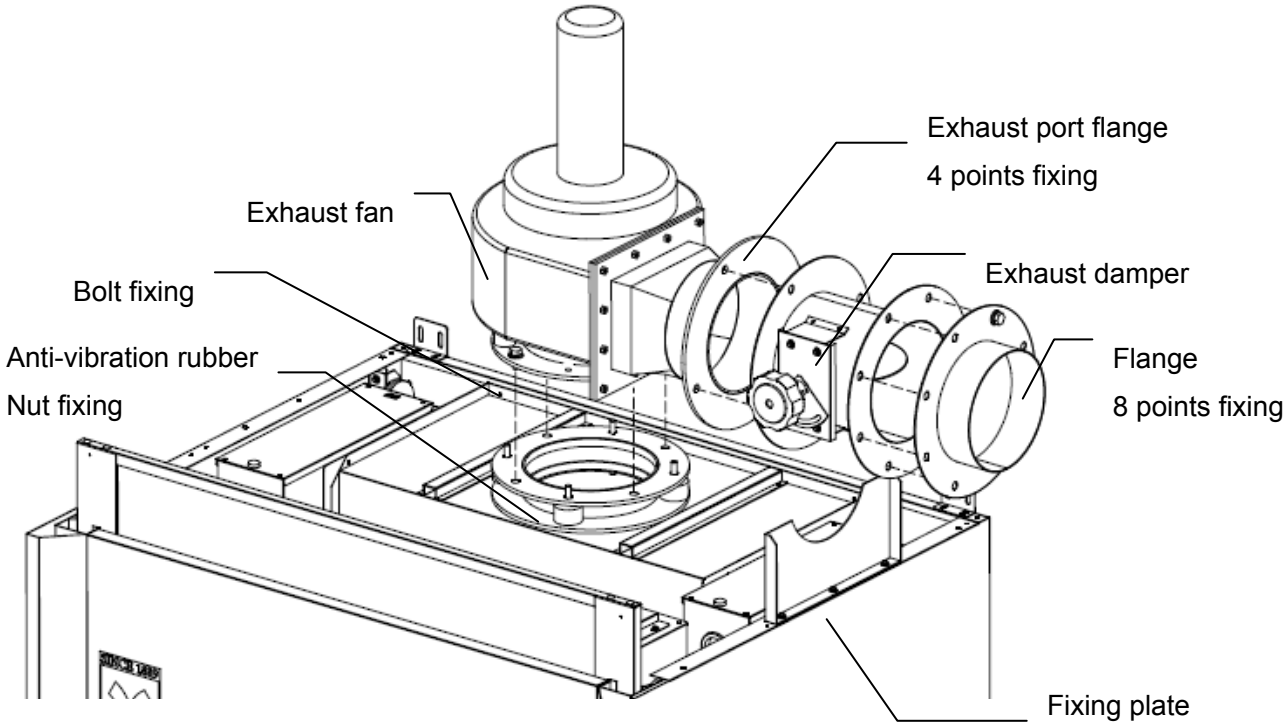


Diagram 2-10 (Installation procedures of exhaust fan)

◆ Flexible tube

※ Fix the flexible tube (hard chloroethylene)

① Install the flange at exhaust damper, and fix the flexible tube to flange with hoop.

② When conducting window air exhaust, refer to page 22 [Connection work of customer].

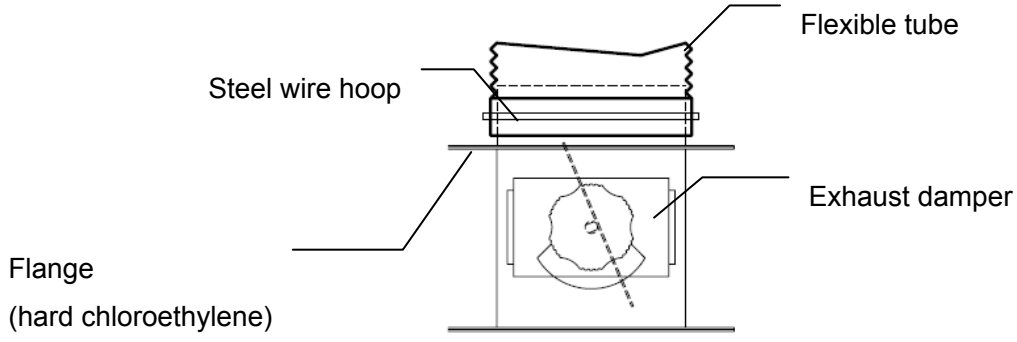


Diagram 2-11 (Installation procedures of flexible tube)

Installation procedures

◆ Decorative plate of exhaust fan

Please install the decorative plates of exhaust fan as per the following procedures.

①exhaust fan → ②exhaust damper → ③decorative plates (left and right) → ④decorative plate (reverse) → ⑤exhaust pipe → ⑥decorative plate (front)

① Please install the exhaust fan as per the installation procedures of exhaust fan ① on page 16.

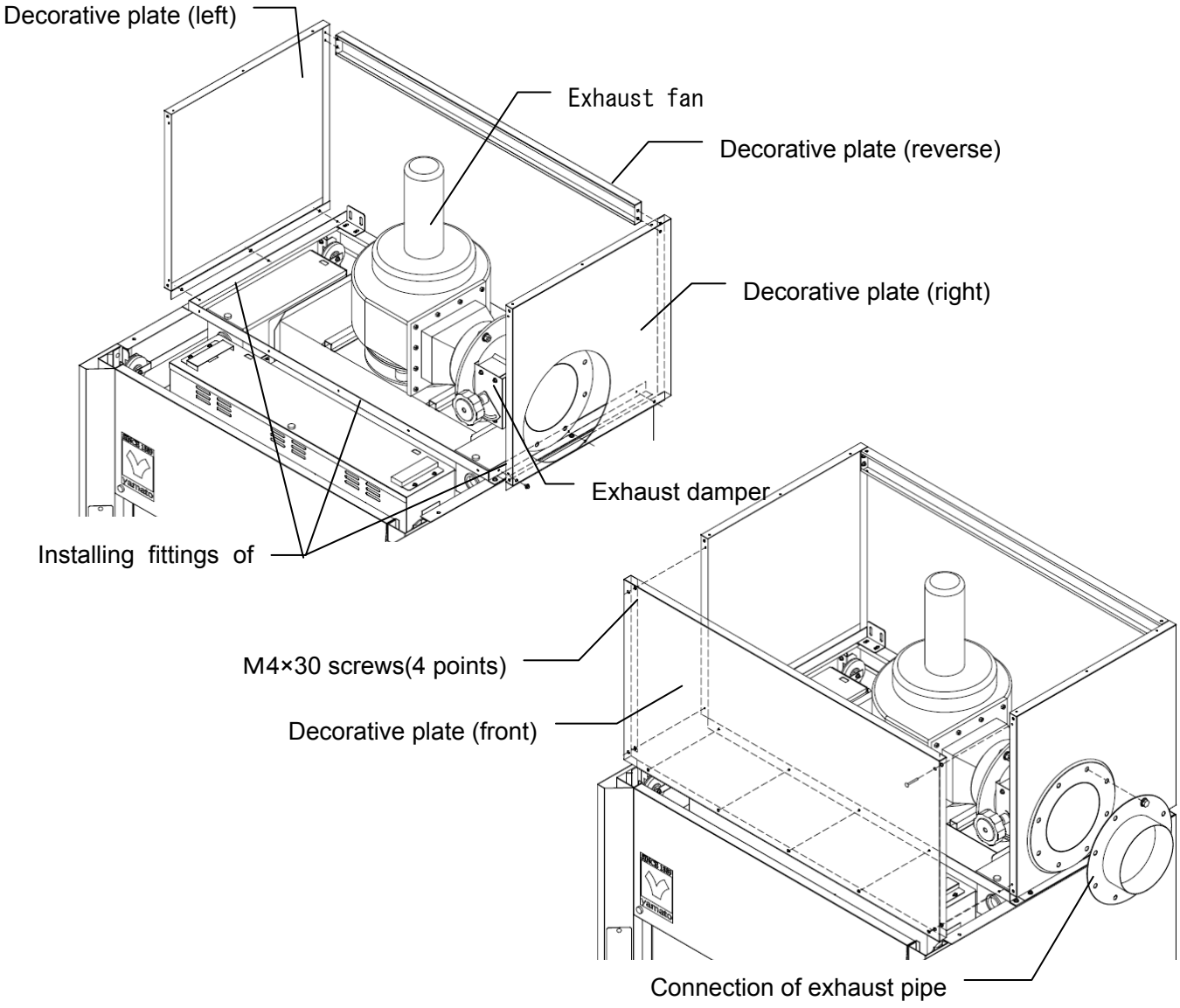
② Please install the exhaust damper as per the installation procedures of exhaust fan ② on page 16.

③ Install left and right decorative plates of exhaust fan (there are installing fittings at upper side boards of unit).

④ When installing the front and reverse decorative plates, use M4×30 screws to fix 4 points at front.

⑤ Please connect the exhaust damper with exhaust pipe.

⑥ Install the front decorative plate.



2. Before using the unit

Connection work of customer

⚠ Caution	**Confirm that the power is off before wiring**
⚠ Warning	**Please have the sales office of our company, sales shop or equipment constructor to do the connection of pipes and wires.** Doing the connection of pipes and wires needs the expertise. If people without the expertise do the connection, it might cause water, air leakage or electrical shock, fire, etc..

Pipe connection work

① The dimension of unit pipe connector is on page 43 [10. Specification]. Please use PE pipe to do pipeline.

② When using the flexible tube, please refer to page 16.

Water pipe connection work (optional)

Please have the local professional constructor to do piping connection.

Drainage

There is no accessorial water saving device. Please drain water as per the following ways.

① Set the device of waste liquid (optional) at the stand to hold water.

② Please install the valve, or else the odor in the exhaust pipe will back flow.

If use the flexible tube to exhaust air from window

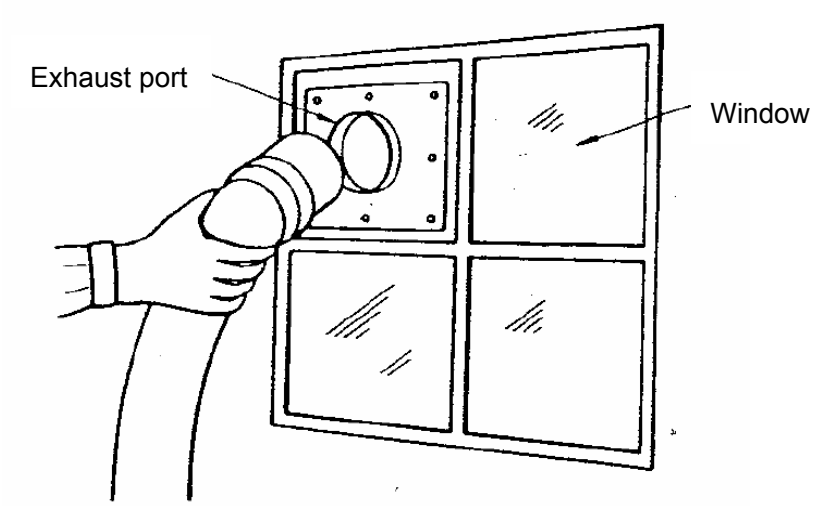
（※ When purchasing flexible tube, the exhaust port for window is necessary.）

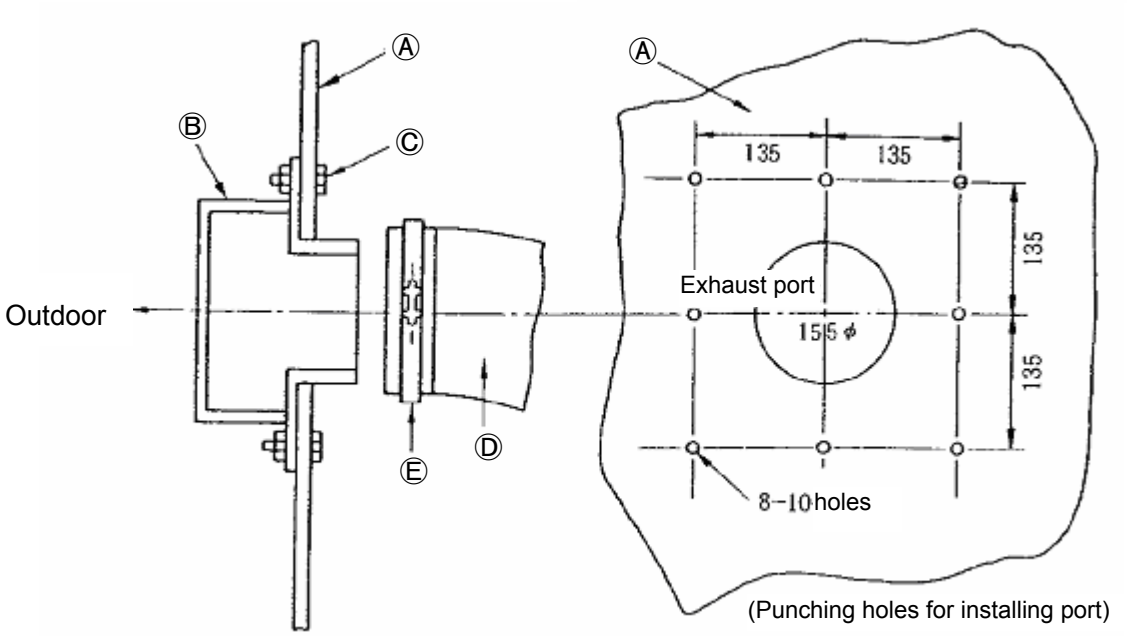
① Please dismount a piece of window glass nearby the hood.

② Make the installing port of exhaust port at the installing plate whose dimension is the same with the dismounted glass, and then install the installing plate at the dismounted place.

③ Use screws to install the exhaust port.

④ If there is no accessorial installing plate, find a plate 3～5mm thick.





(Punching holes for installing port)

Ⓐ Installing plate installed at the glass dismounted place

Ⓑ Exhaust port

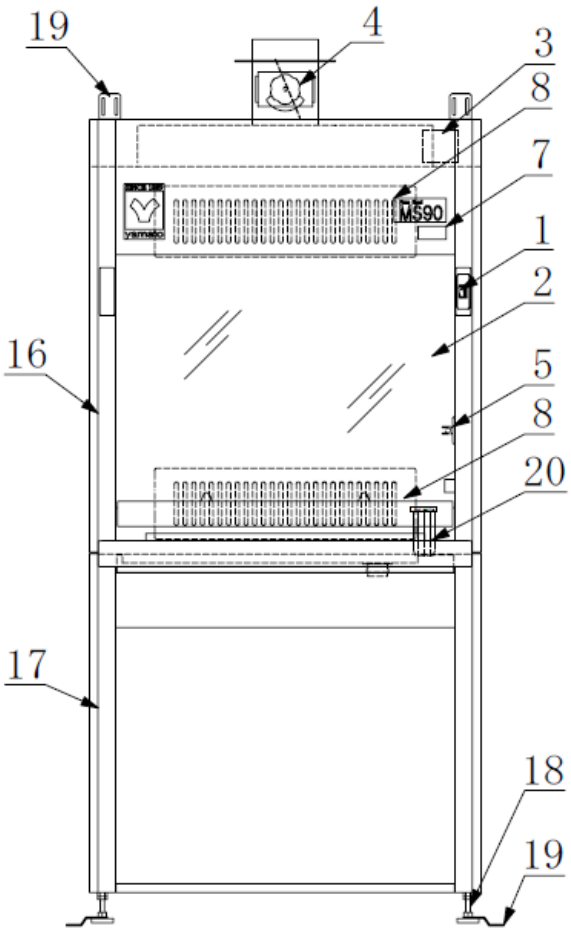
Ⓒ Installing bolt of exhaust port

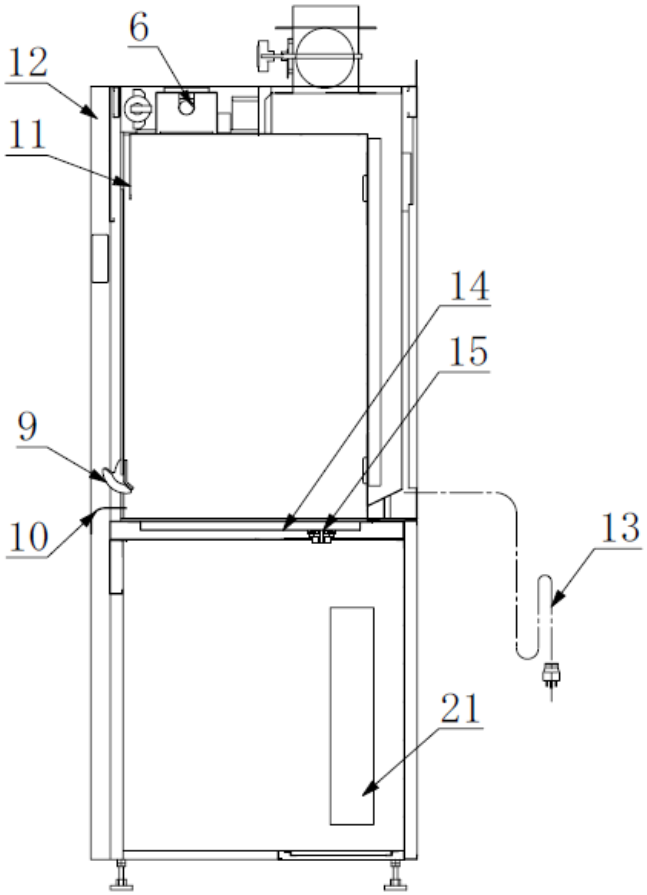
Ⓓ Flexible tube

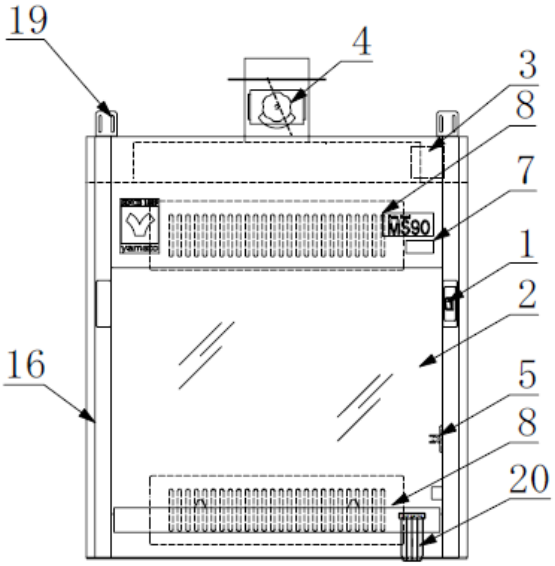
Ⓔ Steel wire hoop

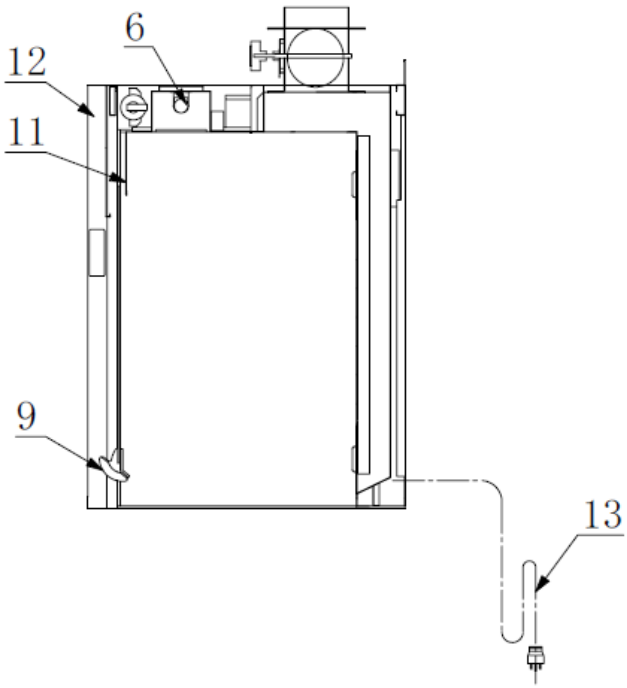
3. Names and functions of parts

Appearance (standard)









)

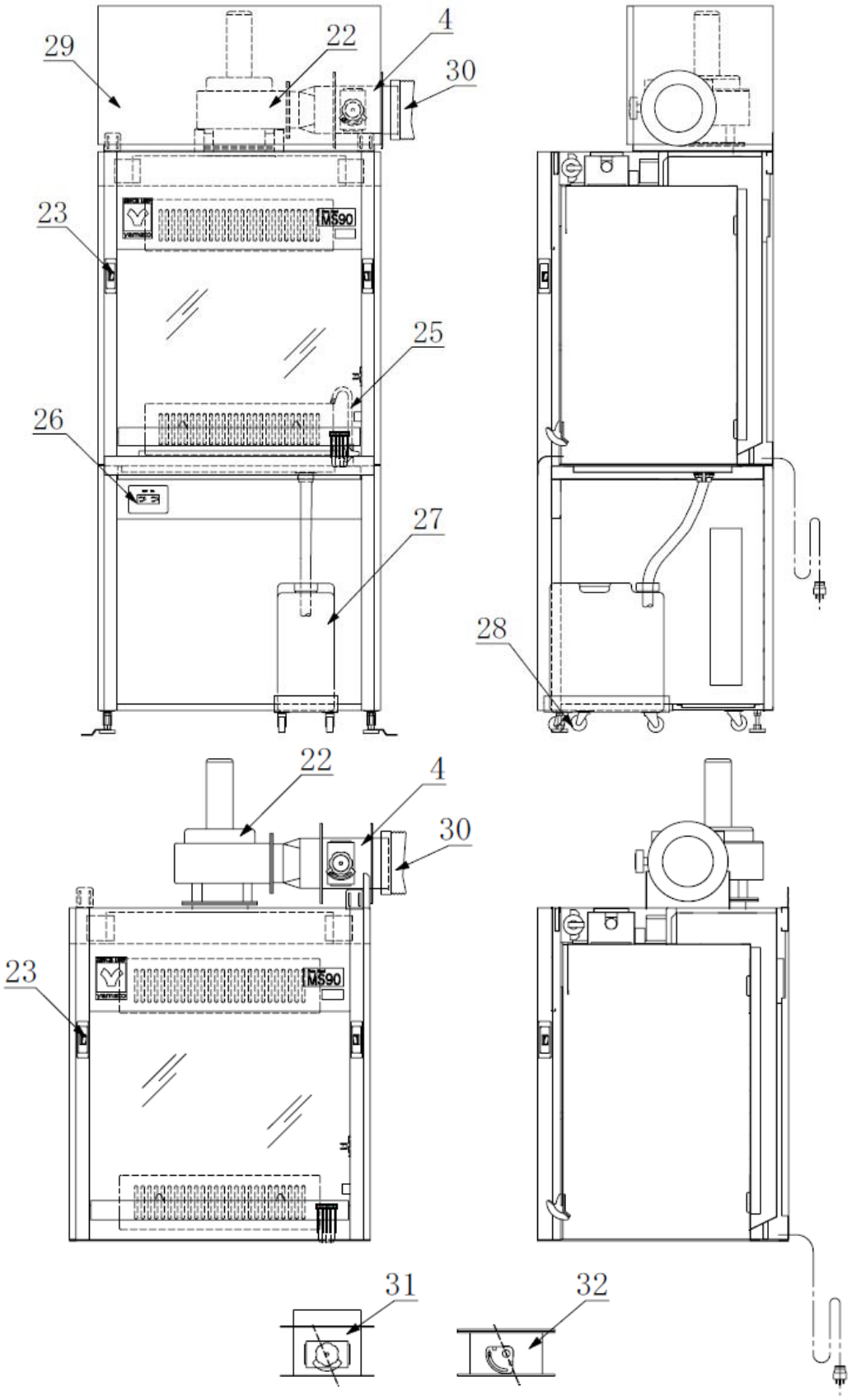
3. Names and functions of parts

Appearance (standard)

№	Name	Function
1	Switch of fluorescent light	Control the ON and OFF of fluorescent light (interior lighting)
2	Front window frame	It's a door to adjust working opening extent, and can be fixed at any positions.
3	Switchboard	Install the power supply system of hood.
4	Connector of exhaust pipe	The connector of hood air exhaust. Install the exhaust pipe there, including the damper which adjusts the air volume.
5	Brake block to prevent door from falling down	Prevent the steel wire rope of front window frame from breaking, used for safeguard.
6	Fluorescent light	Provide lighting during hood working.
7	Front panel	Decorative plate
8	Exhaust port (with damper)	Air exhaust part in hood. Use damper to adjust the air displacement.
9	Handle	Used to open and close the front window frame.
10	Front operation panel	Prevent substance from retaining on the working face.
11	Interior material	The material of interior experiment environment surface
12	Exterior material	Exterior material of hood
13	Plug	Supply power to hood
14	Working face	The platform to do experiment
15	Exhaust port	To connect the device of waste liquid, cover with blind plate if not use it.
16	Upper body	The working platform to do experiment and its surroundings.
17	Lower body	Holding space for device of waste liquid
18	Adjusting foot	To adjust the level
19	Fixing fittings of wall and ground	Fix the unit body to prevent moving.
20	Operation monitor of exhaust fan	When the front window frame closes, we can visually inspect the air exhaust status though the motion of vane.
21	Function plate	It can be disassembled for connection of piping and wiring.

3. Names and functions of parts

Appearance (optional)



3. Names and functions of parts

Appearance (optional)

№	Name	Function
22	Exhaust fan	Fan for hood air exhaust
23	Switch of exhaust fan	Switch to run and stop the operation. 「ON」run the exhaust fan 「OFF」stop the exhaust fan
24	Switchboard	Install the power supply system of hood.
25	Tap	Water supply port. Use the handle to control open and close of water supply.
26	Socket	Supply power to the machine used in the hood.
27	Device of waste liquid	The bottle to collect waste liquid
28	Caster※	Movable caster
29	decorative plates of exhaust fan	The front, left and right plates to cover the exhaust fan
30	Flexible tube	The channel to connect the air exhaust piping
31	Exhaust damper (Φ200/SUS)	MS-90C/90TC(stainless steel interior) Φ200 adjusting damper
32	Exhaust damper (Φ200/PVC)	MV-90C/90TC(PVC interior) Φ200 adjusting damper

※：If install the casters, the height of working face would be 875mm. (The standard height is 850mm)

◆ List of optional parts

NO	Name	Specifications	Main Components		
22	Exhaust fan PVC	PE 0.2kW	Exhaust fan	Switch of exhaust fan	Breaker
			Electromagnetic shutter	Off delay timer	Switchboard
			Anti-vibration rubber		
23	Switch of exhaust fan		Switch of exhaust fan	Breaker	Electromagnetic shutter
			Off delay timer	Switchboard	
25	Tap	Pipe diameter1/2B	Tap	Water supply hose	
26	Socket	115V 15A 2 outlets	Outlet	Breaker	
27	Device of waste liquid	Polyurethane bottle (30ℓ)	Cart	Polyurethane bottle	Water exhaust hose
28	Caster	Nylon caster (Φ150)	Caster		
29	Decorative plates of exhaust fan	Steel	Decorative plates	Installing fittings	
30	Flexible tube (Φ150)	PE	Flexible tube	Exhaust port PVC	Flange PVC
31	Exhaust damper Φ200/SUS	Stainless steel	Exhaust damper	Flange	
32	Exhaust damper Φ200/PVC	PE	Exhaust damper	Flange	

4. Using procedures

Operating procedures

① All the breakers of switchboard are ON.

② The fluorescent light can be controlled by ON/OFF switch.

③ Sliding up and down the glass door can open and close. When the glass door is open, please use the brake block to prevent door from falling down.

④ Using low opening extent is to expedite the controlling air speed at opening part and make it safer to use. Except taking and putting stuff, please use this unit at lower opening extent.

⚠ Caution	• Suggest to replace the deformed brake block. • When the working face heats up, please have the opening extent 100mm away from the heat source.
⚠ Warning	Please set up the brake block well to avoid accident when open the glass door.

※ Followings are the operating methods of optional parts.

⑤ The exhaust fan is controlled by ON/OFF switch.

- When stop the operation, the switch of exhaust fan is OFF. In order to exhaust the residual air, use the off delay timer to delay OFF after the setting time (It's set to be 10mins when delivery; the setting can be changed to be 0.1S~30mins). During the running of off delay timer, if open the exhaust fan again, it will turn to be operation status again.

⑥ Though the socket at lower body, it can use the machine with AC115V15A power source.

Warning

- The electric capacity of socket is the total capacity of 2 outlets.
  Over rated capacity might cause fire.
- Take care of electric shock of socket.
  The electric shock will occur if touch the socket with wet hand or insert the socket with high-electric conductivity substance.
- The applied machine must have grounding plug.
  Not connecting with grounding wire might cause electric leakage or fire.

⑦ Use the handle to open and close the tap in the hood. The working face is leveled plane. Take care of splashed water.

⑧ The device of waste liquid is contained at the lower body of unit body. Refer to page 19 for connection method (Diagram 2-15). Take care of liquid dropping when pull out the hose.

⑨ Casters are used to move the unit body. For safety, please use adjusting feet to suspend casters after installation.

Adjusting air volume

① Measure the air speed at opening part.

Operating the exhaust fan, have the door half open. Divide the opening part equally into 6 sections (※), and use anemograph to measure the air speed in each center of the 6 sections. (Diagram 4-2)

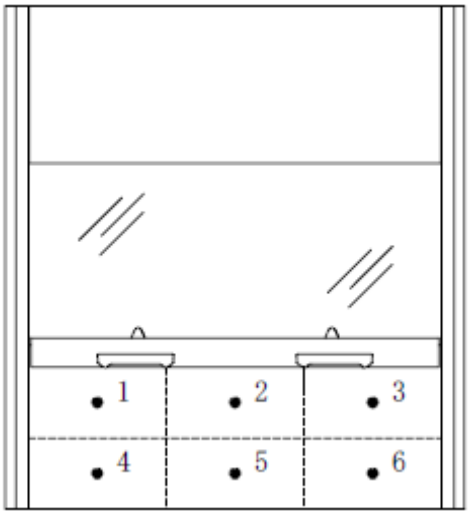


Diagram 4-2 (Measuring positions of air speed)

※ In the state of the opening part (door position) half open, measure the air speed in each center of the 6 sections.

② Calculate the average value of air speed of 6 points (formula 1), and compare with the corresponding standard exhaust air volume of each model (page 43). If the air volumes are different, adjust the damper handle on top to have the volume the same.

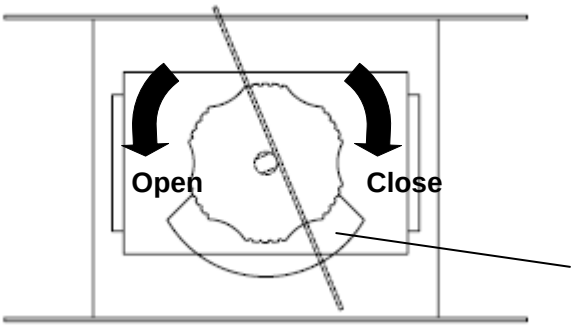
$$Q = 60 \times A \times V$$ [Formula1]

Q : air volume [m^3/min]

A : area of opening part [m^2]

V : air speed [m/s]

・Adjusting method of damper handle

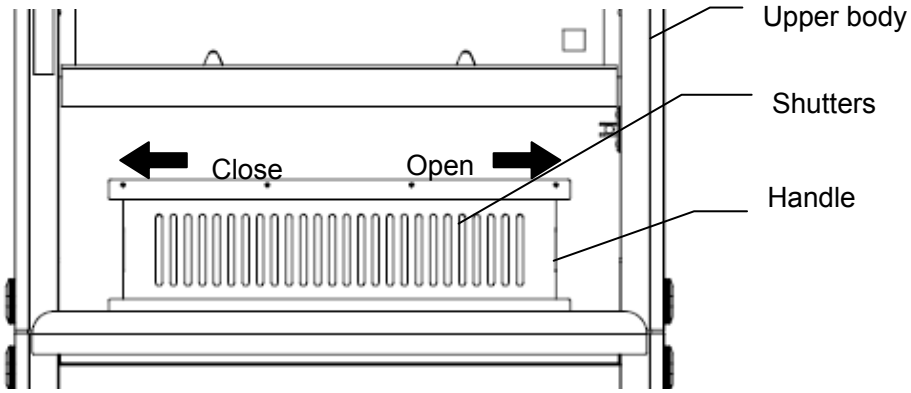


Use butterfly bolt to fix

4. Using procedures

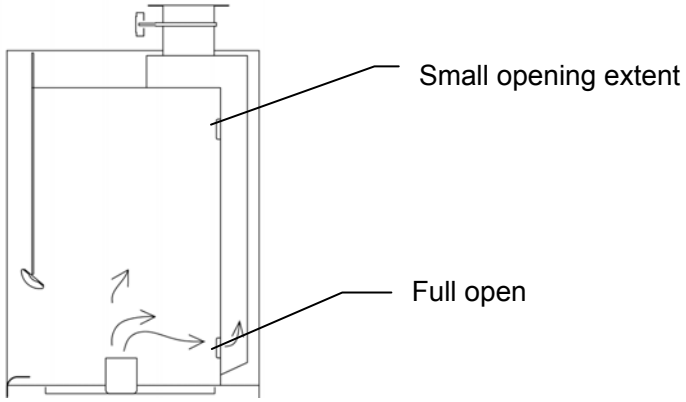
Using shutters

Slide the upper and lower shutter to open and close it.

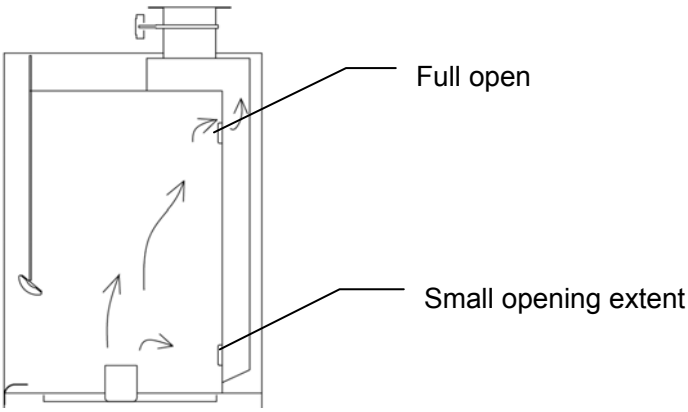


Adjusting the opening extent of shutters according to applied drugs and experiment will have good exhaust effect. The use examples of shutters are as below.

Example 1)
When apply heavy gas (like organic experiment), set the opening extent as below.
Upper shutters: small opening extent
Lower shutters: full open



Example 2)
When apply light gas (like inorganic experiment), set the opening extent as below to do heating experiment
Upper shutters: full open
Lower shutters: small opening extent



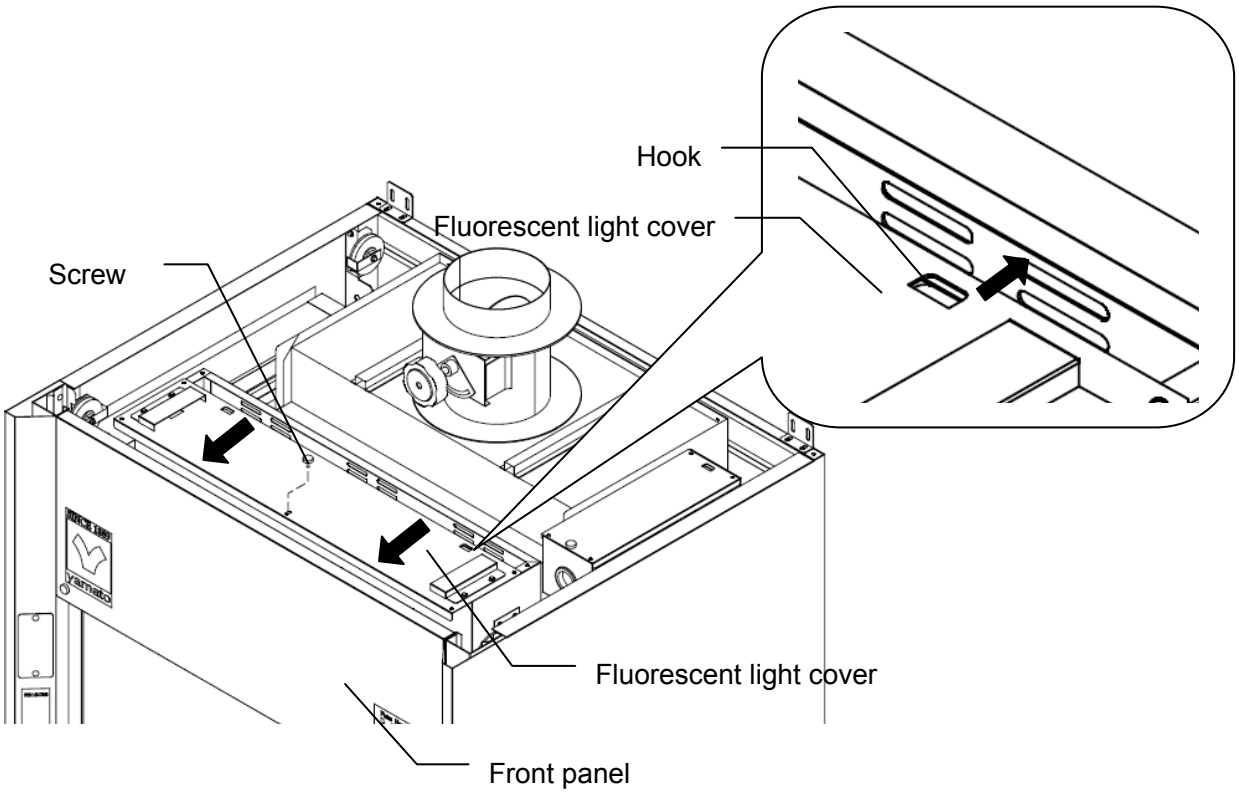
Warning Confirm that the shutters are open, because it cannot exhaust air if full close.

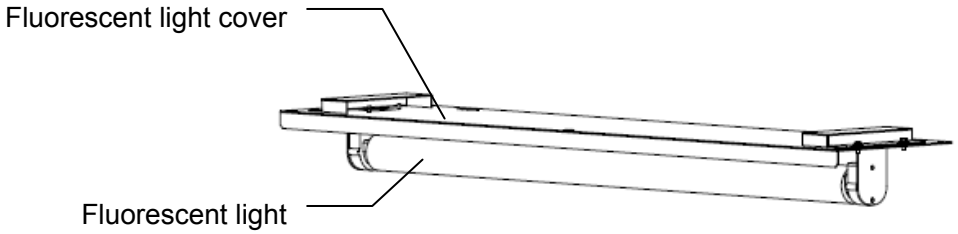
Replacement procedures of fluorescent light

① Take away the screws of fluorescent light cover, and then pull out the cover.

② Replace a new fluorescent light.

③ After replacement, install the cover as per the reverse procedures of above procedures. Hang the cover on the hook.





5. Usage precautions

Operating precautions

⚠ Danger	●Do not apply radioactive substance. Please use special equipment to do the experiment of radioactive substance. ●Do not apply organism (especially pathogenicity substance). Please use special equipment to do the experiment of pathogenicity substance.
⚠ Warning	●Do not use this unit for perchloric acid experiment If use perchloric acid, it will result in corrosion of interior and exterior, and even the explosion if accumulat too much. ●Never use this unit in an area where there is flammable or explosive gas. This unit is not explosion-proof. An arc may be generated when the power switch is turned ON or OFF, and fire/explosion may result. ●Never block the exhaust port. If put bigger machine to have blocking of exhaust port, it will reduce the air volume and generate turbulent flow result in back flow of exhaust air.

- Please use the heat source as per the following power.

	Model	Calorie (kcal/hr)	Machine conversion (approximately)	
			Gas heater	Electric heat
When the front air speed is 0.5m/s	MV-90C	1,000	1	1kW

- Please apply the heat source like gas heater and heating plate and do experiment in the center.
- When the exhaust fan is not running, do not use the heater like burner.

Working face

- Before exhausting the waste liquid containing strong acid and strong alkali, please dilute with water.
- Do not put corrosive, flammable drugs on the working face for long time.
- Although the stainless steel is antirust effectively, it might rust (corrode) according to service environment.
- Hard polyethylene resists about 50℃. When use heat source like heater, please use insulation board and never put the heat source directly on the working face.

5. Usage precautions

Front panel of operation

- It might be corroded according to different service environment, please maintain regularly.
- Please replace timely when finding corrosion.

Exhaust fan

- When the exhaust fan reaches the recommended air volume condition, proper pipe diameter, 3 bending positions of straight pipe and the end with air interchanger, recorded in page 43 [10. Specification]. If not match, choose another exhaust fan.
  （Straight pipe, bending position and air interchanger are based on the standards of that company）

Surrounding environment

- Please set water pipe and fire extinguisher nearby to prevent fire.
- Do not place any dangers and obstacles near the hood.

Maintenance

- Please regularly inspect the steel wire ropes which hoist the glass door. (The service life of ropes might be 3 years which may be shorter according to service condition)
- Use water to clean the exterior and working face of hood regularly.
- When the hood body is corroded or weathered, please replace.
- The power source must be cut off when inspecting the exhaust fan.

Warning

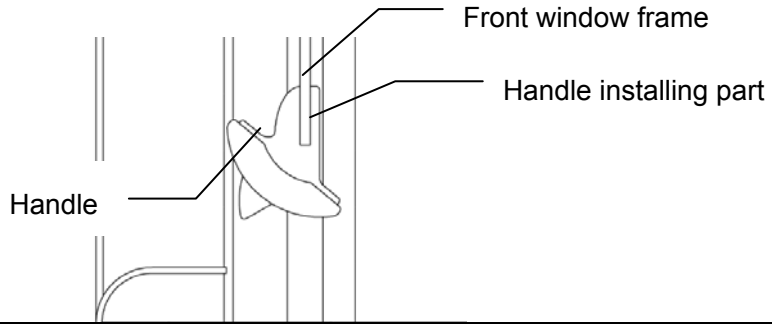
- Take care of electric shock in switchboard.
  Because the power source is connected in the switchboard, take care of electric shock when operating breaker.
- Never alter the switchboard.
  Do not have any alteration on replacing internal parts and wires of the switchboard, or else may result in failure or fire.

Blackout recovery

If the unit stops running due to blackout, when the power is supplied normally again, the unit will automatically recover to the state before blackout and start running.

Notices of cleaning handle

Handle and handle installing part are made from ABS resin. Use neutral detergent to clean them. Do not use organic solvent which will damage them.



6. Maintenance

Daily inspection/maintenance

⚠ Warning

●When doing inspection and maintenance, please cut off the main power expect special circumstances.

⚠ Caution

Unit body

● Please use soft cloth whose water is wringed up to wipe the smudges off. Never water directly which may cause electric shock. Do not use gasoline, banana oil, detergent or brush to clean which might result in deforming, deteriorating and discoloring.

Point inspection

Inspection of water exhaust port

●Please regularly inspect whether the water exhaust port is blocked.

Point inspection of exhaust fan

●When repairing the motor of exhaust fan and inspecting the fan belt, take care not to have the belt twine with fan blades.

●When repairing the motor of exhaust fan and replacing the fan belt, the main power must be cut off.

●Do not disassemble the cover of motor power. Cut off the main power when need to take away the cover.

●Refer to page 39 [9. After sales service and warranty] for details.

7. When the unit is not to be used for long time or when discard

When the unit is not to be used for long time or when discard

⚠Warning	⚠Caution
When discard ●Do not put it at a place where the children play. ●Please disassemble all the drive parts. ●Please treat it as large waste.	When not to be used for long time ●Cut off the power of unit body and pull out the power cord.

Notes about discard

Environmental protection consideration

When discard the unit, considering environmental protection, please disintegrated it and separately discard. Other factors such as resources recycling are also need to be considered. The main components and materials of this unit are as below:

Name of main part	Materials
Main components of unit body	
Exterior	Steel plate, epoxy polyester coating, stainless steel (SUS304)
Interior	MS-90C: stainless steel (SUS304) / MV-90C: hard polyethylene
Handle	ABS resin
Working face	MS-90C: stainless steel (SUS304) / MV-90C: hard polyethylene
Sticker	Synthetic resin
Main components of electrical parts	
Switch, relay	Resin, copper, other composites
Board	Glass fiber, other composites
Power cord	Composites of synthetic rubber, copper, nickel
Wire	Composites of glass fiber, flame-retardant plastic, copper, nickel

8. Troubleshooting

Troubleshooting procedures

Notify	Reason	Solution
exhaust fan does not work or not stop	The plug does not insert into the socket	Insert into the socket
	Failure of exhaust fan switch	Replace the switch
	Wires break off	Wiring again
	The breaker is not open	Open the breaker
	Failure of electromagnetic contactor	Replace the electromagnetic contactor
	Relay off	Excluding the reason of bearing or belt damage, recover the thermal relay
	Failure of thermal relay	Replace thermal relay
	Failure of motor	Replace or repair the motor
Abnormal sound of exhaust fan	Foreign objects getting into the exhaust fan	Take away the foreign objects
	Rotor contacts the outer cover	Repair the exhaust fan
	The axle of rotor is eccentric	Repair the exhaust fan
	Parts of fixed axle are loose	Screw tightly and fix again
	Failure of motor	Replace or repair the motor
Air volume is not enough	The voltage is too low	Inspect the power Inspect the connecting parts of wiring, repair where there is bad contact
	Unexpected obstacles getting into pipe	Inspect pipe and remove obstacles
	Failure of motor	Replace or repair the motor
Strong vibration	Rotation shaft of exhaust fan is dislocated	Repair the motor
	Installing screws of exhaust fan are loose	Screw tightly and fix again

8. Troubleshooting

Troubleshooting procedures

Notify	Reason	Solution
The breaker of exhaust fan is cut off in short time	Wiring short circuit	Inspect the position of short circuit and do wiring again
	Overload operation	Take away the overload objects
	Failure of motor	Replace or repair the motor
Hard to slide the front window frame	No lube for pulley	Apply lube at pulley and slide way
	The steel wire ropes are separated from pulley	Put the ropes into pulley groove
	The steel wire ropes at balance block are break off	Replace the steel wire ropes
Air volume decreases	The angle of damper deviates	Adjust the exhaust damper
	Accumulated dusts in pipes result in more pressure losses, the setting air volume can not be exhausted	Clean the pipe and clear off dusts
	Outer air gets inside due to damage of blade and pipe and loose screws	● Repair the damaged parts ● Screw tightly the nut with washer
	Failure of exhaust fan	Repair or replace exhaust fan
The fluorescent light does not light	Breaker is off	Open the breaker
	The fluorescent light is ageing	Replace the fluorescent light
No power at socket	Wires break off	Wiring again
	Breaker is off	Open the breaker
	No power of primary side	Confirm the primary side and connect with power

9. After sales service and warranty

When requesting a repair

If the failure occurs, stop the operation, turn OFF the power switch, and unplug the power plug. Please contact the sales agency that this unit was purchased, or Yamato Scientific America Inc.'s sales office.

Check following items before contact

- ●Model Name of Product
- ●Production Number
- ●Purchase Date

} See the warranty or production plate attached to this unit.

- ●About Trouble (in detail as possible)

Please show your warranty to our service representative.

Warranty (attached separately)

●Warranty is given by your dealer or Yamato Scientific America Inc.'s sales office, please fill in your dealer, date of purchase and other information and store securely.

●Warranty period is one full year from the date of purchase. Repair service for free is available according to the conditions written on the warranty.

●For repairs after the warranty period consult your dealer or one of our sales offices. Paid repair service is available on your request when the product's functionality can be maintained by repair.

Remove equipment

⚠ Warning

- The expertise is required to remove the product, please contact your dealer or one of our sales offices and it's chargeable.

Minimum guarantee period of repair parts

- The minimum guarantee period of repair parts for this product is seven years after end of production.

  Repair parts here refer to parts necessary for maintaining performance of the product.

9. After sales service and warranty

Maintenance of hood /suggest to sign a contract about maintenance and point inspection

Ageing and smudges caused by hood usage might influence the product performance.
In order to securely use the product, besides the general inspection and maintenance from customer, the regular inspection and maintenance from professional service personnel is also necessary.
When purchase the hood, pleas sign the [Maintenance Contract (chargeable)].
The following table lists the items and periods of standard and regular inspection and maintenance, convenient for your reference.
Please consult your dealer or one of our sales offices for detail.

◆Summary and inspection period of [Items of inspection and maintenance]

Item	Items of inspection and maintenance	Content of inspection and maintenance	Period of inspection and maintenance
Performance	Air exhaust function	Measure the front air speed	1 year
Appearance	Exterior	Damage, corrosion, smudge	1 year
	Fluorescent light	Light lights, blink	1 year
	Working face	Damage, corrosion, smudge	1 year
	Front window frame	Open and close, damage, corrosion	1 year
	Other basic items	Corrosion, damage, ageing	1 year
Piping system	Tap, pipe	Water leakage, corrosion, damage, ageing	1 year
Fan blade of air exhaust	Belt, bearing, etc.	Wear, damage, corrosion, smudge	1 year
Pipeline	outside, damper, etc.	Damage, corrosion, loose connection parts	1 year

9. After sales service and warranty

◆Summary of periods of inspection and guarantee of consumptive parts and replacing parts

Name of main part		Period of point inspection	Guarantee period [Replace • Repair]
Electrical parts	Fluorescent light	1 year	1 year
Structural parts	The steel wire ropes of front window	1 year	3 year
	Motor of exhaust fan	1 year	3 year
	Brake block to prevent door from falling down	1 year	3 year
	Tap	1 year	1 year
	Washer of tap	1 year	3 year

Note 1: The replacement period is not the guarantee period.
Note 2: The parts listed in the table are main parts.
Note 3: The replacement period is approximately estimated period in order to have customer be at ease to use the product for long time. This is also one part of safety design (the cost of inspection and maintenance can be budgeted).

9. After sales service and warranty

Regular self-inspections of exhaust system

In order to prevent poisonous gas intoxication or dust harm caused by failure or blocking of air exhaust system, please have regular self-inspection on following items. Our company can provide chargeable regular inspection, please contact your dealer or one of our sales offices for detail.

NO	Position	Items of inspection
1	Hood	(1) Wear, corrosion, pit, etc.
		(2) Status of intake air and if there is obstacles or not
2	Pipeline	(1) Outer wear, corrosion, pit, etc.
		(2) Status of internal wear, corrosion, etc. and dust accumulation
		(3) Status of exhaust damper
		(4) If the connecting parts are loose or not
		(5) Status of inspection port
3	Fan blade and motor	(1) Surface status of case
		(2) Status of case interior, wheel, guide blade, etc. and dust accumulation
		(3) Status of belt
		(4) Rotation direction of fan blade
		(5) Status of bearing and oiling
		(6) Motor
		(7) Safety guard and installation part
		(8) Control panel
		(9) Air volume of fan blade
4	Capacity of air exhaust	(1) Control the air speed
		(2) Inhibit the concentration

10. Specification

Standard type/specification (MV90C)

Model (Product Code)		MV-90C (□□□□□)
Exhaust pipe	Exhaust damper	Hard polyethylene Inner diameter Φ160, outer diameter Φ165 Fixed by flange
	Matched pipe	Hard polyethylene Inner diameter Φ160, outer diameter Φ165
Fluorescent light		Single phase AC 220V 20W 2
Water exhaust port		Hard polyethylene Single tube fixed (outer diameter Φ40, Inner diameter Φ31)
Material	Exterior	Cold-rolled steel plate, chemical proofing powder coating, with adjusting casters
	Interior	Hard polyethylene
	Working face	Hard polyethylene
	Glass door	Toughened glass 5mm Close and open (up and down) with balance block
Safety structure		① Brake block to prevent door from falling down ② Motor of exhaust fan
Air volume (m^3/min)※1		7
Internal static pressure Pa(㎜ H_2O)		40 (4)
Power source(50/60Hz) rated current		Single phase 115V 1A (capacity of breaker 6A) Length of power cord: about 2m
Outer dimension W×D×H(㎜)		900×750×1985/1990 (with flange)
Weight（about Kg）		120
Exhaust fan	Motor	Single phase 115V 0.2kW
Temperature and humidity condition of location		5～35℃, 20～80% (no frosting)
Accessories		Instruction manual, coating, warranty, motor of exhaust fan, flange, bolts for flange fixing, bolts for upper and lower bodies fixing, fixing fittings of wall and ground, tools for adjusting foot

※1. Recommended value (controlling air speed of opening part: 0.5m/s when the door is half open)

※2. This selected exhaust fan, according to the external static pressure, 10m pipeline, 3 bending positions with air interchanger. Please choose another exhaust fan when the conditions are different.

10. Specification

Standard type/optional

Model (Product Code)	Name of part		MV-90C
OMS-D200 (□□□□) OMV-D200 (□□□□)	Exhaust damper (Φ200/polyethylene)		Hard polyethylene Inner diameter Φ211 outer diameter Φ216 Fixed by flange
OMS-F150 (□□□□)	Exhaust fan	Model	#150 longitudinal fan blade (Φ150)
		Motor	Single phase 115V 0.2kW
		Performance	Air volume 8/10 m^3/min Static pressure 100/150Pa, 50/60Hz
		Material	Hard polyethylene
OMS-FD (□□□□)	Flexible tube		Polyethylene, Φ150× 2m (connecting pipe, steel wire hoop, with air exhaust pipe)
OMS-PN (□□□□)	Decorative plate of exhaust fan		Cold-rolled steel plate (chemical proofing powder coating)
OMS-FA (□□□□)	Tap		Gooseneck tap, nominal value 1/2B flexible tube, external or internal thread fixing
OMS-FS (□□□□)	Power switch of exhaust fan		Switch 15A 220V AC (breaker, with electromagnetic shutter)
OMS-SC (□□□□)	Device of waste liquid		Unit body: cold-rolled steel plate (chemical proofing powder coating), with casters 20L polyurethane bottle, connecting tools of draining water (nut, hose, steel wire hoop)
OMS-CS (□□□□)	Movable parts※1		Nylon caster (Φ50)

※1: If install the casters, the height of working face would be 875mm. (The standard height is 850mm)

※2: Please refer to page 25 Appearance (optional) [Names and functions of parts], the components of optional parts are recorded there.

10. Specification

Optional

Model (Product Code)	Name of part		MV-90C
OMS-D200 (□□□□)	Exhaust damper (Φ200/stainless steel)		
OMV-D200 (□□□□)	Exhaust damper (Φ200/polyethylene)		Hard polyethylene Inner diameter Φ211 outer diameter Φ216 Fixed by flange
OMS-F150 (□□□□)	Exhaust fan	Model	#150 longitudinal fan blade (Φ150)
		Motor	Single phase 115V 0.2kW
		Performance	Air volume 8/10 m^3/min Static pressure 100/150Pa, 50/60Hz
		Material	Hard polyethylene
OMS-FD (□□□□)	Flexible tube		Polyethylene, Φ150× 2m (connecting pipe, steel wire hoop, with air exhaust pipe)
OMS-PN (□□□□)	Decorative plate of exhaust fan		Cold-rolled steel plate (chemical proofing powder coating)
OMS-FS (□□□□)	Power switch of exhaust fan		Switch 16A AC 220V (breaker, with electromagnetic shutter)

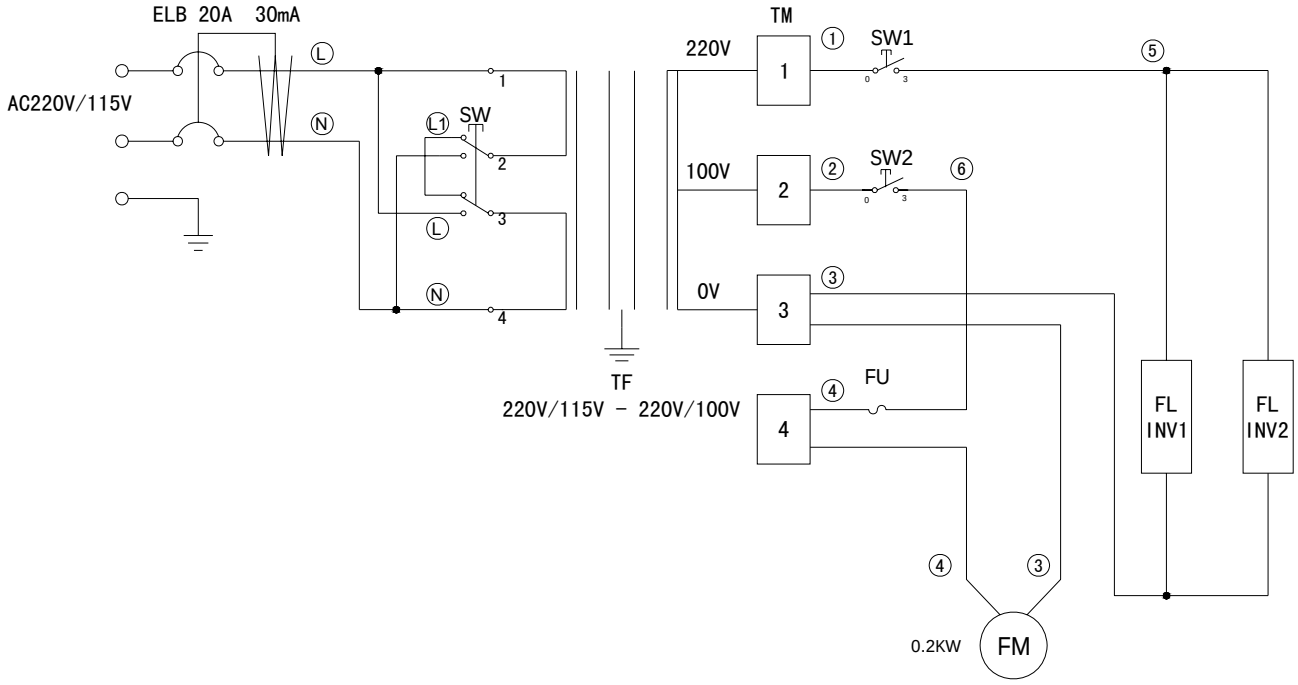
※ Please refer to page 25 Appearance (optional) [Names and functions of parts], the components of optional parts are recorded there.

11. Wiring diagram

Optional switch of exhaust fan

◆ Optional switch of exhaust fan

MV90C-OP01



◆ Parts list

Symbol	Name of part	Symbol	Name of part
ELB	Breaker (220V 20A)	FU	Fuse
SW	Selected Switch	FM	Exhaust fan
SW1	Switch of fluorescent light	TM	Timing relay
SW2	Switch of exhaust fan	FL	Fluorescent light
TF	Transformer		

12. List of dangerous materials

Never use an explosive substance or flammable substance or a substance containing them for this device.

Explosive substance	Explosive substance	①Nitroglycol, glycerine trinitrate, cellulose nitrate and other explosive nitrate esters
		②Nitrobenzene, trinitrotoluene, picric acid and other explosive nitro compounds
		③Acetyl hydroperoxide, methyl ethyl ketone peroxide, benzoyl peroxide and other organic peroxides
Flammable substance	Flammable substance	Metal “lithium”, metal “potassium”, metal “natrium”, yellow phosphorus, phosphorus sulfide, red phosphorus, celluloids, calcium carbide (a.k.a, carbide), lime phosphide, magnesium powder, aluminum powder, metal powder other than magnesium and aluminum powder, sodium dithionous acid (a.k.a., hydrosulphite)
	Acidic substance	①Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates
		②Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates
		③Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides
		④Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates
		⑤Sodium chlorite and other chlorites
		⑥Calcium hypochlorite and other hypochlorites
	Flammable substances	①Ethyl ether, gasoline, acetaldehyde, propylene chloride, carbon disulfide, and other substances with ignition point at a degree 30 or more degrees below zero.
		②n-hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone and other substances with ignition point between 30 degrees below zero and less than zero.
		③Methanol, ethanol, xylene, pentyl acetate, (a.k.a. amyl acetate) and other substances with ignition point between zero and less than 30 degrees.
		④Kerosene, light oil, terebinth oil, isopenthyl alcohol (a.k.a. isoamyl alcohol), acetic acid and other substances with ignition point between 30 degrees and less than 65 degrees.
	Combustible gas	Hydrogen, acetylene, ethylene, methane, ethane, propane, butane and other gases combustible at 15 degrees at one air pressure.

13. List of replacement parts

Electrical parts

Symbol※	Part name	Specification	Manufacturer
ELB	Breaker	BV-D 1P+N 20A 30mA	Mitsubishi
SW	Selected Switch	E-TEN1321 15A 250V	YAMATO
SW1、SW2 （S2 optional）	Ship type Switch	C136	YAMATO
FLINV	Stabilizer of frequency converter	220V/20W	YAMATO
-	Fluorescent light	FL-20SW	YAMATO
TF	Transformer	MV90COP01_03_02-01	YAMATO
TM（optional）	Timing relay	T3052-6-4P-CLO	YAMATO
M（optional）	Exhaust fan	-	

※ For symbol, please refer to page 47 [11. Wiring diagram].

14. Standard installation manual

Install the product according to the followings: (Confirm separately for optional items or special specifications).

Model	Serial number	Date	Installation mgr. (company name)	Installation mgr.	Judgment

№	Item	Implementation method	TOC No. Reference page of the operating instruction manual	Judgment
Specification				
1	Model, accessories	・ Confirm the specification according to model ・Confirm according to accessories	2. Before put into service 10. Specification	
2	Setting	・ Visual check of environmental conditions Caution: Take care for environment	1. Safety precautions	
		・Securing a space		
3	Connection work	・electric, water pipe, gas, drainage, pipeline	2. Before put into service Customer's requirements about equipment	
Operation-related matters				
1	Power voltage	・ Measure the user's voltage (switchboard, outlet) with a multimeter ・Measure voltage during operation (shall meet the standard) Caution: Always use a plug that meets the specification for attaching to the power switch or breaker.	2. Before put into service ・ must connecting grounding wire 10. Specification ・Specification—power source	
2	Operation start	・Operation start	4. Using procedures	
3	Adjust air volume	・Adjust air volume	4. Using procedures 10. Specification	
Instruction				
1	Operation instruction	Explain operations of each part according to the instruction manual	4. Using procedures ・Operating procedures 1. Safety precautions ～12. List of dangerous materials	
2	Error codes	Explain the customer about error codes and procedures for release according to the instruction manual	8. Trouble shooting	

			～9. After sales service and warranty	
3	Maintenance and inspection	Explain operations of each part according to the instruction manual	6. Maintenance procedures ・ Daily inspection/maintenance	
4	Completion of installation Entries	・Fill in the installation date and the installation mgr. on the nameplate of the main unit ・Fill in necessary information to the warranty card and hand it over to the customer ・ Explanation of the route for after-sales service	9. After sales service and warranty	

15. Unit・Connection working

In order to maintain after delivery, please fill in the following information.

The hood needs to be connected with exhaust fan, pipeline, water supply, drainage and electric to come into play. The maintenance for the product is necessary.

After a period, it's inconvenient for maintenance if the construction responsibilities are not defined.

Please fill in the information of product and constructor for further maintenance after delivery.

Item	Name	Manufacturer, constructor	Model	Delivery・construction date
Product	Hood	YAMATO Scientific	MS/MV－	
Product	Exhaust fan			
Construction	Air exhaust pipe			
Construction	Electric			
Construction	Gas			

Responsibility

Please follow the instructions in this document when using this unit. Yamato Scientific has no responsibility for the accidents or breakdown of device if it is used with a failure to comply. Never conduct what this document forbids. Unexpected accidents or breakdown may result in.

Note

- The contents of this document may be changed in future without notice.
- Any books with missing pages or disorderly binding may be replaced.

Instruction Manual
Hood
MV90C
First Edition April. 10, 2015

Yamato Scientific America, Inc.
925 Walsh Ave, Santa Clara, CA 95050
Tel:408-235-7725
For technical information
and service, call: 1-800-292-6286
http://www.yamato-usa.com