



Fume Hood

(Standard, air curtain, desk-top, and low-ceiling types)

Fume Hood LDS

Instruction Manual

First Edition

- Thank you for purchasing Yamato Scientific's fume hood.
- To use this product correctly, please read thoroughly this "Instruction Manual" and "Warranty Card" before using. After reading, please save them in a suitable place for future use.



Warning: Please read carefully and understand the precautions in Owner's manual before using this product.

**Yamato Scientific America Inc.
Santa Clara, CA**

Printed on recycled paper.

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1. Safety Precautions

Explanation of symbols

About symbols

For safety purpose, there are many symbols used in this manual and on the product. Depending on severity which results from improper handling without understanding the meaning of them, these symbols are categorized as shown below.

Please understand the meaning of symbols used in this manual, before reading the main body of this manual.

Warning

Death or serious injury (note 1) is possible, if the instruction is not observed.

Caution

Minor injury (note 2) or damage to property (note 3) is possible, if the instruction is not observed.

(Note 1) Serious injury includes physical damage, electric shock, bone fracture, poisoning and others which have any aftereffect or require medical treatment by going to hospital for a long time or admitting to hospital.

(Note 2) Minor injury includes physical damage, electric shock and others which do not require admission to hospital or going to hospital for a long time.

(Note 3) Damage to property means damage of property such as facilities, equipment or building.

Meaning of symbol



This symbol indicates an item which requires “Warning” level (including “Caution” level) attention.
There is a concrete warning information around this symbol.



This symbol indicates a prohibited item.
There is concrete prohibiting information around this symbol.



This symbol indicate there is a must item.
There is a concrete instruction around this symbol.

1. Safety Precautions

List of symbol marks

Warning



General warning



High voltage!



High temperature!



Driving mechanism!



Explosive!

Cautions



General caution



Electric shock!



Risk of burn!



Do not heat with no water!



Water leak!



Use water only!



Toxic substance!

Prohibition



General inhibition



Do not use fire!



Do not disassemble!



Do not touch!

Mandatory



General mandatory actions



Connect ground cable



Set horizontally



Disconnect power plug



Periodic inspection

1. Safety Precautions

Warning/caution



Warning



Do not use in flammable/explosive atmosphere

Do not use in flammable or explosive atmosphere.

As this system does not have an explosion-proof structure, it will cause a fire or explosion.



Do not use in a hot atmosphere

- The maximum allowable temperature for fan made by polyvinyl chloride or FRP is approximately 50 °C. Therefore, if it is used in a hot atmosphere, the fan blades may be deformed, which leads to degraded ventilation performance or high noise level.
- If the working surface is lead-lined or made of epoxy resin, do not work directly on the surface or do not heat the surface (for example, flowing hot water), because the surface may be damaged.
- The operating temperature of this product is 5 - 35 °C. Therefore, the atmospheric temperature in the installation site must be maintained within 5 - 35 °C.



Do not use this product for experiments of perchloric acids

If a perchloric acid is used, the exterior and interior of this product may be corroded, which may cause an explosion.



Do not use for radioactive materials

This product has not been designed to handle any radioactive materials.



Do not use for living beings

This product has not been designed to handle living beings (especially pathogens).



In case of fire

If a fire dumper is installed, it activates in case of fire not to allow the fume hood to discharge any air.



Always connect the grounding wire

Always connect the grounding wire properly, or electrical shock or fire may be caused.



Do not use the power cord with it tied in a bundle.

Bundled power cord may be heated, which may cause fire.

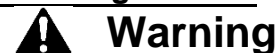


Do not damage the power cord

Avoid damage to the power cord by forcedly bending/pulling/twisting it. Otherwise, fire or electric shock may be caused.

1. Safety Precautions

Warning/caution



Warning



Do not alter the power distribution panel

Do not alter the contents (replace a part or wire) in the power distribution panel, or degraded function or fire may take place. Also, do not touch the panel with wet hands, because electric shock may take place due to the power source connected to this product.



Periodically check the wire for windowpane

Opening/closing mechanism of windowpane consists of balance weights which hoist the windowpane with stainless steel wires. Though typical lifetime of wire is approximately 3 years, it may be broken earlier than expected, depending on the used condition. Check the wires periodically.



Do not change filter alone

The filter must be replaced by multiple persons with each of them standing on his/her own steps (such as stepladder). In this case, stepladders must be locked with stoppers and placed on a stable location. This is a high place work, and therefore, may cause injury when he/she drops.



Do not obstruct the baffle plate.

The baffle plate has been designed in consideration of air flow distribution and discharge of heavy gases. If the baffle plate is clogged or obstructed by an object, its baffle effect may reduce and the discharged gas may be flowing in the reversed direction, which will have an adverse effect on human bodies.



Do not perform any experiments when the exhaust blower stops

If the exhaust blower stops due to defective motor or power interruption, immediately stop the ongoing experimental work, turn off the main power, and escape to a safe place with clean air supplied.



Do not adjust the damper

The damper has been properly adjusted by authorized person since the fume hood is installed. An adjustment by unauthorized person may reduce the ventilation performance and cause an unbalance between intake air and discharged air, which may have an adverse effect on human bodies.



Take care with gas leak (optional)

- Care should be taken with gas leak.
- Check the type of gas used (town gas or LPG) before use.
- Always close the main valve and gas tap when the gas is not used.
- The gas pipe/tube must be periodically checked and replaced.



Take care with electric shock at power plug outlet

An electric shock accident may take place if the power plug outlet on the front face of product is touched by wet hand, or a conductive material is inserted into the outlet.



Take care with ground leakage of power outlet

The power outlet on the front face of this product must be connected to experimental equipment with an appropriate resistance. If not, ground leakage or firing may be caused.

1. Safety Precautions

Warning/caution



Warning



Do not apply any shocks on the windowpane

Though it is made of tempered glass, the windowpane may be broken by a strong impact, and injuries may be caused.



Take care with controlled wind speed

The controlled wind speed of this product with the windowpane fully opened does not comply with “Ordinance on Prevention of Hazards Due to Specified Chemical Substances” and “Ordinance on Prevention of Organic Solvent Poisoning” of “Industrial Safety and Health Law” of Japan.



Caution



When thunder starts to crash

If thunder starts to crash, immediately turn off the power. Otherwise, fire or electric shock may be caused.



Prohibition of experimental works using fluorinated acids

Windows and lighting protection cover are made of glass. If a fluorinated acid is used in the hood, the glasses may be corroded by the acid and become foggy (translucent) to make it difficult to see the inside clearly.



Do not use fire near the windowpane

Do not use fire near the windowpane. Application of open flame may break the windowpane, which may result in an injury.



Do not rapidly heat/cool the working surface (Ceromitite)

The ceromitite working surface is made of one-piece ceramic plate, and therefore, may be cracked when rapidly heated or cooled and result in an injury.



Do not apply shocks on the working surface (Ceromitite)

The ceromitite working surface is made of one-piece ceramic plate, and therefore may be cracked or broken when a strong impact is applied, which may result in an injury.



Heat source should be used at the center of hood

Experiment which requires a heat source such as burner, hotplate, etc. should be performed at the center of hood as much as possible.

1. Safety Precautions

Warning/caution



Caution



Take care with using heat source

Absorbents which are installed to absorption unit as standard equipment generally exercises its full performance at gas temperature of less than 40°C.

Take care with using heat source, because the performance significantly decreases, when the gas temperature exceeds 40°C.



Prepare the extinguisher.

Prepare the extinguisher near the draft chamber for use in case of fire.



Main body

- Though the external surfaces of the main body are coated with chemical proof paint, it may be corroded if the paint is removed due to flaw on it.
- If the interior material is non-asbestos board, machining or strong impact to it may cause a crack, etc.
- Large amount of gases which have been generated during experiments adhere to the interior and working surface as fouling. Clean with water periodically.



Working surface

- If you want to use a heat source (such as gas burner and stove) on ceramitite working surface, place the attached insulation board between working surface and heat source.
- As the working surface is made flat, please perform your operation within the spot sink not on the working surface, if fluid may splash.
- Do not leave corrosive or flammable chemical in the hood for a long time.



Permissible heat source

In the case of LDF-150, permissible heat sources are limited to 2 gas burners or up to 2 kW of electrical heating (See P.29).



Cleaning of handles

Handles and handle attachments on front window sash are made of ABS plastic. Clean these parts with mild detergent. Do not apply any organic solvents to the handle parts to prevent possible damages.

1. Safety Precautions

Warning/caution



Caution



Take care with installation site

● Air supply

- Air quantity corresponding to that discharged from fume hood must be supplied to the installation site. If the air quantity is insufficient, the fume hood may not be able to maintain the design discharge air flow. If so, countermeasures against insufficient air supply may be required.

● Crossed air flow (disturbance)

If a fume hood is installed as shown below, crossed air flow (disturbance) is generated. Depending on the situation, countermeasures against crossed air flow may be required. It is required that the wind speed of crossed air flow be less than 20 % of wind speed at the front face of fume hood.

● Near the entrance door of the room

Air flow generated by door opening/closing or by entering/exiting of human body exerts an impact on the hood.

● Human passage

Air flow is generated by a walking person. (The wind speed is estimated as approx. 1.1 m/s, provided the walking speed is 4 km/h.)

● Near air outlet for air-conditioning/ventilation on the ceiling plane

The blowing wind speed is depending on the shape of outlet, but typically 4 to 6 m/s. As the air goes away from the outlet, the speed becomes lower, but in some cases, an air flow with significant wind speed directly comes into the opening of fume hood, or comes into contact with the front face and then goes down into the opening.

● Near air inlet for air-conditioning/ventilation on the ceiling or on the wall

The suction wind speed at an air inlet is typically 2 to 4 m/s, somewhat smaller than the blowing wind speed. The extent of disturbance at an inlet is smaller than that at an outlet, because the wind speed reduces rapidly, as the measuring position goes away from the inlet.

● Front or side face of floorstanding direct blowing package

As the wind speed of direct installing package is high, its air flow sometimes makes a significant effect on a place which has a long distance from the front face of the package.

In the case of side installation, the side or front air flow from the package may be re-directed by contacting to an obstacle such as medicine shelf, and the secondary air flow may affect the hood.

● Near ventilation fan

As the wind speed of ventilation fan for suctioning outside air is as fast as typical household electric fans, a ventilation fan exerts significant effects on the surrounding area.

The suction wind speed of ventilation fan for air discharge is as same as that for air supply. As the distance between fume hood and fan becomes larger, its speed becomes lower, but depending on the situation, the fan may affect the hood as a disturbance.

● Open window/door

Crossed air flow may occur due to blow in/out through the window of the room.

Installation method and preparation before use

1. Confirm the type.

Please confirm that the type you ordered is delivered before starting the installation work. The type code of this product stands for:

LDS -150 S A

● Shape

None : Standard type

A : Air curtain

T : Desk-top

J : Low-ceiling

● Working surface material

S : Ceramitite

E : Epoxy

K : Ceramic steel plate

● Width dimension

120 : 1200 mm

150 : 1500 mm

180 : 1800 mm

● Model name

2. Damage

In case you find any damages to the product when you received it, please contact the transporter for confirmation as soon as possible.

3. Always connect the grounding wire.



- Always connect the grounding wire properly to prevent electric shock accidents due to ground leakage.

If there are no applicable grounding terminals in your site, please perform required grounding works [D class grounding work (ex. Class 3 grounding, up to 100 Ω)]. This grounding work must be performed by an authorized electric work specialist. Please contact your dealer, us or an electric work shop, if no appropriate person is available. Operation without grounding may cause electric shock accidents.

- Do not connect the grounding wire to gas plumbing, grounding wire of telephone, or lighting conductor. Otherwise, fire or electric shock may be caused.
- Do not connect the grounding wire to water plumbing. If vinyl chloride piping exists, the grounding may be insufficient.

4. Take care with installation site



- Fume hoods must not be installed:

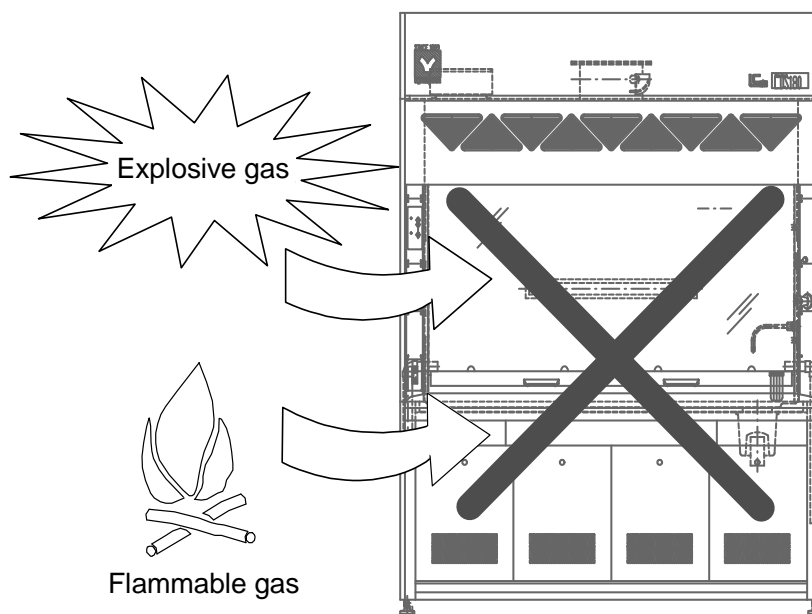
- in flammable or corrosive gas atmosphere
- on uneven or dirty floor
- in a humid place
- in a location with large diurnal temperature range
- in a location with ambient temperature of not less than 35 °C
- in a location with significant vibrations

2. Before Use

Installation method and preparation before use

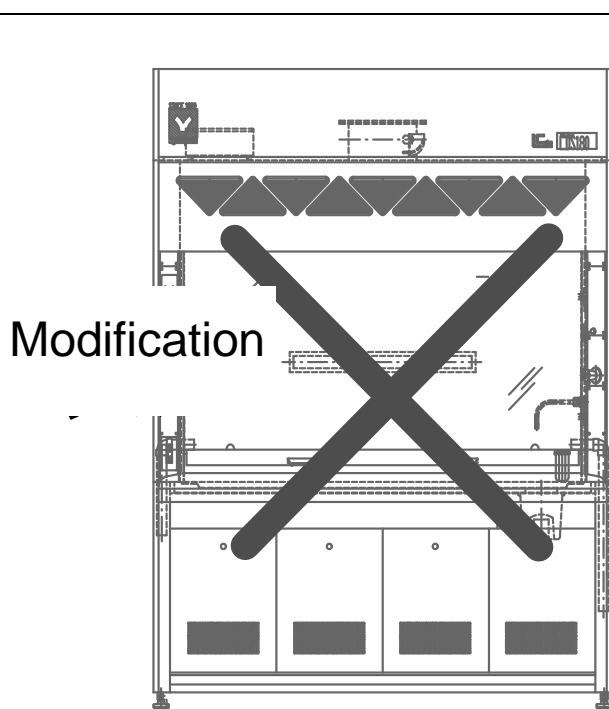
5. Do not use in flammable/explosive atmosphere

- Do not use this product in flammable or explosive gas atmosphere. As this product is not explosion-proof, an arc is generated when turning ON/OFF the switch and during operation, which may cause fire or explosion.
- Refer to P. 43, "Hazardous material list" for flammable and explosive gases.



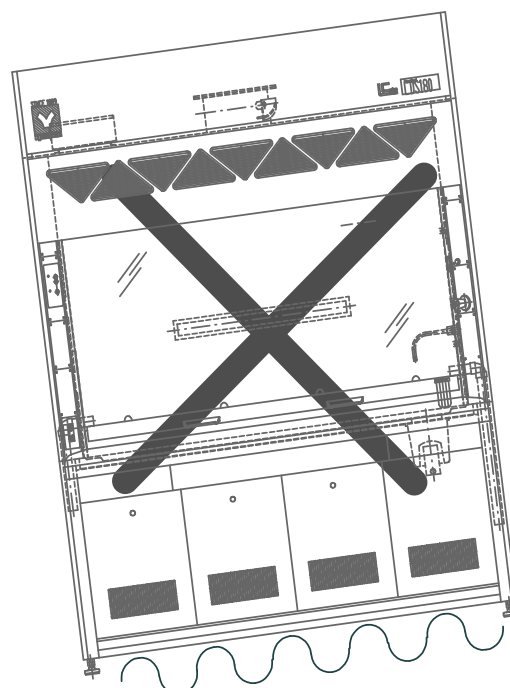
6. Do not modify the product

- Do not modify the product without our permission, which may cause a failure.



7. Install on a level surface

- This product should be installed on a surface as level as possible. If installed on an unlevel surface, an unpredictable trouble or failure may be caused.



8. Use the power outlet within the capacity



- Check the capacity of power outlet at the front of this product, and connect suitable plugs to it with observing the electrical capacity.

Power outlet capacity: Single phase AC 115 V 15A

9. Installation



- This product may topple down by earthquake or strong impact. Take appropriate safety measures including installing the hood in an empty location.

10. Handling of power cord



- Do not use the power cord with it tied in a bundle. Bundled power cord may be heated, which may cause fire.
- Do not modify or forcedly bend/twist/pull the power cord.
Otherwise, fire or electric shock may be caused.
- Do not damage the power cord by pinching it with leg of desk or chair, or other objects.
Otherwise, fire or electric shock may be caused.



- Keep the power cord away from heating devices such as stove. Burnt sheath of cord may cause a fire or electric shock.
- If the power cord is damaged (exposed core, or wire discontinuity), immediately turn off the product power and bus power, and contact your dealer for assistance. If the cord remains damaged, fire or electric shock may be caused.

2. Before Use

Installation method

*** For a knock-down product (that can be customized) of a standard or air curtain type, our workers carry out assembly and installation totally.**

Installation procedure for standard, air curtain, and low-ceiling types

This product consists of the hood and frame. Install as shown below:

- ① At first, put the frame in position. If it is impractical to put the hood on the frame in the position, put the hood on the frame in the forward position, and then move them in position.
- ② Next, remove two blocks which are attached to the lower part of both side plates. (The blocks are secured with four M8 bolts from the bottom.)
- ③ Then, lift the hood and place on the frame.



Caution

- The hood must be lifted with at least 5 persons.
- The mood must be lifted with every location of hood elevated evenly, or interior material may be cracked.

- ④ Install the hood to the frame and secure with the bolts attached. (See fig. 2-1) At this time, measure the outside dimension between front columns of hood and adjust the dimension to that shown in "10. Specifications (P. 411)" (If the dimensions differ, rattling of door or faulty operation may be caused).

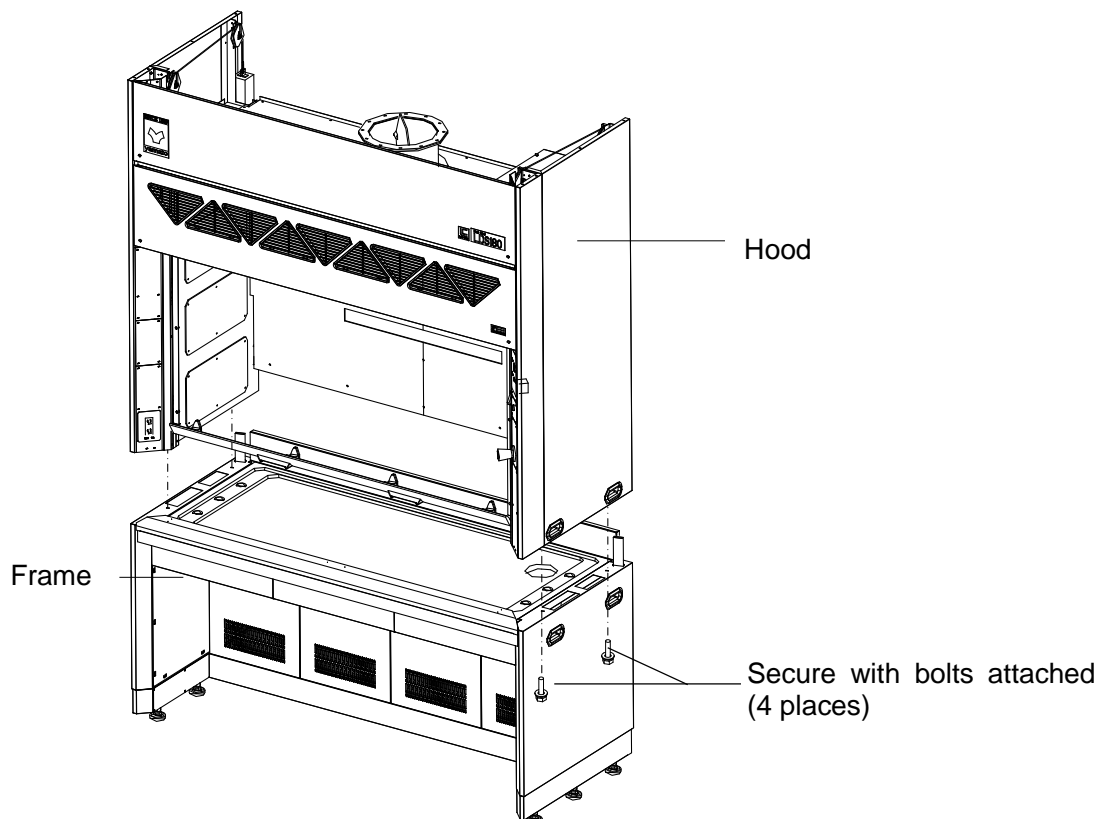


Fig. 2-1

2. Before Use

Installation method

- ⑤ After the upper and lower sections are combined, level the working surface with adjusters and lock at the positions with lock nuts (see Fig. 2-2)
- ⑥ In the case of air curtain, both the outlet and the fluorescent power cord into the frame through a through hole in the left. Similarly the switch board cord into the frame through a through hole in the right. The other type are unnecessary.
- ⑦ Bring the power supply cord for power outlet and lighting and the cord for SW circuit board into the frame through holes of left side plate and right side plate, respectively.
- ⑧ Bring the differential pressure measurement tubes into the frame through the hole on the right side plate, and connect each tube to each nozzle at the back side of pre-filter differential pressure gauge (Fig. 2-2).

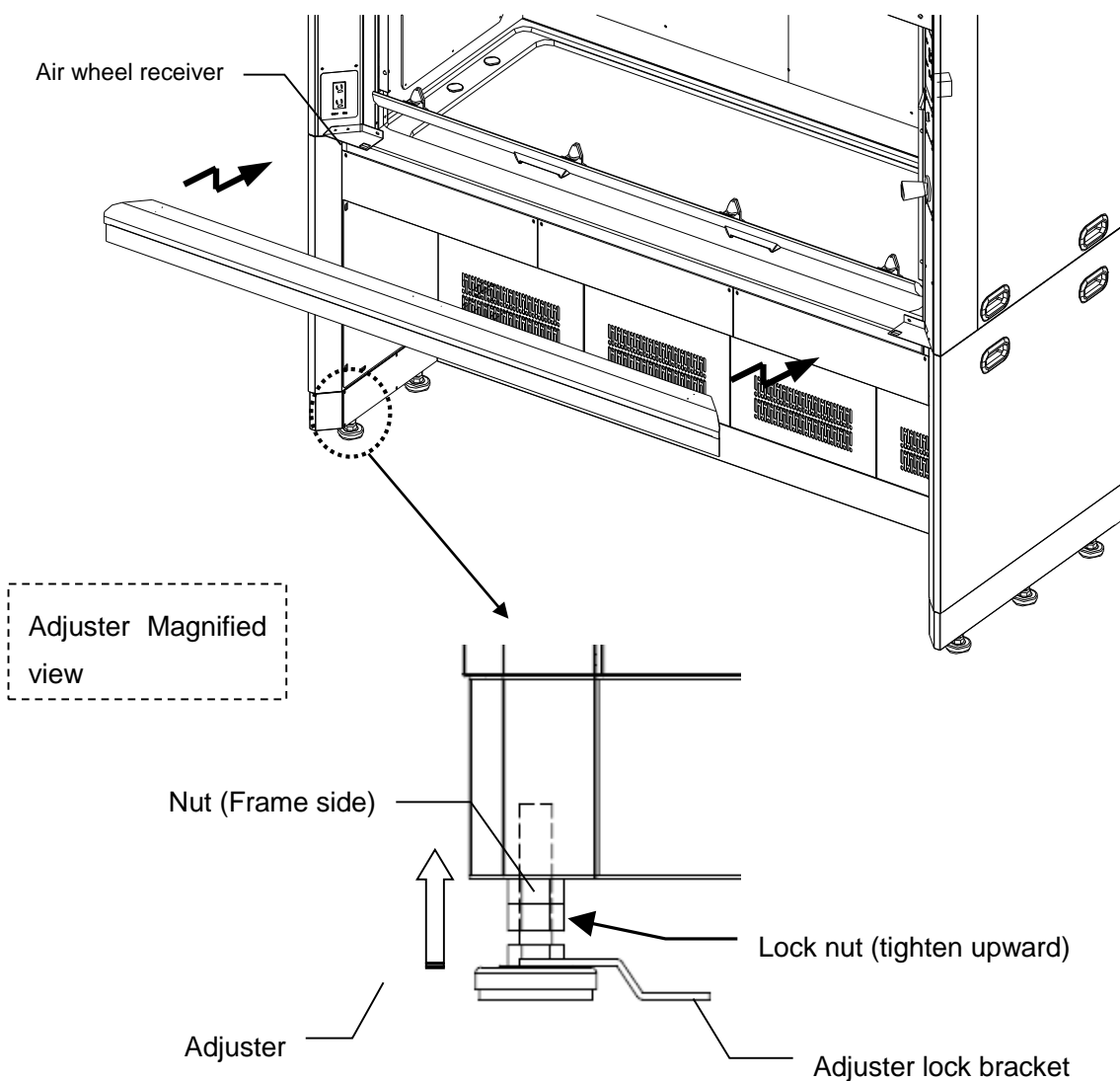


Fig. 2-2

Installation procedure for a desk-top type

● Install the desk-top type product as follows:

- ① Remove two square blocks provided below both side plates of the hood.
(The square block is fixed with four M8 bolts from below.)
- ② Frame on which the desk-top type is installed
 - Confirm that the top surface is free from foreign materials and projection.
 - Confirm that the levelness is achieved. (If not, carry out level adjustment.)
 - Confirm that the frame has the capacity necessary for installation of the hood.
- ③ Before placing the hood on the frame, protect the front side of the hood installation location on the frame with a blanket. After protection, lift up the hood, place it on the protecting blanket and pull the blanket, together with the hood, to the installation position. When installation is over, pull out the protecting blanket.



Caution

- Five workers must take part in lifting the hood.
- When lifting the hood, be sure to lift each point evenly.
Otherwise, the interior material may be broken.

- ④ Measure the internal dimension between hood front panels at two points (upper and lower, as shown in Fig. 3). Adjust the lower dimension to the upper one. (If upper and lower dimensions are not equal, door rattling or malfunction may occur.)

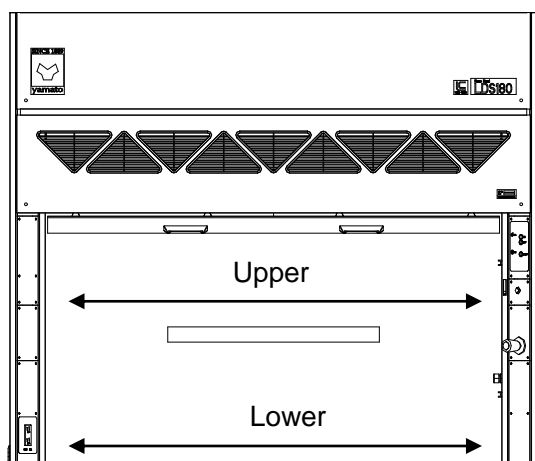


Fig. 2-2

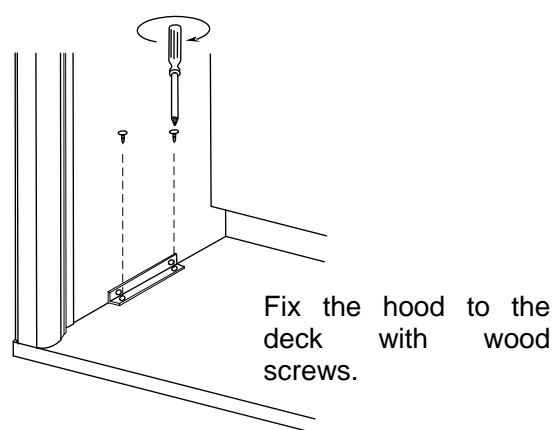



Fig. 2-4

- ⑤ Fix the hood and frame with attached fixing brackets and screws. (Fig.2-4)
- ⑥ When fixing is over, seal a joint between the lower end of interior of the main body and the frame with a silicon caulking agent. This is the end of desk-top type installation procedure.

2. Before Use

Utility connection work




Warning

For connection of piping and wiring, contact our office, your dealer or equipment installation company.

Connection of piping and wiring must be performed by a person who has special knowledge and skills. If performed by an incompetent person, leakage of water or gas, electric shock or fire may be caused.

Electric wiring work

Electric wiring works as shown below must be performed on the power distribution panel. (the distribution board is attached to the right side plate in the case of the desk-top type)



Caution

Make sure that the electric power is disconnected from the product before starting the wiring work.

- ① Arrange the terminal block wiring for the exhaust blower in the power distribution panel as shown in Fig.2-5. The grounding wire must be connected to the grounding terminal block. For the power outlet and the inverter type ballast the wires go through the hole on the left side plate, on the other hand, the wires for SW circuit board go through the hole on the right side plate, into the frame for connection. The inverter type ballast and SW circuit board are connected through connectors.

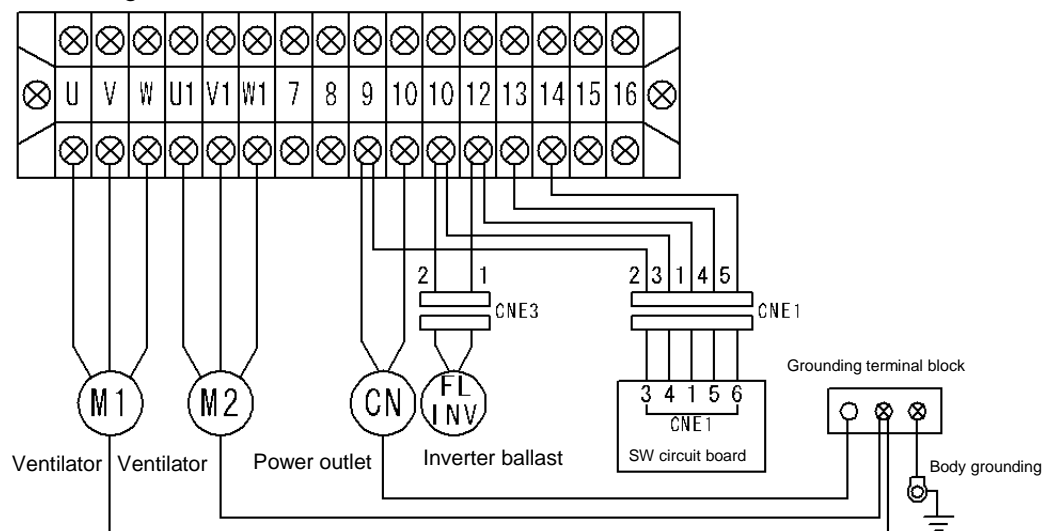


図 2-5

- ② Connect the primary power wiring, that is rising from the floor, to each circuit breaker. Required power supply is AC single-phase 115V or AC three-phase 220V.



- Always connect the grounding wire properly to prevent electric shock accidents due to ground leakage. If there are no applicable grounding terminals in your site, the grounding work [D class grounding work (ex. Class 3 grounding, up to 100 Ω)] should be performed. This grounding work must be performed by an authorized electric work specialist. Contact your dealer, us or an electric work shop, if no appropriate person is available. Operation without grounding may cause electric shock accidents.
- Do not connect the grounding wire to gas plumbing, grounding wire of telephone, or lighting conductor. Otherwise, fire or electric shock may be caused.
- Do not connect the grounding wire to water plumbing. The grounding may be insufficient, if vinyl chloride piping exists.

2. Before Use

Utility connection work

- ③When the wiring has been connected, turn on breakers and push the Exhaust blower operation switch on the control panel to check the rotational direction of Exhaust and Supply blowers. If the rotational direction is incorrect, replace 2 of 3 wires U1, V1, and W1 on the terminal block each other to rotate the fan in the proper direction.

Water piping connection work

The end of rising piping is a flexible tube with it end threaded (nominal diameter 1/2 B, male or female). Connect this end to a primary piping such as a riser from the floor.

Gas piping connection work (optional)

The end of rising piping is a flexible tube with it end threaded (nominal diameter 1/2 B, male or female). Connect this end to a primary piping such as a riser from the floor. Ask an authorized local company for connection of piping.

Drain piping connection work

The size of drain port of this product is as shown in “11. Specifications (P. 40)”. Connect this line to a primary piping such as a riser from the floor by using vinyl chloride tube for draining. For product to which a spot sink made of epoxy resin or ceramic steel plate is installed, no bell trap is attached. For the purpose of deodorization and drainage block prevention, install a dram trap (ceramic).

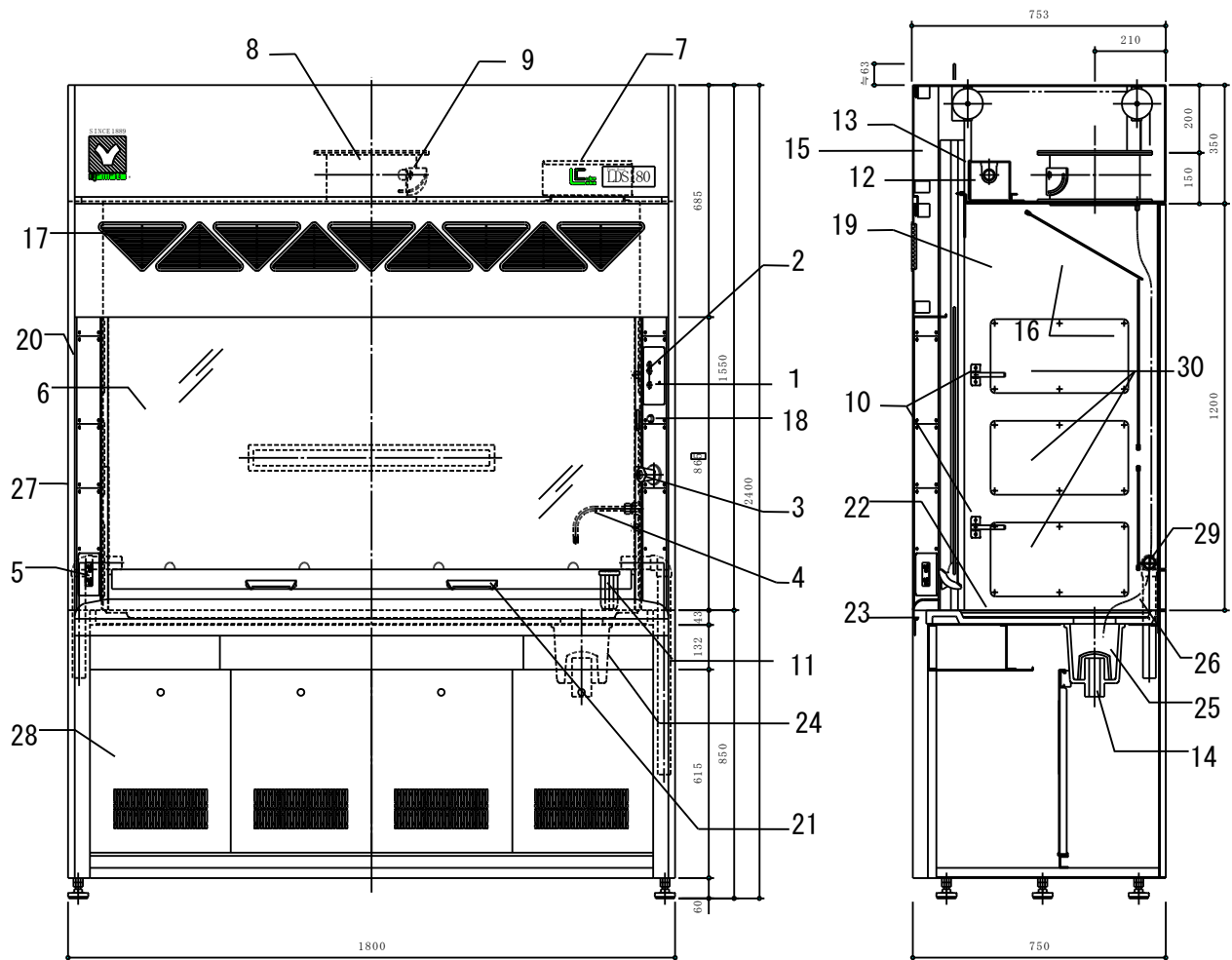
Duct connection work

The size of ventilation duct outlet of this product is as shown in “11. Specifications (P.40)”. Perform the ventilation duct connection works with vinyl chloride ducts, etc.

3. Part Names and Functions

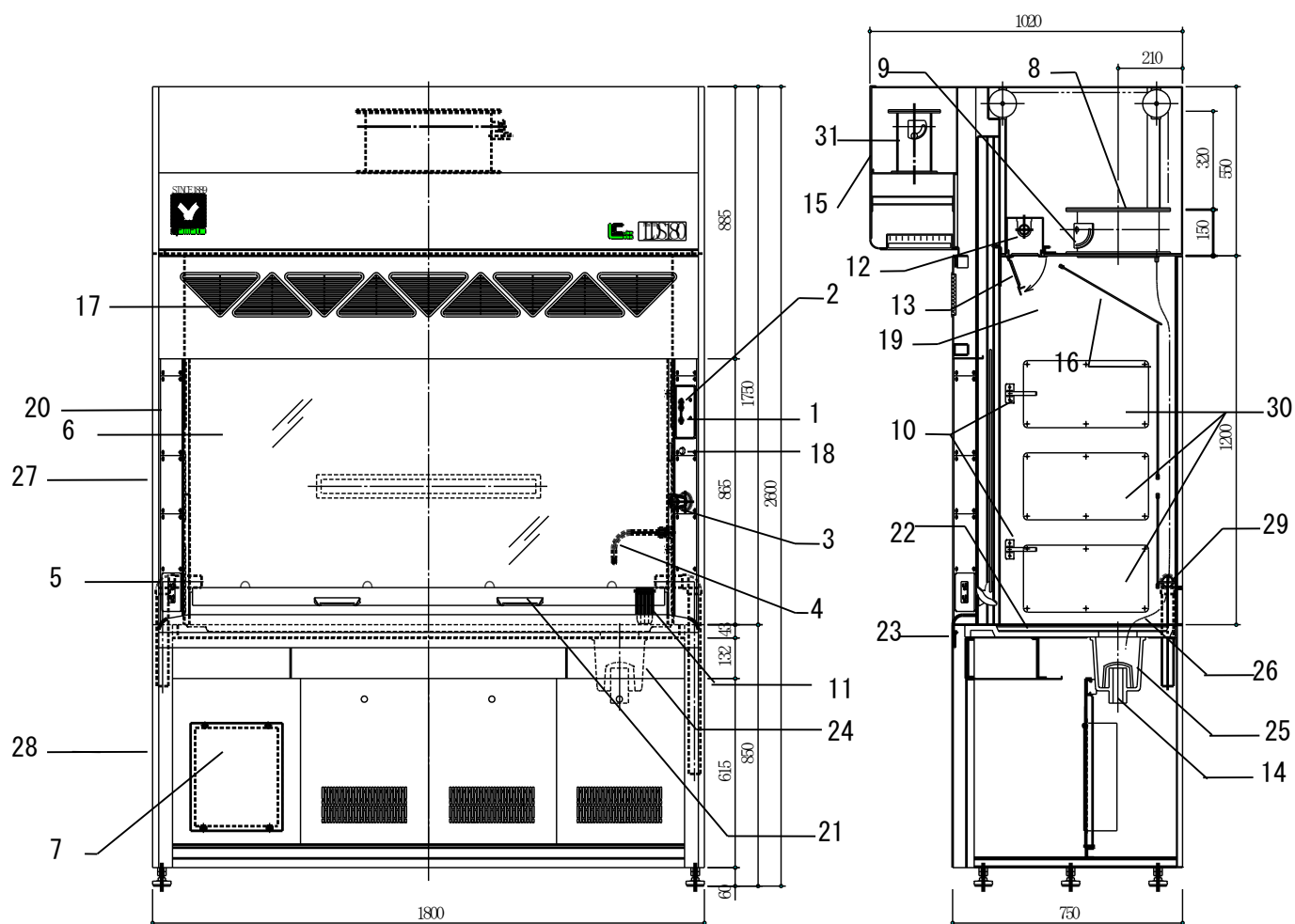
External View

LDS—180S (Standard type)



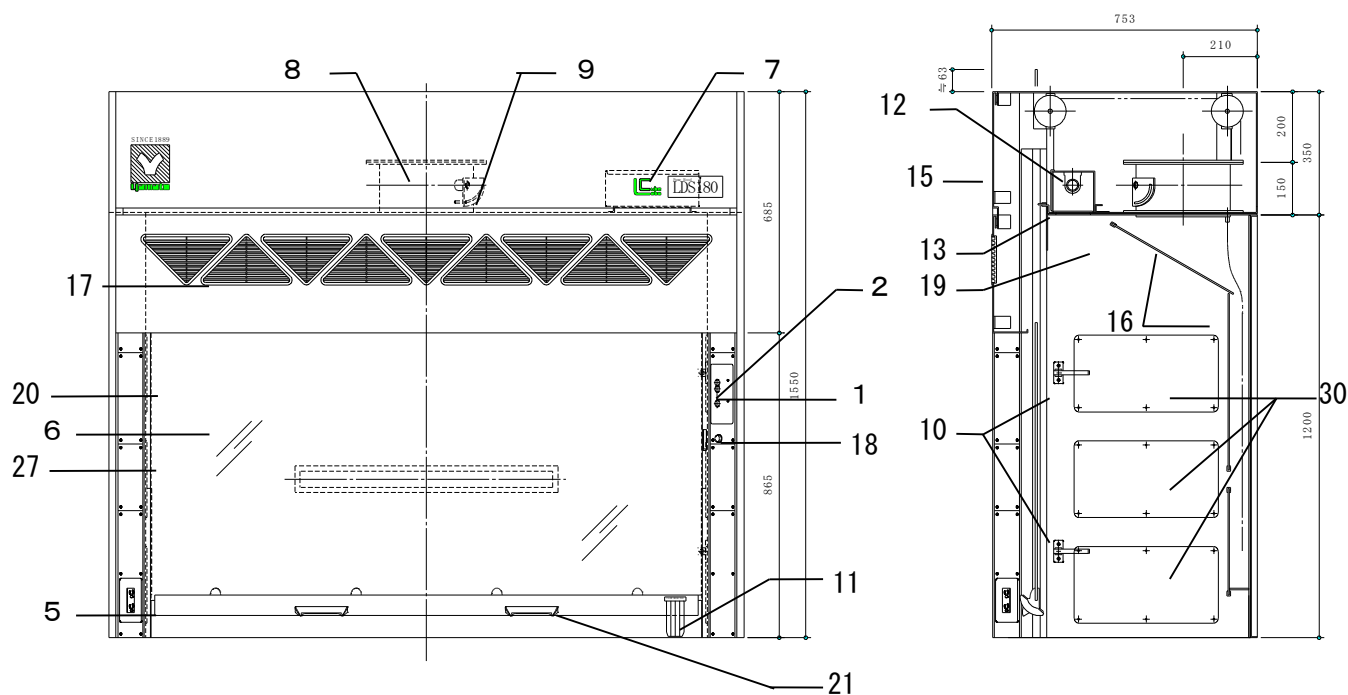
3. Part Names and Functions

LDS—180SA (Air curtain type)

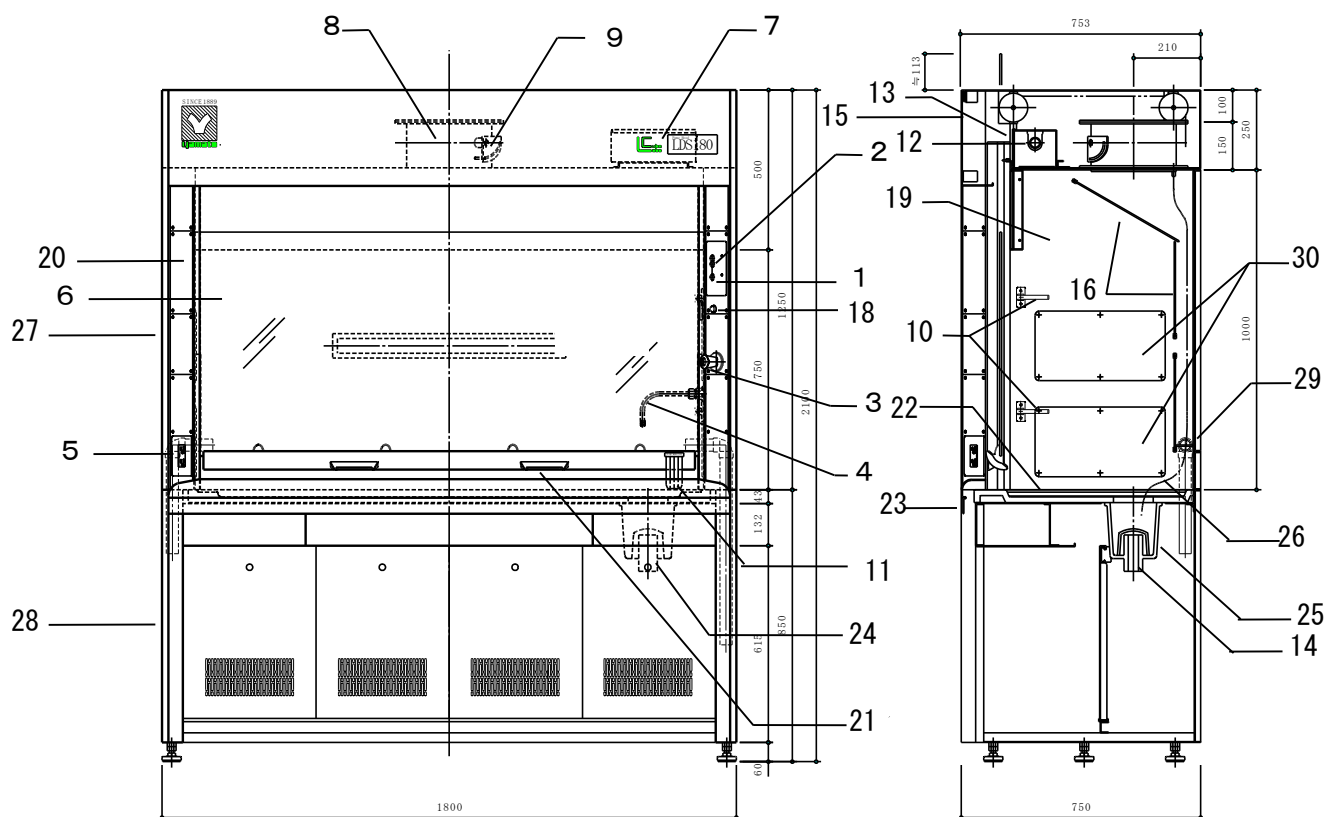


3. Part Names and Functions

LDS—180T (Desk-top type)



LDS—180SJ (Low-ceiling type)



3. Part Names and Functions

No.	Name	Function
1	Lighting Key (On/Off)	Turn on/off the fluorescent light (internal lighting)
2	Exhaust blower On/Off Key	Start or stop the ventilator “ON” start the exhaust blower “OFF” stops the exhaust blower. Generally, the ventilator stops with a delay set by the incorporated timer for discharging gas remaining in the hood.
3	Water supply remote control handle	Remote control the opening/closing of water supply tap
4	Water tap	Water outlet
5	Power outlet	Supplies electricity to appliances used in the hood.
6	Front windowpane	This is a vertical door used to adjust the area of opening. It can be held at any position.
7	Power distribution panel	It contains circuit breakers for power supply to the fume hood. Also it establishes the connection to the primary power.
8	Ventilation duct outlet	Outlet for discharging gas generated in the fume hood. A ventilation duct is connected to this part.
9	Damper handle	This handle is used to adjust the discharged air flow.
10	Door drop prevention stopper	Safety stopper which retain the windowpane in position in case of broken wire. Use in accordance with the opening extent of windowpane.
11	Exhaust blower activation monitor	The movement of feathers visualizes the condition of air discharge during the windowpane is fully closed.
12	Fluorescent light	Supplies a lighting intensity required to perform the work.
13	Fluorescent light access panel	Access panel to replace the fluorescent light.
14	Drain water connection	Connection of water drain to the primary side.
15	Front panel (upper)	This is a decorative panel. This must be removed at first, to replace the fluorescent light.
16	Baffle plate	This is a straightening vane to improve the confinement performance of hood. It is installed at the back within the fume hood.
17	Gallery	This is a by-pass opening which prevents an extreme rise in wind speed at the front opening when the front windowpane is about to be closed.
18	Door opening stopper	This stopper limits the maximum opening degree of windowpane. This can be locked with a lock (optional).
19	Interior material	This constructs the inside surface of fume hood which is exposed to experimental environments.
20	Exterior material	Material used for exterior of fume hood.
21	Sash handle	Handle to open/close the windowpane.

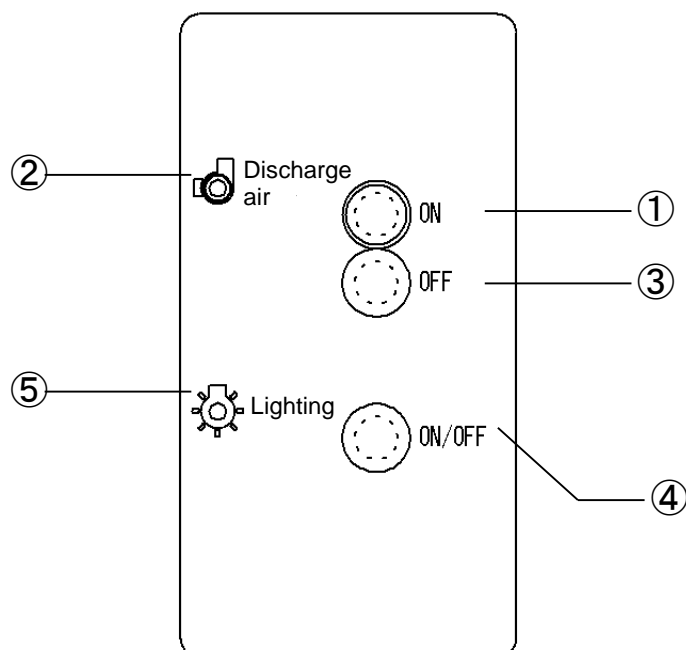
3. Part Names and Functions

No.	Name	Function
22	Working surface	Plane on which experiments are performed.
23	Air wheel	Baffle plate to prevent gas from being stuck on the working surface.
24	Spot sink	Fluid draining outlet in the hood.
25	Bell trap	Deodorization traps for fluid drain outlet.
26	Drain hose	Drain hose from discharge air duct.
27	Upper section	Hood and associated equipment.
28	Lower section	Provides connections to utilities and stowing space for the special-purpose cart.
29	Suction prevention net	This net prevents foreign objects such as pieces of paper or plastic being sucked into the duct.
30	Internal access panel	Removable access panel for checking utilities.
31	Aeration duct	Aeration duct is the drain port for air curtain. Air flow adjustment dumper is installed.

3. Part Names and Functions

Control panel

Standard ▪ Air curtain ▪ Low-ceiling panels



No.	Name	Description
1	Exhaust blower operation key (ON)	Used to start the exhaust blower
2	Exhaust blower operation lamp	Illuminates when the exhaust blower is operating. It flashes when the delay timer is operating.
3	Exhaust blower stop key (OFF)	Used to stop the exhaust blower. Generally, the ventilator stops with a delay set by the incorporated timer for discharging gas remaining in the hood.
4	Lighting key (ON/OFF)	Used to illuminate the fluorescent light. If it is pressed again, the fluorescent light turns off.
5	Lighting indication lamp	Illuminates when the fluorescent light is on.

4. How to Use

Perform the discharge air quantity adjustment before use for using this product under an appropriate condition. Refer to P. 255, "Wind speed control" for detailed adjustment procedure.

Operation Method

- ① Turn all breakers in the distribution panel to ON.
- ② The exhaust blower and fluorescent light can be controlled with keys on the control panel.
 - When the exhaust blower stop key is depressed at the end of operation of this product, the delay timer activates to continue the operation of exhaust for the predetermined time period (factory setting: 10 min; 0, 5, 10 or 30 min is selectable), in order to discharge the possible remaining gas. Even in the delay timer is in operation, it is possible to return the exhaust blower to operating mode by depressing the ventilator operation key.
 - The supply blower (air curtain type only) is interlocked with the exhaust blower. The supply blower stop switch on the side of distribution board enables stop of the supply blower only. This can be used for loading/unloading of the powder sample.
- ③ The windowpane can be opened/closed vertically.

The signs attached to the left side of windowpane and the left rail indicate the half open position which is achieved by aligning the signs as shown in Fig. 4-1. This makes it possible to use this product safer, by producing faster wind speed by using this product with opening the windowpane narrower than that. Use this product with opening the windowpane narrower than the half open position, as far as possible, except when opening than the half is required for example carrying in or out an apparatus.



Fig. 4-1

Caution

- It is recommended to replace a stopper if deformed.
- In a heat source is placed on the working surface, the door open degree must be set at 100 mm higher than the heat source.

Warning

Always set the door drop prevention stoppers for possible accidents (they can be installed to two positions depending on the height of opening).

- ④ The water tap in the hood can be opened/closed by using the remote control handle on the control panel.
- ⑤ The power outlet on the side panel provides electric power source of AC 115V 15A for apparatus.



Warning

- The power capacity of power outlet indicates the total capacity of two plugs. If the given capacity is violated, ignition may be caused.
- Take care with electric shocks from the power outlet.
An electric shock accident may take place if the power plug outlet is touched by wet hand, or a conductive material is inserted into the outlet.
- Always use an appliance with grounding terminal in its power plug.
If not grounded, ground leakage or fire may be caused.

⑥ Suction prevention net

In the lower side of baffle plate, there is a suction prevention net installed to prevent foreign objects such as pieces of paper or vinyl from being sucked. If an object is adhered to the net, stop the test temporarily and remove the object. Then, resume the test.

If an object is adhered to the net, the blockage of baffle plate tunnel makes it impossible to discharge air properly.

⑦ Gas tap (optional)

The gas tap installed within the hood can be remotely controlled with the remote handle on the control panel, provided the knob of the gas tap has been opened manually. After using this product, always close both the gas tap in the hood and the remote handle.

⑧ Door opening degree limiting stopper (option)

This stopper limits the opening height of windowpane. Usually it is used in locked condition. If the stopper is required to be disabled, for example for a work preparation, the windowpane can be opened over the maximum open degree, by unlocking the stopper. After the required work is completed, always lower the windowpane, lock the stopper in position, and take the key to the person in charge for storing.

Discharge wind speed adjustment procedure

- ① Measure the wind speed at the opening.

Start the exhaust blower with the ventilator operation key, and fully open the windowpane. Then, measure the wind speed at the center of each segment, which is derived by dividing the opening area (of windowpane) by 16*¹ as shown in Fig.4-2, with an anemometer.

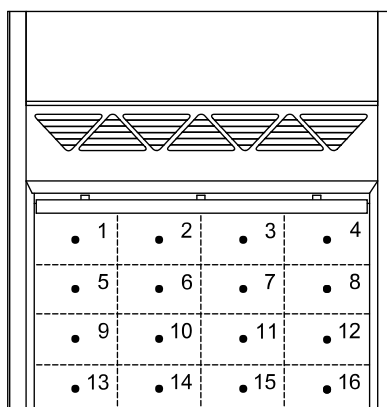


Fig 4-2

*1 For applications which must comply with “Ordinance on Prevention of Organic Solvent Poisoning” and “Ordinance on Prevention of Hazards Due to Specified Chemical Substances”, the 16-division measurement is mandatory. On the other hand, for applications other than above, the wind speed at the center of each segment which is obtained by dividing the opening area (of windowpane) in the half open position by 8 is measured.

- ② Calculate the average value of 16 measurements in accordance with the formula shown below, and compare the value with the standard discharge air quantity for applicable product type (P. 40, “Specifications”). If the values differ, align them by adjusting the damper handle at the overhead discharge air duct.

$$Q = 60 \times A \times V$$

[Formula 1]

Q: Wind quantity [m³/min]

A: Opening area [m²]

V: Wind velocity [m/s]

Air flow adjustment method (for the air curtain type only)

- ① Measure the air flow at the blow port of air curtain.

Run exhaust and fan blowers with the operation key and open the door fully. Provide a guide plate of about 100 mm at the blow port. Divide the opening into five equal portions and measure the air flow in a center of each of these portions with a wind speed indicator. (Fig.4-3)

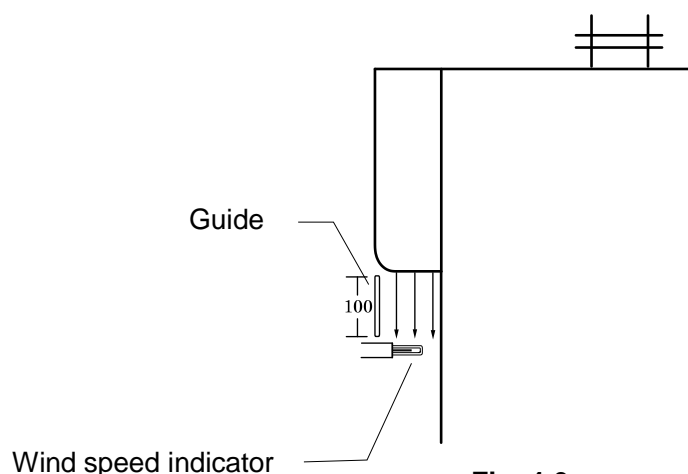


Fig. 4-3

- ② From the average of air flow values obtained from five points, calculate the air flow using [Formula 1] and compare the calculated value with the standard supply air flow (Page 41) for each type. When the air flow thus calculated deviates from the standard value, adjust it with a damper handle of the ceiling supply duct.

Replacement of fluorescent light

Replacement of fluorescent light (Standard · Desk-top · Low-ceiling types)

- ① Remove the decorative panel (upper). It can be removed by removing the screws attaching the panel, and by lifting the panel upward.
- ② Remove the screws and remove the lighting cover. There is a fluorescent light in it.
- ③ Replace the fluorescent light with new one.
- ④ Return to the original condition in the reversed order of removal as shown above.

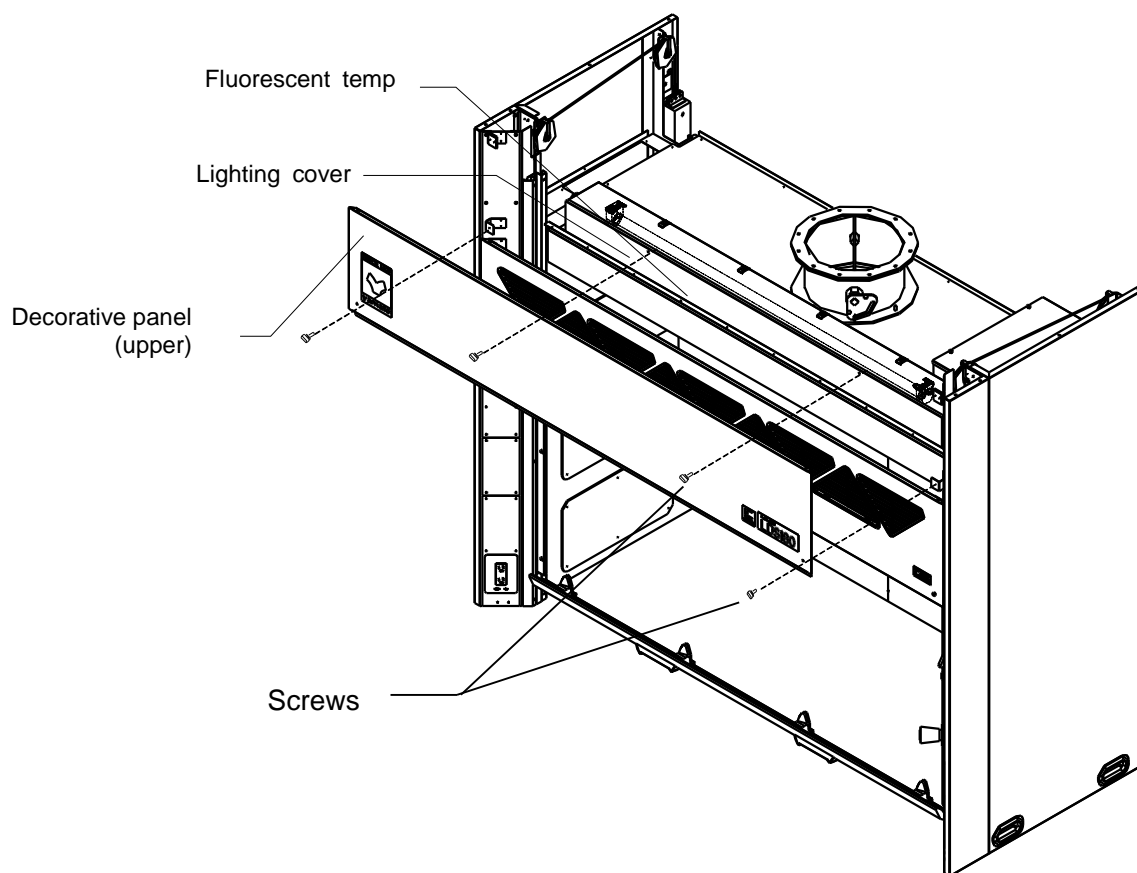


Fig. 4-4

How to install decorative panel

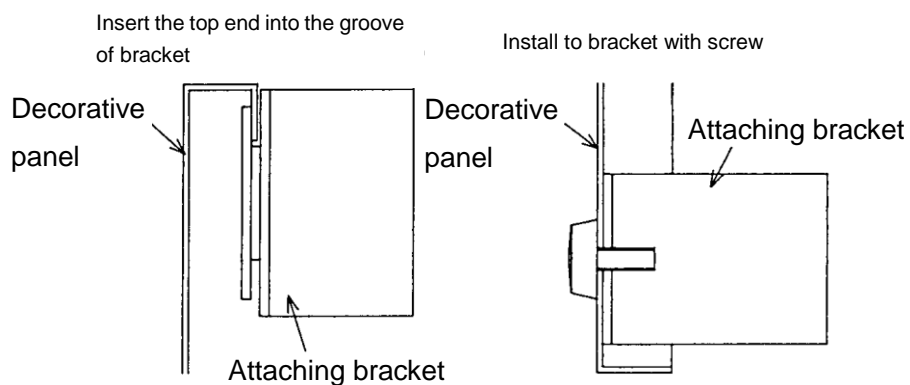


Fig. 4-5

Fluorescent light replacement method (Air curtain type)

- ① Remove screws from the fluorescent light cover in the hood ceiling. The fluorescent tube is inside the cover.
- ② Change the tube with new one.
- ③ Reverse the removal procedure after change.

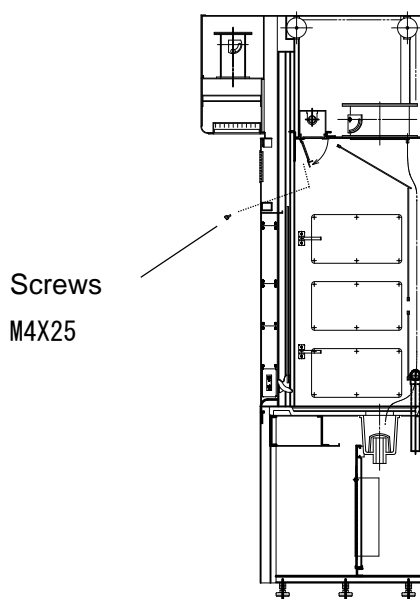


図 4-6



Warning

- Wear protection glasses, rubber gloves, protection mask, etc., when performing this work.

5. Handling Precautions

Precautions for operation

Danger

- **Do not use for living beings (especially pathogens).**
Experiments for living beings must be performed by using specially designed equipment.
- **Do not use for radioactive materials.**
Experiments handling radioactive material must be performed by using specially designed equipment.

Warning

- **Do not use perchloric acids.**
If a perchloric acid is used, the exterior and interior of this product may be corroded and the deposition may cause an explosion.
- **Do not use in a flammable or explosive gas atmosphere.**
This product is not explosion proof and therefore, may cause a fire or explosion, if an arc is generated by turning ON or OFF the electric switch.
- **Do not obstruct the baffle plate.**
If the baffle plate is blocked by a device placed in the hood, the discharged air may flow in the opposite direction because of reduced discharge air flow, or turbulence.

- Heat sources used in the hood must be limited to the extent as shown in the table below.

	Type	Heat quantity used (kcal/hr)	Equivalent	
			Gas burner	Electric heat
Front wind speed at 0.5 m/s	LDS-120	1300	1	1.5 kW
	LDS-150	2000	2	2.3 kW
	LDS-180	2400	3	2.8 kW

- Use of heat source such as burner, hotplate, etc. and experiment work should be performed at the center of hood as far as possible.
- Do not use heating devices such as burners, without operating the exhaust blower.
- Note that the controlled wind speed of this product with the windowpane fully opened does not comply with "Ordinance on Prevention of Hazards Due to Specified Chemical Substances" and "Ordinance on Prevention of Organic Solvent Poisoning".

Working surface (excluding the desk top type)

- If you want to use a heat source (such as gas burner and hot plate) on ceramitite or epoxy working surface, place the attached insulation board between working surface and heat source.
- When disposing waste liquid containing strong acid or alkaline, drain it into the spot sink directly while diluting it with water.
- Do not leave corrosive or flammable chemical on the working surface for a long time.

5. Handling Precautions

Exhaust blower

- In order for the standard ventilator mentioned in “10. Specifications (P. 41)” to achieve the standard discharge air quantity, the connecting duct must have the adequate diameter, be up to 10 m in the straight length, and have up to 3 bends and an exhaust blower at the end. If the condition is not satisfied, another ventilator must be selected.
(Straight section, bend and ventilator at the end are estimated to be our company's standard items.).

Ambient environment

- As fire-fighting measures, place water hose and/or foam extinguisher near the hood.
- Do not place any hazardous objects or obstacles near the hood.

Maintenance

- Periodically check the wires hoisting the windowpane. (Typical lifetime of wire is 3 years, but it may be shortened depending on the used condition.)
- Interior and working surface of fume hood must be periodically cleaned with water.
- If the exhaust blower is corroded or whitened, replace it with new one.
- The exhaust blower must be turned off before check.
- Refer to “9. After-the-sale Service and Guarantee (P. 366)” for detailed information.

Others



Warning

- **Take care with electric shocks from power distribution panel.**
Care should be taken not to receive an electric shock, when handling a breaker in power distribution panel to which driving power is connected.
- **Do not modify the power distribution panel.**
Modification of parts or wiring in the power distribution panel may result in failure or fire.

In case of blackout

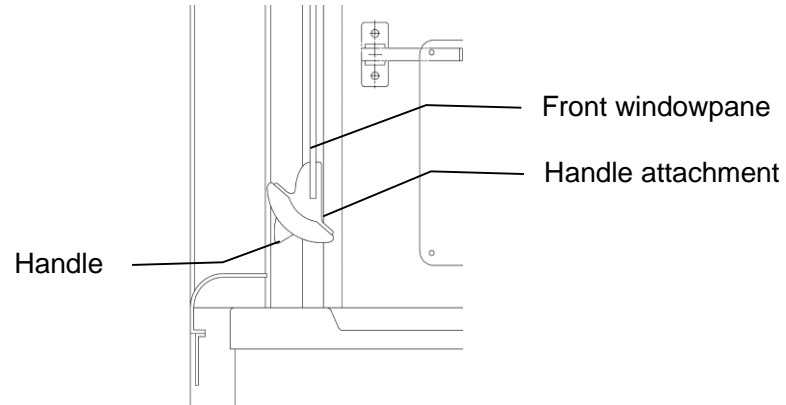
For safety purposes, this product automatically stops the operation and comes into the operation standby mode, in case of blackout. To resume the operation, turn ON the exhaust blower operation key.

5. Handling Precautions



Precautions for cleaning of handles

Handles and handle attachments on front window sash are made of ABS plastic. When cleaning them, use a mild detergent, not organic solvents. Avoid using organic solvents because they may cause damage to handles and handle attachments.



6. How to Care

Daily check/care



Warning

- Except in the case that electricity is required, always disconnect the power cord when maintenance or care for the product is performed.



Caution

Body

- Wipe out dirt with clean soft cloth which has been dampened with water and well squeezed. Do not directly apply water to any surfaces of product, or an electric shock may be caused. Do not wipe the surface using benzene, thinner or cleanser, or do not rub the surface with a brush. The paint may be damaged and rust may be caused.

Maintenance and inspection

Check of drain tube

- Periodically check the drain tube for drop-out and blockage.

Check of spot sink

- Periodically check the spot sink for blockage, and the bell trap for disconnection. If the bell trap is disconnected, gas in the drain pipe with bad smell flows in the reversed direction.

Check of exhaust blower

- Take care not to be caught by the fan belt, when repairing the exhaust blower motor and checking the fan belt.
- Always turn off the main power supply, before repairing the exhaust blower motor and replacing the fan belt.
- Do not remove the power supply cover of exhaust blower motor. If the cover is required to be removed, always turn off the main power supply in advance.

- Refer to "9. After-the-sale Service and Guarantee (P. 366)" for detailed information.

7. When not Used for a Long Time, or Disposed

When not used for a long time, or disposed

Warning

When disposed

- Do not leave the product on any place children can access.
- Remove all the driving section.
- In general, it should be disposed as an oversize trash.

Caution

When not used for a long time.

- Turn off the main power and disconnect the power plug from the outlet.

Precautions for disposal

Take care with environmental conservation of the earth.

From the standpoint of environmental conservation, dispose your fume hood so that it is to be disassembled as much as possible, and its disassembled items are segregated and disposed or recycled as much as possible. The major components of this product and their materials are as shown below:

Major component	Material
Major component of body	
Exterior	Steel plate, epoxy polyester plastic paint, stainless steel (SUS304)
Interior	General-purpose type: Non-asbestos special board (fire-proof melamine resin decorative glass fiber reinforced board) U type: Stainless steel plate SUS304
Absorption tower	General-purpose type: Hard vinyl chloride U type: Stainless steel plate SUS304
Absorbent	Activated charcoal (k), Chemical absorbent (A2, E2, F, 02)
Windowpane	Tempered glass
Handles, gallery	ABS plastic
Working surface	S: Ceramitite (Large size ceramic plate), E: Epoxy resin, K: Ceramic steel plate (stainless steel + ceramic), L: Stainless steel
Seal	Synthetic resin
Major component of electric system	
Switches, relays	Plastic, copper and other materials (combined)
Circuit boards	Glass fiber and others (combined)
Power cord	Synthetic rubber sheath, copper, nickel and others (combined)
Wiring	Glass fiber, fire resistant vinyl, copper, nickel and others (combined)

8. Troubleshooting

Fault diagnosis

Symptom	Cause	Remedy
Pilot lamp does not turn on, and the exhaust blower does not run	Main power is not turned on	Turn on the main power
	Defective exhaust blower key switch	Replace the key and circuit board as an assembly
	Discontinued wire	Re-connect the discontinuity
Pilot lamp turns on, but exhaust blower does not run	The breaker does not turn on	Turn the breaker on
	Defective magnetic contactor	Replace the magnetic contactor
	Thermal relay tripped	Eliminate the cause of broken bearing, or broken belt, and reset the thermal relay
	Defective thermal relay	Replace the thermal relay
	Defective motor	Replace or repair the motor
	Discontinued wire	Re-connect the discontinuity
Exhaust blower develops the running sound, but not operating	Defective motor	Replace or repair the motor
	Open-phase operation of motor	<ul style="list-style-type: none"> • Check that the power supply connection is single phase • Check there is a discontinuity in the wiring
Large noise from exhaust blower	Foreign object in exhaust blower	Remove the foreign object
	Runner contacts with casing	Repair the exhaust blower
	Run-off of runner axis	Repair the exhaust blower
	Loosened shaft stopper	Re-tighten
	Defective motor	Replace or repair the motor
Reduced air flow	Low voltage	Check power supply. Check wiring connections, and repair if a poor contact exists.
	Reversed rotating direction of exhaust blower	Replace two of three wires of exhaust blower each other
	Unexpected resistance in the duct system	Check the duct system, and remove the cause of unexpected resistance
	Defective motor	Replace or repair the motor
Large vibrations	Run-off of exhaust blower runner	Repair the exhaust blower
	Loosened exhaust blower attaching screw	Re-tighten

8. Troubleshooting

Fault diagnosis

Symptom	Cause	Remedy
Breaker for motor trips in a short time	Short circuit	Detect the location of short-circuit, and rewire
	Overload operation	Remove the cause of overload
	Defective motor	Replace or repair the motor
Too large moving friction of windowpane	Insufficient lubrication of pulley	Apply grease to the pulley and guide rail
	Wire is off its pulley	Engage the wire into groove of pulley
	Broken balance weight wire	Replace the wire
Reduced discharged air quantity	Clogged pre-filter	Clean or replace the pre-filter
	Clogged part filter	Replace the part filter
	Drift of volume damper angle	Re-adjust the volume damper
	Reduced air flow caused by increased pressure loss due to built-up of particles in the duct	● Clean the inside of duct to remove particles
	Outside air enters the duct because of broken fan duct or loosened attaching bolt	● Repair the broken section ● Re-tighten the bolt and insert a spring washer
	Defective exhaust blower	Repair or replace with new one
Fluorescent light does not illuminate	The breaker does not turn on	Turn the breaker on
	Deteriorated fluorescent light	Replace the fluorescent light
No electricity to the outlet	The breaker does not turn on	Turn the breaker on
	Discontinued wire	Re-connect the discontinuity
Exhaust blower does not stop when the stop key is pushed	The delay timer is activating	It stops when the predetermined time interval elapses, because the delay timer is activating
	Defective key	Replace the key and circuit board as an assembly

9. After-the-Sale Service and Guarantee

When requesting a repair

When requesting a repair

If a fault should take place, immediately stop the operation, turn off the main power switch, withdraw the power plug (cord), and contact your dealer or Yamato Scientific's office.

Information to be notified

- Type name of product
 - Manufacturing number
 - Date of buy out
 - Detail of defect (precisely as possible)
- } Refer to the guarantee booklet or the nameplate attached to this product

Please show the guarantee booklet when our field technician visits your place.

Guarantee booklet (attached separately)

- The guarantee booklet is sent to you from your dealer or Yamato Scientific's office. Check the entries such as name of dealer and date of purchase, and save it with caution.
- The period of guarantee is one year from the date of purchase. In accordance with the term of guarantee booklet, the product in question shall be repaired or replaced at no charge.
- Contact your dealer or Yamato Scientific's office, if you want to repair your product after the period of guarantee is expired. If the repair is practical to maintain the required functions, we could repair the product for pay on your request.

Relocation

Warning

- Be sure to contact your dealer or our office before relocation, because it requires expert skills. In such a case, the cost required for the relocation is charged to the demandant.

Minimum holding time of repair part

- The minimum holding period of repair parts for this product is 7 years after discontinuance. Here, the term "repair parts" is defined as parts required to maintain the functions and performances of this product.

9. After-the-Sale Service and Guarantee

Recommendation - maintenance/inspection contract of fume hood

Depending on the operational condition, a fume hood may be deteriorated, or its performance may be degraded by fouling.

In order to use your fume hood safely, periodic maintenance activities performed by an expert service person is required as well as daily care done by your own.

We strongly recommend you to set up a paid maintenance contract for your fume hood with us, when you purchase.

Refer to the table shown below for check items and intervals of standard maintenance check and periodic inspection for your convenience.

For detailed information, consult your dealer or our office.

◆ Summary of maintenance/check items and intervals

Category	Maintenance/check item	Description	Interval
Performance	Discharge function	Front wind speed measurement	1 yr
External view	Exterior	Damage, corrosion, dirt	1 yr
	Fluorescent light	Illumination, flickering	1 yr
	Baffle plate	Damage, corrosion, dirt	1 yr
	Working surface	Damage, corrosion, dirt	1 yr
	Front windowpane mechanism	Open/close, corrosion, damage	1 yr
	Circuit boards	Corrosion, damage, deterioration	1 yr
	Operation indication	Corrosion, damage, deterioration	1 yr
Piping system	Gas tap, piping	Gas leak, corrosion, damage, deterioration	1 yr
	Water tap, piping	Water leak, corrosion, damage, deterioration	1 yr
Ventilator fan	Belt, bearing etc.	Wear damage, corrosion, dirt	1 yr
Duct	Outside surface, damper, etc.	Damage, corrosion, loosened connection, etc.	1 yr

9. After-the-Sale Service and Guarantee

◆ Consumable parts and replacement parts - Check and maintenance interval

Major component		Check interval	Maintenance interval [Replacement/repair]
Electric	Fluorescent light	1 yr	1 yr
Mechanical part	Windowpane wire	1 yr	3 yr
	Baffle plate	1 yr	3 yr
	Water tap packing (19 mm)	1 yr	3 yr
	Water tap	1 yr	3 yr
	Insulator board	1 yr	3 yr
	Exhaust blower activation monitor	1 yr	3 yr
	Door drop prevention stopper	1 yr	3 yr

Note 1: Each maintenance interval does not mean the warranty period.

Note 2: This table only describes major parts.

Note 3: Maintenance interval is a guideline of time period between replacements required to use the product safely for a long time.

Utilize these values for safe and appropriate operation (for example, estimation of maintenance check costs).

9. After-the-Sale Service and Guarantee

Periodic self check in accordance with Industrial Safety and Health Law

This fume hood is categorized as enclosed type of local exhaust ventilation system, which requires the following maintenance items for disasters prevention.

In addition, in accordance with related rules, such as “Ordinance on Prevention of Hazards Due to Specified Chemical Substances”, “Ordinance on Prevention of Organic Solvent Poisoning”, “Ordinance on Prevention of Lead Poisoning” and “Ordinance on Prevention of Hazards Due to Dust”, employers are mandated to perform periodic self checks once a year.

For detailed information, refer to Industrial Safety and Health Law of Japan.

If these rules are not applicable to your fume hood, we recommend you to perform periodic self checks by using the table below as a reference.

We also provide periodic self check services (charged). Consult your dealer or one of our company’s offices, if interested.

No.	Location	Check Item
1	Hood	(1) Condition such as wear, corrosion, and dent
		(2) Condition of suction air flow and existence of obstacle
2	Duct	(1) Condition of external surface such as wear, corrosion, and dent
		(2) Condition of internal surface, such as wear, corrosion, and built-up of particles
		(3) Condition of damper
		(4) Loosened connection
		(5) Condition of access opening
3	Fan/motor	(1) Condition of casing surface
		(2) Condition of casing inside surface, impeller and guide vane, including particles accumulation
		(3) Condition of belt
		(4) Rotational direction of fan
		(5) Condition of bearings including lubrication condition
		(6) Condition of motor
		(7) Condition of safety cover and its installation points
		(8) Condition of control panel
		(9) Discharge air quantity of fan
4	Exhaust ventilation capacity	(1) Controlled wind speed
		(2) Restricted concentration

10. Specifications

Specification of Main Body(Standard, air curtain, desk-top, and low-ceiling types)

Type		LDS－120	LDS－150	LDS－180
Equipment	Water tap	One-way water tap: 1 pcs (Epoxy work surface, width 1800 mm: 2 pcs)		
	Power outlet	1 phase AC 115V 15A with dual grounding (drop out prevention) 1 pcs		
	Fluorescent light	1 phase AC 100 V 32W 1 pcs		Fluorescent light
Exhaust	Ventilation duct outlet	PVC ID Φ261 mm, OD Φ267 mm Connected by mating flanges		
	Applicable duct	PVC ID Φ261 mm, OD Φ267 mm		
Water supply		Nominal 1/2B, Flexible tube secured with male/female thread		
Drain port	Ceromitite	Ceromitite: OD Φ50 mm, ID Φ34 mm		
	Epoxy	Epoxy: OD Φ50 mm, ID Φ30 mm		
	Ceramic steel plate	Epoxy: OD Φ50 mm, ID Φ30 mm		
Material	Exterior	Cold rolled steel plate (SPCC), chemical-proof powder coating, with adjuster		
	Interior	Non-asbestos special board (fire-resistant melamine resin, decorative) (Baffle plate: Multi-slit type)		
	Windowpane	Temper glass 6 mm Vertical open/close balance weight type		
	Working surface *1	LDS-□□□S: Ceromitite		
		LDS-□□□E:Epoxy		
		LDS-□□□K: Ceramic steel plate		
Safety device		(1) Door drop prevention stopper (upper/lower 2 places each) (2) Ventilator delay timer (factory set 10 min, setting changeable to 0, 5, 10, and 30 min) (3) Exhaust blower activation monitor (4) Suction prevention net (5) Door opening degree label		
Accessories		Instruction manual, touch-up paint, Warranty card		
Applicable exhaust blower		Type : YCB-101、Motor : 3-phase 200V 0.4kW		
Option	Gas	Nominal 1/2B, Flexible tube secured with male/female thread		
	Door opening stopper	Hard vinyl chloride, with lock		
Temperature/humidity on installation site		5 - 35 °C, 20 - 80% (no condensation)		
*1. This is not provided to the desk-top type.				

10. Specifications

Individual specification for standard type

item \ Type	LDS-120	LDS-150	LDS-180
Standard discharge air quantity m ³ /min	12	16	19
Static pressure within the machine Pa (mmH ₂ O)	30(3)	59(6)	79(8)
External dimensions WxDxH (mm)	1200x750x2400	1500x750x2400	1800x750x2400
Weight (Approx. kg)	290	330	370

Individual specification for air curtain type

item \ Type	LDS-120A	LDS-150A	LDS-180A
Standard discharge air quantity m ³ /min	12	16	19
Static pressure within the machine Pa (mmH ₂ O)	30(3)	59(6)	79(8)
Air flow(m ³ /min)	8.4	11.2	13.3
Air flow pressure within the machine Pa (mmH ₂ O) Pa(mmH ₂ O)	20(2)	35(3.6)	49(5)
Air flow duct	Each duct PVC with ID 400 mm OD 100 mm Connected with a half flange		
Applicable air supply duct	PVC with ID 211 mm OD 216 mm		
External dimensions WxDxH (mm)	1200x750/1020 x2600	1500x750/1020 x2600	1800x750/1020 x2600
Weight (Approx. kg)	340	380	440

Individual specification for desk-top type

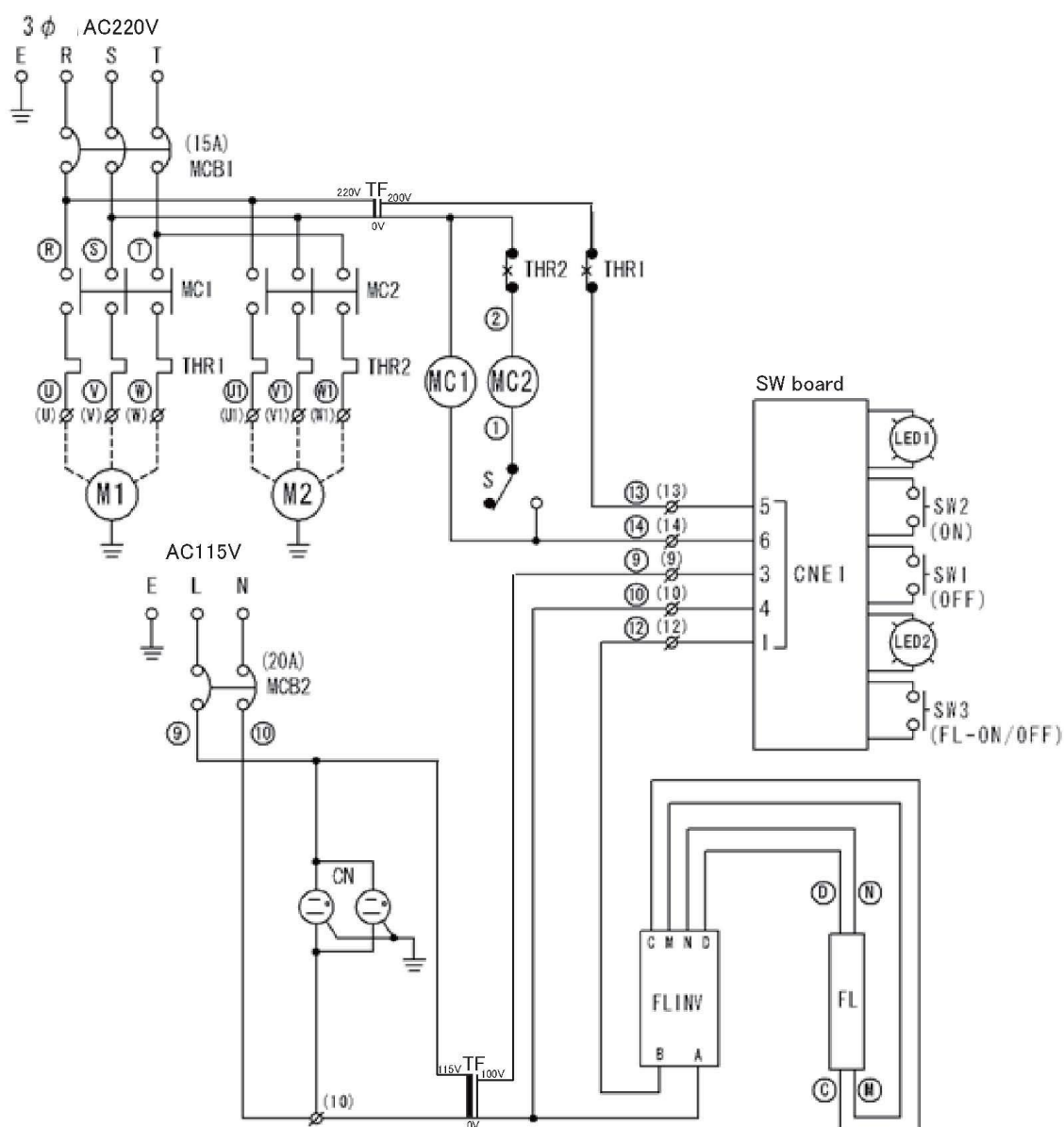
item \ Type	LDS-120T	LDS-150T	LDS-180T
Standard discharge air quantity m ³ /min	12	16	19
Static pressure within the machine Pa (mmH ₂ O)	30(3)	59(6)	79(8)
External dimensions WxDxH (mm)	1200x750 x1550	1500x750 x1550	1800x750 x1550
Weight (Approx. kg)	130	150	170

Individual specification for low-ceiling type

item \ Type	LDS-120J	LDS-150J	LDS-180J
Standard discharge air quantity m ³ /min	10	13	16
Static pressure within the machine Pa (mmH ₂ O)	25(2.5)	39(4)	59(6)
External dimensions WxDxH (mm)	1200x750x2100	1500x750x2100	1800x750x2100
Weight (Approx. kg)	280	320	360

11. Wiring Diagram

No provided non-standard accessories
(Standard, air curtain, desk-top, and low-ceiling types)



※ M2, MC2, THR and S are provided only to the air-curtain model.

Symbol	Part name	Symbol	Part name
MCB1	Circuit breaker	LED1	Exhaust blower lamp
MCB2	Circuit breaker	LED2	Fluorescent light
MC1	Magnetic contactor	CN	Power outlet
MC2	Magnetic contactor	FL	Fluorescent light
THR1	Thermal relay	FLINV	Inverter ballast
THR2	Thermal relay	M1	Exhaust blower
SW1	Exhaust blower stop key	M2	Supply blower
SW2	Exhaust blower operation key	S	Supply blower stop switch
SW3	Fluorescent light key		

12. List of Hazardous Materials



Special care must be taken when handling explosive materials, flammable materials, and substances which contain explosive and/or flammable materials in this product.

Explosive material	Explosive substance	(1) Nitroglycol, nitroglycerin nitrocellulose, and other explosive nitric esters
		(2) Trinitrobenzene, trinitrotoluene, picric acid and other explosive nitro-compounds
		(3) Peracetic acid, methyl ethyl ketone peroxide, benzoyl peroxide and other organic peroxides
Flammable material	Combustible substance	Metallic "lithium", Metallic "Potassium", Metallic "Sodium", Yellow phosphorus, Phosphorous sulfide, Red phosphorous, Celluloids, Calcium carbide (alias carbide), Calcium phosphide, Magnesium powder, Aluminum powder, Metallic powders other than magnesium powder and aluminum powder, Sodium dithionite (alias hydrosulfite)
	Oxidizing Substance	(1) Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates
		(2) Potassium perchlorate, sodium perchlorate, ammonium perchlorate and other perchlorates
		(3) Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides
		(4) Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates
		(5) Sodium chlorite and other chlorites
		(6) Calcium hypochlorite and other hypochlorites
	Inflammable Substance	(1) Ethyl ether, gasoline, acetaldehyde, propylene oxide, carbon disulfide, and other substances having a flash point lower than - 30°C
		(2) n-Hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone, and other substances having a flash point of - 30°C or higher to lower than 0°C)
		(3) Methanol, ethanol, xylene, n-pentyl acetate (alias n-amyl acetate), and other substances having a flash point of 0°C or higher to lower than 30°C
		(4) Kerosene, light oil, turpentine oil, isopenthyl alcohol (alias isoamyl alcohol), acetic acid, and other substances having a flash point of 30°C or higher to lower than 65°C
	Flammable	Hydrogen, acetylene ethylene, methane ethane, propane, butane and other flammable substances which is in gas state at 15°C under 1 atm.

(From Enforcement Order of the Industrial Safety and Health Act, Attached Table 1)

13. List of Spare Parts

Mechanical part

No	Part name	Specification	Manufacturer
—	Windowpane wire	LDS18-40450	Yamato Scientific
16	Baffle plate	間口 1200、1500、1800 別	Yamato Scientific
—	Water tap packing (19 mm)	0724	Kakudai
4	Water tap	LDS18-30350	Yamato Scientific
—	Insulator board	LDS18-42670	Yamato Scientific
11	Exhaust blower activation monitor	LT00017848	Yamato Scientific
10		KT180-40600	Yamato Scientific

Refer to “3. Part Names and Functions (P. 17)” for numbers

Electric part

Symbol	Part name		Specification	Manufacturer
MCB1	Breaker (200V 15A)		BBW315	Panasonic
MCB2	Breaker (100V 20A)		BS2022	Panasonic
CN	Power outlet		WN1162	Panasonic
MC1,2 + THR1,2	Magnetic contactor		SC13ZAN-21022D 0.4kw	Fuji Electric
—	Terminal block		TB-20C(16P)	Sakazume
S	Supply blower stop switch		WD1111F	Panasonic
FLINV	Inverter Ballast	120 and 150 types	FTN32	Mitsubishi Electric
		180 type	FTN40	Mitsubishi Electric
FL	Fluorescent light	120 and 150 types	FL32S・W(32W)	—
		180 type	FL40S・W(40W)	—
—	SW circuit board		LT00030253	Yamato Scientific

14. Standard Installation Manual

Install the product in accordance with the items shown below. (Confirm optional accessories and customized items in an independent manner.)

Type	Manufacturing number	Date	Installation company	Person in charge	Judge

No.	Item	Procedure	Content No./ Referenced Page of OM	Judge
Specifications				
1	Type, accessory	<ul style="list-style-type: none"> Confirm the specification by type Quantity check based on accessory column 	2. Before Use P.8 11. Specifications P.40	
2	Installation	<ul style="list-style-type: none"> Visual check of ambient condition Note: Be care with ambient condition Keep space 	1. Safety Precautions P.7	
3	Connection work	<ul style="list-style-type: none"> Electric, water, gas, drain, duct 	2. Before Use P.15 • Utility connection work	
Action				
1	Power source voltage	<ul style="list-style-type: none"> Measure the customer side voltage (Power distribution panel, power outlet, etc.) with multimeter Voltage measurement in operation (Must be within the specification) Note: Use applicable items when installed to plugs and breakers 	1. Before Use P.9 • Always connect... 11. Specifications P.40 • Specification - power supply	
2	Start operation	<ul style="list-style-type: none"> Start the operation 	4. How to Use P.23	
3	Air quantity adjustment	<ul style="list-style-type: none"> Adjust the discharge air quantity 	4. How to Use P.25 11. Specifications P.41	
Description				
1	Description of operation	Describe how to operate the product in accordance with Owner's manual	4. How to Use P.2 • Operating procedure 3 1. Safety Precautions P.1 - 13. List of Hazardous Materials	
2	Fault indication	Describe the fault indication contents and how to cancel the indication	9. Troubleshooting - 10. After-the-Sale Service and Guarantee P.34	
3	Maintenance and inspection	Describe how to operate the product in accordance with Owner's manual	7. How to Care P.32 • Daily check/care	
4	Complete installation Entries	<ul style="list-style-type: none"> Fill in the date of installation and installer on the nameplate on the body Fill required information in the guarantee booklet and hand over the booklet to the customer Describe the after-the-sales service 	10. After-the-Sale Service and Guarantee P.366	

15. Memorandum - Product Manufacturer and Connection Work Vendor

For maintenance work after delivery, please fill in the items shown in the table below.

Note that your fume hood cannot accomplish its designed performance without exhaust blower, duct, supply water, drain water and electricity connected. Moreover, remember that periodic maintenance is mandatory to keep your fume hood in a good condition.

It is often the case that associate work vendors will become unknown in the process of time.

To facilitate maintenance activities after delivery, please note the product manufacturer and work vendors in the form shown below.

Category	Item name	Manufacturer/Vendor	Type	Delivery/work data (YYYY/MM/DD)
Product	Fume Hood	Yamato Scientific	LDS-	
Product	Exhaust blower			
Work	Exhaust duct outlet			
Work	Water supply			
Work	Drain water			
Work	Electricity			
Work	Gas			

Responsibility

This product must be used in accordance with this manual.

Yamato Scientific Co., Ltd. does not bear any responsibility for an accident or trouble caused by deviation from the content of this manual.

Do not perform any action which is prohibited in this manual, or, unexpected accidents or troubles may be caused.

Notice

- **The content of this manual may be changed without prior notice**
- **We will replace the manual if it has a manufacturing defect.**
- **There are minor differences in illustrations of products and menu displays between this manual and actual.**

Instruction Manual

Fume Hood (Standard, Air curtain, Desk-top, and Low-ceiling types)

LDS

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