



Forced Convection Constant Temperature Oven

DKV400/600/610/810/910 Series Instruction Manual - Structure -

Second Edition

Thank you for choosing a product of Yamato Scientific Co., Ltd.

For proper equipment operation, please read this instruction manual thoroughly before use. Always keep equipment documentation safe and close at hand for convenient future reference.



The warnings given in the instruction manual are important for the safe use of the product. Please read carefully and familiarize yourself with the product before use.

Yamato Scientific Co. Ltd.

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INTRODUCTION

- Please note that this product has different models for different destinations, with different product specifications and available options. The model is noted separately where it differs from model to model.
- Contact information differs for each destination. Refer to “13. CONTACT DETAILS (p. 34)”.

DKV400 series	Power Specifications	Power Cable	Destination	Language	Warranty
DKV400	100 V $\pm$ 5% 14 A 50/60 Hz	Type A plug (PSE)	Japan	Japanese	Included
DKV400-Y	115 V $\pm$ 5% 13.5 A 50/60 Hz	Type A plug (UL/CSA)	America Asia Others (Except China)	English	— (Note 1)
DKV410-Y	220 V $\pm$ 5% 7.5 A 50/60 Hz	Round terminal (UL/CSA)			

DKV600/610 series	Power Specifications	Power Cable	Destination	Language	Warranty
DKV600	100 V $\pm$ 5% 14 A 50/60 Hz	Type A plug (PSE)	Japan	Japanese	Included
DKV610	200 V $\pm$ 5% 8 A 50/60 Hz	Round terminal (UL/CSA)			
DKV600-Y	115 V $\pm$ 5% 13.5 A 50/60 Hz	Type A plug (UL/CSA)	America Asia Others (Except China)	English	— (Note 1)
DKV610-Y	220 V $\pm$ 5% 7.5 A 50/60 Hz	Round terminal (UL/CSA)			

DKV810 series	Power Specifications	Power Cable	Destination	Language	Warranty
DKV810	200 V $\pm$ 5% 13 A 50/60 Hz	Round terminal (UL/CSA)	Japan	Japanese	Included
DKV810-Y	220 V $\pm$ 5% 12 A 50/60 Hz		America Asia Others (Except China)	English	— (Note 1)

DKV910 series	Power Specifications	Power Cable	Destination	Language	Warranty
DKV910	200 V $\pm$ 5% 15.5 A 50/60 Hz	Round terminal (UL/CSA)	Japan	Japanese	Included
DKV910-Y	220 V $\pm$ 5% 14.5 A 50/60 Hz		America Asia Others (Except China)	English	— (Note 1)

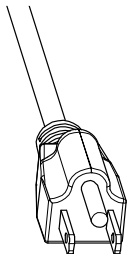
Note 1: Warranty will be included in some regions.

If you do not know the model, check the caution rating sticker on the right side of the product. For details on where to affix the sticker, refer to “2. COMPONENT NAMES AND FUNCTIONS (p. 10)”.

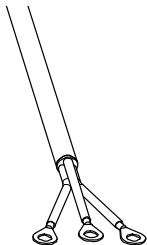
Power cord

*Cord specifications and plug shape differ depending on the model.

Power cable plug shape list



Type A



M4 round terminal

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1. SAFETY PRECAUTIONS

Explanation of Symbols

A Word Regarding Symbols

Various symbols are provided throughout this text and on equipment to ensure safe operation. Failure to comprehend the operational hazards and risks associated with these symbols may lead to adverse results as explained below. Become thoroughly familiar with all symbols and their meanings by carefully reading the following text regarding symbols before proceeding

 **Warning** Signifies a situation which may result in serious injury or death (Note 1.)

 **Caution** Signifies a situation which may result in minor injury (Note 2) and/or property damage (Note 3.)

(Note 1) Serious injury is defined as bodily wounds, electrocution, bone breaks/fractures or poisoning, which may cause debilitation requiring extended hospitalization and/or outpatient treatment.

(Note 2) Minor injury is defined as bodily wounds or electrocution, which will not require extended hospitalization or outpatient treatment.

(Note 3) Property damage is defined as damage to facilities, equipment, buildings or other property.

Symbol Meanings

 Signifies warning or caution.
Specific explanation will follow symbol.

 Signifies restriction.
Specific restrictions will follow symbol.

 Signifies an action or actions which operator must undertake.
Specific instructions will follow symbol.

1. SAFETY PRECAUTIONS

Symbol Glossary

WARNING / CAUTION



General



Danger!:
High Voltage



Danger!:
High Temperature



Danger!:
Moving Parts



Danger!:
Blast Hazard



Caution:
Shock Hazard!



Caution:
Burn Hazard!

Restriction



General
Restriction



No Open Flame



Do Not
Disassemble



Do Not Touch

ACTION



General Action
Required



Connect Ground
Wire



Level Installation



Disconnect Power



Inspect Regularly

1. SAFETY PRECAUTIONS

Residual Risk Map

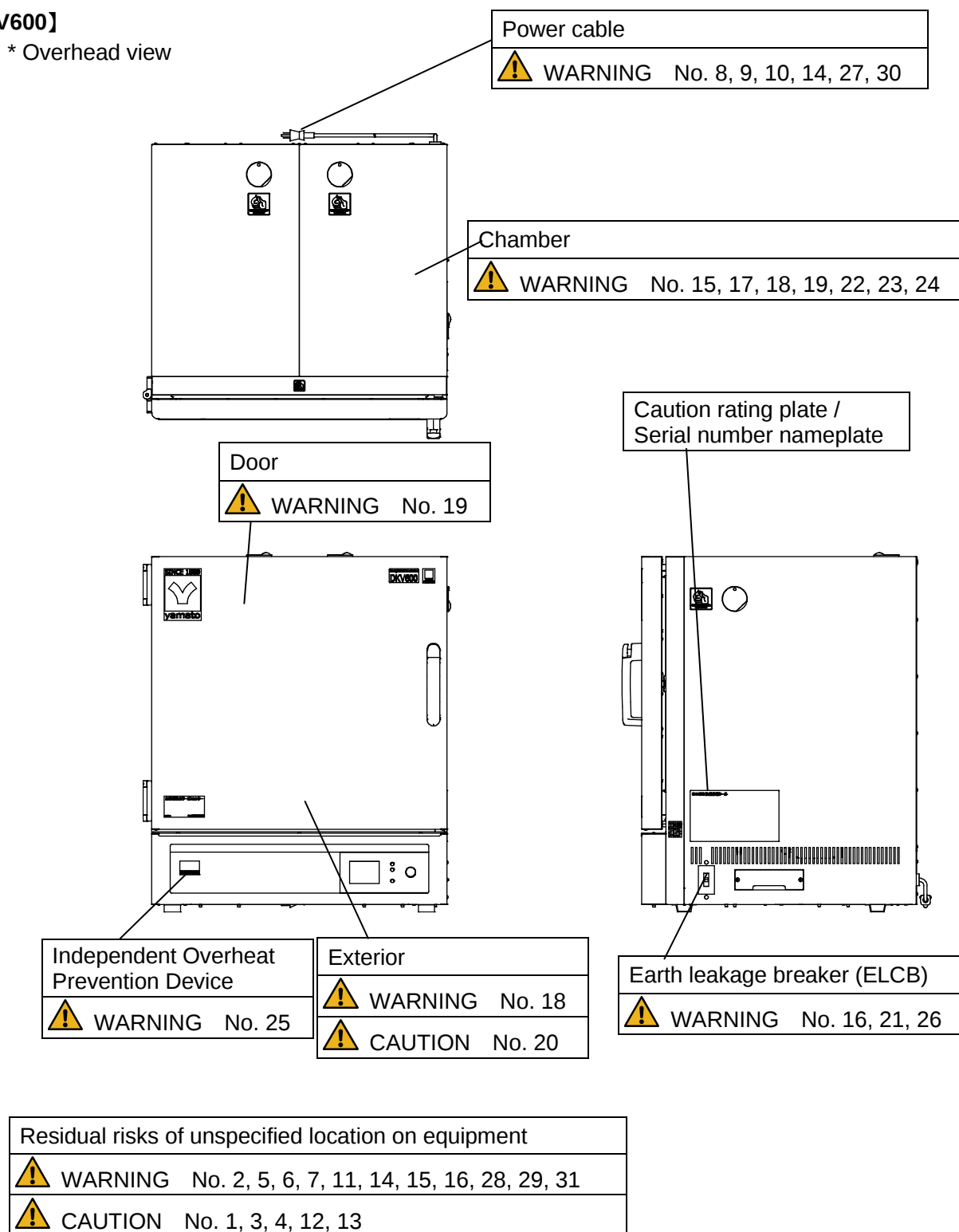
These figures indicate positions of caution labels.

The numbers shown in the figure indicate the numbers listed in the "List of Residual Risks" in this manual.

For details of individual residual risks, see the List of Residual Risks.

[DKV600]

* Overhead view



* Contact original dealer of purchase if the nameplates and caution labels have come off or become illegible. New nameplates are available at cost.

1. SAFETY PRECAUTIONS

Residual Risk List

List of residual risks (instructions for risk avoidance)

This list summarizes residual risks to avoid personal injuries or damages to properties during or related to the use of equipment.

Be sure to fully understand or receive instructions on how to use, maintain and inspect equipment before starting operation.

Loading/Installation			
No.	Degree of risks	Risk description	Protective measures taken by the user
1	CAUTION	Injury	Use cargo-handling equipment to move or install unit. When performing manual labor, transport the unit with at least two persons and appropriate work methods.
2	WARNING	Fire/Electric shock	Choose an appropriate installation site.
3	CAUTION	Injury	Install unit on a level surface.
4	CAUTION	Injury	Take appropriate safety measures when installing.
5	WARNING	Fire	Install equipment in a well-ventilated place.
6	WARNING	Fire/Electric shock	Not for use in areas where liquids are splashed.
7	WARNING	Explosion/fire	Install in a location free of flammables and explosives.
8	WARNING	Fire/Electric shock	Always connect power cable to appropriate facility outlet or terminal.
9	WARNING	Fire/Electric shock	Handle power cable with care.
10	WARNING	Fire/Electric shock	Ground wire MUST be connected properly.
11	WARNING	Fire/Electric shock	DO NOT disassemble or modify equipment.
12	WARNING	Injury	Use optional stacking hardware for double stacking.
13	CAUTION	Fire	Install equipment in a well-ventilated place

1. SAFETY PRECAUTIONS

Residual Risk List

Use			
No.	Degree of risks	Risk description	Protective measures taken by the user
14	WARNING	Explosion/fire	DO NOT process explosive or flammable substances.
15	WARNING	Fire	When using resin containers for processing, use caution not to exceed their heat-resistant temperature.
16	WARNING	Fire/Electric shock	Turn OFF (○) ELCB immediately when an abnormality occurs.
17	WARNING	Fire / electric shock / burn	Take care not to drop test samples or objects into the inside unit.
18	WARNING	Burn	DO NOT touch hot surfaces.
19	WARNING	Fire / Burn	Carefully handle test samples following high temperature operation.
20	CAUTION	Injury	DO NOT climb or place any objects on top of equipment.
21	WARNING	Fire	Do not use equipment during a thunderstorm and turn off the breaker.
22	WARNING	Fire / Burn	Carefully handle test samples.
23	WARNING	Leak Current / Burn	When processing wet samples, remove as much of the moisture as possible beforehand, and open the exhaust port.
24	WARNING	Burn/Injury/Fire	DO NOT place samples exceeding 15 kg on a single shelf. Also, be careful not to overfill the sample and leave a space of at least 30% of the shelf area.
25	WARNING	Fire	Set the independent overheat prevention device activation temperature.

Daily inspection/maintenance			
No.	Degree of risks	Risk description	Protective measures taken by the user
26	WARNING	Fire/Electric shock	Inspect earth leakage breaker on a regular basis.
27	WARNING	Fire/Electric shock	Disconnect the power plug or power terminal when inspecting and cleaning the unit.
28	WARNING	Burn	Perform inspections and maintenance when unit is at room temperature.
29	WARNING	Fire/Electric shock	DO NOT disassemble or modify equipment.

Extended storage/disposal			
No.	Degree of risks	Risk description	Protective measures taken by the user
30	WARNING	Fire/Electric shock	Turn the breaker OFF (○) and disconnect the power plug or power terminal.
31	CAUTION	Injury	Do not leave unit in a location where children may have access.

1. SAFETY PRECAUTIONS

Warnings and Cautions



WARNING



Install in a location free of flammables and explosives.

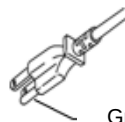


Never install or operate unit in a flammable or explosive gas atmosphere. Unit is NOT fire or blast resistant. Simply switching earth leakage circuit breaker (ELCB) "ON" or "OFF" can produce a spark, which can then be relayed during operation, causing fire or explosion when near flammable or explosive fluids, chemicals or gases/fumes.
See " 11. LIST OF HAZARDOUS SUBSTANCES (p. 32)" for explosive and flammable substances.



Ground wire must be connected (plug) [DKV400/400-Y/600/600-Y].

- Connect power cable to a grounded outlet in order to avoid electric shock.
 - Never insert multiple plugs into a single outlet. Doing so may result in power cable overheating, fire or drop in voltage.
- * Contact original dealer of purchase for location-specific electrical requirements.



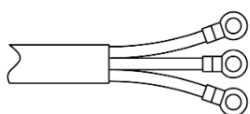
Grounding prong

Grounded plug (Type A)



Ground wire must be connected (round terminal) [DKV410-Y/610/610-Y/810/810-Y/910/910-Y].

- Securely connect to a distribution board.
 - No power plugs or connectors of any kind are included. When using a power plug, use a plug that meets the voltage and electrical capacity. (For the voltage of each model, refer to "9. SPECIFICATIONS (p. 26)".
- * Contact original dealer of purchase for location-specific electrical requirements.



White
Black
Green

Core color	Wiring on distribution board
White	Neutral
Black	Live
Green	Ground

Terminal size: $\phi 4$



Turn OFF (○) ELCB immediately when an abnormality occurs.

If unit begins emitting smoke, fire or abnormal odors for reasons unknown, turn OFF (○) ELCB immediately, disconnect power cable from power supply, and contact original dealer of purchase for assistance. Failure to do so may result in damage to components, fire or electric shock. Never attempt to disassemble or repair unit. Repairs should always be performed by a certified technician.

1. SAFETY PRECAUTIONS

Warnings and Cautions

  	Handle power cable with care. Observe the following precautions in order to prevent fire, electric shock, or other accidents. • Do not operate unit with power cable bundled or tangled. • Do not modify, bend, forcibly twist or pull-on power cable. • Do not risk damage to power cable by positioning it under desks or chairs, or by allowing it to be pinched in between objects. • Do not place power cable near kerosene/electric heaters or other heat-generating devices. • Regularly check and clean the connection part and avoid using an old outlet. • Turn off (○) ELCB immediately and disconnect from facility terminal or outlet, if power cable becomes partially severed or damaged in any way. Contact original dealer of purchase for information about replacing power cable.
 	DO NOT process explosive or flammable substances. Never attempt to process explosives, flammables or any items which contain explosives or flammables. Fire or explosion may result. See "14. LIST OF HAZARDOUS SUBSTANCES" (p. 32) for information on flammable and explosive gases.
	DO NOT touch hot surfaces. Do not touch high temperature portions during or immediately after operation. Burn injury may result. Always wear protective equipment and be careful not to contact with hot surfaces when handling test samples
	When using resin containers for processing, use caution not to exceed their heat-resistant temperature. When using resin containers for processing, confirm that they conform to the heating specifications of this unit. Heating resin beyond capacity to withstand temperature will cause resin to melt and may result in fire or equipment malfunction.
	Take care not to drop test samples or objects into the inside unit. In the event that a foreign object accidentally falls inside, turn OFF (○) ELCB immediately, disconnect power cable and contact original dealer of purchase for assistance. Failure to do so may result in fire or electric shock.
	Carefully handle test samples following high temperature operation. Interior surfaces and sample/process items are hot during operation and for some time after operation. Be careful with hot items in order to avoid burn injury. Do not turn the power to "OFF (○)" at high temperatures. Always wear protective equipment when handling test samples during operation or right after operation.

1. SAFETY PRECAUTIONS

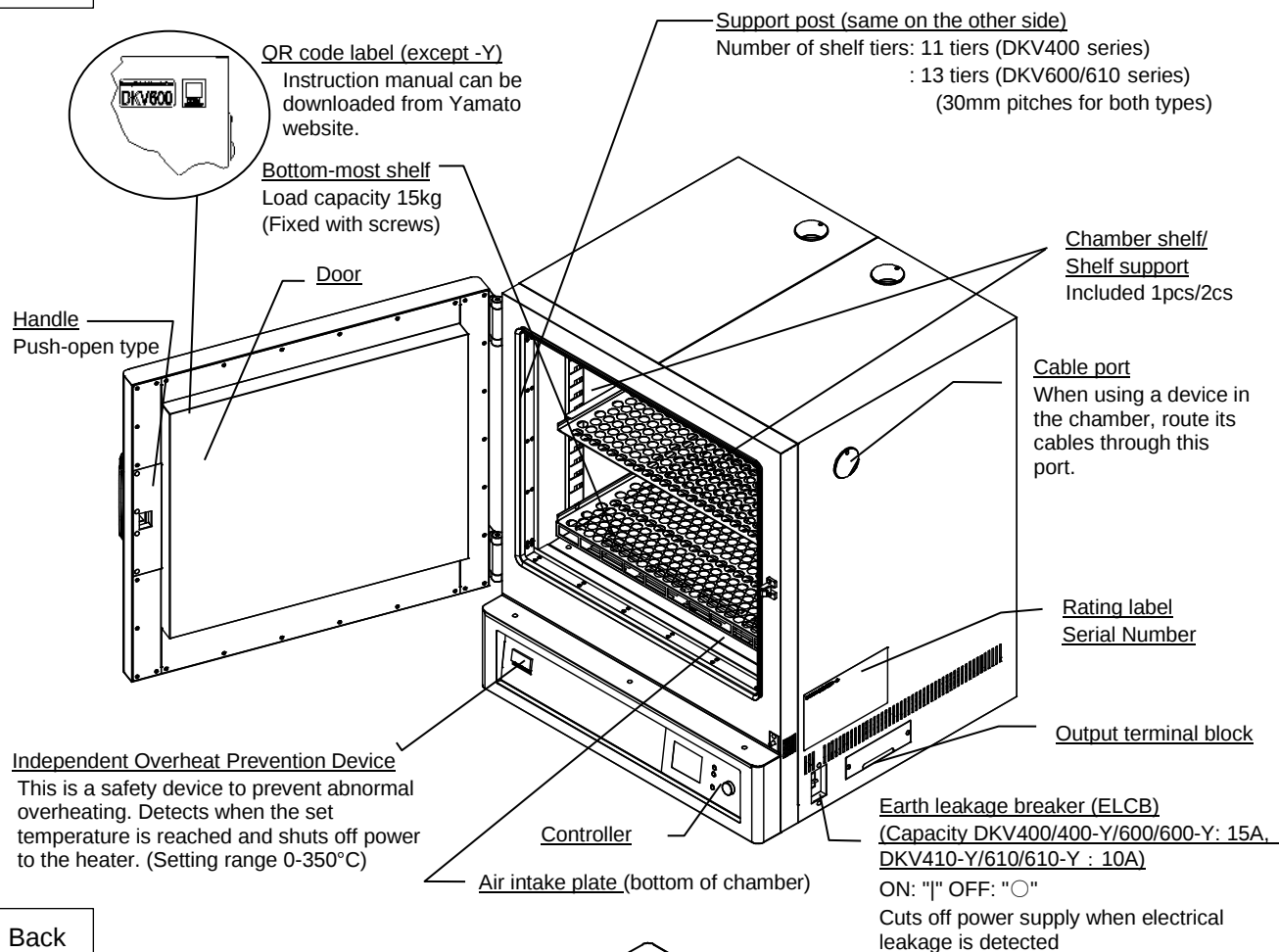
Warnings and Cautions

	Be careful when opening the door at high temperatures.
 	Maintain a safe distance until hot air, expelled from chamber, has dissipated when opening door during operation or Immediately after the end of operation. When working with the door open, turn the power to "ON (I)" and check the interior temperature. Do not touch internal door or other heated interior surfaces. Severe burns may result. After operation is finished, make sure the unit is cool enough before opening the door. Be advised that if a fire/smoke alarm is installed in close proximity to unit, it may be set off when chamber door is opened, and hot air or smoke is expelled.
	Be careful opening and closing doors.
	When opening or closing the door keep hands and face away from area that the door swings. The door may impact with them causing an injury.
	Be aware of performance degradation when using cable ports.
	Whenever a manual temperature gauging sensor or probe is inserted through the cable port, close the port cover as fully as possible and completely seal any gaps with heat-resistant insulation or sealant. If the seal is inadequate, temperature characteristics or other performance properties will be degraded and inaccurate.
	DO NOT disassemble or modify equipment.
	Never attempt to disassemble or modify unit. Doing so may cause malfunction, fire, electric shock, or personal injury. Note that any malfunction resulting from unauthorized modifications or customizations to unit will void the warranty.
	Inspect regularly
	Circuit breakers and overheating prevention devices are important security devices. Inspect regularly. Refer to " Inspection and Maintenance (p. 21)" for the inspection method.
	CAUTION
	DO NOT use equipment during a thunderstorm and turn off the breaker.
	In the event of a thunderstorm, turn OFF (○) ELCB and disconnect power cable immediately. A direct lightning strike may cause equipment damage, fire or electric shock, resulting in serious injury or death.
	DO NOT climb or place any objects on top of equipment.
	Personal injury or equipment malfunction may result.

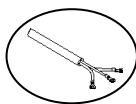
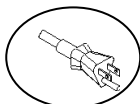
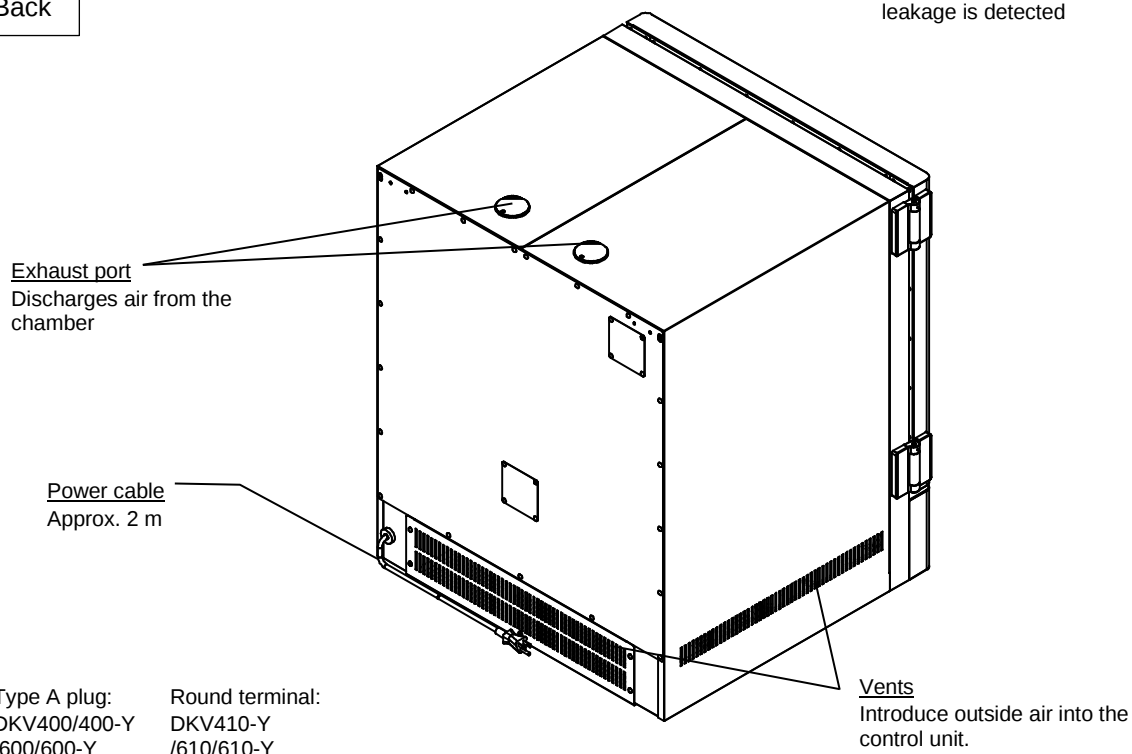
2. COMPONENT NAMES AND FUNCTIONS

Main Unit (DKV400/600/610 series)

Front

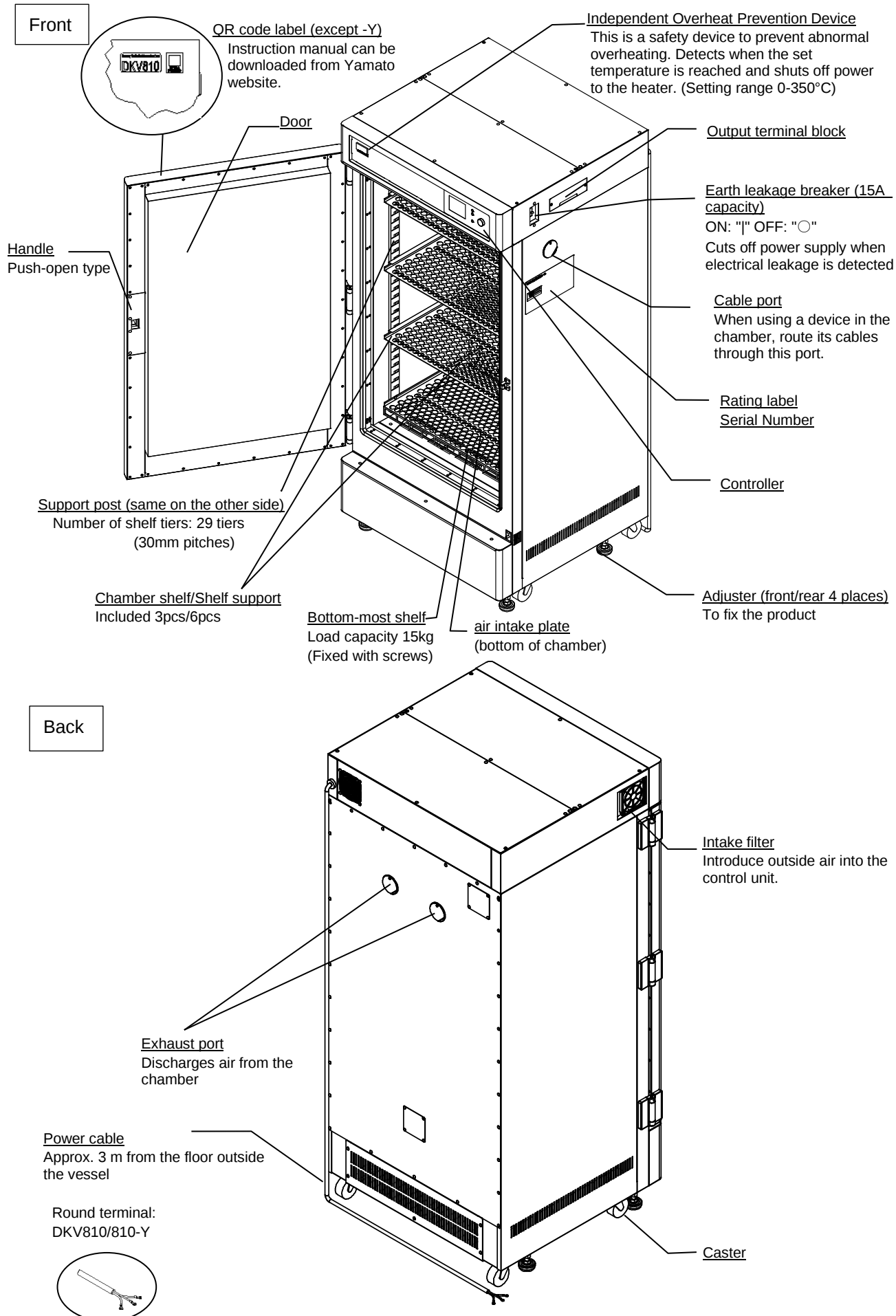


Back



2. COMPONENT NAMES AND FUNCTIONS

Main Unit (DKV810 series)



2. COMPONENT NAMES AND FUNCTIONS

Main Unit (DKV910 series)

Independent Overheat Prevention Device

This is a safety device to prevent abnormal overheating.
Detects when the set temperature is reached and shuts off power to the heater.
(Setting range 0-300°C)

Controller

Earth leakage breaker (Capacity
DKV910: 20A, DKV910-Y: 16A)

ON: "I" OFF: "O"

Cuts off power supply when electrical leakage is detected

Vents

Introduce outside air into the control unit.

Output terminal block

Cable port

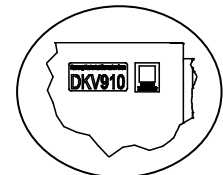
When using a device in the chamber, route its cables through this port.

Rating label

Serial Number

QR code label (except -Y)

Instruction manual can be downloaded from Yamato website.



Handle

Push-open type

Door

Support post (same on the other side)

Number of shelf tiers: 29 tiers x 2 rows
(30mm pitches)

Chamber shelf/Shelf support

Included 6pcs/12pcs

Bottom-most shelf

Load capacity 15kg
(Fixed with screws)

Air intake plate

(bottom of chamber)

Adjuster (front/rear 4 places)

To fix the product

Exhaust port

Discharges air from the chamber

Vents

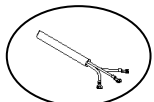
Introduce outside air into the control unit.

Power cable

Approx. 3 m from the floor
outside the vessel

Round terminal:
DKV910/910-Y

Type O plug:
DKV910-B



Caster

3. PRE-OPERATION PROCEDURES

Installation Precautions



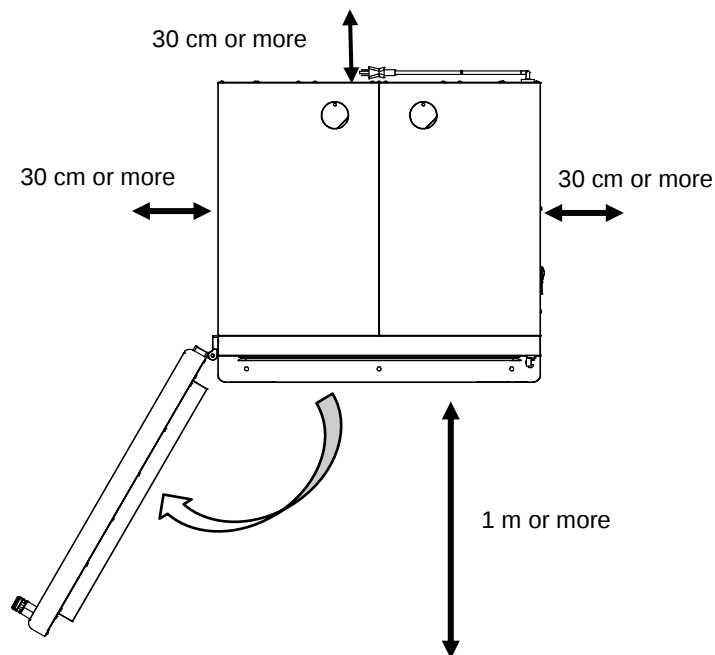
Choose an appropriate installation site.

DO NOT install unit:

- where installation surface is not completely level, not even or not clean.
- where flammable or corrosive gases/fumes may be present.
- where external temperature will exceed 35 °C or fall below 5 °C.
- where liquid is assumed to splash on unit.
- where external temperature will fluctuate largely.
- in excessively humid or dusty locations.
- in direct sunlight or outdoors.
- where there is constant vibration.
- in direct contact with the outside air
- where power supply is erratic.
- where there is a risk of freezing or condensation.
- where exposed to a strong wind.
- in the proximity of, particularly right below a fire alarm.
- where there is combustible material nearby.



Install unit in a location with sufficient space, as specified below.

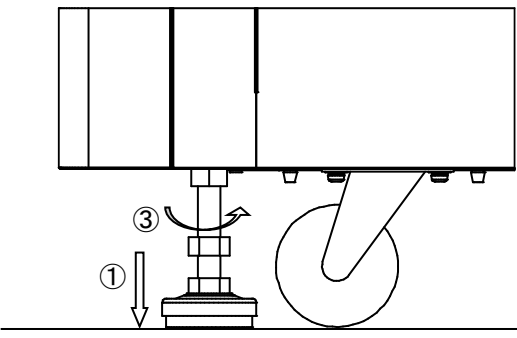
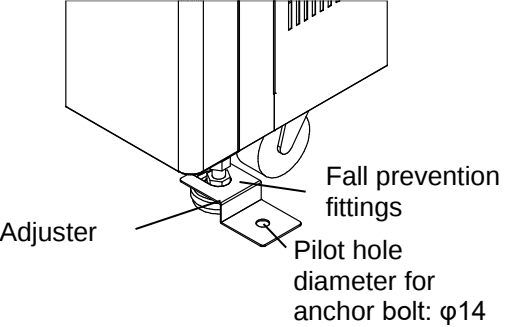


Leave 50 cm or more space above unit

The recommended space is described in reference to the Tokyo Fire Prevention Ordinance. Install unit as stipulated by the ordinance of each prefecture.

3. PRE-OPERATION PROCEDURES

Installation Precautions

	Always use cargo-handling equipment to move or install unit. Use cargo-handling equipment to move or install unit. When performing manual labor, transport the unit with at least two persons and appropriate work methods. * Unit weight: DKV400 series: approx. 60 kg, DKV600/610 series: approx. 75 kg, DKV810 series: approx. 120 kg, DKV910 series: approx. 195 kg
	Install unit on a level surface. Install unit on level and even surface. This can cause unexpected problems and performance degradation/failure. It may also cause vibration and noise.
	Remove protective caster covers with care [DKV810/910 series]. There is a risk of injury when removing the caster protective cover. Please carry out the work with due care.
	Fix the device with adjusters. [DKV810/910 series]. This unit has four level adjusters, located on the undercarriage of main unit. After unit is installed, position the adjusters using the following procedure: ① Rotate the adjusters down until unit stands securely on the floor. ② Check the level of the installation surface. Check for any gaps between the floor and four contact points. ③ Once unit is secure, tighten both adjusters stop nuts firmly against the topmost nut to prevent the adjuster from turning under vibration. 
	Take appropriate safety measures when installing the machine. [DKV400/600/610 series] For safety reasons, take measures to prevent tipping over that are appropriate for your installation environment. In the event of an earthquake or other unforeseen incident, equipment may unexpectedly shift or fall, causing serious injury.
	Take appropriate safety measures when installing the machine. [DKV810/910 series] For safety reasons, please use the fall prevention fittings provided with the product to prevent the product from tipping over. Fix the fall prevention fittings according to the following procedure. ① Place the anti-tip over fittings on the adjuster portion of the main unit. ② Fasten to the ground or a solid floor of a building with anchor bolts. (M12 recommended) 

3. PRE-OPERATION PROCEDURES

Installation Precautions

	Always connect power cable to appropriate facility outlet or terminal.
	Connect power cable to a suitable facility outlet or terminal, according to the electrical requirements.
	Power requirements DKV400 : AC100 V, single-phase, 50/60 Hz, rated current, 14 A (breaker capacity 15 A) DKV400-Y: AC115 V, single-phase, 50/60 Hz, rated current, 13.5 A (breaker capacity 15 A) DKV410-Y: AC220 V, single-phase, 50/60 Hz, rated current, 7.5 A (breaker capacity 10 A) DKV600 : AC100 V, single-phase, 50/60 Hz, rated current, 14 A (breaker capacity 15 A) DKV600-Y: AC115 V, single-phase, 50/60 Hz, rated current, 13.5 A (breaker capacity 15 A) DKV610 : AC200 V, single-phase, 50/60 Hz, rated current, 8 A (breaker capacity 10 A) DKV610-Y: AC220 V, single-phase, 50/60 Hz, rated current, 7.5 A (breaker capacity 10 A) DKV810 : AC200 V, single-phase, 50/60 Hz, rated current, 13 A (breaker capacity 15 A) DKV810-Y: AC220 V, single-phase, 50/60 Hz, rated current, 12 A (breaker capacity 15 A) DKV910 : AC200 V, single-phase, 50/60 Hz, rated current, 15.5 A (breaker capacity 20 A) DKV910-Y: AC220 V, single-phase, 50/60 Hz, rated current, 14.5 A (breaker capacity 16 A) Operational voltage range is $\pm 10\%$ of power rating, performance guarantee voltage range is $\pm 5\%$, and frequency is $\pm 1\%$. * If unit does not start up or operate properly even when the breaker is turned "ON (I)", investigate the voltage of the main power supply and whether it is being used on the same power line as other products, and take measures such as receiving power from a separate line from other products. Inserting multiple cords into a single outlet, using branch outlets or extension cords, may cause a drop in voltage, which may affect performance, resulting in failure to control or maintain proper temperature.
	Not for use in areas where liquids are splashed.
	Install unit where it will be free from liquid spray and other moisture. Failure to do so may result in control mechanisms becoming wet, causing malfunction, electric shock and/or fire.
	Install equipment in a well-ventilated place
	Install unit so that side and rear panel vents are unobstructed and allowed to sufficiently diffuse heat. Doing so may result in excessive temperatures inside the unit control panel, causing possible degraded CPU board performance, malfunction or fire. See "2. Component names and functions/ Main Unit (DKV400/600/610/810/910) (p. 10)" for the position of the vent.
	Odor occurs during initial operation.
	When using the product for the first time, an unusual odor may occur if the product is heated to a high temperature. This is due to the decomposition of the binding material in the insulation, not equipment failure. It is recommended to run unit at the highest temperature before use.
	Use optional stacking hardware for double stacking [DKV400/600/610 series].
	Be sure to use stacking hardware (optional) when mounting unit on top of another, and do not stack up on unit direct. In the event of an earthquake or other unforeseen incident, equipment may unexpectedly shift or fall, causing serious injury.

4. PRE-OPERATIVE PREPARATIONS

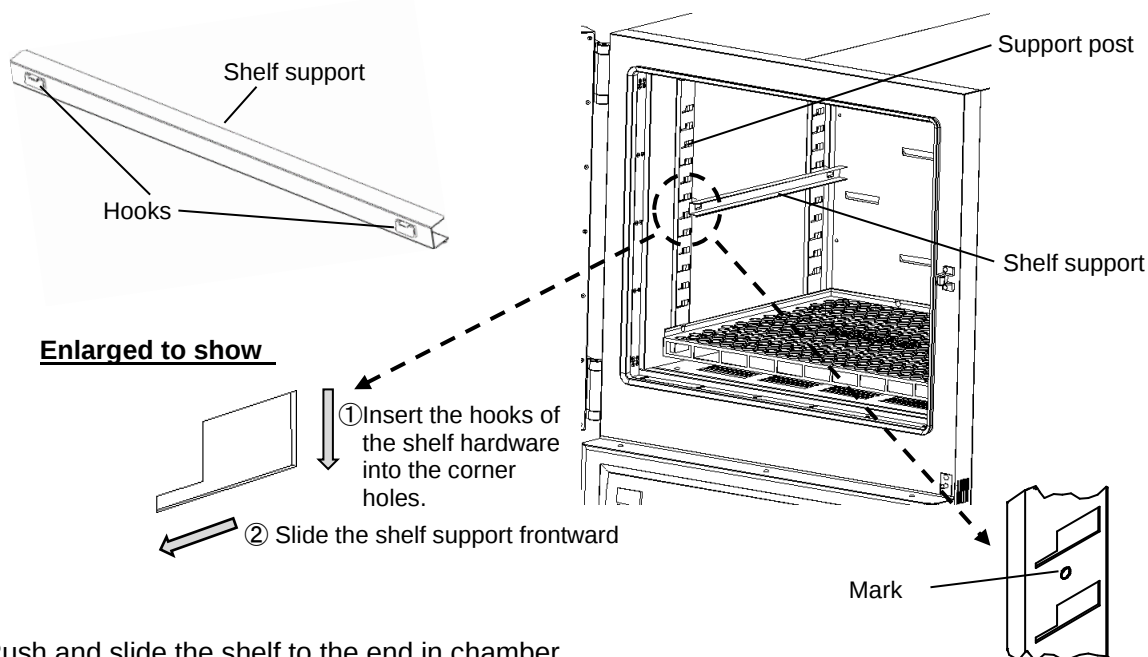
Installation Method

Chamber Shelf Placement

Install the chamber shelf

- Do not remove the bottom-most shelf secured with screws to chamber.
* There are sharp protrusions on the chamber interior, chamber shelf, and shelf support post, so be careful not to get injured.
In particular, working with bare hands is dangerous. Please wear gloves.

- ① Attach shelf supports to the left and right support posts inside chamber in the desired height.

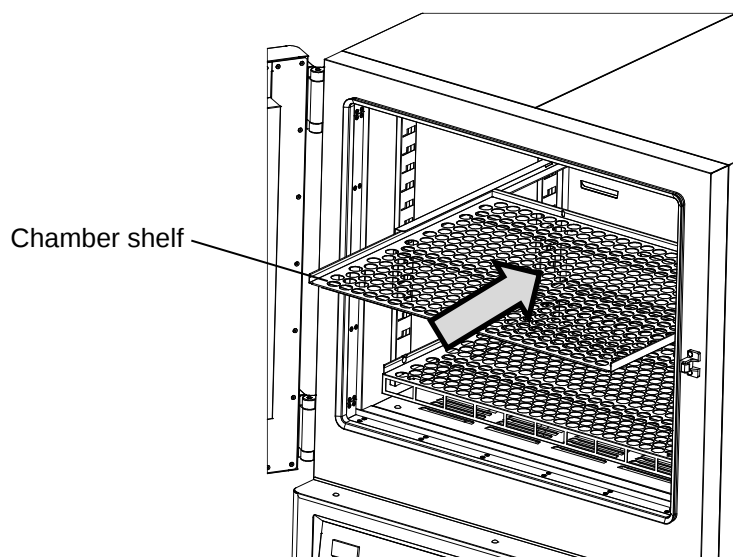


- ② Push and slide the shelf to the end in chamber.

* Pay attention to the height of the left and right shelf supports.

Marked on the shelf support columns. Adjust the height of the shelf support fixture using the mark as a guide.

- ③ Make sure that the shelf is properly in place and does not rattle or fall.



4. PRE-OPERATIVE PREPARATIONS

Installation Method

How to set the samples

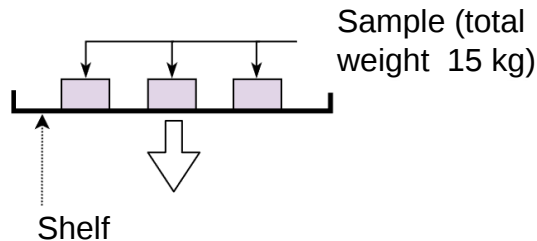


CAUTION



Do not place samples that are too heavy.

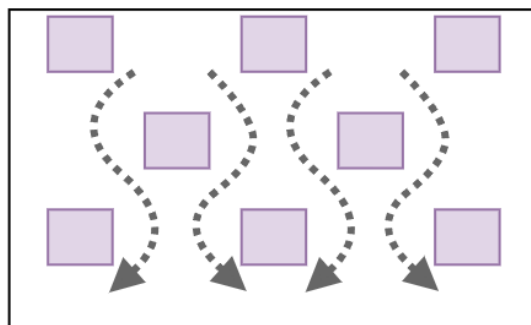
The load capacity of the chamber shelves is approximately 15 kg each, when load is evenly distributed. Test sample load total for each shelf should not exceed this specification. Arrange test samples evenly on shelves, leaving as much space between them as possible.



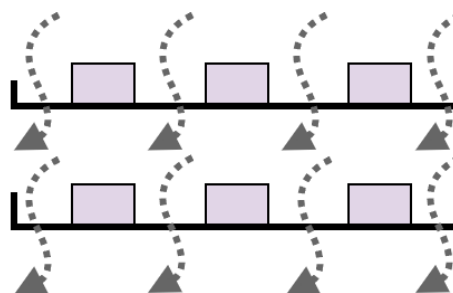
Do not overstuff samples.

To ensure temperature control, leave space on the shelf when placing the sample. Overpacking specimens may lead to a decrease in temperature performance, smoking, ignition, or other fire hazards.

Be sure to use shelves and as much space as possible between specimens, leaving at least 30% of the shelf area free.



Leave 30% of total shelf space empty



Be careful not to pack too much samples



DO NOT place items on bottom surface of chamber (air intake plate).

Always use the supplied chamber shelves, supported on the standard shelf supports, and avoid placing any items on bottom surface. Also, avoid direct contact with wall surfaces. Never remove the shelf plate screwed to the bottom row and do not use it by placing samples directly on the bottom of the chamber (air intake plate). Failure to do so may result in insufficient performance of the product or abnormally high temperatures in the chamber.

4. PRE-OPERATIVE PREPARATIONS

Installation Method



DO NOT process corrosive items.

Do not process items containing corrosive chemicals of any kind. Potent acids may corrode unit interior despite stainless steel construction.



Exercise caution when processing heat-generating substances.

Note that temperature reading may not be consistent when processing heat-generating samples.



When processing wet samples, remove as much of the moisture as possible beforehand, and open the exhaust port.

Failure to do so may cause the electrical system to be adversely affected due to excessive humidity rise, resulting in electrical leakage or equipment malfunction. It may also cause rust, corrosion, and condensation on the interior and exterior.
Steam emitted from the exhaust port is hot. Do not look into or bring hands close to the exhaust port.

4. PRE-OPERATIVE PREPARATIONS

Setup of independent overheat prevention device

This product is equipped with an independent overheat prevention device (manual reset) consisting of a separate power supply, a separate circuit, and a separate sensor from the controller as a safety measure.

Shuts off the power supply to the heater when the measured temperature becomes higher than the temperature set by the independent overheat prevention device setup

When the independent overheat prevention device is activated, the independent overheat prevention device Alm lamp lights, the buzzer sounds, and the controller displays the error screen "Er07 Independent overheat prevention device error" alternately with the home screen.



No.	Description	Display and Operation
①	Up/down key	Used to change setting values.
②	Mode key	Used to set the brightness and in the transition to the setting mode screen.
③	Display	The set value of the independent overheat prevention device and the character for the mode are displayed.
④	Alm Lamp	Illuminates when independent overheat prevention device is activated.

How to set the activation temperature of Independent Overheat Prevention Device

A close-up of the control panel with a hand icon pointing to the down arrow button. The display shows '290' and the Alm lamp is lit.	Set temperature with ▼▲ keys The set value is determined immediately after the change.
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4. PRE-OPERATIVE PREPARATIONS

Independent Overheat Prevention Device Setup

The independent overheat prevention device in this product can be set to any brightness setting.

* The initial value is "7".

How to set the brightness of the independent overheat prevention device

	① Press and hold the Mode key for 5 seconds. The indicator alternates between "disp" and the brightness setting
	② Use the ▲ and ▼ keys to set the desired brightness. The set value is determined immediately after the change. ③ Press and hold the Mode key for 2 seconds to complete the brightness setting.



If the difference between the set temperature of the independent overheat prevention device and the set temperature of the controller is small, the independent overheat prevention device may work and stop operation. The set temperature of the independent overheat prevention device should be at least 20°C higher than the controller's set temperature.

The purpose of the over-temperature protector is not to protect samples, but to prevent abnormal overheating of the equipment. It does not prevent accidents in the use of explosive or flammable materials.

Factory defaults and setting ranges are shown below:

Model	Factory default set temperature	Temperature setting range
DKV400 series	350 °C	0 °C ~ 350 °C
DKV600/610 series	350 °C	0 °C ~ 350 °C
DKV810 series	350 °C	0 °C ~ 350 °C
DKV910 series	300 °C	0 °C ~ 300 °C

To confirm whether IOPD functions as intended, set chamber temperature to any value within unit specification range and allow temperature to stabilize. Gradually lower IOPD temperature setting. If IOPD activates within 10°C of temperature setting, it is functioning normally. Note: it normally takes 5 seconds for IOPD to activate. Waiting 5 seconds each time temperature is lowered in the confirmation test above, is therefore recommended. When IOPD activates, error code Er07 shows in main unit display and operation is terminated.

When changing the IOPD temperature setting, a few seconds are needed for changes to finalize. For this reason, wait 5 seconds after entering change before turning main unit off.

5. MAINTENANCE PROCEDURES

Inspection and Maintenance

Daily general maintenance and inspection is recommended to ensure optimal equipment performance.



WARNING

- Periodic inspections must be performed.
- When inspecting or maintenance, be sure to turn off the breaker OFF (○) and disconnect the power cord from the outlet.
- Perform inspections and maintenance when unit is at room temperature.
- Never attempt to disassemble unit.

Precautions in Daily Maintenance



CAUTION

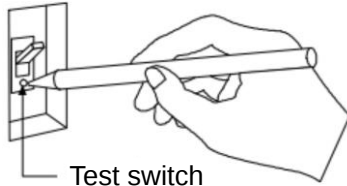
- Clean unit using soft damp cloth. Never use benzene, paint thinner, scouring powder, scrubbing brush or other abrasives and solvents to clean unit. Superficial damage and/or discoloration, as well as deformity to some components may result.
- There are sharp protrusions on the chamber interior, chamber shelf, and shelf support post, so be careful not to get injured.
- Working with bare hands is dangerous, so wear gloves.

Maintenance and Inspection

1. Inspect earth leakage breaker ON and OFF function.

Prepare unit for inspection by connecting power cable to a facility outlet or terminal.

- Make sure the earth leakage breaker is OFF (○), then turn it ON (I).
- Depress the red test switch with a fine-point object, such as a ballpoint pen, etc. If power switch turns OFF (○) without delay, it is functioning normally.



2. Check Independent Overheat Prevention Device.

- Set the temperature setting of the independent overheat prevention device to 20°C higher than the product's set temperature.
- Operate unit in Fixed temperature mode and wait until chamber temperature becomes stable.
- Once the measured temperature has stabilized, lower the set temperature of the independent overheat prevention device by 1°C.
- When the independent overheat prevention device normally, the heater circuit is interrupted and the "Er07" error screen appears at the same time.
It is displayed alternately with the home screen.

3. Check power plug for damage. [DKV400/400-Y/600/600-Y]

- Check power plug for dust or dirt on its prongs. If there is dust or dirt on it, remove it.
- Confirm that the prongs of power plug are not bent or damaged. Replace if bent or damaged.
- Check the power plug for discoloration or abnormal heat generation. If there is discoloration or abnormal heating, the internal contact of the outlet may be faulty.

5. MAINTENANCE PROCEDURES

Inspection and Maintenance

- 4 . Check terminals at the cable end for abnormalities. [DKV410-Y/610/610-Y/810/810-Y/910/910-Y]
- Visually check the terminals for dust and dirt. If there is dust or dirt on it, remove it.
 - Visually check the terminals for deformation. Replace if bent or damaged.
 - Check for discoloration or abnormal heat generation at the terminals. If there is discoloration or abnormal heating, the internal contact of the distribution board may be faulty.
- * ELCB and overheat prevention device must be inspected, as prescribed above, prior to every instance of extended or overnight operation.

Care of the controller

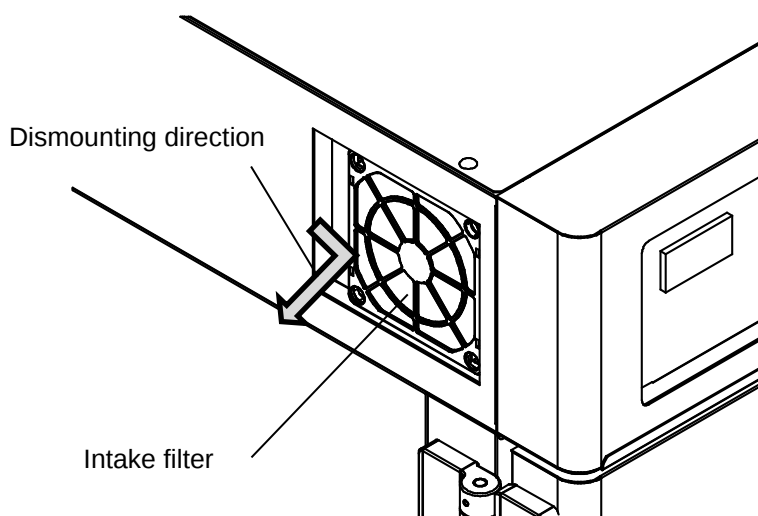
- Clean unit using soft damp cloth. Do not wipe with alcohol. Superficial damage and/or discoloration, as well as deformity to some components may result.

Chamber maintenance

- Stop the operation and turn OFF (○) ELCB. Disconnect the power cord from the distribution board or outlet. Check the temperature inside the chamber and remove the shelf plate and shelf support hardware.
- Stainless steel is used for the inside of the chamber, the shelf, and the shelf support. Use a cloth soaked with alcohol for cleaning, wipe it well, and then lightly wipe it again with a dry cloth.
- Use of acidic detergents, alkaline detergents, oils, organic solvents, etc. may cause corrosion or damage.

Cleaning the air intake filter [DKV810 series].

- Clean the intake filter.
 - Dust and dirt will adhere to the intake filter as operation continues. Clogging reduces the performance of the cooling fan inside the control unit. Since the clogging condition varies depending on the ambient environment and the duration of use, please clean and replace the filter periodically according to the conditions of use.
 - An intake filter is located on the left side of the unit. Intake air filter is a fit-in type. Remove by hand when removing.
 - Remove dust from the air intake filter using a vacuum cleaner, etc., and then return the air intake filter to the product.
- Note 1: Always run unit with the air intake filter installed.
- Note 2: Do not wash the air intake filter in water.



- ◆ Contact original dealer of purchase, if further questions arise concerning maintenance procedures.

6. EXTENDED STORAGE AND DISPOSAL

Extended Storage / Unit Disposal



WARNING

- Turn off the earth leakage circuit breaker (○) and remove the power plug.
- Do not leave unit in a location where children may have access



CAUTION

- Remove door handle and hinges to prevent it from locking.
- Dispose of this unit in accordance with local laws and regulations.

Dispose of or recycle this unit in a responsible and environmentally friendly manner

When disposing of this product, please dismantle it as much as possible from the perspective of environmental conservation and dispose of it separately or recycle it according to the disposal method specified by your local government. Major components and materials, comprising this unit are listed in the table below

Component Name	Composition
Main Unit Components	
Exterior	Chromium-free electrogalvanized steel sheet, baked-on finish
Chamber	Stainless steel
Heat insulator	Glass wool
Door gasket	Silicon rubber
Control panel	Acrylic
Labels	Polyethylene (PET), resin film
Electrical Parts	
Switches and relays	Resin, copper
Circuit boards	Composite of fiber glass and other materials
Control panel	Glass, glass fiber and other composite products
Heater	Stainless steel
Power cable	Synthetic rubber coating, copper, nickel
Wiring material	Composites of fiber glass, fire-retardant vinyl, copper, nickel and other compounds
Stickers	Resin material
Sensor	Stainless steel etc.

7. TROUBLESHOOTING

Troubleshooting Guide

Troubles Check

Symptom	Possible causes	How to deal with it
Unit does not activate when power is turned ON.	Power cord is not connected to power supply equipment	Connect the power cord to the power source
	Power failure in progress	Restore power supply facilities.
	No or low supply voltage from power supply facility	Provide appropriate power supply facilities
The temperature does not rise.	Setpoint is lower than the temperature inside the chamber.	Set the set value higher than the temperature inside the chamber
	Low or unstable supply voltage	Connect to adequate power supply ⇒ "Always connect power cable to appropriate facility outlet or terminal. (p. 15)"
	Low ambient temperature	Use within the operating ambient temperature range
	Large load in the chamber	Place the sample properly. ⇒ "Installation method (p. 17)"
	Door open	Close the door securely and operate the unit.
Temperature fluctuates during operation.	Temperature setting is inappropriate	Set the proper temperature
	Unstable supply voltage	Connect to adequate power supply ⇒ "Always connect power cable to appropriate facility outlet or terminal. (p. 15)"
	The ambient temperature is heavily fluctuating	Use in an appropriate installation location.
	Thermal load in chamber is high	Please check the sample before use. ⇒ "Installation method (p. 17)"
	Sample placement is not appropriate	Place the sample properly. ⇒ "Installation method (p. 17)"
	Door open	Close the door securely and operate the unit.
	Defective fan in chamber	Parts need to be replaced. Ask for repair. ⇒ "Requests for Repair (p. 25)"
Temperature reading differs from manually measured temperature	Calibration offset value is inappropriate.	Check the "Calibration Offset Function" setting. (For details, please refer to the "Additional Functions and Errors" section.)
	Inadequate placement and amount of sample in the chamber	Please check the sample before use. ⇒ "Installation method (p. 17)"
	Power supply voltage has dropped	Connect to adequate power supply ⇒ "Always connect power cable to appropriate facility outlet or terminal. (p. 15)"

◆ If none of the above applies, immediately turn the breaker OFF (○) and disconnect the power cord from the main power source. Contact your distributor, our sales office, or our customer service center.

8. SERVICE & REPAIR

Requests for Repair

Warranty card (attached separately)

Warranty card will be handed by dealer or Yamato personnel upon delivery and installation, or will be attached to equipment if no one from dealer or Yamato is to be present at delivery and installation.

Please register your warranty by clicking on the "Register Warranty" link on our website below.

(JP) <https://www.yamato-net.co.jp/support/warranty.html>

(US) <https://www.yamato-usa.com/product-registration>

- Keep warranty card safe.
- The above registration is only available in certain regions including Japan and the U.S. Please contact our representative for details.

Requests for Repair

If there is any abnormality, stop operation, turn off the power, and disconnect the power cord for safety reasons. Contact your distributor, our sales office, or our customer service center.

What we would like to hear from you (see warranty card for product information and delivery date)

- Product Name
 - Model
 - Serial number
 - Date (year/month/day) of Delivery
- } Refer to warranty card.
- Description of problem in as much detail as possible
 - Repair this equipment for free of charge according to the contents on warranty card.
Warranty period is 1 (one) year from date of purchase.
 - Consult with original dealer of purchase or Yamato sales office for any repair after warranty ended.
Charged repair service of this equipment will be available on customer's request when it can be maintained functional by its repair.

* Be sure to present warranty card to the service representative.

Guaranteed Supply Period for Repair Parts

Guaranteed maximum supply period for repair parts is 7years from date of discontinuation for this equipment.

"Repair parts" is defined as components which, when installed, allow for continued equipment operation.

9. SPECIFICATIONS

Model	DKV400	DKV600	DKV610	DKV810	DKV910
Product code	213016	213017	213018	213019	213020
System	Forced convection				
Ambient temp. range	5 ~ 35℃				
Setting temp. range	0 ~ 270℃				0 ~ 220 ℃
Performance *1*2					
Performance control range	Room temp. +10℃ ~ 270℃				Room temp.+10 ℃ ~ 220℃
Temperature fluctuation (JIS C 60068-3-5:2020)	±0.6℃ (at270℃)	±0.5℃ (at270℃)		±0.6℃ (at270℃)	±0.5℃ (at220℃)
Temperature gradient (JIS C 60068-3-5:2020)	9℃ (at270℃)			11℃ (at270℃)	11℃ (at220℃)
Temperature rise rate (JIS C 60068-3-5:2020)	3.3℃/min	2.1℃/min	2.8℃/min	3.4℃/min	2.5℃/min
Temperature rise time (Reference data) (room temp. to 220/270℃)	Approx. 75 min	Approx. 115 min	Approx. 85 min	Approx. 75 min	Approx. 80 min
Composition					
Exterior	Chromium-free electrogalvanized steel sheet, baked-on finish				
Chamber	Stainless steel				
Heat insulator	Glass wool				
Heater	Stainless steel tube heater				
	1.34 kW		1.5 kW	2.5 kW	3.0 kW
Blower fan / Motor	Sirocco fan / Capacitor motor				
	1 set				2 sets
Cable port	1 pc (33 mm I.D.) (right side)				
Exhaust port	2 pcs (33 mm I.D.) (ceiling)			2 pcs (33 mm I.D.) (back)	
Safety devices *3					
Safety devices	Self-diagnostic functions (automatic overtemperature protection, temperature sensor error, SSR short circuit, heater disconnection, fan error, clock element error, main relay error, memory error, internal communication error) / independent overheat prevention device / door switch (door alarm) / overcurrent leakage breaker / fall prevention fitting (Model 810/910)				
Controller					
Controller Type	VSD-1 Controller				
Temp. control system	PID control by microcomputer				
Temp. setting system	Digital setting method using operation keys and dials				
Temp. display system	3.5-inch color LCD panel Digital display				
Temperature resolution	1 ℃				
Timer / Clock Timer	1 minute to 99 hours 59 minutes / Date: hour: minute (up to 31 days later)				

9. SPECIFICATIONS

Model	DKV400	DKV600	DKV610	DKV810	DKV910
Controller					
Timer setting resolution	Can be set in 1-minute increments				
Operation modes	Fixed temperature / Timer・Hourly quick auto stop operation / Timer・Hourly auto stop operation / Timer・Hourly auto start operation / Program operation / Timer・Hourly program auto start operation				
Additional functions	Calibration offset / Power failure return mode selection function / Timer Wait function / Security management function / Temperature upper/lower limit alarm function / Fan OFF delay function / Power failure alarm / External communication terminal (RS-485) / Temperature output terminal (4-20mA) / Time-up output terminal / Error output terminal / Recorder terminal / Program preview function / Operation trend function				
Sensor	Temperature controller / independent overheat prevention device : K thermocouple				
Standard					
Internal Dimensions (W x D x H mm)	450×450 ×450	600×500×500		600×500 ×1,000	1,090×500 ×1,000
External dimensions *4 (W x D x H mm)	580×635 ×830	730×685×880		730×685 ×1,610	1,220×685 ×1,610
Internal volume (L)	90	150		300	545
Number of shelves / pitch	11 steps / 30 mm	13 steps / 30 mm		29 steps / 30 mm	29 steps / 30mm x 2 rows
Chamber shelf load capacity	15 kg/shelf Total load capacity: 30 kg			15 kg/shelf Total load: 60 kg	15 kg/shelf Total load: 120 kg
Power supply (50/60 Hz) Rated current	AC 100 V 14 A		Single phase AC 200 V 8 A	Single phase AC 200 V 13 A	Single phase AC 200 V 15.5 A
Breaker capacity	15 A		10 A	15 A	20 A
Weight	Approx. 60 kg	Approx. 75 kg		Approx. 120 kg	Approx. 195 kg
Attachments					
Chamber shelf	Perforated stainless steel plate				
Number of shelves / Number of shelf supports (separately, bottom shelf is fixed in the chamber)	1 pc / 2 pcs			3 pcs / 6 pcs	6 pcs / 12 pcs
Fall prevention fittings	-			4 pcs (Fixing hole diameter Φ14 M12 recommended)	
Instruction Manual	1 set (5 parts) * Including quick manual				
Warranty card	1				
Optional					
Optional	See "10. OPTIONAL ACCESSORIES"				

9. SPECIFICATIONS

Model	DKV400-Y DKV410-Y	DKV600-Y DKV610-Y	DKV810-Y	DKV910-Y
Product code	213021 213022	213024 213025	213027	213029
System	Forced convection			
Ambient temp. range	5 ~ 35℃			
Setting temp. range	0 ~ 270℃			0 ~ 220 ℃
Performance *1*2				
Performance control range	Room temp. +10℃ ~ 270℃			Room temp.+10 ℃ ~ 220℃
Temperature fluctuation (JIS C 60068-3-5:2020)	±0.6℃ (at270℃)	±0.5℃ (at270℃)	±0.6℃ (at270℃)	±0.5℃ (at220℃)
Temperature gradient (JIS C 60068-3-5:2020)	9℃ (at270℃)		11℃ (at270℃)	11℃ (at220℃)
Temperature rise rate (JIS C 60068-3-5:2020)	4.4℃/min	2.8℃/min	3.4℃/min	2.5℃/min
Temperature rise time (Reference data) (room temp. to 220/270℃)	Approx. 55 min	Approx. 85 min	Approx. 75 min	Approx. 80 min
Composition				
Exterior	Chromium-free electrogalvanized steel sheet, baked-on finish			
Chamber	Stainless steel			
Heat insulator	Glass wool			
Heater	Stainless steel tube heater			
	1.5 kW		2.5 kW	3.0 kW
Blower fan / Motor	Sirocco fan / Capacitor motor			
	1 set			2 sets
Cable port	1 pc (33 mm I.D.) (right side)			
Exhaust port	2 pcs (33 mm I.D.) (ceiling)		2 pcs (33 mm I.D.) (back)	
Safety devices *3				
Safety devices	Self-diagnostic functions (automatic overtemperature protection, temperature sensor error, SSR short circuit, heater disconnection, fan error, clock element error, main relay error, memory error, internal communication error) / independent overheat prevention device / door switch (door alarm) / overcurrent leakage breaker / fall prevention fitting (Model 810/910)			
Controller				
Controller Type	VSD-1 Controller			
Temp. control system	PID control by microcomputer			
Temp. setting system	Digital setting method using operation keys and dials			
Temp. display system	3.5-inch color LCD panel Digital display			
Temperature resolution	1 ℃			

9. SPECIFICATIONS

Model	DKV400-Y DKV410-Y	DKV600-Y DKV610-Y	DKV810-Y	DKV910-Y
Controller				
Timer / Clock Timer	1 minute to 99 hours 59 minutes / Date: hour: minute (up to 31 days later)			
Timer setting resolution	Can be set in 1-minute increments			
Operation modes	Fixed temperature / Timer・Hourly quick auto stop operation / Timer・Hourly auto stop operation / Timer・Hourly auto start operation / Program operation Timer・Hourly program auto start operation			
Additional functions	Calibration offset / Power failure return mode selection function / Timer Wait function / Security management function / Temperature upper/lower limit alarm function / Fan OFF delay function / Power failure alarm / External communication terminal (RS-485) / Temperature output terminal (4-20mA) / Time-up output terminal / Error output terminal / Recorder terminal / Program preview function / Operation trend function			
Sensor	Temperature controller / independent overheat prevention device : K thermocouple			
Standard				
Internal Dimensions (W x D x H mm)	450×450×450	600×500×500	600×500×1,000	1,090×500×1,000
External dimensions *4 (W x D x H mm)	580×635×830	730×685×880	730×685×1,610	1,220×685×1,610
Internal volume (L)	90	150	300	545
Number of shelves / pitch	11 steps / 30mm	13 steps /30 mm	29 steps / 30mm	29 steps / 30mm x 2 rows
Chamber shelf load capacity	15 kg/shelf Total load capacity: 30 kg		15 kg/shelf Total load: 60 kg	15 kg/shelf Total load: 120 kg
Power supply (50/60 Hz) Rated current	DKV400-Y: Single phase AC115V 13.5A DKV410-Y: Single phase AC220V 7.5A	DKV600-Y: Single phase AC115V 13.5A DKV610-Y: Single phase AC220V 7.5A	Single phase AC220V 12A	Single phase AC220V 14.5A
Breaker capacity	DKV400-Y:15A DKV410-Y:10A	DKV600-Y:15A DKV610-Y:10A	15A	16A
Weight (kg)	Approx. 60kg	Approx. 75kg	Approx. 120kg	Approx. 195kg
Attachments				
Chamber shelf	Perforated stainless steel plate			
Number of shelves / Number of shelf supports (separately, bottom shelf is fixed in the chamber)	1 pc / 2 pcs		3 pcs / 6 pcs	6 pcs / 12 pcs
Fall prevention fittings	-		4 pcs (Fixing hole diameter Φ14 M12 recommended)	
Instruction Manual	1 set (5 parts) * Including quick manual			
Warranty card	- (*5)			

9. SPECIFICATIONS

Model	DKV400-Y DKV410-Y	DKV600-Y DKV610-Y	DKV810-Y	DKV910-Y
Optional				
Optional	See "10. OPTIONAL ACCESSORIES"			

- *1. Performance (excluding temperature rise time) is measured at rated voltage, 50Hz or 60Hz frequency, room temperature 23°C±5°C, humidity 65%RH±20%, and no load. Note that the maximum temperature in the temperature control range may not be reached if the power supply voltage is below the rating or if the outside temperature is low.
- *2. The temperature rise time is reference data for rated voltage, 50 Hz or 60 Hz, room temperature 23°C, humidity 65%, and no load.
Note that the temperature rise time may be longer when the power supply voltage is below the rating or when the outside temperature is low.
- *3. If the product is used beyond the operating voltage range (±10% of rating), there is a possibility that the safety function will malfunction.
Pay attention to the power supply voltage when using the product.
- *4. Protrusions are not included.
- *5. Warranty will be included in some regions
- *6. Specifications are subject to change without notice for product improvement.

Consumables List

Part name	Parts code	Compatible models	Specifications
Fan Filter Kits	LT00040195	DKV810 series	Filter and guard set
Door Hinges	LT00041289	All models	-
Door gasket	NE401S0200	DKV400 series	2.2m
	NE601S0200	DKV600/610 series	2.5m
	NE811S0400	DKV810 series	3.4m
	NE911S0300	DKV910 series	6.5m

10. OPTIONAL ACCESSORIES

List of Options

◆ Available for installation after delivery

Product name	Product code	Model	Compatible models	Description
Stand	281596	OA194	DKV400/600/610 series	Unit can be secured on this stand with screws. (Caster less)
	281355	OA117	DKV400 series	
	281356	OA118	DKV600/610 series	
Stacking hardware	281598	OA196	DKV400 series	For use to stack a DKV400 unit on another.
	281599	OA197	DKV600/610 series	For use to stack a DKV600/610 unit on another.
Chamber shelf (one perforated stainless steel / two supports)	212246	—	DKV400 series	Same as standard shelves; available for additional purchase.
	212266	—	DKV600/610/810 series	
	212490	—	DKV910 series	
Seismic isolation mat	296902	—	DKV400/600/610 series	For use to prevent unit from falling or tipping.
Sheath sensor (K thermocouple)	212946	ODT48	Common to all models	Temperature sensor for checking chamber temperature, sample temperature, etc.
Silicon plug	212947	ODT52	Common to all models	A silicon rubber plug for fixing sensors inserted through cable holes and preventing gaps. It has a 2 mm dia. hole in the center.
External communications adapter kit (RS485-USB conversion)	281146	OA017	Common to all models	Adapter kit for connecting unit to remote PC workstation.
Recorder	281635	OA199	DKV400/600/610/810/910	Paperless recorder with 6-channel input. The communication function can record the measured and set temperatures of the product.

◆ Not available for installation after delivery

Product name	Product code	Model	Compatible models	Description
Cable port (inner diameter 25 mm)	281454	ODM36	Common to all models	Please contact us for installation position and quantity.
Cable port (inner diameter 50 mm)	281455	ODM38	Common to all models	
Rubber feet	281634	OA198	DKV400/600/610 series	Rubber feet attachable to the main unit legs.

11. LIST OF HAZARDOUS SUBSTANCES



Never attempt to process explosives, flammables or any items which contain explosives or flammables.

List of hazardous substances

Explosive substances	
①	Nitroglycol, Nitroglycerin, Nitrocellulose and other explosive nitrates
②	Trinitrobenzene, Trinitrotoluene, Picric acid and other explosive nitro compounds
③	Peracetic acid, Methyl ethyl ketone peroxide, Benzoyl peroxide and other organic peroxides
④	Sodium azide and other metal azides
Combustible substances	
①	Metal "lithium"
②	metal "potassium"
③	metal "sodium"
④	yellow phosphorus
⑤	phosphorus sulfide
⑥	red phosphorus
⑦	celluloids
⑧	calcium carbide (aka Carbide)
⑨	phosphorized lime
⑩	magnesium powder
⑪	aluminum powder
⑫	metal powder other than magnesium powder and aluminum powder
⑬	Sodium subthionate (also known as hydrosulfite)
Oxidizing substances	
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
Flammable substances	
①	Ethyl Ether, Gasoline, Acetaldehyde, Propylene Chloride, Carbon Disulfide, and other substances having ignition point of 30 or more degrees below zero.
②	n-hexane, Ethylene Oxide, Acetone, Benzene, Methyl Ethyl Ketone and other substances with ignition point between 30 degrees below zero and less than zero.
③	Methanol, Ethanol, Xylene, Pentyl n-acetate, (a.k.a. amyl n-acetate) and other substances having ignition point of between zero and less than 30 degrees.
④	Kerosene, Light Oil, Terebinth Oil, Isopenthyll Alcohol (a.k.a. Isoamyl Alcohol), Acetic Acid and other substances having ignition point of between 30 degrees and less than 65 degrees.
Combustible gas	
hydrogen, acetylene, ethylene, methane, ethane, propane, butane and other flammable objects that are gases at 1 atm.	

12. STANDARD INSTALLATION MANUAL

Install this machine according to following format (check options and special specifications separately).

Model	Serial Number	Installation Date	Installation proved by (Company name)	Installation proved by	Judgment

No.	Item	Implementation method	Reference page of instruction manual	Judge
Specifications				
1	Accessories	Quantity checks according to the accessory's column	9. Specifications (p. 26)	
2	Installation	- Visual check of surrounding conditions Caution: Take care for environment - Securing a space	3. PRE-OPERATION PROCEDURES Installation Precautions (p. 13)	
		Installing chamber shelves	4. PRE-OPERATIVE PREPARATIONS Installation Method (p. 16)	
Operation-related matters				
1	Power supply voltage	- Measure customer side voltage with a tester. - Measure the voltage at the time of operation (within specifications) Caution: Use a compliant plug to install	1. SAFETY PRECAUTIONS Ground wire must be connected (p. 7) 3. PRE-OPERATION PROCEDURES Always connect power cable to appropriate facility outlet or terminal. (p. 15) 9. SPECIFICATIONS (p. 26)	
2	Confirmation on operation	Explain name and function of each component.	2. COMPONENT NAMES AND FUNCTIONS Main Unit (DKV400/600/610 series) (p. 10) Main Unit (DKV810 series) (p. 11) Main Unit (DKV910 series) (p. 12)	
Description				
1	Operational descriptions	Explain operations of each component and handling precautions according to instruction manual.	1. SAFETY PRECAUTIONS (p. 2) ~11. LIST OF HAZARDOUS SUBSTANCES (p. 32) DKV400/600/610/810/910 series Instruction Manual, Operation	
2	Error Codes	Explain about error codes and procedures for reset according to instruction manual.	7. TROUBLESHOOTING (p. 24) ~8. SERVICE & REPAIR (p. 25) DKV400/600/610/810/910 series Instruction Manual, Additional Functions and Errors	
3	Maintenance and Inspection	Explain about maintenance of equipment and each component according to instruction manual.	5. MAINTENANCE PROCEDURES (p. 21)	
4	Installation complete, Descriptions	- Write the date of installation and the name of the person in charge on the nameplate of the unit. - Fill out the warranty card and hand it to the customer. - Explain how to contact the service representative.	8.SERVICE & REPAIR (p. 25)	

13. CONTACT DETAILS

1) Japan
Customer service center Free call: 0120-405-525 FAX: 055-284-5210 Reception hours: 9:00~12:00, 13:00~17:00 (Excluding weekends and holidays)  https://www.yamato-net.co.jp
2) USA, Canada, Latin America
Yamato Scientific America Inc. 925 Walsh Avenue, Santa Clara, CA 95050, U.S.A Toll Free: 1-800-2-YAMATO (1-800-292-6286) URL: https://www.yamato-usa.com
3) Other Country
For repair service, maintenance service and consumables purchase support, please contact to our distributors from whom you purchased. Or please visit our customer support website at URL: https://www.yamato-scientific.com/support/inquiry/

Limited Liability

Always operate equipment in strict compliance to the handling and operation procedures set forth by this instruction manual.

Yamato Scientific Co., Ltd. assumes no responsibility for malfunction, damage, injury or death resulting from negligent equipment use.

Never attempt to disassemble, repair or perform any procedure which are not expressly mandated by this manual.

Doing so may result in equipment malfunction, serious personal injury or death.

Notice

- **Instruction manual descriptions and specifications are subject to change without notice.**
- **Yamato Scientific Co., Ltd. will replace flawed instruction manuals (pages missing, pages out of order, etc.) upon request.**

Instruction Manual, Structure
Forced Convection Constant Temperature Oven
DKV400/600/610/810/910 Series

Second Edition December 9, 2024

Revision -
