

Yamato

Shaking Unit

Model

BN300

Instruction Manual

- First Edition -

- Thank you for purchasing " Shaking Unit, BN 300" of Yamato Scientific Co., Ltd.
- To use this unit properly, read this "Instruction Manual" thoroughly before using this unit.
Keep this instruction manual around this unit for referring at anytime.

 **WARNING!:**

Carefully read and thoroughly understand the important warning items described in this manual before using this unit.

Yamato Scientific Co. LTD.,

This paper has been printed on recycled paper.

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Explanation

MEANING OF ILLUSTRATED SYMBOLS

Illustrated Symbols

Various symbols are used in this safety manual in order to use the unit without danger of injury and damage of the unit. A list of problems caused by ignoring the warnings and improper handling is divided as shown below. Be sure that you understand the warnings and cautions in this manual before operating the unit.

 **WARNING!** If the warning is ignored, there is the danger of a problem that may cause a serious accident or even fatality.

 **CAUTION!** If the caution is ignored, there is the danger of a problem that may cause injury/damage to property or the unit itself.

Meaning of Symbols



This symbol indicates items that urge the warning (including the caution). A detailed warning message is shown adjacent to the symbol.



This symbol indicates items that are strictly prohibited. A detailed message is shown adjacent to the symbol with specific actions not to perform.



This symbol indicates items that should be always performed. A detailed message with instructions is shown adjacent to the symbol.

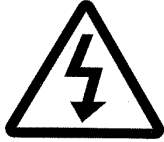
Cautions in Using with Safety

Table of Illustrated Symbols

Warning



Warning,
generally



Warning,
high voltage



Warning,
high temperature



Warning,
drive train



Warning,
explosive

Caution



Caution,
generally



Caution,
electrical shock



Caution,
scald



Caution,
no road heating



Caution,
not to drench



Caution,
water only



Caution,
deadly poison

Prohibit



Prohibit,
generally



Prohibit,
inflammable



Prohibit,
to disassemble



Prohibit,
to touch

Compulsion



Compulsion,
generally



Compulsion,
connect to the
grounding
terminal



Compulsion,
install on a flat
surface



Compulsion,
disconnect the
power plug



Compulsion,
periodical
inspection

Cautions in Using with Safety

Fundamental Matters of “WARNING!” and “CAUTION!”

WARNING!

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

Never use this unit in an area where there is flammable or explosive gas. This unit is not explosion-proof. An arc may be generated when the power switch is turned on or off, and fire/explosion may result. (Refer to page18 “List of Dangerous Substances”.)

Always ground this unit

Always ground this unit on the power equipment side in order to avoid electrical shock due to a power surge.

If a problem occurs

If smoke or strange odor should come out of this unit for some reason, turn off the power key right away, and then turn off the circuit breaker and the main power. Immediately contact a service technician for inspection. If this procedure is not followed, fire or electrical shock may result. Never perform repair work yourself, since it is dangerous and not recommended.

Do not use the power cord if it is bundled or tangled

Do not use the power cord if it is bundled or tangled. If it is used in this manner, it can overheat and fire may be caused.

Do not process, bend, wring, or stretch the power cord forcibly

Do not process, bend, wring, or stretch the power cord forcibly. Fire or electrical shock may result.

Substances that can not be used

Never use explosive substances, flammable substances and substances that include explosive or flammable ingredients in this unit. Explosion or fire may occur.

Do not disassemble or modify this unit

Do not disassemble or modify this unit. Fire or electrical shock or failure may be caused.

CAUTION!

During a thunder storm

During a thunderstorm, turn off the power key immediately, then turn off the circuit breaker and the main power. If this procedure is not followed, fire or electrical shock may be caused.

Requirements for Installation

WARNING!

1. Always ground this unit



- Connect the power plug to a receptacle with grounding connectors.



- Do not forget to ground this unit, to protect you and the unit from electrical shock in case of power surge. Choose a receptacle with grounding connectors as often as possible.
- Do not connect the grounding wire to a gas pipe, or by means of a lightning rod or telephone line. A fire or electrical shock will occur.

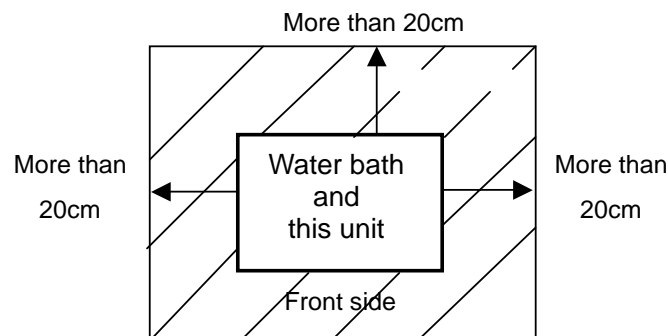
2. Choose a proper place for installation



- Do not install this unit in a place where:
 - ◆ Rough or dirty surface.
 - ◆ Flammable gas or corrosive gas is generated.
 - ◆ Ambient temperature exceeds 35°C.
 - ◆ Ambient temperature fluctuates violently.
 - ◆ There is direct sunlight.
 - ◆ There is excessive humidity and dust.
 - ◆ There is a constant vibration.



- Install this unit setting with water bath on a stable place with the space as shown below.



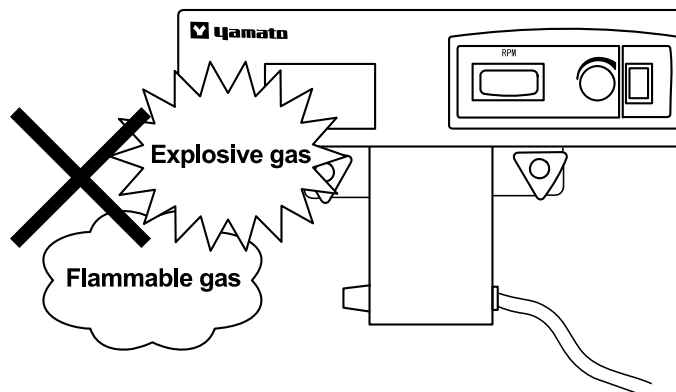
3. Do not use this unit in an area where there is flammable or explosive gas



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



- To know about flammable or explosive gas refer to page18 "List of Dangerous Substances".

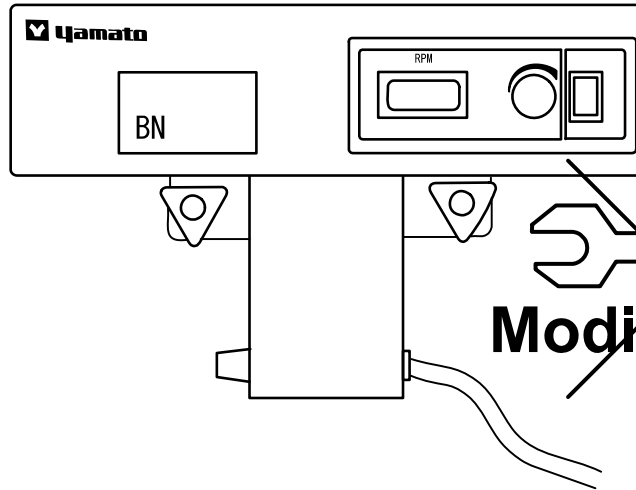


Requirements for Installation

4. Do not modify



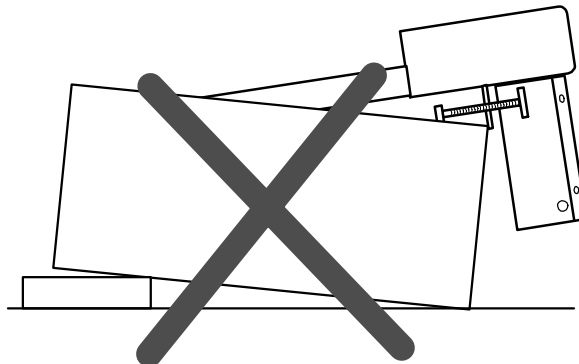
- Modification of this unit is strictly prohibited. This could cause a failure.



5. Installation on horizontal surface



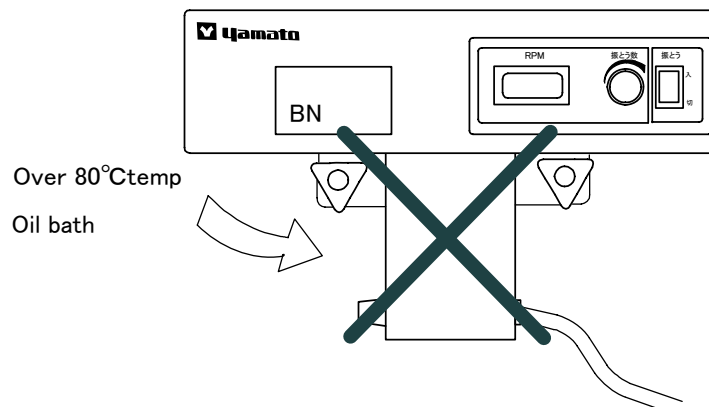
- Set this unit to the flattest place. Setting this unit on rough or slope place could cause the vibration or noise, or cause the unexpectible trouble or malfunction.



6. Do not use high temperature



- This is the shaking unit exclusive for water bath. Don't use for the water bath or oil bath which temperature is over 80 degrees C. It causes unexpected troubles and breakdown.



Requirements for Installation

CAUTION!

7. Choose a correct power distribution board or receptacle



- Choose a correct power distribution board or receptacle that meets the unit's rated electric capacity.

Electric capacity: 100V AC 1A

NOTE)

There could be the case that the unit does not run even after turning ON the power. Inspect whether the voltage of the main power is lowered than the specified value, or whether other device(s) uses the same power line of this unit. If the phenomena might be found, change the power line of this unit to the other power line. And besides, confirm that the shaking adjusting knob is not set to the minimum.

8. Before/after installing



- It may cause injure to a person if this unit falls down or moves by the earthquake and the impact. etc..To prevent, take measures that the unit cannot fall down, and not install to busy place.

9. Handling of power code



- Do not entangle the power cord. This will cause overheating and possibly a fire.
- Do not bend or twist the power cord, or apply excessive tension to it. This may cause a fire and electrical shock.
- Do not lay the power cord under a desk or chair, and do not allow it to be pinched in order to prevent it from being damaged and to avoid a fire or electrical shock.
- Keep the power cord away from any heating equipment such as a room heater. The cord's insulation may melt and cause a fire or electrical shock.

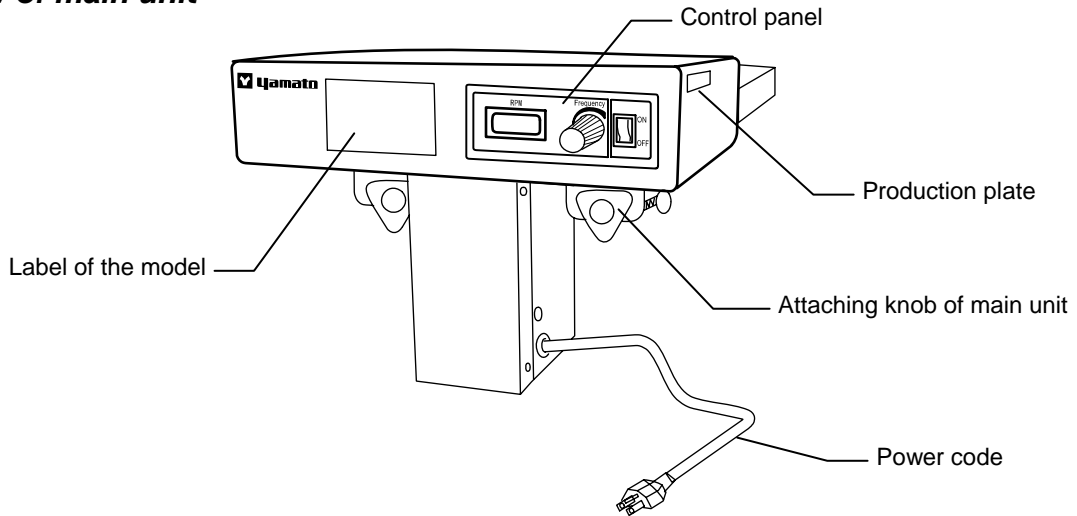


- If the power cord becomes damaged (wiring exposed, breakage, etc.), immediately turn off the power at the rear of this unit and shut off the main supply power. Then contact your nearest dealer for replacement of the power cord. Leaving it may cause a fire or electrical shock.
- Connect the power plug to the receptacle which is supplied appropriate power and voltage.

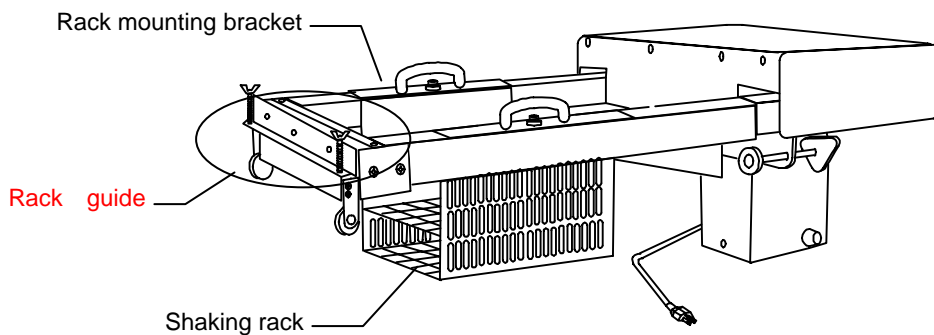
Description and Function of Each Part

Main Unit and Control panel

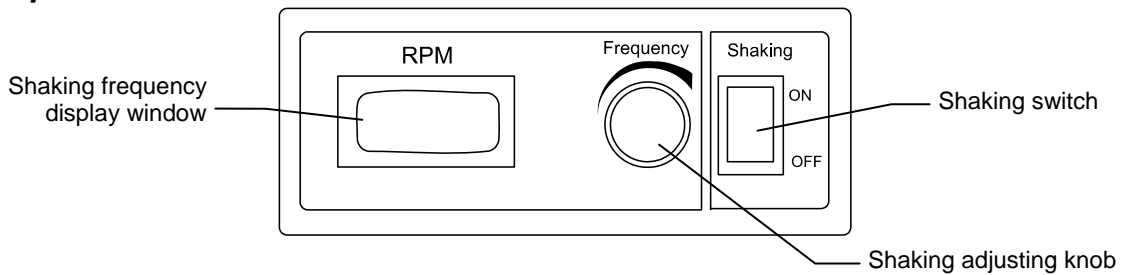
Front view of main unit



Rear view of main unit



Control panel



Function of each part

Part Name	Function
Shaking Adjusting Knob :	Turn to clockwise to increase the shaking frequency, and turn to counterclockwise to decrease the shaking frequency.
Shaking Switch :	Press "ON" (UP) to turning ON the power, and press "OFF" (LOW) to turning OFF the power.
Shaking Frequency Display Window :	Displays the setting shaking frequency.
Attaching Knob of Main Unit :	Knob for fixing the main unit to a water bath.
Rack guide	Slide style guide supporting rack end. Locate rack with brackets.

Preparation

Fix this unit to the water bath

Fix this unit to the applicable constant temperature water bath or user's water bath securely.

Shaking unit adjust to temperature controlled bath : BQ300
 BV300
 BK400/500
 BA400/500
 BF+BZ

* Fix shaking unit to water bath with attaching knob of main unit. Locate rack ends with both ends screws of rack guide .



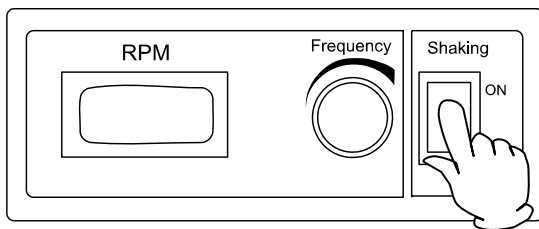
If you apply your water bath, check the size of the water bath before applying it.

Inner Size	Width of Water Bath: 300 to 500 mm, Depth: 450 mm or more, Height: 150 mm or more
Outer Size	Max. Attachable Width: 500 mm, Max. Attachable Depth: 450 mm, Min. Attachable Height: 180 mm
Attaching Width of Knob	Max. Width 75 mm

Set the sample container

Fix the container with sample to the shaking rack before turning on the shaking switch.

Turn on the power

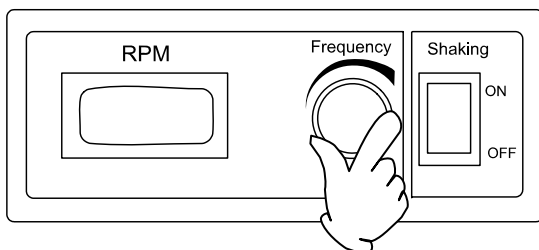


- Connect the 100VAC \pm 10% to the power source without fail. Then turn "ON" the shaking switch.
- The shaking frequency display window lights on.



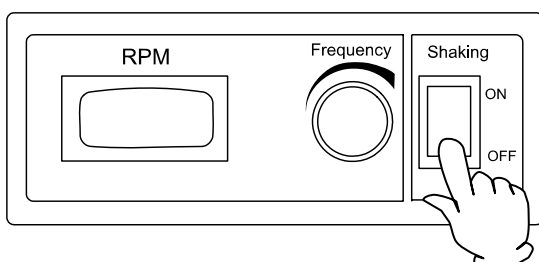
Check the shaking adjusting knob is turned back to "0" when turning on the power.

Start shaking.



- The shaking frequency is set using the adjusting knob.
- Turn the adjusting knob to clockwise, increase the shaking frequency little by little watching the shaking frequency display window on the control panel, and stop turning the knob at the desired shaking frequency.
- ❖ Use this unit with the shaking frequency at under 160 rpm.

Stop shaking.



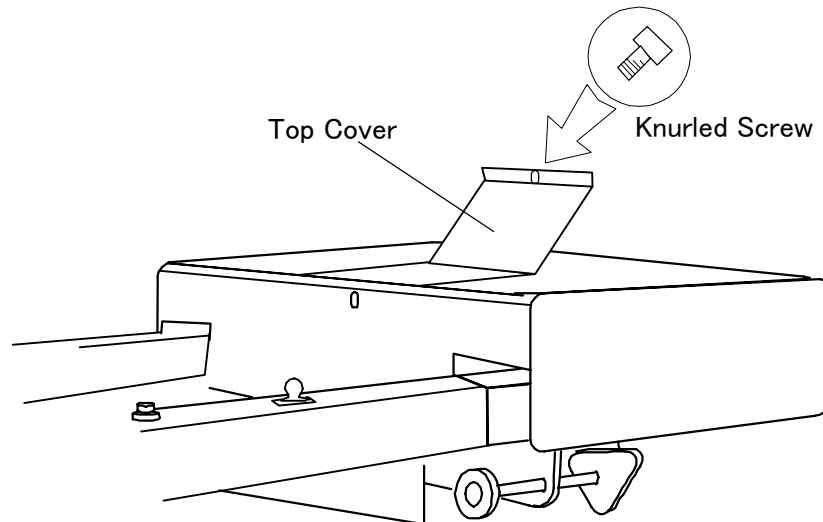
- For stopping shaking, the shaking frequency is set using the adjusting knob.
- Turn the shaking adjusting knob to counterclockwise little by little, decrease the shaking frequency, and turn off the power when the shaking display window indicates the shaking frequency at "0".

Shaking Width Adjusting Method

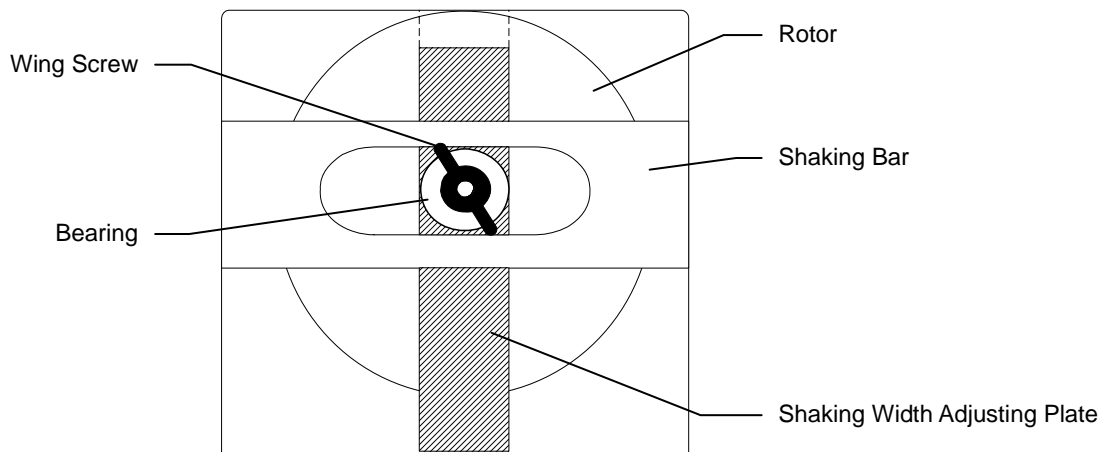
CAUTION!

Before setting, turn off the power and remove the power cord from the receptacle without fail.

1. Open the top cover of the unit.



2. Loosen the wing screw fixing the shaking width adjusting plate by pressing the rotor. Slide the shaking width adjusting plate to the desired shaking width, and tighten the wing screw securely.




- The shaking width is adjustable within the range 10 to 30mm, and possible to set at the arbitrary position.


3. Close the top cover of the unit, and tighten the knurled screw.

WARNING!

If a problem occurs


-  If smoke or strange odor should come out of this unit for some reason, turn off the power key right away, and then turn off the breaker and the main power. Immediately contact a service technician for inspection. If this procedure is not followed, fire or electrical shock may result. Never perform repair work yourself, since it is dangerous and not recommended.

Substances that cannot be used


-  Never use explosive substances, flammable substances and substances that include explosive or flammable ingredients in this unit. Explosion or fire may occur. (Refer to page18 “List of Dangerous Substances”.)

CAUTION!


Do not step on this unit

-  Do not step on this unit. It will cause injury if this unit fall down or break.


Do not put anything on this unit

-  Do not put anything on this unit. It will cause injury if fall.


During a thunder storm

-  During a thunderstorm, turn off the power key immediately, then turn off the circuit breaker and the main power. If this procedure is not followed, fire or electrical shock may be caused.


Clean this unit with enough

-  Though this unit is cleaned beforehand, clean it with enough after leaving for a long period or when using it for the first time.


Water to be applied for a bath

-  Do not use the water including other liquids. The recommended water to be applied is, if possible, either ion exchange water or distilled water, and purify the water sometimes.


Do not sprinkle water on this unit

-  Pay attention not to sprinkle water on this unit when you set the unit to (or remove from) a water bath. If the control panel gets wet with water, wipe water off immediately. Failure to do so could cause the electric leakage or electric shock.


Countermeasure for stop operation during night or long-term stop

-  In case of stopping operation during night or long-term, remove the power plug from the receptacle.

Unattended continuous operation

-  In case of performing unattended continuous operation, pay attention to the auto supplying water device (optional accessory, Level Controller (OBF10 Model) product code: 221570) for not heating with empty status. If a water bath is heated with empty status, samples get an influence.

Return after power failure

-  When power is supplied after a power failure, the device automatically starts operation again with the same state as just before the power failure. It is danger that the device starts unattached operation after a power failure. We recommend for you to turn off the shaking switch of this unit if a power failure occurs during operation.

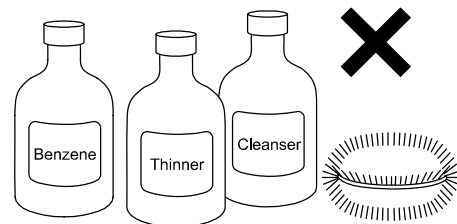
Daily Inspection and Maintenance

WARNING!

- Disconnect the power cable from the power source when doing an inspection or maintenance unless needed.
- Perform the daily inspection and maintenance after returning the temperature of this unit to the normal one. (Be sure to check the water in the test bath is cooled down.)
- Do not disassemble this unit.

CAUTION!

- Use a well-drained soft cloth to wipe dirt on this unit. Do not use benzene, thinner or cleanser for wiping. Do not scrub this unit. Deformation, deterioration or color change may result in.



Maintenance of shaking rack

- The density of the water in the water bath is concentrated gradually, and dirt might be attached and accumulated. If a fur or dirt is attached or accumulated in the shaking rack, dip the water out of the water bath, and clean it completely.

For any questions, contact the dealer who you purchased this unit from, or the nearest sales division in our company.

When not using this unit for long term / When disposing

CAUTION!

When not using this unit for long term...

- Turn off the power and disconnect the power cord.

WARNING!

When disposing...

- Keep out of reach of children.
- Treat as large trash.

Environmental protection should be considered

We request you to disassemble this unit as possible and recycle the reusable parts considering to the environmental protection. The feature components of this unit and materials used are listed below.

Component Name	Material
Parts of Main Unit	
Exterior	Iron steel plate
Interior	Stainless steel SUS304
Production plates	Polyethylene (PET) resin film
Knobs	Resin, Rubber, SUS304
Electrical Parts	
Switches, Relays	Composites with resin, copper and others
Circuit board	Composites with glass fiber and others
Power cord	Composites with synthetic rubber, copper, nickel and others
Parts of Shaking Device	
Motor	Composites with aluminum, copper and others
Rotation part	Aluminum, SUS304
Shaking part	SUS304, Resin
Accessory	
Shaking rack	Stainless steel SUS304

Trouble Shooting

Condition	Possible Causes
The device does not start shaking when turning on the shaking switch.	<ul style="list-style-type: none">• Power plug is not connected to the receptacle correctly.• Shaking switch is turned to "OFF".• The shaking adjusting knob is set to the minimum.• Shaking rack is touching any obstacle.• The thermal protector for shaking motor might be activated. After removing any trouble, turn off the power temporarily, and turn on it again.

When power failure occurs...

- When power is supplied after a power failure, the device automatically starts operation again with the same state as just before the power failure. It is danger that the device starts unattached operation after a power failure.
- We recommend for you to turn off the switch of device if a power failure occurs during operation.

In the case if the error other than listed above occurred, turn off the power switch and primary power source immediately. Contact the shop of your purchase or nearest Yamato Scientific Service Office.

In Case of Request for Repair

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

< Check following items before contact >

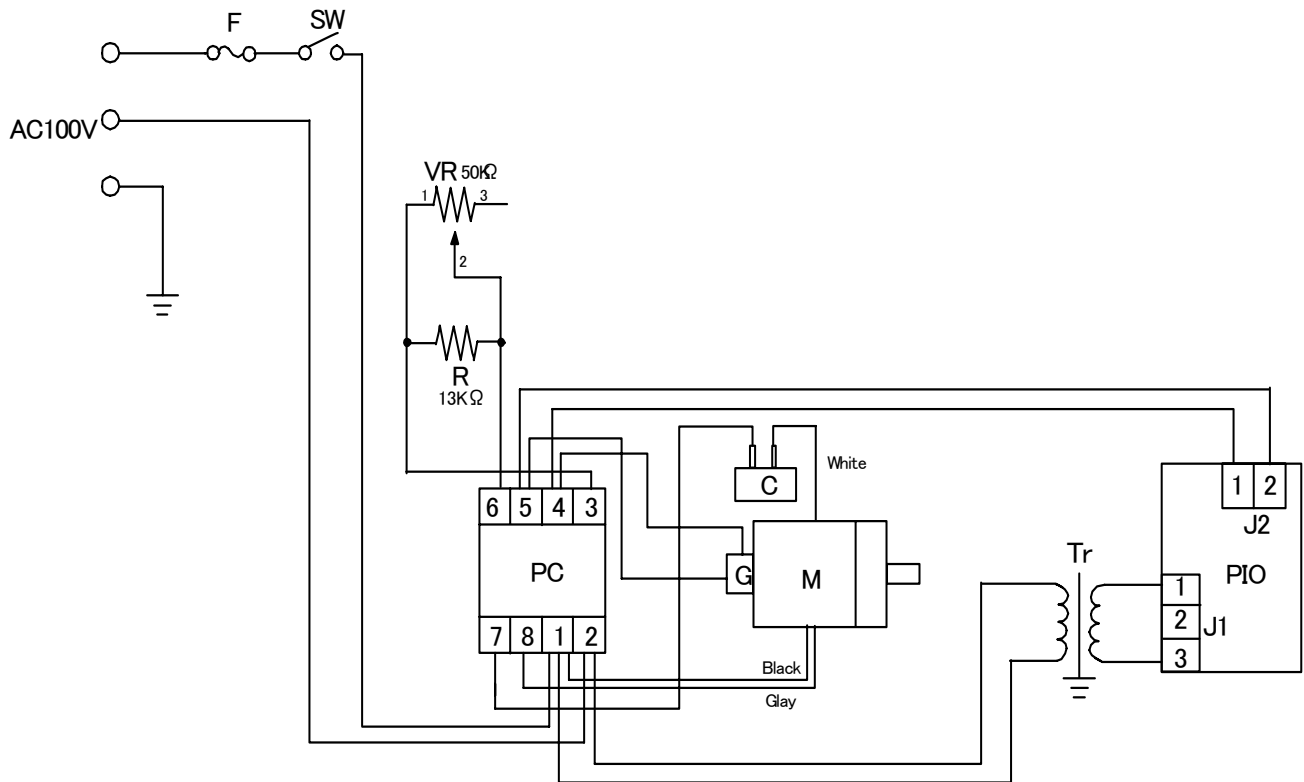
- ◆ Model Name of Product
 - ◆ Production Number
 - ◆ Purchase Date
 - ◆ About Trouble (in detail as possible)
- } See the production plate attached to this unit.

Minimum Retention Period of Performance Parts for Repair

The minimum retention period of performance parts for repair of this unit is 7 years after discontinuance of this unit.

The "performance part for repair" is the part that is required to maintain this unit.

Model	BN300
Shaking frequency	20 to 160 times/min.
Shaking width	10 to 30mm adjustable
Shaker	Condenser motor 25W
Shaking frequency setting system	Digital setting
Shaking frequency display system	Digital display
Safety device	Motor overload prevention, Fuse at power source
Power supply	100V AC, 1A
External dimensions	W340 × H644 × D250 mm
Weight	Approx. 10Kg
Spring pitch	15mm (Both the vertical and the horizontal)
No. of container	Test tube (Diameter 15mm): × 80
	Erlenmeyer flask (50mL): 300mL × 6/500mL × 3
Accessories	Shaking rack, Instruction manual



◆ Electrical Parts List

Symbol	Part name
SW	Shaking switch
PC	Speed controller
VR	Shaking frequency setting volume
R	Fixed resistor
M/C/G	Shaking motor
Tr	Transformer
PIO	Shaking frequency display board

Replacement Parts Table

Part Name	Code No.	Specification	Manufacturer
Power code	DN005	3 cores 1.25sq 1.8m with plug	Yamato Scientific
Shaking switch	2010010016	DS-850S-F2-ON	Miyama
Speed controller	2140000043	SRC02 100V	Seishin
Shaking frequency adjusting volume	212020005	RV24YN50SB 50K Ω	Cosmos
Shaking motor	2140000038	S8125GCH-S12(TP) 100V 25w	Seishin
Transformer	2180000044	100V FR 301N234	Yamato Scientific
Shaking frequency display board ROM	RE50040120 2210000003	RE510 (ROM=BN)	Yamato Scientific
Gear head	2140000041	S8KA7.5B1	Seishin

Refer to the described code No. for the part to be replaced.

List of Dangerous Substances



Never use explosive substances, flammable substances and substances that include explosive or flammable ingredients in this unit.

EXPLOSIVE

EXPLOSIVE:	Ethylene glycol dinitrate (nitro glycol), Glycerin trinitrate (nitroglycerine), Cellulose nitrate (nitrocellulose), and other explosive nitrate esters
	Trinitrobenzene, Trinitrotoluene, Trinitrophenol (picric acid), and other explosive nitro compounds
	Acetyl hidroperoxide (peracetic acid), Methyl ethyl ketone peroxide, Benzyl peroxide, and other organic peroxides

FLAMMABLE

IGNITING:	Lithium (metal), Potassium (metal), Sodium (metal), Yellow phosphorus, Phosphorus sulfide, Red phosphorus, Celluloid compounds, Calcium carbide, Lime phosphate, Magnesium (powder), Aluminum (powder), Powder of metals other than magnesium and aluminum, Sodium hydrosulfite
OXIDIZING:	Potassium chlorate, Sodium chlorate, Ammonium chlorate, and other chlorate
	Potassium perchlorate, Sodium perchlorate, Ammonium perchlorate, and other perchlorate
	Potassium peroxide, Sodium peroxide, Barium peroxide, and other inorganic peroxide
	Potassium nitrate, Sodium nitrate, Ammonium nitrate, and other nitrate
	Sodium chlorite and other chlorites
Calcium hypochlorite and other hypochlorites	
INFLAMMABLE LIQUID:	Ethyl ether, Gasoline, Acetaldehyde, Propylene chloride, Carbon disulfide, and other flammable substances having a flash point of lower than -30°C
	Normal hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone, and other flammable substances having a flash point of -30°C or higher but lower than 0°C
	Methanol, Ethanol, Xylene, Pentyl acetate (amyl acetate), and other flammable substances having a flash point of 0°C or higher but lower than 30°C
	Kerosene, Light oil (gas oil), Oil of turpentine, Isopentyl alcohol (isoamyl alcohol), Acetic acid, and other flammable substances having a flash point of 30°C or higher but lower than 65°C
FLAMMABLE GAS:	Hydrogen, Acetylene, Ethylene, Methane, Propane, Butane, and other flammable substances which assume a gaseous state at 15°C and 1 atm

(Source: Appendix Table 1 of Article 6 of the Industrial Safety and Health Order in Japan)

Responsibility

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

Note

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

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Model BN300

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