

Low temperature constant bath

BU 200

BU 300

Version 1.1

- Thank you very much for purchasing the product of Yamato Scientific Co., Ltd.
- Read this operating manual and the guarantee card thoroughly for the proper use of this product. Please keep both importantly after reading.

Warning : Before attempting to use the product, read the important warnings that appear in the text of this manual and get familiar with them.



<i>Attention</i>	<u>1</u>
<i>Merit</i>	<u>2</u>
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Please observe the following rules

Installation



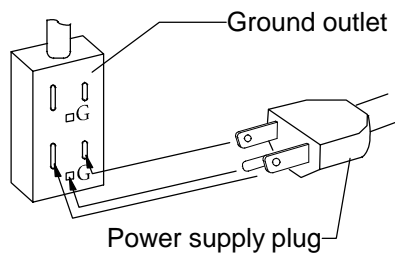
Warning

1. Please take the earth

Please take the earth to avoid the electric shock hazard by the leak.

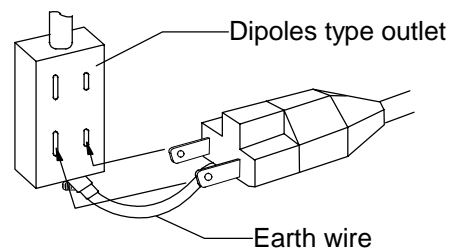
■ In case of outlet with ground at use

Please insert the power supply plug in the ground outlet.



■ When you use the outlet of the dipoles type

The optional earth adapter is inserted in the power supply plug. Please connect the power supply plug with the outlet after confirming the polarity on the outlet side.



■ In case of no earth terminal

In this case, the special construction is needed. Please consult the dealer or our company sales office.

2. Please confirm the voltage and capacity of power supply.

Electric capacity :

- BU200 AC100V 4A (when the service outlet is used 15A)
- BU300 AC100V 8A



Caution

1. Please note the installation place

■ Please do not set up especially in the following places.

- Place where flammable gas and corroded gas are generated
- Place where surrounding temperature becomes 35°C or more
- Place where surrounding temperature becomes 35°C or more
- Place where temperature difference is violent
- Place where a lot of moistures exists
- Place where direct sunshine strikes
- Place where vibration is received
- Place where ventilation is bad
(Please set up with separating at least 10 cm or more from the wall)

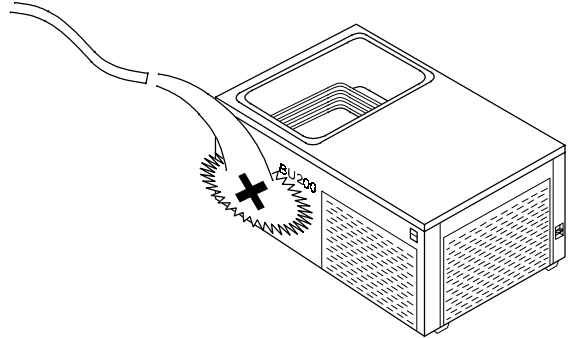
■ Please set up in a strong and horizontal place. Otherwise, the refrigerator might break down. Please turn the caster stopper on after setting up. (applicable to BU300 only)



Warning

1. Do not sprinkle water on the main body

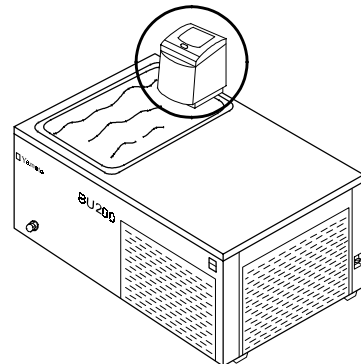
- When water splashes to the electrical component, the leak and the electric shock are caused. Water must not splash to the operation panel and the power supply switch. Please turn off the power supply on the building side when water lies by any chance. And, please wipe water off. The danger of the leak and the electric shock grows when leaving as it is.



Caution

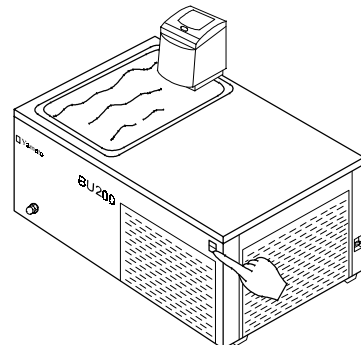
1. Do not operate without immersion temperature control device

- Sure to combine with a immersion temperature control device. The temperature of the liquid goes down and it is impossible to keep a constant temperature when using without immersion temperature control device.



2. Turn the power of the refrigerator off

- Please turn the switch of the refrigerator off when a set point of immersion temperature control device exceeds room temperature +5°C.



3. About the liquid in the reservoir

- Please use water or the ethyl alcohol solution.

(1) When using water

To use the ion exchange water or distilled water is recommendable. Because the adhesion of scale is few, maintenance becomes easy.

		×
Ion exchange water	Water service water	Well water

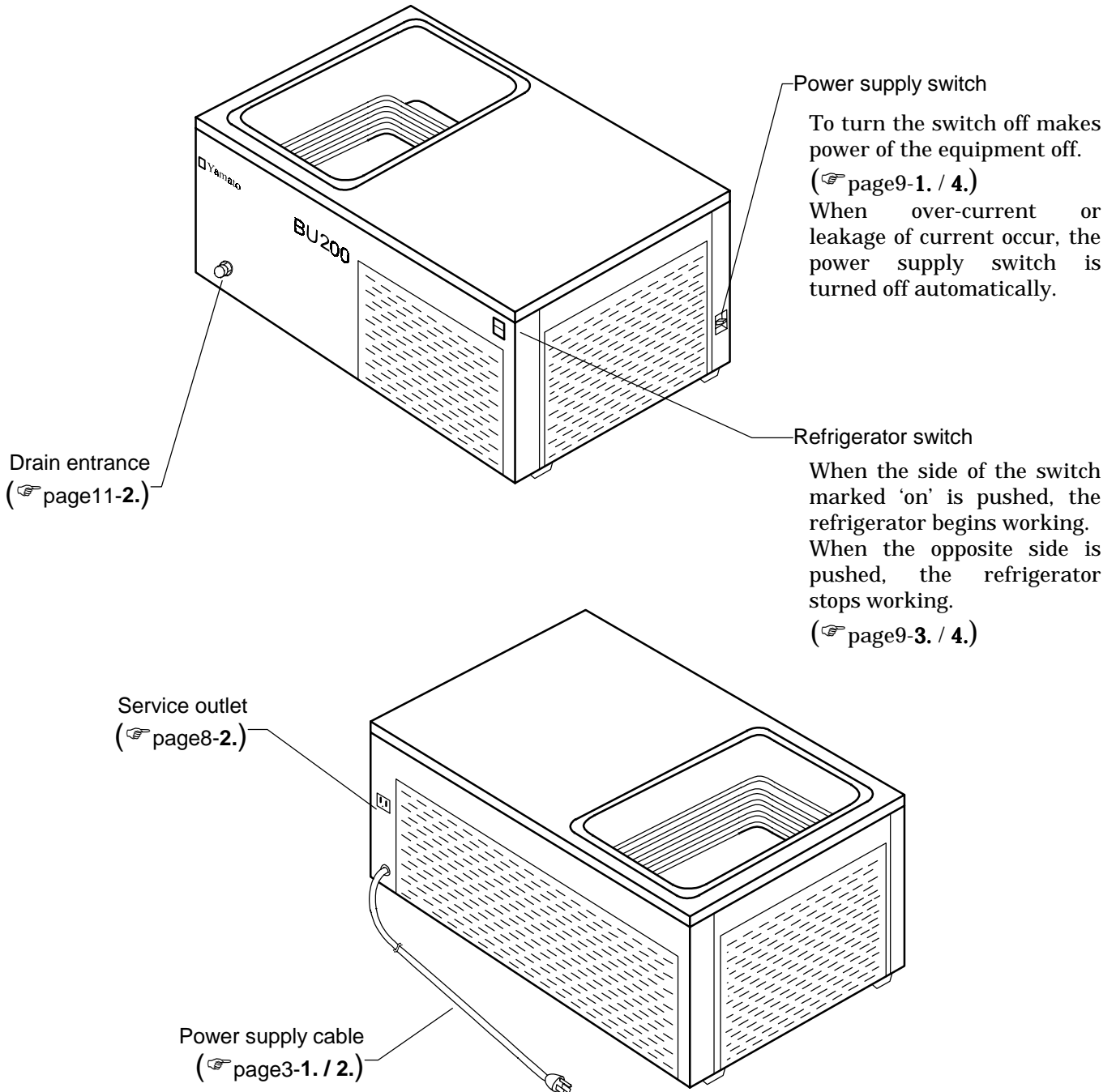
(2) When using alcohol

Be sure to use the ethyl alcohol solution. Please refer to the table to your right for the density of solution. Please never use neither antifreezing solution for the car nor the ethylene glycol solution. Immersion temperature control device might not operate normally.

Density of ethanol		Coagulation point ()
Wt %	Vo1 %	
4.8	6.0	-2.0
11.3	14.0	-5.0
13.8	17.0	-6.1
16.4	20.2	-7.5
17.5	21.5	-8.7
18.8	23.1	-9.4
20.3	24.8	-10.6
22.1	27.0	-12.2
24.2	29.5	-14.0
26.7	32.4	-16.0
29.9	36.1	-18.9
33.8	40.5	-23.6
39.0	46.3	-28.7
46.3	53.8	-33.9

Name of each part and function

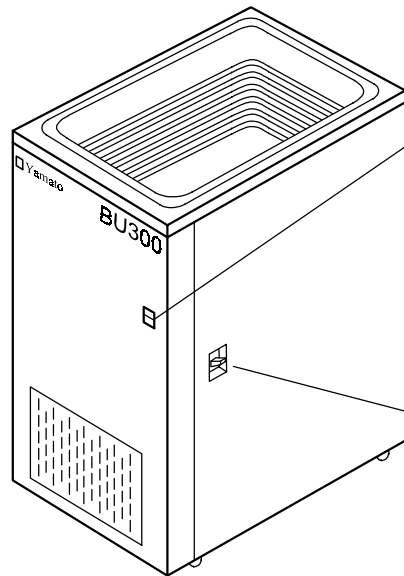
BU200



Attached goods

auxiliary printed matters

- Instruction manual
- Guarantee book



Refrigerator switch

When the side of the switch marked 'on' is pushed, the refrigerator begins working. When the opposite side is pushed, the refrigerator stops working.

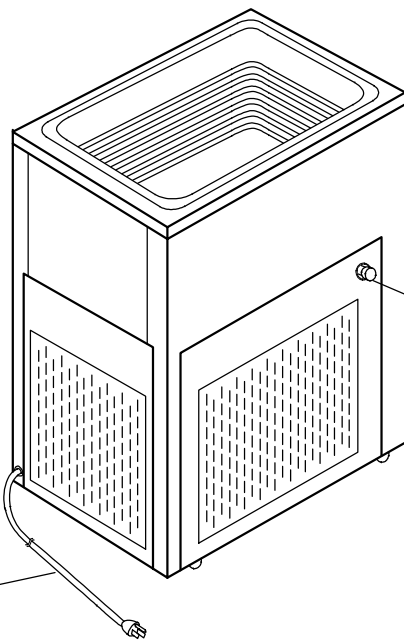
(☞ page10-3. / 4.)

Power supply switch

To turn the switch off makes power of the equipment off.

(☞ page10-1. / 4.)

When over-current or leakage of current occur, the power supply switch is turned off automatically.

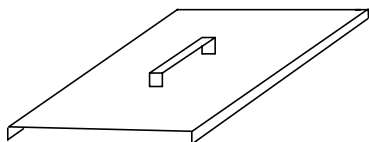


Drain entrance

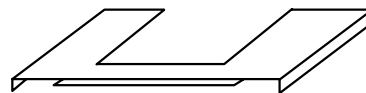
(☞ page11-2.)

Power supply cable
(☞ page3-1. / 2.)

Attached goods



• Bath cover complete set for low temperature



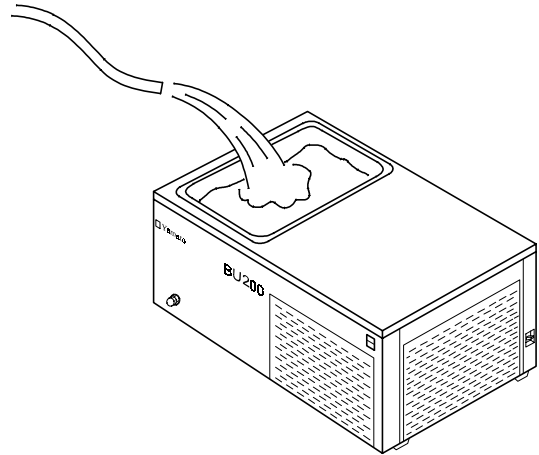
auxiliary printed matters

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Preparation and confirmation before using

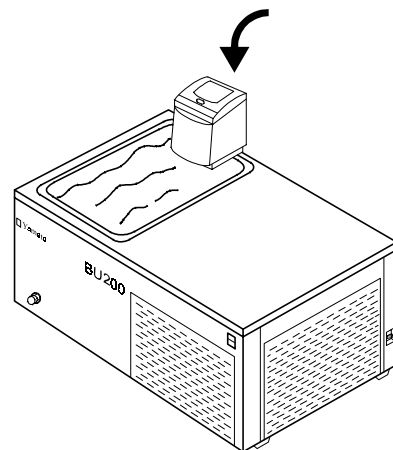
1. Pour the liquid into the reservoir

- The amount of the overflow liquid changes depending on the shape and the number of the container. Please pour appropriate amount of liquid into the reservoir. It is recommended to pour the liquid to the extent that the liquid just hides the cooling coil.



2. Attach immersion temperature control device

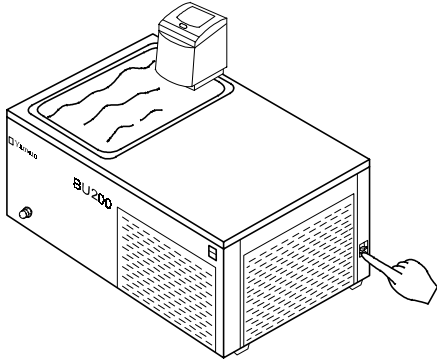
- Please loosen the knob for fixation of the immersion temperature control device and set it up at the back of the main body. BU200 provides the immersion temperature control device with the power from its service outlet. Service outlet can be used as long as the power supply switch of main body is turned on. For more detailed information, please see the instruction manual for immersion temperature control device.



BU200

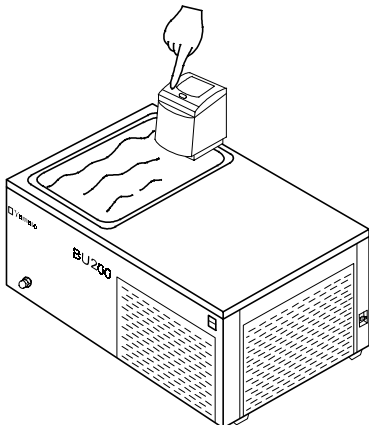
1. Turn the power supply switch on

- The power supply turns on when the power supply switch is moved up.



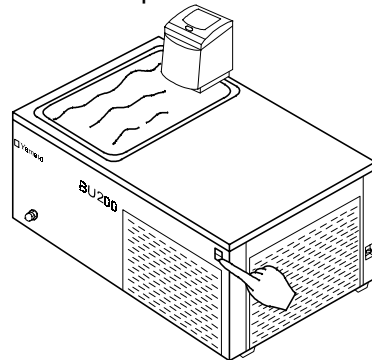
2. Set the setpoint (desired temperature) of immersion temperature control device

- Please set the setpoint of immersion temperature control device. The method of a detailed operation is described in the instruction manual for the immersion temperature control device. Please see the instruction manual for more detailed information.



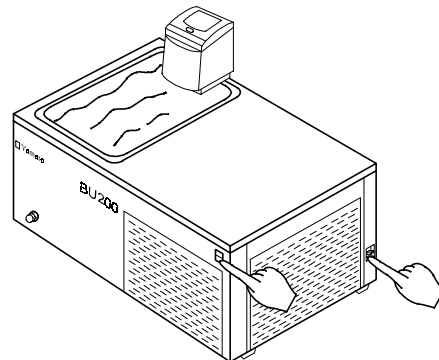
3. Push the "On" side of the refrigerator switch

- So long as the setpoint of immersion temperature control device is equal to or less than the room temperature +5°C, turn the power of the refrigerator on. Even if the temperature in the reservoir is high, the refrigerator can operate.



4. When you stop the refrigerator

- Push the "OFF" side of the refrigerator switch. Then, the refrigerator stops. In this case, power of immersion temperature controller is still ON. Please turn off the immersion temperature controller if you do not use it any more.

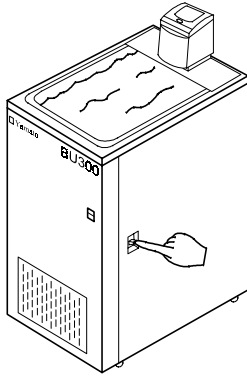


Caution

- Do not turn on and off the refrigerator in a short term (5 minutes or less). This causes the refrigerator to break down.
- When making the low temperature in the reservoir low in the high room temperature, the drop of water might adhere to this machine. Please wipe the drop of water off with a soft cloth in every case.

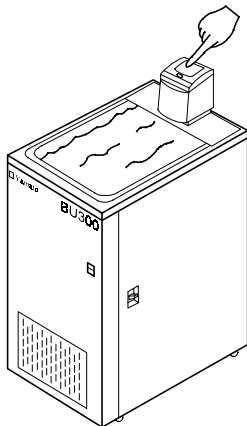
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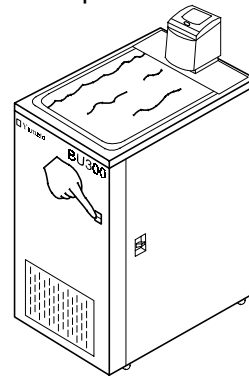
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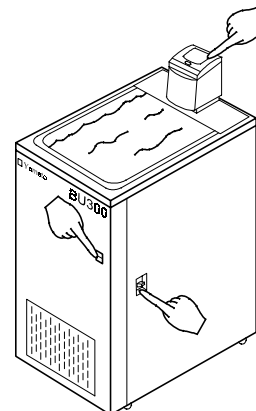
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4. When you stop the refrigerator

- Push the "OFF" side of the refrigerator switch. Then, the refrigerator stops. In this case, power of immersion temperature controller is still ON. Please turn off the immersion temperature controller if you do not use it any more.



Caution

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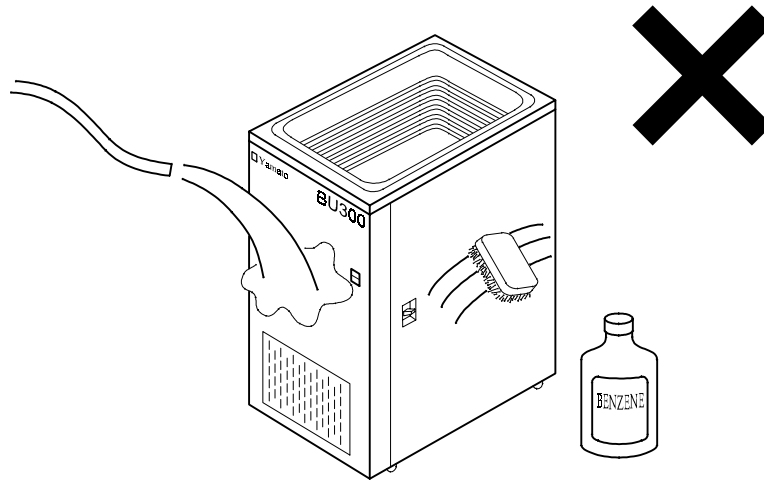


Caution

When maintaining, please pull out the power supply plug from the outlet for safety. Do not decompose the equipment.

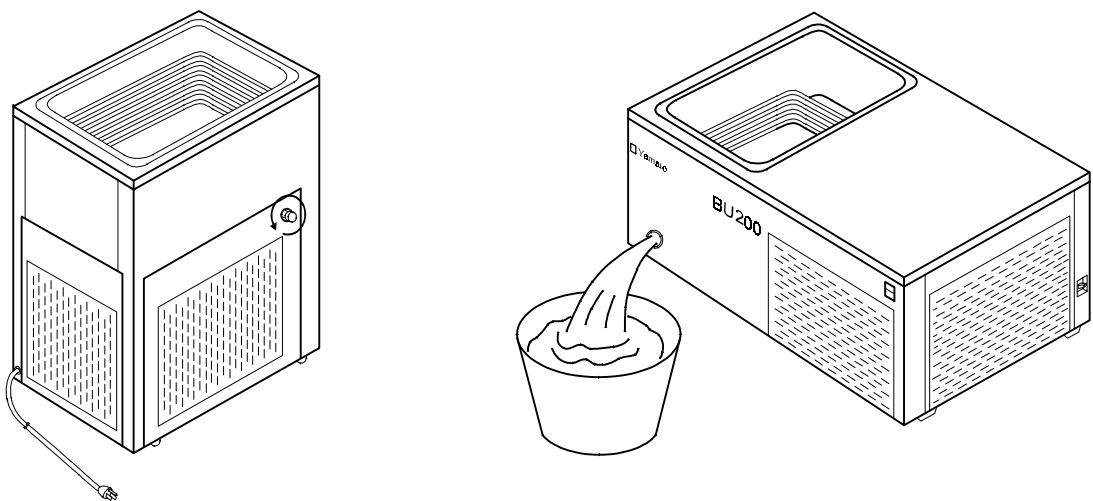
1. Main body

- Please wipe the dirt of the surface off with a soft cloth which squeezes and removed moisture. There is danger of the electric shock. Please do not wipe the equipment with benzine, thinner or kurenzah etc. Please do not rub with the scourer. The painting of the equipment is hurt and rust is caused.



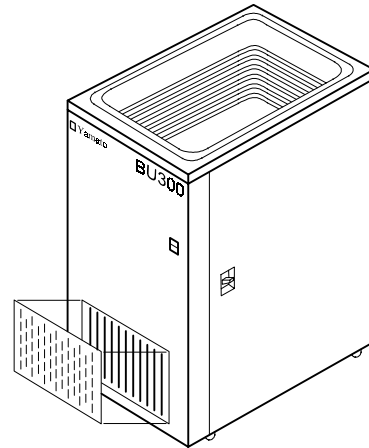
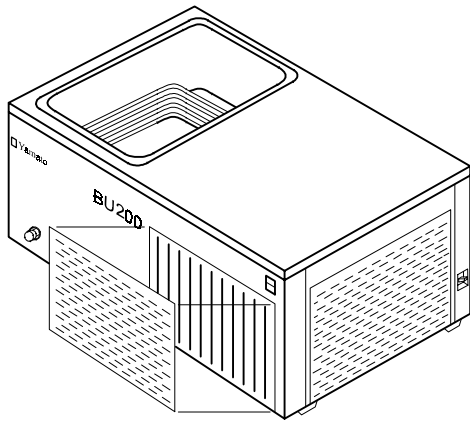
2. Reservoir

- When the reservoir becomes dirty with the scales and the floatage, please remove the cap of the drain and pull out the liquid in the reservoir. After that, please wash the reservoir with the neutral detergent. Afterwards, please rinse the detergent by water. Please do not use an alkaline detergent.
- If reservoir is not used for a long term, empties the reservoir and keep it dry.



3. Refrigerator

- Please detach the cover of the front of this machine regularly and remove the garbage which adheres to the condenser fin with a cleaner. Please pay attention so as not to crush the fin when cleaning.



After-sales service and guarantee

1. When you request the repair

- Please record the error code, turn off the power supply switch, and pull out the power supply plug if abnormality occurs by any chance. Please report to the dealer or our company office.
- Contents to report
 - Model of product
 - Product number
 - Date of purchase (Please look at the guarantee book or the rating plate pasted to the main body)
 - Symptom of breakdown (as detailed as possible)
- Please present the guarantee book when the person in charge of service visits.

2. Guarantee book

- The guarantee book is passed from the dealer or our company office. Please keep it importantly after confirming the filling in matter such as the shop name and the purchase days and often reading.
- The guaranteed term is for one year from purchase day. When the breakdown occurs within the guaranteed term, our company repairs free of charge according to the condition described to the guarantee book.
- Please consult the dealer from which you purchase the equipment or our company about the repair after the guaranteed term expires. When the function can recover by repair, we repair the equipment upon your request. In this case the repair is charged.

3. The minimum possession periods of parts for repair

- After discontinuance of manufacturing, the minimum possession periods of parts for repair of this machine are seven years. Parts for the repair mean the parts necessary to maintain the performance of the product.

4. When thinking the equipment breaks down

Symptom	Checkpoint before requesting repair
The equipment does not work even if the refrigerator switch is turned on	<ul style="list-style-type: none"> • Check whether the power supply switch will be turned off. • Check whether the plug and the outlet come in contact neatly.
If the temperature in the reservoir does not go down or is slow to go down even if the refrigerator switch is turned on	<ul style="list-style-type: none"> • Check whether there will be a lot of samples. • Check whether the cooling coil freezes. • Check whether a lot of garbage adhere to the condenser fin.

Specification table

Model		BU200	BU300
Performance ↓			
Temperature Range (°C)		- 10 to 80	- 20 to 80
Cooling Capacity (J/s)		350 (300 kcal/h) ¹ at 20 °C 290 (250 kcal/h) ² at 10 °C	465 (400 kcal/h) ³ at 20 °C 400 (350 kcal/h) ⁴ at 0 °C
Time to reach the lowest temperature (minute)		approximate 90 ⁵ (20 to -10 °C)	approximate 120 ⁶ (20 to -20 °C)
Refrigerator	Compression machine output	Air cooling sealing type 150 W	Air cooling sealing type 400 W
	Refrigerant	R22	
Dimensions ↓			
Capacity of Reservoir (litter)		13	30
Reservoir (W × D × H mm)		220 × 160 × 150	360 × 240 × 200
Overall (W × D × H mm)		650 × 480 × 315	385 × 575 × 830
Power Requirement		AC100V, 15A (with BF200 or BF400 or BF500 working)	AC100V, 8A ⁷
Standard auxiliary goods		None	Bath cover for low temperature
Options		<ul style="list-style-type: none"> ● Bath cover for low temperature ● Putting stand with height adjustment mechanism 	None

¹ Standard rating

² Standard rating

³ Standard rating

⁴ Standard rating

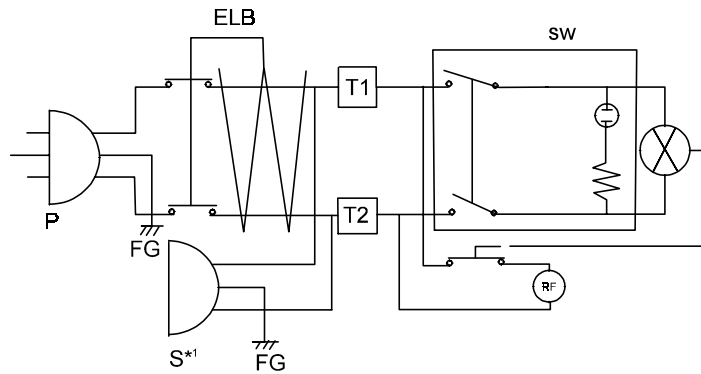
⁵ Heating medium is 100% ethanol.

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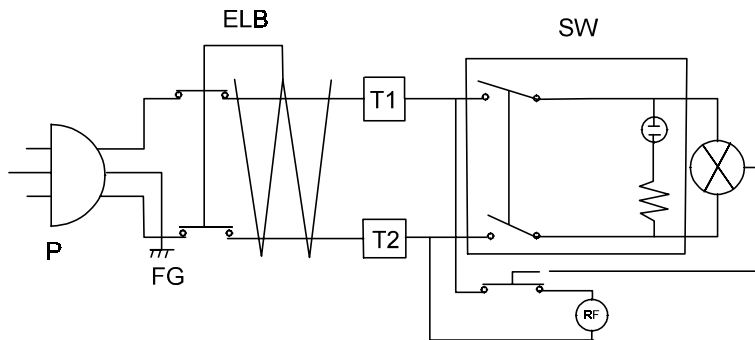
⁷ It is a voltage source capacity of the main body. Using together with immersion temperature control device, the power supply for the immersion temperature control device is required

Chart of connecting wires

BU200



BU300



Symbol	Name
FG	Frame ground
ELB	Earth leakage circuit-breaker
P	Power supply plug
RF	Refrigerator
S ⁸	Service outlet
SW	Switch
T1, T2	Terminal Block
X	Relay

⁸ Applicable to BU200 only

Exchange part table

BU200

Symbol	Part name	Code number	Specification	Maker
ELB	Earth leakage circuit-breaker	2-06-005-0019	AC100V 15A BJS1531	Matsushita Elec.
T1, T2	Terminal block	2-07-000-0004	F1112-250-6-4P	Fujicon
S	Service outlet	7-08-002-0008	S-150	Satohparts
SW	Switch	2-01-011-0008	C1353AT-BGS	Izumi
RF	Refrigerator	3-01-002-0006	UF-S210ML	Sanyo
X	Relay	2-05-012-0003	15A 250VAC AR6524	Matsushita Elec.
	Bath	BU200-30190	SH-1706	Yamato Scientific

BU300

Symbol	Part name	Code number	Specification	Maker
ELB	Earth leakage circuit-breaker	2-06-005-0019	AC100V 15A BJS1531	Matsushita Elec.
T1, T2	Terminal block	2-07-000-0004	F1112-250-6-4P	Fujicon
SW	Switch	2-01-011-0008	C1353AT-BGS	Izumi
RF	Refrigerator	3-01-002-0005	NU-401-ALE	Matsushita Elec.
X	Relay	2-05-012-0003	15A 250VAC AR6524	Matsushita Elec.
	Bath	BU300-30310	SH-1908	Yamato Scientific