

# **WATER BATH**

## **BM110**

## **BM210**

First Edition

- Thank you for your Yamato Scientific BM series Water Bath purchase.
- For proper use of this unit, please read the instruction manual and warranty thoroughly before operation. Keep both for any future references.



Read and apprehend important warnings in this instruction manual prior to use.

**Yamato Scientific**

# Table of Contents

---

<b>1. Specifications .....</b>	<b>1</b>
<b>2. Safety Information .....</b>	<b>2-5</b>
Safety Symbols.....	2
Safety Precautions.....	3-4
Hazardous Materials.....	5
<b>3. Identification of Parts.....</b>	<b>6-9</b>
BM110.....	6
BM210.....	7
Sample : Combined with RE210.....	8
Sample : Combined with RE510.....	9
<b>4. How to Operate.....</b>	<b>10</b>
<b>5. Maintenance.....</b>	<b>11</b>
Daily maintenance/Weekly maintenance .....	11
Troubleshooting Guide.....	11
<b>6. After Sale Service and Warranty.....</b>	<b>12</b>
Request for Repair.....	12
<b>7. Replacement Parts .....</b>	<b>13</b>
<b>8. Wiring Diagram.....</b>	<b>14</b>

# 1. Specifications

Model		BM110	BM210
Temp. range during operation		Room temp. +5°C ~ 95°C *1	
Temp. setting range		0°C ~ 100°C	
Accuracy of temp. adjustment *2		±2°C at 60°C	
Control system		ON/OFF control	
Set-up system		Analog set-up	
Display system		Thermometer	
Operation function		Operation at fixed point	
Thermoregulator		Liquid-operated thermoregulator	
Heater	Material	SUS316 pipe heater	
	Capacity	500W	1kW
Power switch		Paddle switch	
Power lamp		Lit when power is on	
Others		–	Drain (with plug)
Safety device		Protection from overcurrent (fuse)	
Tank	Capacity	4 000L	7000 L
	Dimension	Φ 7.9 × Depth 4.7 (inches) Φ 20 × Depth 12 (cm)	Φ 9.8 × Depth 5.9 (inches) Φ 25 × Depth 15 (cm)
External dimensions (W × D × H) *3		9.4 × 11.8 × 5.9 (inches) 24 × 30 × 15 (cm)	12.2 × 14.2 × 9.1 (inches) 31 × 36 × 23 (cm)
Weight		7.7lb (3.5kg)	13.2lb (6kg)
Required power source		AC230V ± 10% 50Hz 2.3A	AC230V ± 10% 50Hz 4.5A
Liquid used		Water	
Standard accessories		● Bar Alcohol Thermometer (–10°C ~ 110°C with immersion line)      1 ● Fuse      1 ● Instruction manual      1 ● Guarantee      1	

\*1 In case of unloaded operation of bath only. The maximum temperature varies on circumstances and operational conditions.

\*2 It shows the performance under rated power supply at the room temperature of 23°C ± 5°C and with humidity of 65% ± 20%.

\*3 It does not include projection parts.

## 2. Safety Information

### Safety Symbols

#### **Safety Information**

This instruction manual and our products apply various indications for safety. Ignoring these indications can cause such situations as listed below. Read and understand the following warning and caution signs in this manual prior to use.



**WARNING** Indicates the possibility of serious or fatal injury (Note 1).



**CAUTION** Indicates the possibility of injury (Note 2) or damage (Note 3) to the equipment.

(Note 1) Serious injury : Bodily harm by electric shock, bone fracture or poisoning which may require hospitalization.

(Note 2) Injury : Bodily harm by electric shock, bone fracture or poisoning which may not require hospitalization.


(Note 3) Damage : Any damage on equipment, facility, structure, etc.

#### **Meaning of Graphic Indications**

	Shows warning or caution. Specific contents are described aside each sign.
	Shows users important information not to do. Specific contents are described aside each sign.
	Shows users important information sure to do. Specific contents are described aside each sign.

# Safety Information


## Safety Precautions

 Do not use this unit for any purpose other than its intended use, described in this manual.


### ***Do not use this unit in flammable or explosive gas environments.***

 This unit is not explosion proof. Never use this unit in flammable or explosive gas environments.


### ***Never fail to ground the unit.***

 This unit uses a 3-conductor power cord (including ground wire). Be sure to ground the unit for safety.


### ***Do not use this unit if a malfunction occurs.***

 If smoke or any strange odor should disburse from this unit, turn the power off immediately and pull out the main power cord. Then contact Yamato Scientific. Neglecting this procedure can result in fire or electric shock. Never try repairing the unit yourself.


### ***Do not bundle the power cord.***

 Overheat or fire can occur if the power cord is bundled or if an object is on the cord.


### ***Do not damage the power cord.***

 Forcible bending, pulling wrenching or extending the power cord can cause fire or electric shock.


### ***Do not use any explosive or flammable heat medium.***

 Never use any explosive or flammable substances or such compounds as a heat medium which could cause an explosion or fire.

### ***Avoid water contact.***

 To avoid electric leak or shock, avoid direct contact with water.

### ***Do not heat with low water.***

 If you operate this unit with low water, fire can be caused by overheating.

### ***Do not disassemble or remodel the unit***

 To avoid fire or electric shock, never try disassemble this unit.

## Safety Information

### Safety Precautions

---

#### ***If it begins to thunder...***



In the event of electrical storm turn off the main power. Neglecting this procedure can result in fire, electric shock or other troubles due to thunderbolts.

#### ***In case of power failure...***



When the power is restored after a power failure, the unit resumes operation at the temperature previously set as if you turned off the unit.

#### ***Indication of temperature and operational range.***



This unit is not equipped with a stirring function. Therefore, the maximum temperature varies according to the environments or operational conditions. This unit does not necessarily reach the maximum operational temperature under such environments as low room temperature.

# Safety Information

## Hazardous Materials

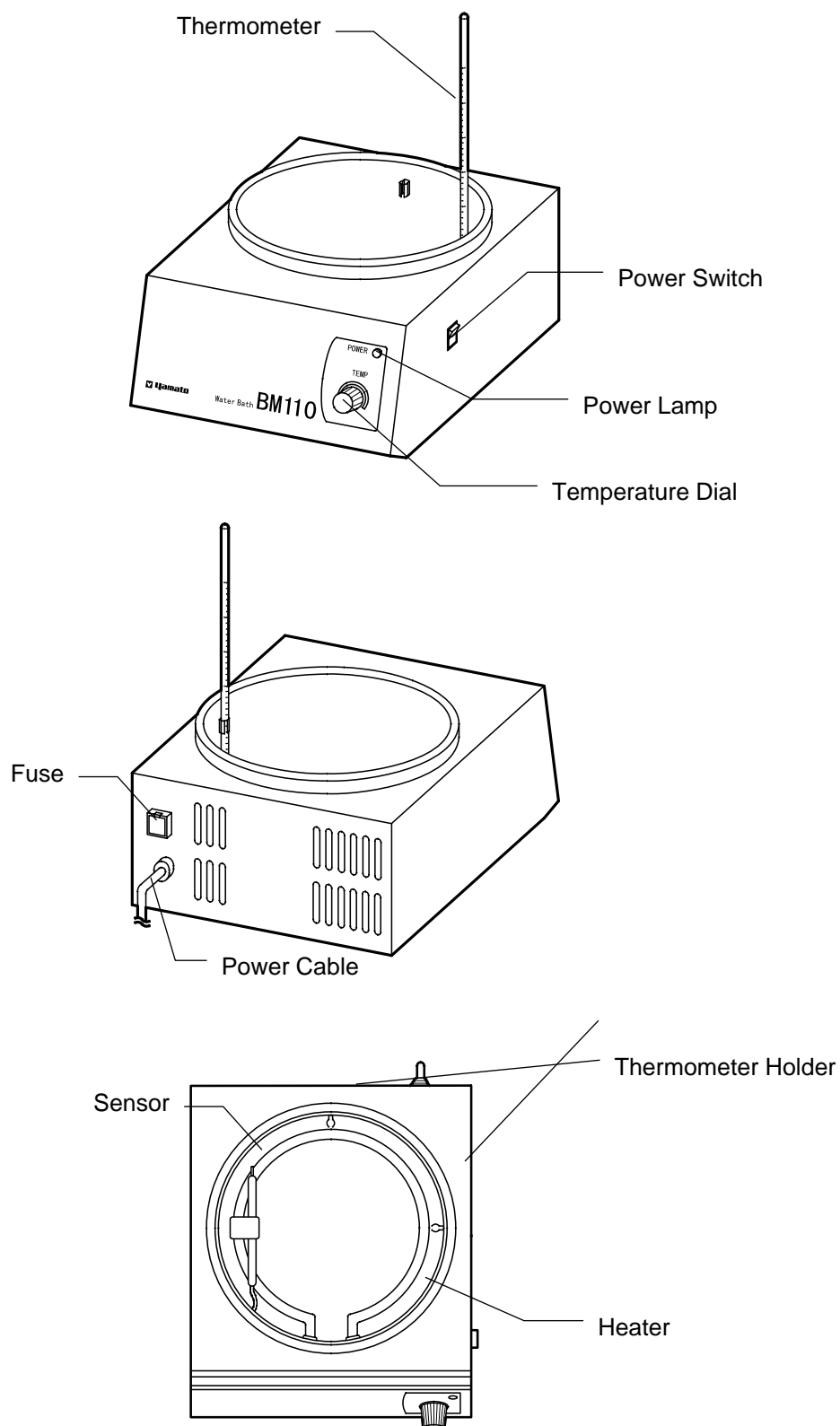
***Hazardous material are listed below. Never use these materials as samples or heat media.***

Explosive	Explosive Substance	Nitroglycol, Nitroglycerin, Nitrocellulose, and other explosive nitric esters.
		Trinitrobenzene, Trinitrotoluene, Picric acid, and other explosive nitro compounds.
		Peracetic acid, Methyl ethyl ketone peroxide, Benzoyl peroxide, and other organic peroxides.
		Sodium azide, and other metallic azides
Flammable	Combustible Substance	Metallic lithium, Metallic potassium, Metallic sodium, Yellow phosphorus, Phosphorus sulfide, Red phosphorus, Celluloid, Calcium carbide, Lime phosphate, Magnesium powder, Aluminum powder, and other combustible metal powders and sodium dithionite (hydrosulfite).
	Oxidant	Potassium chlorate, Sodium chlorate, Ammonium chlorate, and other chlorates.
		Potassium perchlorate, Sodium perchlorate, Ammonia perchlorate, and other perchlorates.
		Potassium peroxide, Sodium peroxide, Barium peroxide, and other inorganic peroxides.
		Potassium nitrate, Sodium nitrate, Ammonia nitrate, and other nitrates.
		Sodium chlorite and other chlorites.
		Calcium hypochlorite and other hypochlorites.
	Ignitable Substance	Ethyl ether, Gasoline, Acetaldehyde, Propylene Oxide, Carbon disulfide, and other flammable substances with a flash point below minus 30°C.
		Normal hexane, Ethylene oxide, Acetone, Benzene, Methyl ethyl ketone, and other flammable substances with a flash point between minus 30°C and 0°C.
		Methanol, Ethanol, Xylene, Pentyl acetate (amyl acetate), and other flammable substance with a flash point between 0°C and 30°C.
		Kerosene, Light oil, Turpentine oil, Isoamyl alcohol, Acetic acid, and other flammable substances with a flash point between 30°C and 65°C
	Combustible Gas	Hydrogen, Acetylene, Ethylene, Methane, Ethane, Propane, Butane and other flammable gas at 15°C degree and under 1 atmosphere.

### 3. Identification of Parts

#### BM110

**BM110**

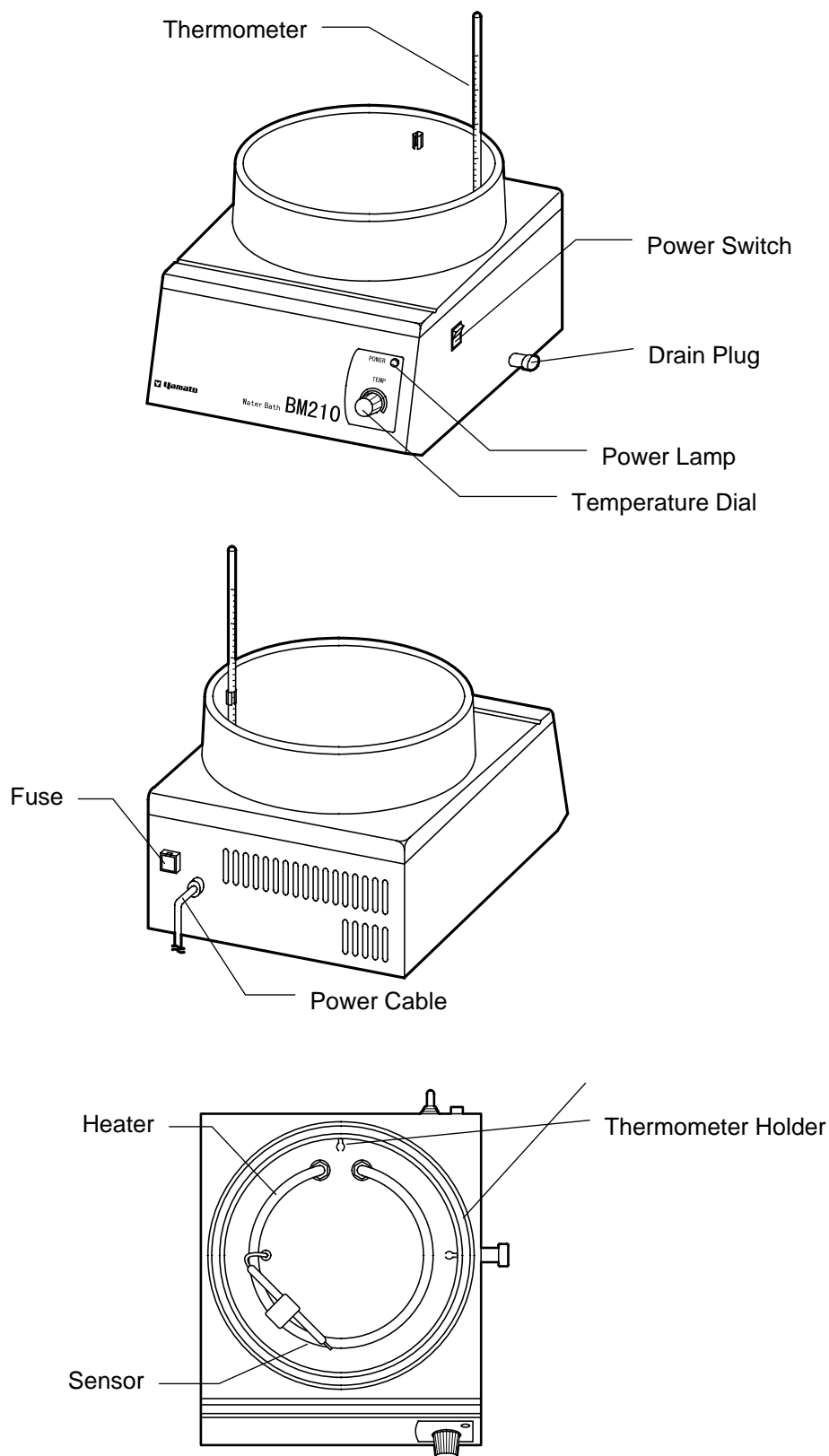




# Identification of Parts

## BM210

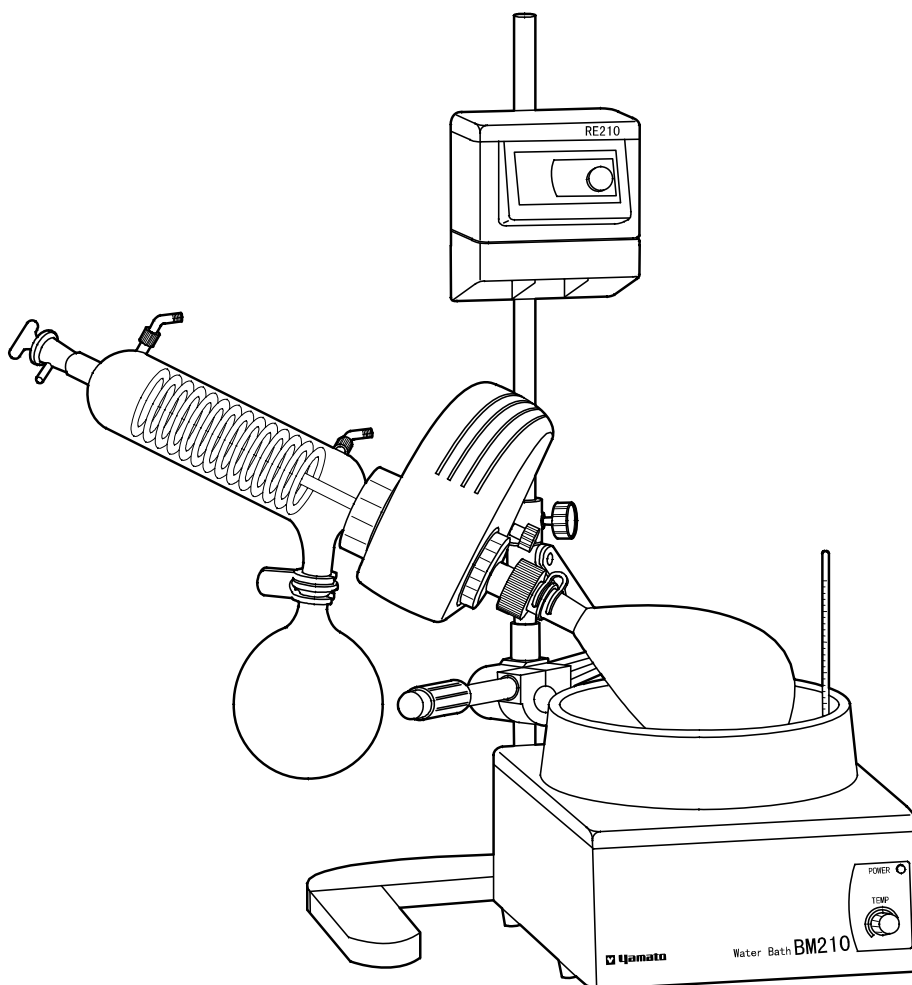
**BM210**



# Identification of Parts

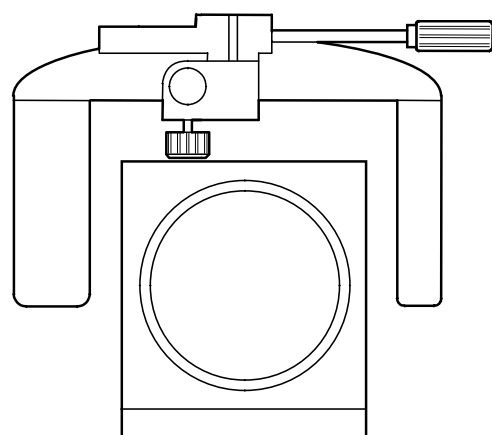
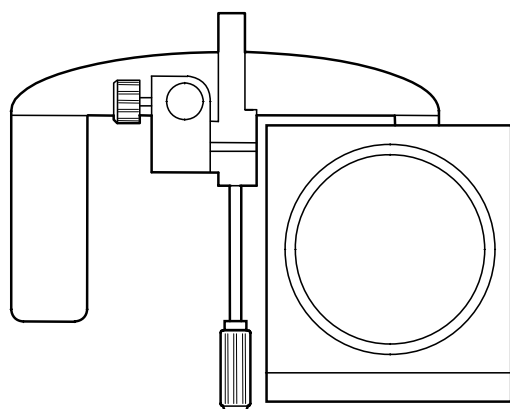
## Sample : Combined with RE210

### Combination with RE210



Drawing 1

Drawing 2

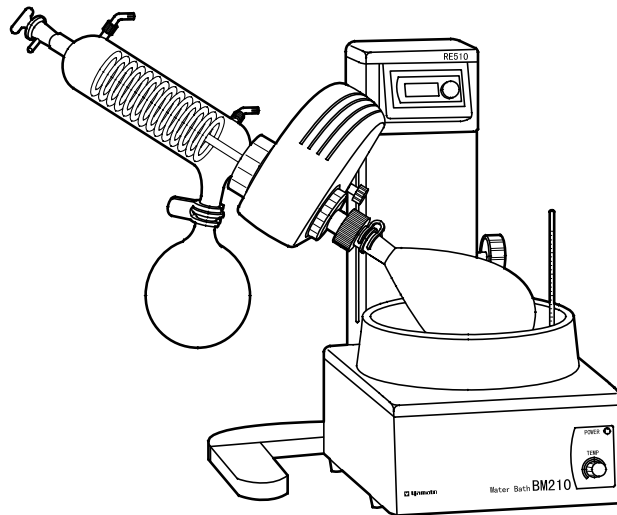


According to the position or space to set the bath and the body, the arm jack can be set in the front (drawing 1) or on the right side (drawing 2) as shown above.

# Identification of Parts

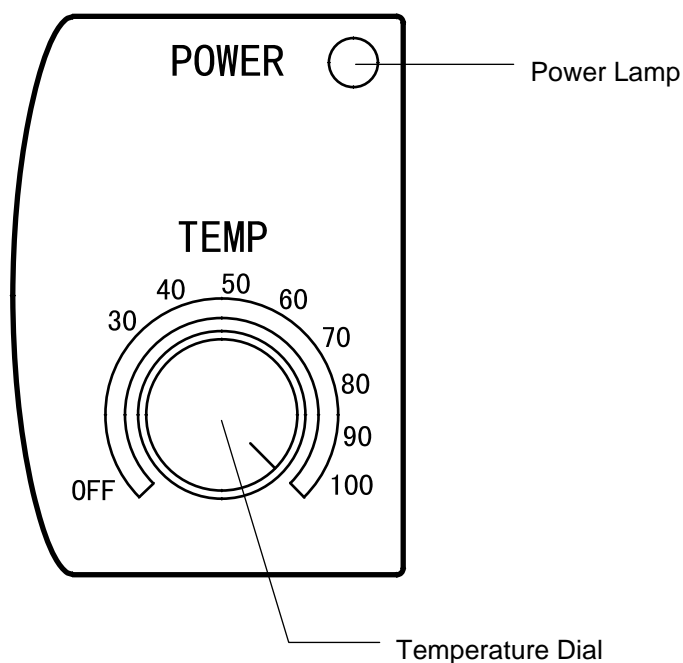
## Sample : Combined with RE510

### *Combination with RE510*



## 4. How to Operate

### *How to operate*



1. Pour adequate water (3000ml for BM110, 5000ml for BM210) into the tank, and place a thermometer in the holder. **Use distilled water. Deionized water should not be used.**
2. Connect the unit securely to a power source with AC230V. Always use a grounded outlet. Set the temperature dial to the desired temperature and turn on the power switch. The power lamp is lit when the power heater is on.
3. The temperature scale shows an approximate figure. When the temperature rises close to the set point, read the thermometer to adjust the temperature. Since there are some differences from the set point the first time, check if the current temperature accords with the degree to operate.

This unit does not have a stirring function and the tank temperature varies. We recommend you to use any stirrer (our Lab. Stirrer etc.,) together with this unit.

### *Power Failure*

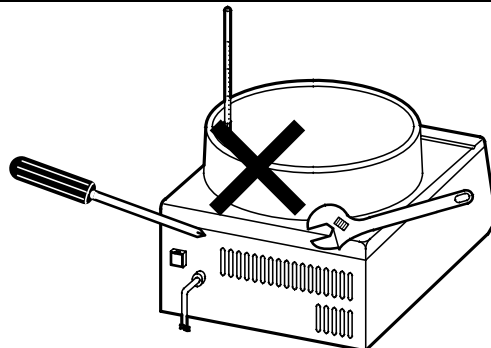
When power supply is restored after a power failure, the unit re-starts operation from previously set temperature.

## 5. Maintenance

### Daily maintenance/Weekly maintenance

#### ***Do not disjoint the unit***

- ⊘ Never modify the unit. There are some high-voltage areas inside the unit, which could cause electric shock. Request Yamato Scientific for internal check, adjustment or repair.



#### ***Maintenance***

##### **!** Daily Maintenance:

Turn power switch off and disconnect main power cord before attempting any maintenance.

Once the water bath has cooled to room temperature you may empty the water.

Wipe off any excess dirt on the interior and exterior with a damp cloth. Do not use benzene, thinner or cleanser.

##### Weekly Maintenance:

The pipe heater should be cleaned at least twice a month. Accumulation of scale build up results in poor heat transfer and high sheath temperatures.

#### ***When the unit is not in use for a long period of time.***

- !** Be sure to disconnect main power and drain the water tank if the unit will not be used for a long period of time.

## Troubleshooting Guide

Situation	Make Sure
The power lamp on the panel is not lit when the power switch is on.	● Check main power cord is connected firmly. ● Check main input voltage.

**If you have any question, contact Yamato Scientific.**

## 6. After Sale Service and Warranty

### Request for Repair

---

#### ***When you request repair***

If any troubles should occur, stop the operation immediately, turn the power off, pull the power cord out and contact Yamato Scientific's Technical Service Department.

Necessary information

- Model Number
- Serial Number
- Date of Purchase
- Distributor Name
- Information on difficulties

#### ***Warranty***

- Keep your warranty card for future references. Check the name of the distributor, date of purchase and any other contents of warranty.

- The terms of warranty is two years limited commencing the date of purchase. Repair is made without charge according to the contents of warranty.

- Decontamination Statement:

We can not accept any products or parts returned to us for repair or credit that is contaminated with or has been exposed to potentially infectious agents or radioactive materials.

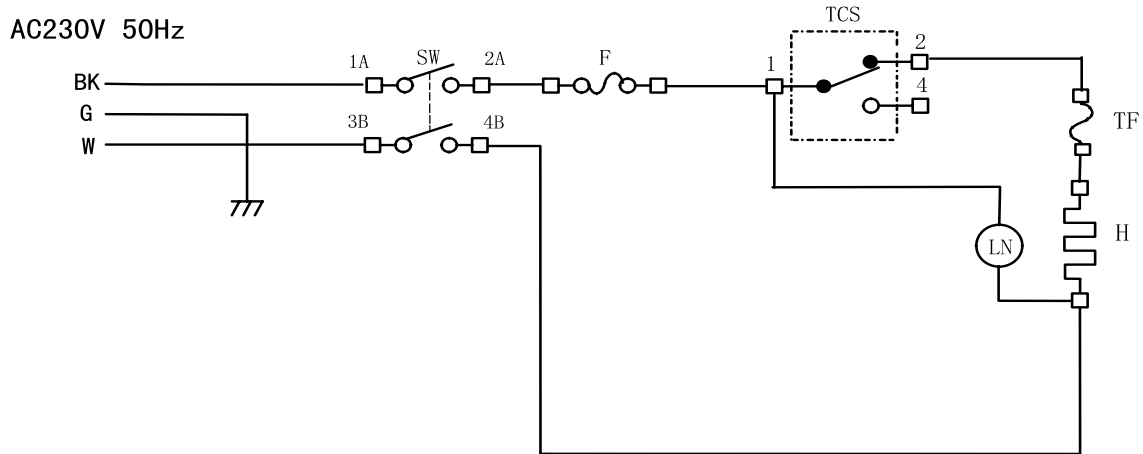
If you need repair, please call Yamato Scientific for a return authorization number. No product will be accepted without this number.

## 7. Replacement Parts

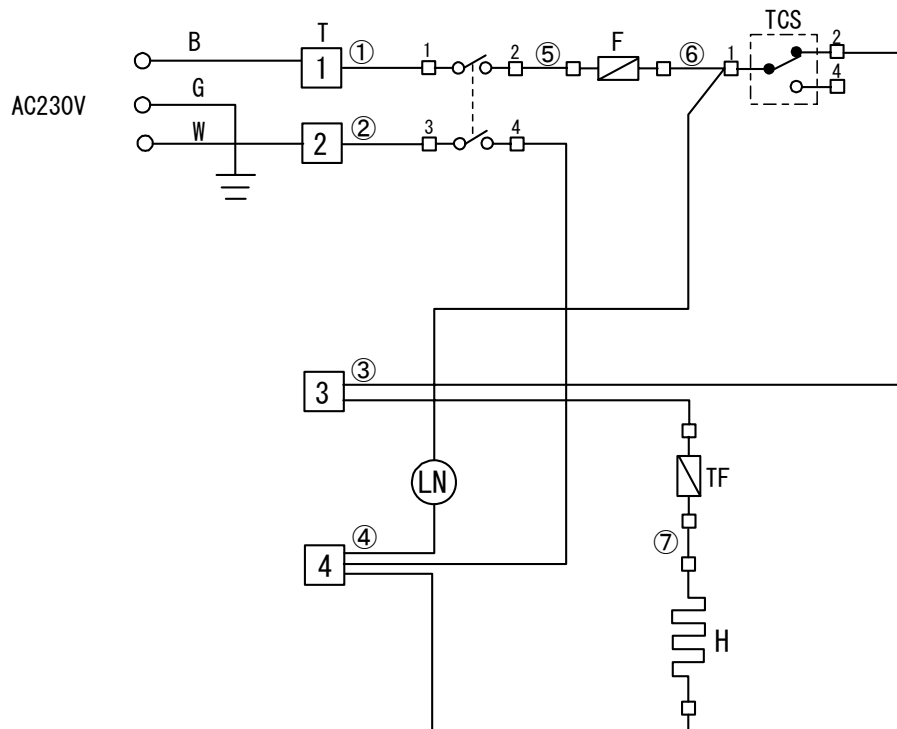
Name of Parts	Parts Number	Specification
Fuse	2-10-006-0002	$\Phi 6.4 \times 30$ 250V 4A (for BM110)
Fuse	2-10-006-0003	$\Phi 6.4 \times 30$ 250V 7A (for BM210)
Thermometer	5-02-001-6016	(for BM110/210)
Drain Plug	7-32-001-6005	(for BM210)
O Ring	4-21-002-6020	P12.5 Baiton (for BM210)
Thermal Fuse	2-10-003-0010	(for BM110/210)
Heater Element	BM110-30260	(for BM110)
Heater Element	BM410-30070	(for BM210)
Power Lamp	2-09-006-0049	(for BM110/210)
Thermoregulator	1-03-002-0005	(for BM110/210)

## 8. Wiring Diagram

### BM110



### BM210



Symbol	Name of Parts	Symbol	Name of Parts
F	Fuse	S	Service Outlet
H	Heater	SW	Power Switch
TF	Thermal Fuse	TCS	Thermoregulator
LN	Power Lamp	T	Terminal