



# User Manual

# Hotplate & Magnetic Stirrer

Model: TM-14SG, TM-17SG, TM-18QG

Manual No. : 34211L002  Version: 5.0

JEIOtech

**⚠WARNING**



Before using this product, read this entire Operator's Manual carefully. Users should follow all of the Operational Guidelines contained in this Manual and take all necessary safety precautions while using this product. Failure to follow these guidelines could result in potentially irreparable bodily harm and/or property damage.

# Thank you for purchasing Jeio Tech’s products.

Jeio Tech Co., Ltd. is committed to customer service both during and after the sale. If you have questions concerning the operation of your unit or the information in this manual, contact our Sales Department. If your unit fails to operate properly, or if you have questions concerning spare parts or Service Contracts, contact our Service Department.

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# 1.0 Safety

## 1.1 How to use the Manual

This manual is intended for individuals requiring information about the use of Hotplate Stirrers. Use this manual as a guide and reference for installing, operating, and maintaining your Jeio Tech Hotplate Stirrers. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No installation, service procedure or other maintenance should be undertaken without first contacting a service technician, nor should be carried out by someone other than a service technician with specific experience with laboratory equipment and electricity.

## 1.2 Symbols used in this manual

(1) The user's manual uses warning and caution marks to ensure safe and proper use of the product and to prevent accidents or damage.

(2) Information about safety precautions is defined in the signal word panels according to their importance and risk.

(3) Please thoroughly read and understand the warning contents when using it.

| Signal word panels | Use |
|---|---|
| ⚠ DANGER | "Danger" is a signal that indicates a dangerous situation. Failure to prevent it can result in death or serious injury and property damages. |
| ⚠WARNING | "Warning" is a signal that indicates a dangerous situation which, if not avoided, could result in serious injury or serious injury and property damage. |
| ⚠ CAUTION | "Caution" is a signal to indicate a dangerous situation, and if not avoided, it could result in injury and property damage. |
| *NOTICE* | "Notification" is a notification of actions requiring attention that are not related to the user's injury. |

## 1.3 Exemption for responsibility

(1) The claim which is out of the quality guaranteed by the manufacturer is out of Manufacturer's responsibility.

(2) The damage which is from unexpected fault or damage of user by Acts of God is out of Manufacturer's responsibility.

## 1.4 Warning statement

| ⚠WARNING |
| --- |
| Indicates a hazardous situation which, if not avoided, could result in death or serious injury. |

Please thoroughly read and understand all warning labels.

Do not remove or damage the warning label.

Do not move the product while it is running.

Do not use or store flammable gas near the product.

Do not install the product in an environment where there is a possibility of flammable gas leakage.

Do not use the product in an environment where there is a possibility of explosion due to organic vapor.

Do not place explosive, flammable chemicals (alcohol, benzene, etc.) on the product.

Do not allow moisture, organic solvents, dust or corrosive gases to enter the product.

Install the product on a stable and flat surface in a laboratory equipped with safety equipment in case of an accident.

Before installing the product, check the voltage, phase, and capacity of the ID plate and connect it properly.

Be sure to use a grounded power source.

Do not expose the product to direct sunlight.

Do not expose the product to direct heat sources.

Do not install in a place subject to high humidity or water leakage.

Do not use the product in the presence of soot or metal dust.

Do not use the product if it produces unusual sounds, smells, or smoke.

Do not disassemble or modify this product beyond those described in this user's guide.


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## 1.5 Caution statement

| ⚠ CAUTION |
| --- |
| Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. |

Do not touch the top plate or any object near it even when the heater is turned off. You may get burned due to residual heat.

After using this equipment, make sure to turn off the main power switch and also to disconnect the power cord from the power outlet for the safety of other users.

Do not place heavy objects on the power cord and do not let the power cord be pushed under the appliance.

Do not touch the power outlet, power socket, or power cord with wet hands. And make sure to connect the power cord directly and firmly to the power outlet and power socket.

Do not put or insert any objects (especially if conductive or flammable) inside this equipment

Do not pour water into the unit.

Do not impact the top plate or heat sink. You can damage the equipment or get injured.

Do not touch the heat sink with your hands or shock it.

Do not install this equipment near any device that generates high frequency noise.

Note that 'Cardiac pacemaker' or 'Magnetic data devices' may be affected by the instrument and the magnetic bar.

Do not use chlorine bleach, ammonia-based cleaners, abrasives, ammonia, or metal scouring pads. Wipe with a soft damped cloth or a sponge soaked in water or diluted neutral detergent.

Before cleaning, make sure to unplug the power cord to avoid electric shock or fire.

# 2.0 General Description

## 2.1 Product Introduction

TM-14SG has 600W of heating value, TM-17SG and TM-18QG have 800W of heating value, they are basic heating magnetic stirrer to control easily with the powerful rotational force.

## 2.2 Characteristics

### 2.2.1 Safety

- If the heating plate is 50℃ or higher even when the main switch of the device is off, “Hot Top” warning indicator blinks to ensure safe use
- A heating plate overheating prevention device is particularly built-in.
- It has over temperature protection unit and circuit over temperature protection unit.
- Heating bath with ribbed combination structure makes it not to slip. (TM-14SG/17SG Option)
- Silicone cover
  A silicone cover prevents foreign substances from entering the knob and display.
- A transparent safety shield is also provided to allow you to monitor your operations more safely by shielding you against decoupled stir bars or liquid splashes (TM-14SG/17SG Option)

### 2.2.2 Convenience

- It is possible to set heating rate and stirring speed with two dials.
- Two support rods(Clamp Rod, Option) enable to hold thermometer, temperature sensor, clamp, or other devices conveniently.

### 2.2.3 Superior performance

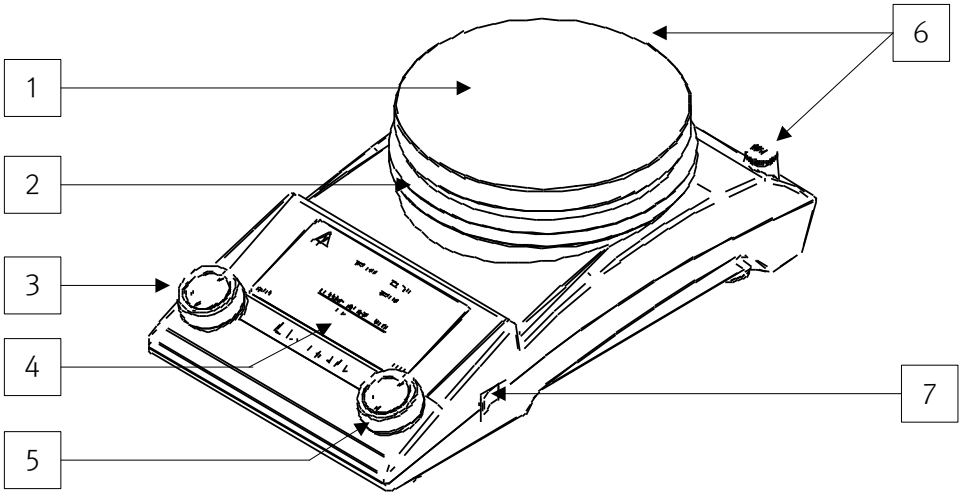
- It is outstanding for stirring ability in high temperature thanks to BLDC which has precise rotational power and magnet with superb magnetic coupling.(MAX 2,000 rpm)
- The motor response characteristics are astute, it enables the stirring stops quickly.
- It has the integral structure of the heater and aluminum alloy which enables to have outstanding thermal conductivity and heat up quickly. (up to 350℃)

### 2.2.4 Outstanding durability

- It has excellent heat resistance and corrosion resistance, also has a white-ceramic coated plate that enables to identify the color of reactant.
- It is equipped with BLDC motor which has strong rotational power and superb durability.
- Spill-proof Design: It enables to protect inner components from a reagent.


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## 2.3 Structures




[TM-14SG / 17SG]

(1) Heating Plate : It heats an experiment container.

(2) Heat sink : It has the structure to prevent the heat from heating plate to the main body, the tip of the heat sink is processed as round for safety. Watch out for the high temperature.

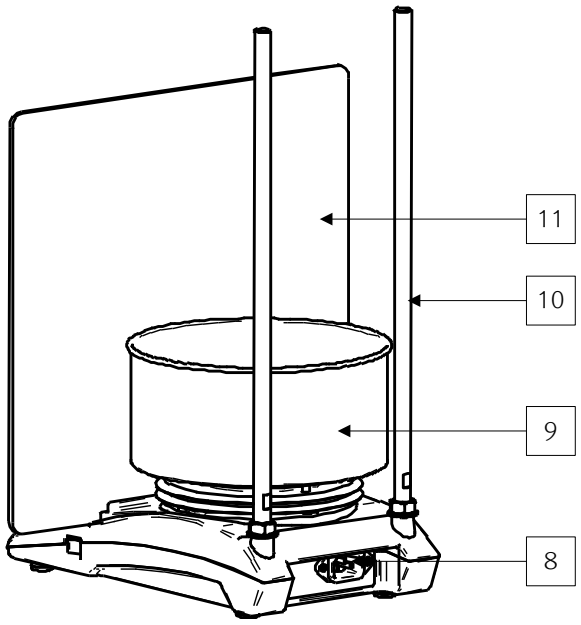
(3) HEATER knob : It controls heat.

(4) Control panel : It consists of LED to show the status of the power, heater and stirrer.

(5) STIRRER knob : It controls rotational speed of Magnetic Stirrer.

(6) Holder : It can fix up to two support rods to fix experimental tools.

(7) Power switch : It is a power switch.




(8) Power Input Terminal : This is the input that accepts the main power, where the power line should be connecting.

(9) Heating Bath(Option) : Heating bath for TM-14SG/17SG.

(10) Clamp rod(Option) : It enables to fix thermometer or experimental apparatus.

(11) Transparent Shield (Option) : It allows to prevent hot liquid from splashing into the control panel or the user watching(TM-14SG/17SG only)

※ TM-14SG, TM-17SG, TM-18QG models have the same function and internal structure.


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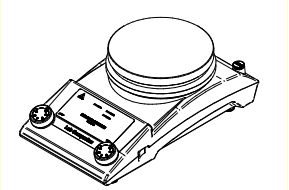
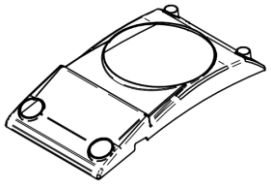
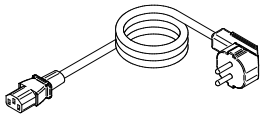
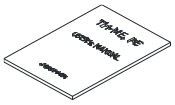
# 3.0 Unpacking and Installation

## 3.1 Checking Shipment Damage and Unpacking

Upon receiving the instrument, check to ensure that no damage has occurred during shipment. It is important that any damage that occurred during shipment must be detected before unpacking. If you find such damage, notify the carrier immediately.

## 3.2 Checking the Contents of the Package

After unpacking, check to ensure that all the following parts and accessories are included in the package. If not, contact your dealer or Jeio Tech immediately.

| Item | Figure | Quantity | Description |
|---|---|---|---|
| Main body |  | 1 | - |
| Silicone cover |  | 1 | - |
| Power cord |  | 1 | - |
| Operation Manual |  | 1 | - |

## 3.3 Installation

This instrument is designed for indoor use in laboratory environments and to be operated only by properly trained staff knowledgeable in safe laboratory practices.

The operating conditions for this instrument are as follows:



Avoid from direct radiation



Remain the temperature from 5 to 40℃ near the unit




Remain the relative humidity under 10~80%.



Remain an altitude of installation place under 2,000m above sea level

## 3.4 Operation conditions

Maintain proper spacing (typically over 30cm) to avoid placing it too close to other equipment.

**⚠WARNING**

- The unit should be located away from naked flame sources, direct sunlight. It can come with the malfunction or lower the function.

## 3.5 Pre start up check

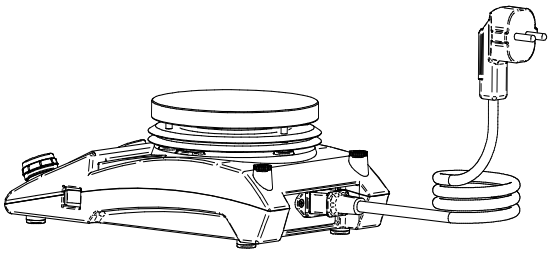
- Check the unit is balanced well.
- Never install or use this instrument with or near to hazardous or flammable substances.
- Do not install this instrument near any device that generates high frequency noise.
- Do not install with short circuit, water leak, and risk of flooding places.
- Do not install with industrial harmful gas, metal dirt environments.

## 3.6 Power Connection

When connecting power, use only the power cord that came with your instrument. The power connection procedures are as follows:

(1) Before connecting the power cord, make sure that the main power switch is turned off.
(2) Plug the power cord into the power socket at the back of your instrument as shown in the diagram below.
(3) Plug the other end into a properly grounded and dedicated power outlet nearby.


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**⚠WARNING**

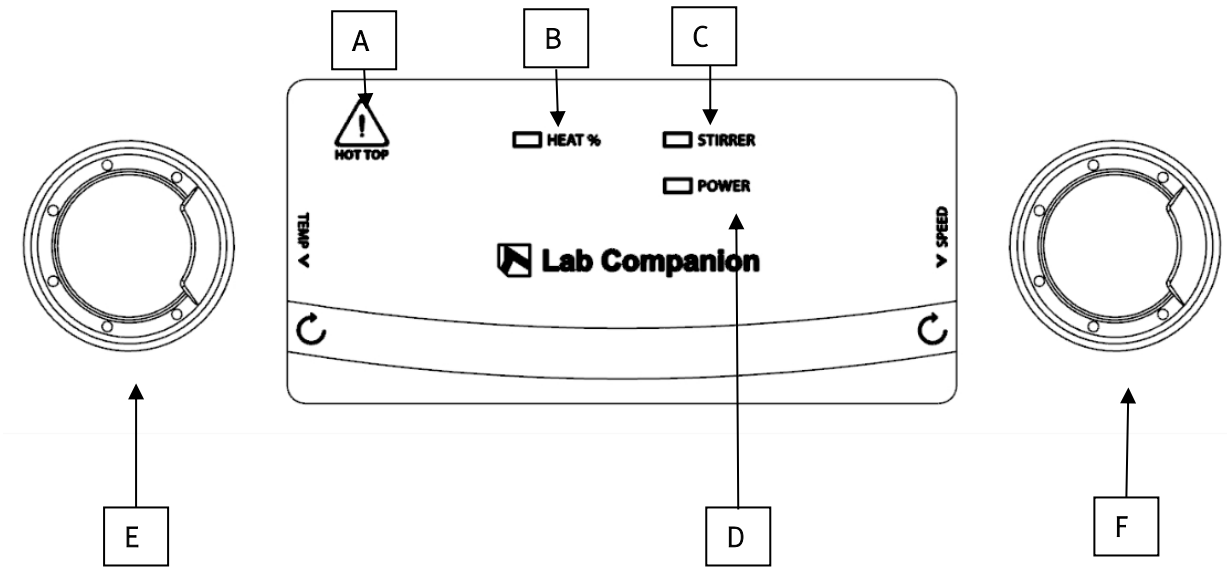
Electrical Shock Hazard.



- Check the voltage, phase and the capacity of the power supply and connect properly.
- Do NOT use a branch socket or a double tap, as it may cause a cable burnout or fire due to over current.
- Improper power connections may result in serious injury or death to the equipment and damage to the equipment.
- DO NOT use without safety equipment. (working clothes, gloves, glasses)
- DO NOT handle or touch electrical cord and electrical parts with wet hands.
- Make sure to connect this instrument only to properly grounded power outlets to protect you and your instrument.

# 4.0 Operation

## 4.1 Control Panel




[ TM-17SG Control panel ]

(1) Control panel

| | | |
|---|---|---|
| A | HOT TOP | It is illuminated when the heating plate's temperature is 50℃ or higher |
| B | HEATER LED | Heater in operation |
| C | STIRRER LED | Stirrer in operation |
| D | Power LED | When power is on |

(2) Knob

| | | |
|---|---|---|
| E | HEATER Knob | It is to adjust heater on/off and heat |
| F | STIRRER Knob | It is to adjust stirrer ON/OFF and speed |

**NOTICE**


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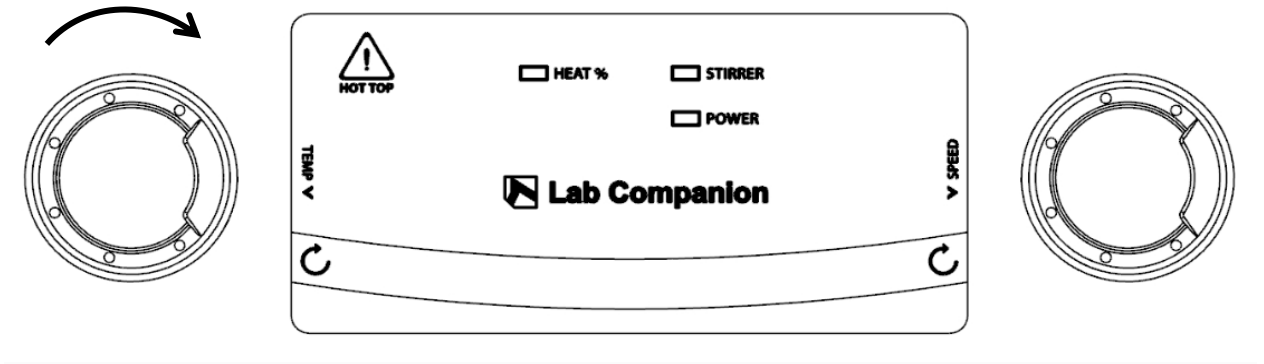
- Please check that The stirrer knob is at the “0” point before starting
- For safe testing, slowly turn up the volume at first to ensure that the solution is well mixed without splashing.

## 4.2 Operation

### 4.2.1 Operation and Stop of the HEATER

(1) When heater knob is turned clockwise, it will turn on the heater with a ‘tick’ sound.
If you turn the knob as much as you want, it will start to heat. The LED is illuminated only when a heating plate is supplied with electricity, and when fully heated, the LED will remain illuminated without blinking.

This LED lamp HOT TOP turns on when the heating plate’s temperature is 50℃ and higher.

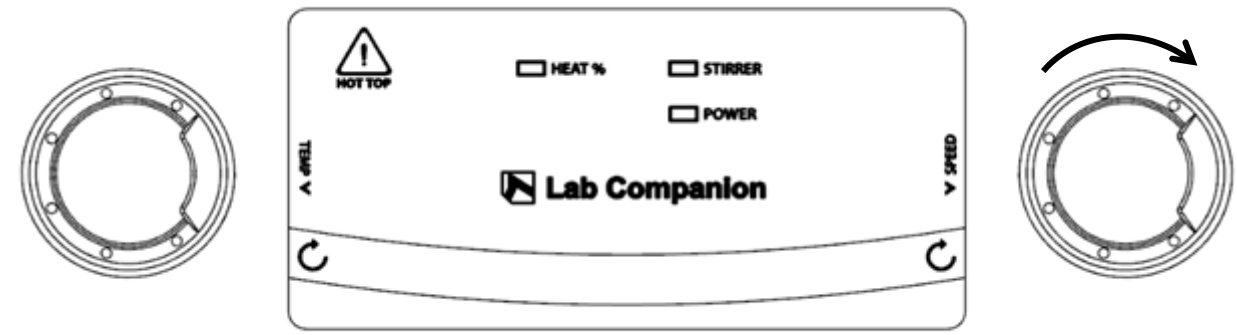



[ TM-17SG control panel image ]

(2) Please turn the heater knob counterclockwise to turn off the heater until it makes ‘tick’ sound.

### 4.2.2 Operation and Stop of the STIRRER

(1) When stirrer knob is turned clockwise, it will turn on the stirrer with a ‘tick’ sound. As soon as you turn the knob at the desired speed, the rotation starts. For a safe experiment, first turn a little and accelerate when the contents of the container begin to rotate.




[ TM-17SG control panel image ]

(2) Heater knob is turned counter clockwise to turn off the stirrer after use.


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## ⚠ CAUTION

- Watch out for the heating plate and laboratory equipment which are hot even though it is not supplied with electricity.
- In the HEATER OFF state, the lamp of the control panel 

turns on with temperature indication if the temperature of heating plate is higher than 50℃ and the lamp automatically turns off if the temperature is lower than 50℃.
- The recommended allowable temperature in the environment to use the device is under 25℃.
- If it is unavoidable that the product must be used in an environment higher than 30℃, the heater knob should be gradually reduced to prevent the operation of protective circuit (ref. 5.0 Safety Features) due to overheating of the product.

A

## NOTICE

- The temperature rises slowly by heating the device, experimental container and solvent. If the amount of excessive heat is set from the start, the temperature may overheat later.

# 5.0 Safety Features

(1) Heating Plate Safety Limit
This is a protection device that prevents the heating plate from heating above the set value by setting the safety limit of the heating plate in advance. The default setting is 350 ℃.
If the temperature of the heating plate overheats from the set value, the heater operation is stopped and the Heat LED of the status display LED would be turned off, but the temperature of the heating plate may rise continuously depending on the specific heat of the object.
When the temperature of the hot plate is lowered, the heater power is automatically connected and reheated.

(2) Thermal plate overheat protection device
This is a protection device that cuts off the power of the heater and sounds a buzzer when the temperature of the heating plate exceeds the safe range due to the function of Heating Plate Safety Limit not working or a circuit malfunction.
If the hot plate overheat protection device operates, turn off the power switch of the device and unplug the power cord. When the heating plate has cooled down, restart it.

(3) Device protection device
It is a protection device that mechanically cuts off the power supply of the heater when the temperature of the main body is overheated.
When the temperature of the main body is lowered, the heater power is automatically connected and reheated.

(4) Circuit protection device
In order to protect the circuit inside the device, if the internal circuit board is overheated, the heater is turned off and a buzzer sounds.
If the circuit protection device is activated, turn off the power switch of the device and unplug the power cord. If the unit has cooled down, restart it.

(5) Warning light for user protection
If the temperature of the heating plate exceeds 50 ℃, the "HOT TOP" LED on the control panel lights up on the temperature display. When the temperature of the heating plate is over 50 ℃, this LED will continue to light with the temperature display even if the power switch is turned off.
When the temperature of the heating plate drops below 50 ℃, it goes off automatically.

**NOTICE**

- If any overheat prevention activates or warning sound is alarming, turn off the power switch and disconnect the power cord first. Then allow your unit to cool down completely before operating it again.


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# 6.0 Maintenance

## 6.1 Inspection Interval

| Item | Inspection Interval | |
|---|---|---|
| | Daily | Weekly |
| Connection status of power cord or plug | ● | |
| Damages in power cord or plug | ● | |
| Damages or cleanliness of top plate | ● | |
| Cleanliness of main body and accessories | | ● |
| Damages in switches, buttons, LED's, dial knobs | ● | |
| Heating capability check (up to 350℃) | ● | |
| Motor on/off, whether or not speed is increased or not. | ● | |
| Assembly status of all parts or accessories | ● | |

## 6.2 Cleaning

### 6.2.1 Heating plate and Main body

Make sure that there is foreign material before and after use, and wipe with a mild detergent and a dry cloth to remove any foreign matter and keep it clean.

**⚠ CAUTION**

- Never immerse this unit in water or any other liquid.
- Do not use chlorine bleach, ammonia-based cleaners abrasives, ammonia, or metal scouring pads when cleaning.

### 6.2.2 Accessories

Before and after use, check for foreign objects, wipe with a mild detergent and a dry cloth, always keep it clean by removing it.

## 6.3 Relocation

If you need to move the equipment to another place,

(1) Disconnect the power cord from the power outlet.
(2) Pack the equipment and its accessories into the original packaging or any other suitable container before moving.

**⚠ CAUTION**

- Pay attention to avoid mechanical shock or vibration while moving the instrument. Damages caused by mechanical shock or vibration may result in injury or fire.

## 6.4 Storage

If you know you will not use this equipment for an extended period of time,

(1) Disconnect the power cord from the power outlet.
(2) Clean the equipment with a soft cloth.
(3) Pack the equipment properly and make sure to store it in a dry place.


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# 7.0 Troubleshooting Guide

If any abnormality occurs while using the device, check the following and act according to the instructions.
If the problem cannot be solved even after checking the contents of the problem, please contact JEIO-TECH sales department to solve the problem immediately.

## 7.1 Power Troubles

| Problem | Cause | Corrective Action |
|---|---|---|
| No power | Unsuitable power supply. | Meet the electrical requirements of this instrument before use.<br>Check the voltage, phase, and capacity of the power supply and connect the power properly. |
| | Power cut-off by a circuit breaker or power blackout. | Find out why blackout or cut-ff happened and restore power. If there is a short circuit or leakage, trace the source of the problem and fix it. |
| | Loose power connection. | Reconnect the power cord firmly to the power outlet as well as to the power socket at the back of the instrument. |
| | Damages in power cords, power outlets, or plugs. | Replace the damaged part with a proper one. |
| | Internal circuit failure. | Contact Jeio Tech for service. |
| Repetitive tripping of the circuit breaker | electrical overload. | Disconnect all the appliances connected to the breaker first and reconnect them one by one to find the reason for the overload. |
| | Internal circuit failure. | Contact Jeio Tech for service. |
| No operation with power on | Over temperature causes internal devices protection unit and shut down power. | If the device's body temperature is over 85℃, it will shout down power automatically to preserve its performance and protect the internal circuit. If the temperature of the device is under 85℃, the heater will operate automatically. |

| | | |
|---|---|---|
| No operation with power on | Power cut-off by built-in overheat prevention circuit. | If the main body is overheated, the built-in overheat prevention circuit stops heating to protect the instrument.<br>In such cases, let the instrument cool down for some time before power reconnection. |
| | Internal circuit failure. | Contact Jeio Tech for service. |

## 7.2 Malfunctions during Operation

| Problem | Cause | Corrective Action |
|---|---|---|
| No heat | Power cut-off by built-in overheat prevention circuit. | Turn off the main power switch and wait until the heater cools down. Then, turn on the main power switch. |
| | Internal circuit failure. | Contact Jeio Tech for service. |
| When The heater operates but the temperature does not rise. | Insufficient heating due to not turning the heater knob on the left side of the control panel. | Turn the heater knob on the control panel to the right to observe the status change. |
| | Too much sample. | Reduce the amount of samples and heat. |
| | Internal circuit failure. | Contact Jeio Tech for service. |
| When the magnetic stirring bar is dislodged | Too much sample. | Reduce the amount of samples or increase the rotation speed slowly. |
| | The viscosity of the sample is high. | Increase the rotational speed slowly. |
| | The magnetic force of the magnetic stirring bar is weakened. | Replace the magnetic stirrer. |
| When a clashing sound happens during operation. | The magnetic bar and the bottom of the experimental container are bumped each other because The bottom of the experimental container is uneven. | Replace the experimental container with a flat surface. |
| | Unlocking of the parts inside the device. | Contact Jeio Tech for service. |
| Rotation speed is not controlled normally | Too much sample. | Divide the samples and mix them. |
| | BLDC motor abnormality and circuit abnormality. | Contact Jeio Tech for service. |
| Knob malfunction | Damaged knob. | Take out the knob and relocate it.<br>Contact Jeio Tech for service. |
| LED display malfunction | Damage due to chemical spill or overheat. | Contact Jeio Tech for service. |


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# 8.0 Accessories

| Designation | Order No. | Description |
|---|---|---|
| Heating Bath for 14 series | HPS0012 | Option |
| Heating Bath for 17 series | HPS0015 | Option |
| Transparency Shield PC for 14 series | HPS0059 | Option |
| Transparency Shield PC for 17 series | HPS0039 | Option |
| Support Rod, M10 (Ø12mmx400mm / Ø0.47″x15.74″) | MTT0132 | Option |
| Clamp holder, max. Φ27, C-20 | AAA37511 | Option |
| Clamp holder, max. Φ17, C-10 | AAA37512 | Option |
| Clamp holder, max. Φ12, C-7 | AAA37513 | Option |
| Clamp holder, max. Φ12, C-5 | AAA37514 | Option |
| 3 Prong clamp, 80mm grip | BEA1000011 | Option |
| 3 Prong clamp, 60mm grip | BEA1000012 | Option |
| 3 Prong clamp, 20mm grip | BEA1000013 | Option |
| RBP-100, Round flask heating block plate 100ml | AAA34511 | Option (for 100ml Flask, including 3EA of M8 Support) |
| RBP-500, Round flask heating block plate 500ml | AAA34512 | Option (for 500ml Flask, including 3EA of M8 Support) |
| RBP-1000, Round flask heating block plate 1,000ml | AAA34513 | Option (for 1000ml Flask, including 3EA of M8 Support) |
| RBP-2000, Round flask heating block plate 2,000ml | AAA34514 | Option (for 2000ml Flask, including 3EA of M8 Support) |
| RBI-25, Round flask heating block insert 25ml (for Plate 100ml) | AAA34521 | Option (for 25ml Flask) |
| RBI-50, Round flask heating block insert 50ml (for Plate 100ml) | AAA34522 | Option (for 50ml Flask) |
| RBI-100, Round flask heating block insert 100ml (for Plate 500ml) | AAA34523 | Option (for 100ml Flask) |
| RBI-250, Round flask heating block insert 250ml (for Plate 500ml) | AAA34524 | Option (for 250ml Flask) |
| RBI-500, Round flask heating block insert 500ml (for Plate 1,000ml) | AAA34525 | Option (for 250ml Flask) |
| RBI-1000, Round flask heating block insert 1,000ml (for Plate 2,000ml) | AAA34526 | Option (for 1000ml Flask) |

| | | |
|---|---|---|
| VBP, Vial heating block plate, 190x190x20mm | AAA34531 | Option (191x191x20mm, Including M8 Support x 3, M4 Support x 4) |
| VBI-1D, Vial heating block insert 1dram (4ml), Φ15x17mm, 16holes | AAA34541 | Option, 1dram (4ml), Φ15x17mm, 16holes |
| VBI-2D, Vial heating block insert 2dram (8ml), Φ17x23mm, 16holes | AAA34542 | Option, 2dram (8ml), Φ17x23mm, 16holes |
| VBI-4D, Vial heating block insert 4dram (15ml), Φ21x30mm, 16holes | AAA34543 | Option, 4dram (15ml), Φ21x30mm, 16holes |
| VBI-20S, Vial heating block insert scintillation 20ml, Φ28x22mm, 4holes | AAA34544 | Option, scintillation 20ml, Φ28x22mm, 4holes |
| VBI-30S, Vial heating block insert scintillation 30ml, Φ28x32mm, 4holes | AAA34545 | Option, scintillation 30ml, Φ28x32mm, 4holes |
| VBI-40S, Vial heating block insert scintillation 40ml, Φ28x42mm, 4holes | AAA34546 | Option, scintillation 40ml, Φ28x42mm, 4holes |
| Silicone Cover for TM-14SG | 00HPS0000190 | Cannot installed with Transparency Shield |
| Silicone Cover for TM-17SG | 00HPS0000191 | |
| Silicone Cover for TM-18SG | 00HPS0000192 | |

※ For accessory exchange, please visit JEIO-TECH homepage (http://www.labcompanion.com), or contact sales department or seller(Distributor)

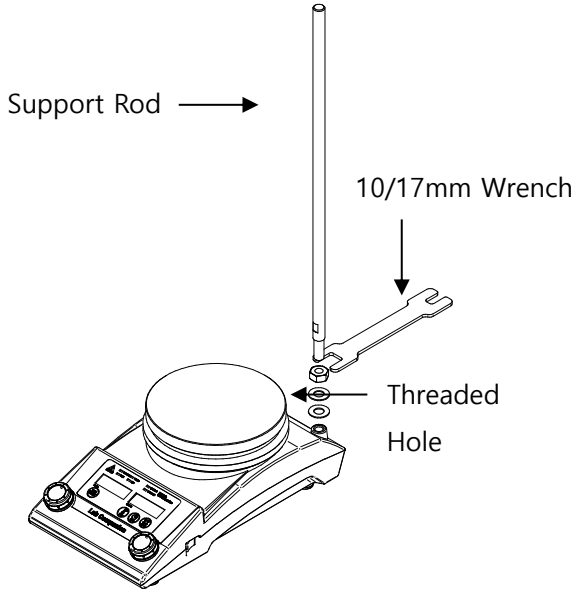

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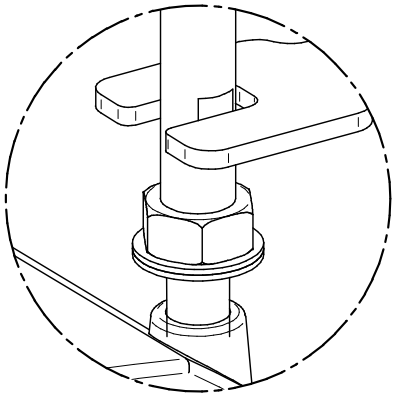
## 8.1 Assembly of Support Rods

Step 1 : Insert two M10 nuts and two flat washers at the bottom of the support rod.

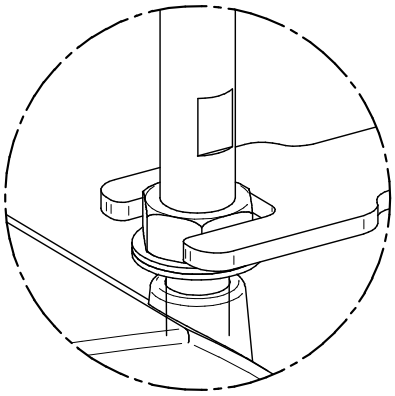
Step 2 : Set up the support rod, insert the thread groove of the screw into the holder of the body, and turn it clockwise using the 10mm groove of the wrench.

Step 3 : Fix the M10 nut clockwise by using the 17mm thread groove of the wrench.



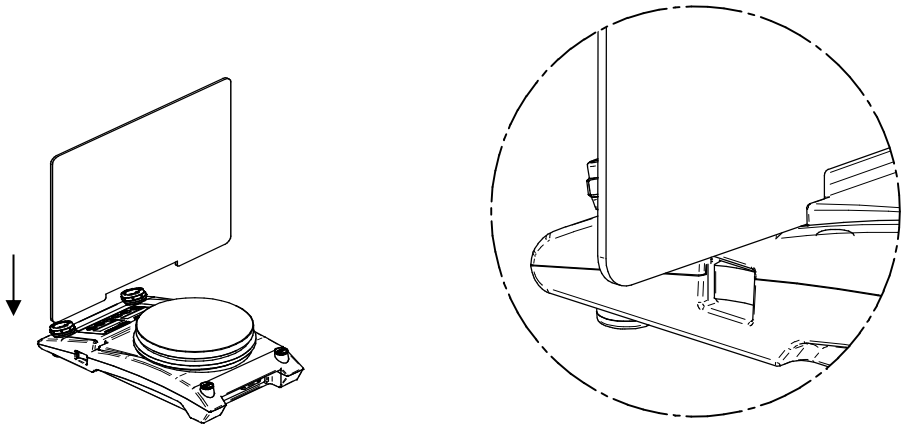
[10mm Wrench]



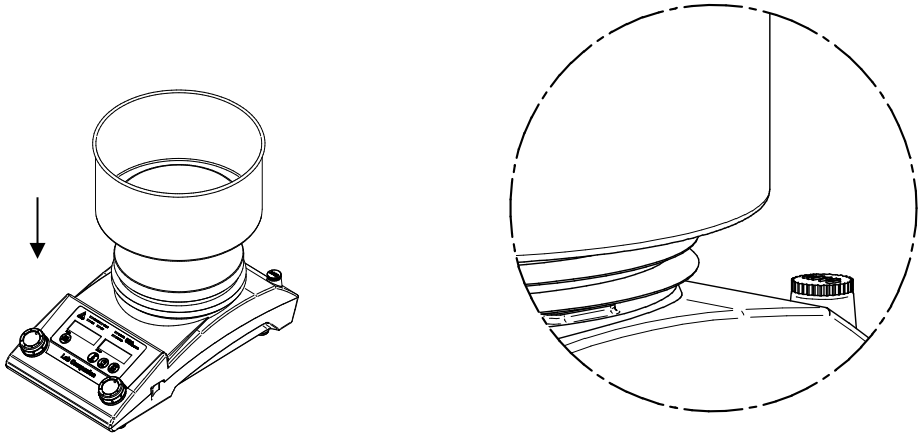
[17mm Wrench]

## 8.2 Assembly of Transparent Safety Shield and Non-slip Heating Bath

When necessary, you can easily assemble the transparent safety shield and/or the non-slip heating bath as shown below:



[ Transparent Safety Shield ]



[ Non-slip Heating Bath ]

**⚠ CAUTION**

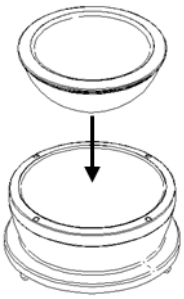


- The "HOT TOP" LED on the control panel illuminates when the temperature of the heating panel is more than 50°C.
- Do not touch the heating block with your bare hands until the "HOT TOP" LED is switched off and the heating block is sufficiently cold.
- Heater power may be turned off for instrument and circuit protection when the heater is used continuously at a maximum output (350℃, 2000 rpm).
- The shield cannot be installed with the silicon cover.


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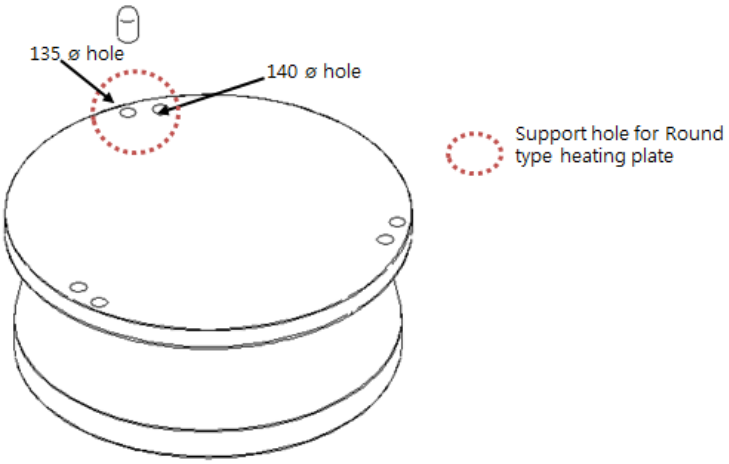
## 8.3 Heating block for round bottom flask

Using the heating block for round bottom flasks for TS, TM and T models, you can perform the reaction test safer and more convenient than heating mantle or oil bath. On TS models, the external temperature sensor can be used to control the temperature of the heating block. Install the heating block plate for the round floor flask and then insert the correct size for the flask capacity to be used as indicated.



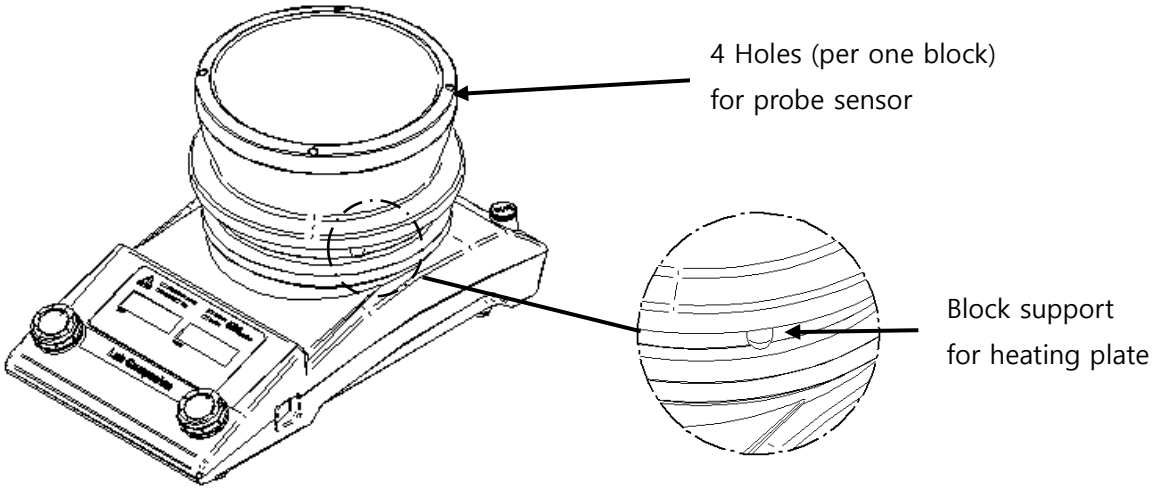
[Combination of Heating plate for round bottom flask and Insert]

The bottom face of the heating plate for round bottom flask provides a support fixing hole to ensure that the heating block is safely secured without being pushed onto the heating flask as the below picture, and it is supplied with securing support (bolt). (Three points fixing on the round heating plate, Three M8 support are provided) Check the location of the support fixing hole suitable for the size of the hot plate you wish to use, and then tighten the suitable support provided with the heating block plate. However, in the case of round or square heating plate with a size of 170ø or more, the heating block plate can be placed directly on the heating plate without any support engagement.




[Position of support fixing on the bottom face of heating block for round bottom flask]

Install the heating block for the flask on the product body heating plate as detailed in the drawing below.




[T-17SG combined with heating block for round bottom flask]

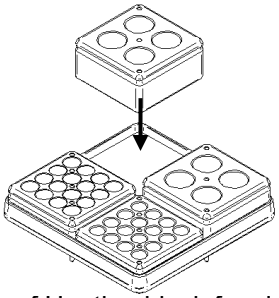
**⚠ CAUTION**



- The "HOT TOP" LED on the control panel illuminates when the temperature of the heating panel is more than 50°C.
- Do not touch the heating block with your bare hands until the "HOT TOP" LED is switched off and the heating block is sufficiently cold.
- The temperature range of heating blocks is up to 300 degrees. Depending on the heating conditions, it may not reach 300 degrees.

## 8.4 Heating block for vial

Using the heating block for the vial for TS, TM and T models, you can perform the reaction test safer and more convenient than the heating mantle or oil bath. On TS models, the external temperature sensor can be used to control the temperature of the heating block. Install the heating block plate for the vial followed by the appropriate size insert as indicated.

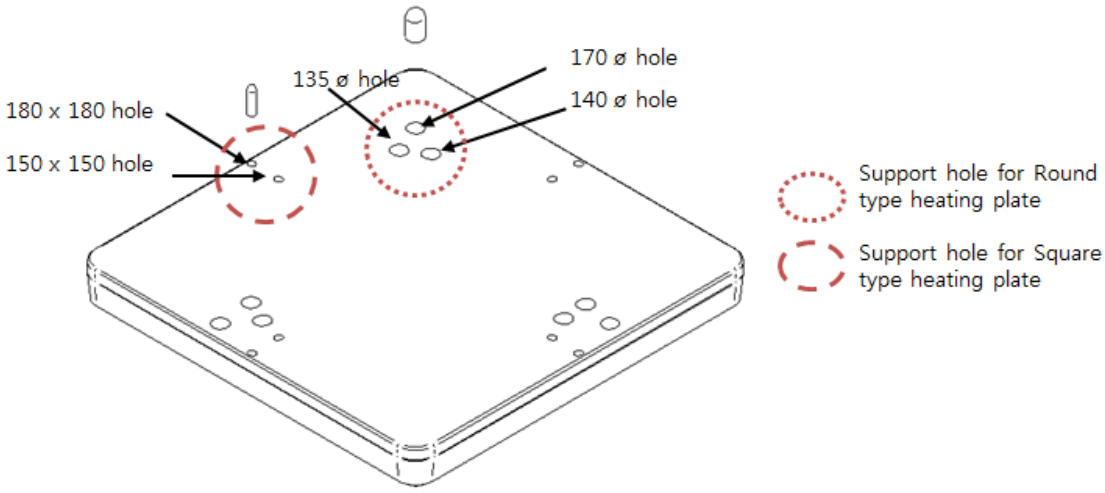


[ Combination of Heating block for vial and Insert ]

The bottom face of the heating plate for vial provides a support fixing hole to ensure that the heating block is safely secured without being pushed onto the heating flask as the below

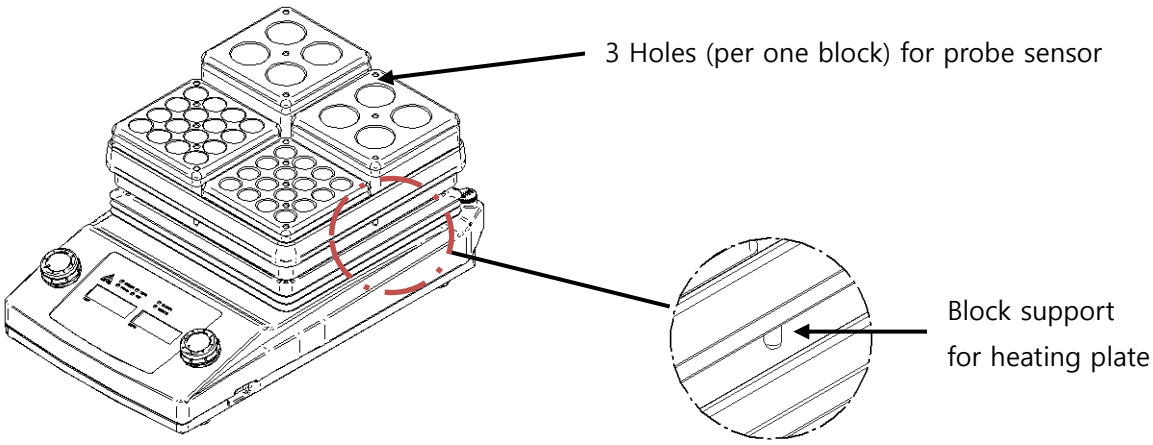

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picture, and it is supplied with securing support (bolt). Three points fixing on the round heating plate, three M8 support, four points fixing on the square heating plate, and four M4 support are provided. Check the location of the support fixing hole suitable for the size of the hot plate you wish to use, and then tighten the suitable support provided with the heating block plate.




[Position of support fixing on the bottom face of heating block plate for vial]

Install the heating block for the flask on the product body heating plate as detailed in the drawing below.




[T-18QG combined with heating block for vial]

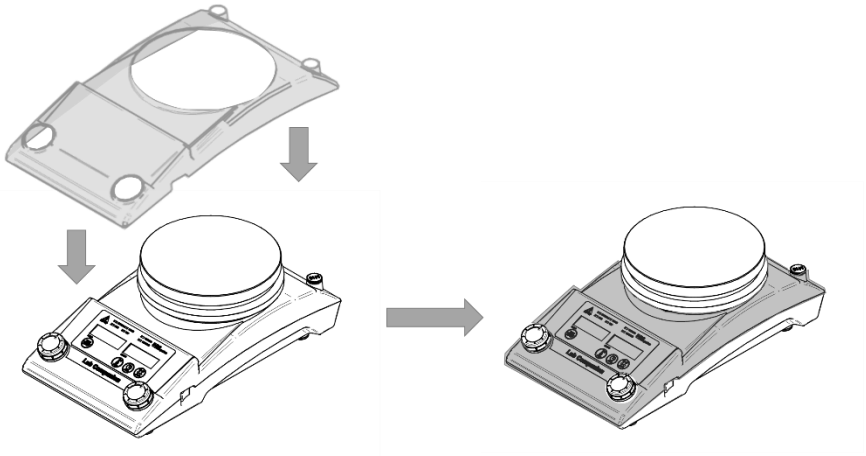
**⚠ CAUTION**



- The "HOT TOP" LED on the control panel illuminates when the temperature of the heating panel is more than 50°C.
- Do not touch the heating block with your bare hands until the "HOT TOP" LED is switched off and the heating block is sufficiently cold.
- The temperature range of heating blocks is up to 300 degrees. Depending on the heating conditions, it may not reach 300 degrees.

## 8.5 Silicon cover

The silicone cover prevents foreign substances from entering the knob and display. Install the silicone cover referring to the illustration below.



[ TS-14SG with Silicon Cover]

**⚠ CAUTION**



- The "HOT TOP" LED on the control panel illuminates when the temperature of the heating panel is more than 50°C.
- Do not touch the Silicon Cover with your bare hands until the "HOT TOP" LED is switched off and the heating block is sufficiently cold.
- Do not poke or scratch the silicone cover with sharp objects.
- Do not pull the silicone cover with excessive force.
- The heating plate must not be covered by a silicone cover.
- Silicone covers cannot be installed with transparent shields.
- If foreign substances enter between the silicone cover and the body, remove the silicone cover and remove the foreign substances from the silicone cover and body and refit it.


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# 9.0 Appendix

## 9.1 Technical Specification

| Item \ Model | TM-14SG | TM-17SG | TM-18QG |
|---|---|---|---|
| Temperature range (℃/ ˚F) | Max. 350/662 | | |
| Heating control | Analog | | |
| Heater output, max. (W) | 600 | 800 | 800 |
| Speed range (rpm) | Max 2,000 | | |
| Speed control | Analog | | |
| Stirring capacity, max ($H_2O$, L) | 20 | | |
| Motor type | BLDC | | |
| Magnetic bar, Max. ( L x Φ, mm/inch) | 40 x 8/ 1.57 x 0.31 | | |
| Warning | Hot top warning lamp blink over 50℃ at Top plate | | |
| Over temp. Protection | Top plate, Main body, PCB | | |
| Heating plate | Molded aluminum alloy top plate, sheath heater inserted white ceramic coated | | |
| Main body | Cast Aluminum alloy, Powder coated | | |
| Heating Plate Dimension (Φ or W x D, mm/inch) | 140/5.51 | 170/6.69 | 180 x 180/7.08 |
| Overall Dimensions (W x D x H, mm/inch) | 161 x 290 x 100/ 6.34 x 11.42 x 3.94 | 191 x 330 x 101/ 7.52 x 12.99 x3.98 | 209 x 326 x 102/ 8.22 x 12.83 x 4.0 |
| Weight (kg/ lbs) | 2.8/6.17 | 3.5/7.72 | 3.8/8.37 |
| Electrical requirements (230V, 50/60Hz,A) | 3 | 4 | 4 |
| Electrical requirements (120V, 60Hz,A) | 5 | 6.7 | 6.7 |
| Max. load (Kg/ lbs) | 25 / 55.12 | | |

※ Unless otherwise specified, the above-mentioned data represent values at 25℃ and 60% relative humidity.

※ Jeio Tech reserves the right to make changes in design and specification without prior notice

## 9.2 Equipment Disposal




Disposing of this equipment must be done in an environmentally responsible way if it has been potentially exposed to bio-agents or radioactive samples. Failure to follow stringent requirements for equipment disposal may lead to actions against you and your organization.

1. First, check with your laboratory or organization to ensure that you are following all the policies and procedures for the disposal of laboratory equipments.

2. If not possible, contact your local governing body for regulations regarding disposal of laboratory equipments. Jeio Tech highly recommends you to find a local service provider that can properly dispose of your instrument.

## 9.3 Warranty

### 9.3.1 Warranty Period

(1) If the product fails during normal and proper use, the warranty period for manufacturing liability shall be two years from the date of delivery.

(2) If you request a repair, please check the items below and let us know so that you can get a quicker and more accurate repair.

- Date of purchase:
- Customer name / address / phone number / E-mail:
- Fault status
- Model
- Serial number

### 9.3.2 Technical Service Contact Points

Technical Services
Address : 153 (Youngsan-dong), Techno 2-ro, Yuseong-gu, Daejeon, 34025, Republic of Korea
Tel : +82 (0)2-2627-3824
Website : www.jeiotech.com/eng/
E-mail : overseas@jeiotech.com


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### 9.3.3 Certificate of Product Warranty

This is a guide to the product quality warranty and service terms provided by Jeio Tech Co., Ltd

All products are guaranteed to operate normally when installed under proper conditions, as specified in the user manual for each product, and used according to the intended purposes and permissible operating conditions.

The warranty period for product quality starts from the delivery date and is indicated in the catalog provided for each product or in the purchase order agreed upon with the customer. If a product malfunctions within the warranty period, Jeio Tech Co., Ltd. provides free repair services. However, among the transportation costs incurred during the repair process, any special costs resulting from the customer's site conditions (e.g., door or wall modifications, use of special handling equipment) are not covered under the warranty. Furthermore, Jeio Tech's liability under this warranty is limited to replacing the product or refunding the original purchase price at Jeio Tech's sole discretion if reasonable attempts to repair or replace the product fail.

Parts replaced during free repairs within the warranty period become the property of Jeio Tech Co., Ltd. Additionally, the warranty period is not extended due to free repairs. Jeio Tech is not responsible for any losses incurred by the customer due to delays in repairs caused by issues such as part shortages or shipping delays.

The following cases will be handled as paid repairs, even within the warranty period:

1. Non-defective cases
   * Requests to resolve issues arising from improper operating environments or abnormal installations.
   * Reinstallation requests or connections with external equipment other than the initial installation.
   * Requests for usage instructions or simple adjustments that do not require disassembly.
   * Inspections of non-defective products.
   * Cleaning or debris removal service requests.

2. Failures caused by user errors:
   * Malfunctions due to usage not in accordance with the user manual.
   * Issues resulting from improper operating environments or abnormal installations.
   * Malfunctions caused by incompatible chemical usage.
   * Malfunctions caused by irregular or improper electrical or utility supplies.
   * Damage due to product movement, storage, external impact, or dropping by the customer.
   * Malfunctions resulting from unauthorized modifications or repairs without prior written approval from Jeio Tech Co., Ltd.
   * Malfunctions caused by using consumables or optional components not specified by Jeio Tech Co., Ltd.
   * Repairs performed by personnel other than Jeio Tech or its authorized service agents.

3. Other cases

* When the product model or serial number has been damaged, removed, manipulated, or altered.

* Malfunctions caused by fire, flooding, or other natural disasters.

* Failure due to consumable parts reaching the end of their lifespan (e.g., lamps, filters, fuses, gaskets, packings, hoses, heat transfer fluids).

* Natural wear and tear (e.g., discoloration, screen printing degradation).

* Damage or malfunction of product accessories (e.g., power cables, data cables, glass components) or options.

* Malfunctions caused by errors in computers, computer components, or connected network systems.

- Before Jeio Tech performs free or paid repairs or accepts the return of a product, the customer must ensure the product has been decontaminated of chemical and biological hazards.
- Replacement parts used during repairs may differ from the original but will function correctly and be equivalent in performance.
- Jeio Tech does not bear any responsibility for damage to stored samples, data loss, or any other direct or indirect damages caused by product malfunctions, regardless of the warranty period.
- Jeio Tech does not guarantee issues related to computers, computer components, or network systems connected to the product, regardless of the warranty period.
- This warranty is the sole and exclusive warranty provided. Any implied warranties imposed by applicable laws are limited to the warranty period stated herein. This warranty cannot be modified by any verbal advice, statements, or documents on behalf of Jeio Tech unless explicitly labeled as a "Warranty Amendment" and signed by an authorized representative of Jeio Tech.

- This warranty applies only to products purchased for direct use by the customer. It does not cover products purchased for resale purposes without prior written approval from Jeio Tech.
- This warranty does not apply to consumables and is non-transferable.

- The contents of this manual can be changed or upgraded without prior notice.
- The copyright of this manual is reserved by Jeio Tech


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