



User Manual

Hotplate & Magnetic Stirrer, Multi-Position

Model: MS-33MH, MS-53MH
Manual No.: 34015L002 Version: 3.0



 WARNING

Please read this user manual carefully before using the product. Users should operate the product according to the operating instructions contained in this user manual. Users should be aware of cautions and warnings for your safety. Failure to follow these guidelines may result in serious injury or damage to your property.

Thank you for purchasing Jeio Tech's products.

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1.0 Safety

1.1 How to use the Manual

This manual contains important safety and operation information. You must carefully read, understand, and follow all the instructions in this manual prior to operating this instrument. Keep this manual in a safe place nearby for reference and make it easily available to all users.

1.2 Signal word panels to use it for safe

- (1) There are Warning and Caution in the manual to use it safely and preventing any accidents and property damages.
- (2) These alerts are classified into four types in this manual depending on the importance and the risk levels as described below:
- (3) Ensure to read and understand the warning alerts carefully before use.

Signal word panels	Meaning
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a property damage message.

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 and Caution to use safely



- Please understand all warning alerts labels completely.
- Do not remove any labels.
- Do not move the instrument while it is running.
- Do not use and keep flammable gas near instruments.
- Do not place the instruments in the place where flammable gas can be leaked.
- Do not use the instruments in the explosive conditions.
- Do not put explosive, flammable chemical (Alcohol, Benzene) on the units.
- DO NOT let moisture, organic solvents, dust, and corrosive gas enter into inside.
- Please install the units on the plate floor and in the laboratory room with safety facility in case of accidents.
- Please check electrical requirements like Voltage, Current and Phase on the ID plate of this instrument before use.
- Do not expose the Instruments cooler to direct sunlight.
- Do not expose the Instruments cooler to direct heat sources.
- Do not use the Instruments cooler in places where moisture is high and flooding.
- can occur.
- Do not use Instruments cooler in environments that contain industrial oil smoke and metallic dust.
- DO NOT operate the Instruments cooler when there is strange sound, smell and
- smoke coming from the unit.
- Do not disassemble, fix or change the Instruments cooler other than for those
- items described in this operating manual.

1.5 Caution statements



- Please be careful not to get burn from remaining heat during operation or even turning off.
- After using this equipment, make sure to turn off the main power switch and disconnect the power cord from the power outlet for the safety of other users.
- Do not place heavy objects, including this equipment, on top of the power.
- 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 on the instruments.
- Do not impact or vibrate the top plate.
- Do not install the instruments cooler near machinery generating high frequency noise.
- Please be careful that an artificial heat pulse device or Magnetic memory devices can influence on the instruments much.
- Do not use chlorine bleach, ammonia-based cleaners, abrasives, ammonia, or metal scouring pads. Wipe with a soft damp cloth.
- Before cleaning, make sure to unplug the power cord to avoid electric shock or fire.



Be careful of Electrical shock.



Be careful of Heat on the surface.

2.0 General Description

2.1 Product Introduction

The instrument is Hotplate & Magnetic Stirrer Multi-position which has Temperature control and stirring mode (All mode, Column mode, Row mode, each point mode with 30rpm to 2000rpm).

2.2 Characteristics

2.2.1 Great Performance

- It has less noise and great durability because of BLDC motor which has special magnet and powerful and elaborate torque. (30~2000rpm)
- Motor's response is fast and should be stopped quickly.
- Be able to set timer for each stirring mode (1min ~ 99hr 59min) and check remaining timer and reset as well.
- You can adjust temperature by using volume switch.
- Heater integrated with aluminum plate has quick speed of heating by high heat transfer and good durability.

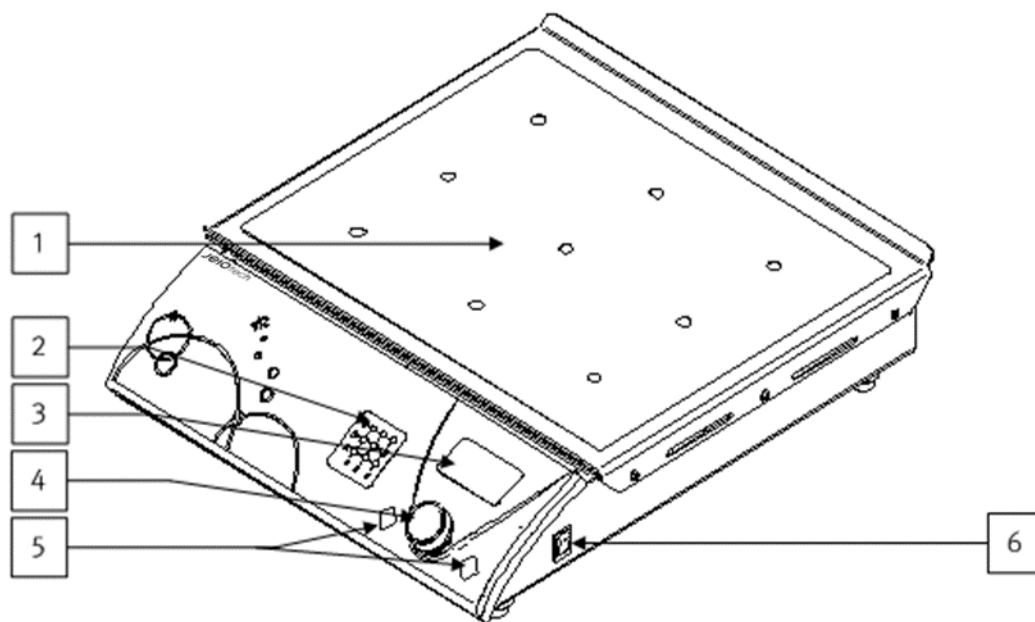
2.2.2 Safety

- It has Smooth starting function and is designed preventing from overflow by quick stirring and decantation.
- The structure is designed with waterproof type to minimize inflow of liquid and sample for safety.
- Integrated silicon pad with top plate gives easy checking for stirring point and preventing form slip.
- You can know whether heater is working or not by checking heat lamp on the left side of Heater Knob.

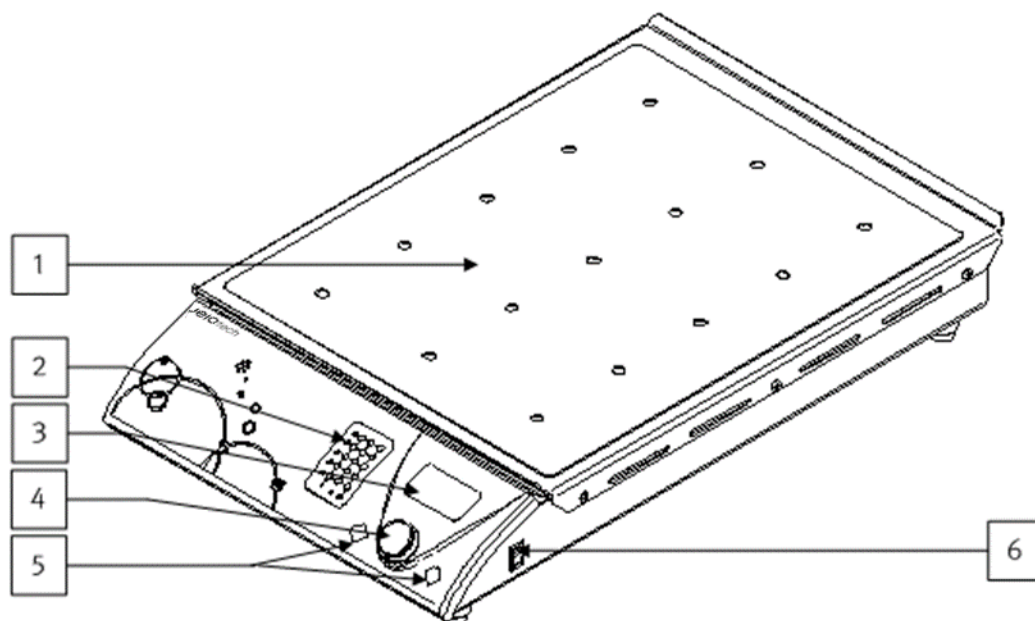
2.2.3 Convenience

- You can choose 4 kinds of mode [All, Column, Row, Point mode].
- It is possible to heat and stir with many small vessels.
- VFD (Vacuum Fluorescent Display) is easy to check the conditions of operation and stirring setting.
- It is easy to control the unit by touch button and dial knob.

2.3 Structure

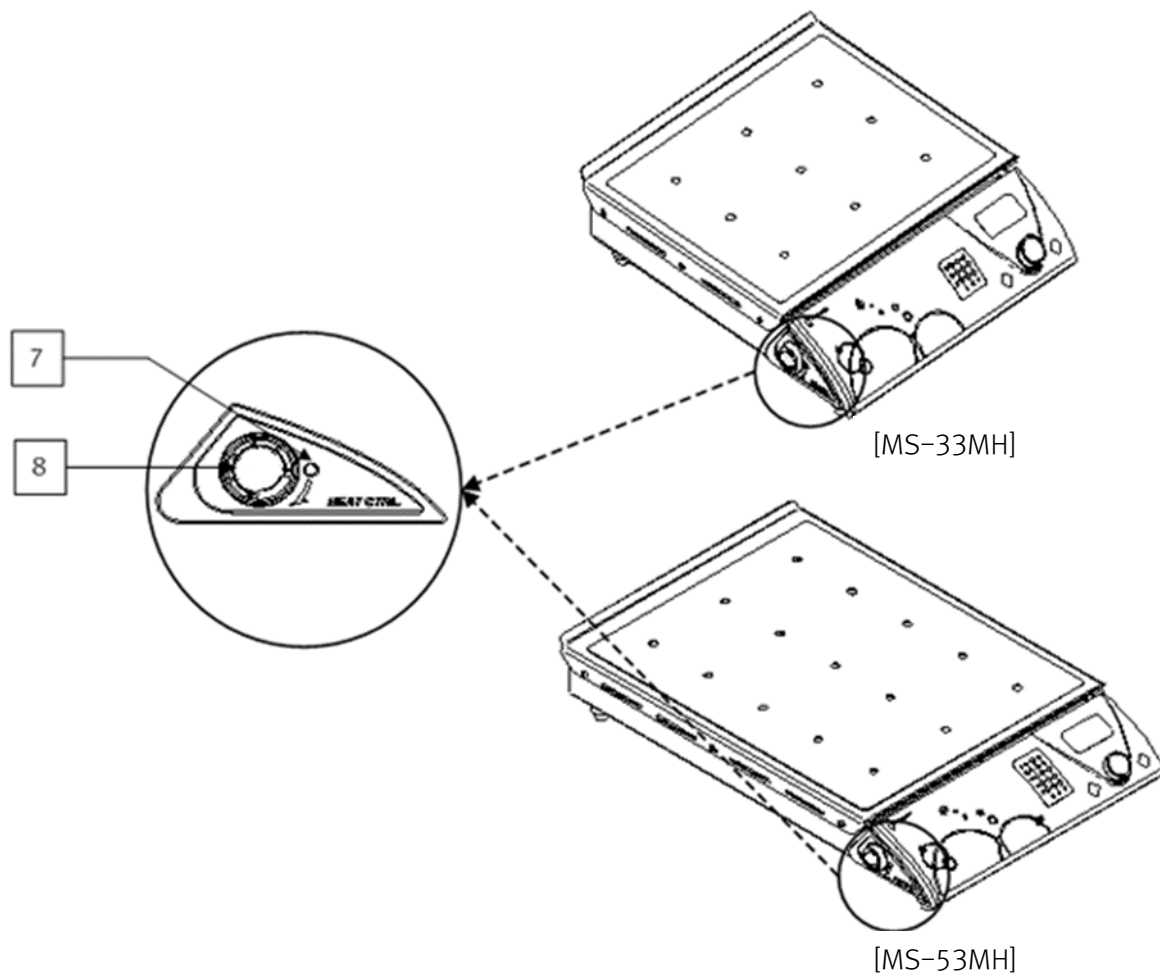


[MS-33MH]

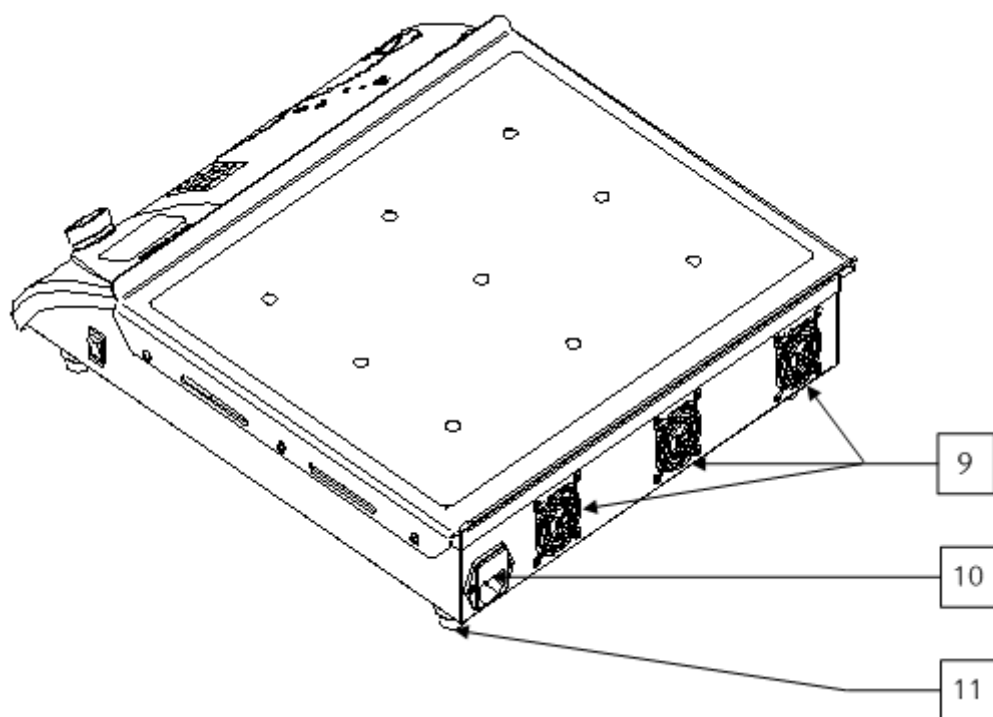


[MS-53MH]

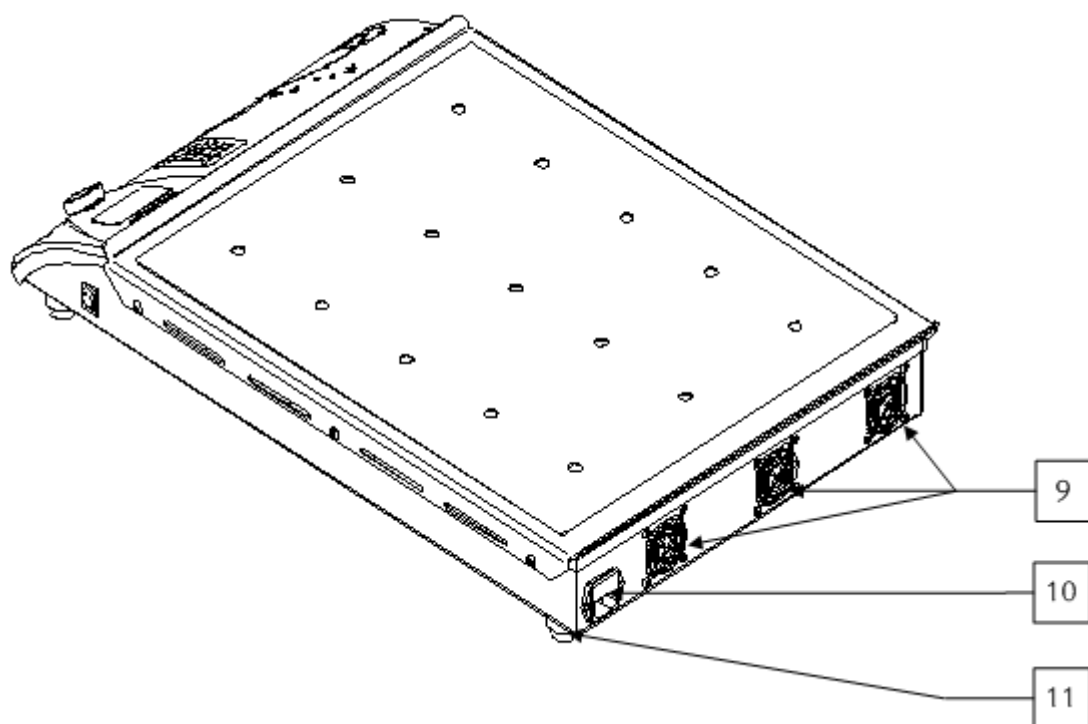
- (1) Top plate : Place samples on it.
- (2) Point indicator : Display the points under the working and ready to be worked.
- (3) VFD(Vacuum Fluorescent Display) : Check the setting value and operating status.
- (4) Stirrer Knob : Select the stirring mode, speed and timer.
- (5) Touch Button : Set the escape and timer.
- (6) Power Switch : ON/OFF the power.



- (7) Heater Lamp : Light on when the heater is working.
- (8) Heater Knob : Operate heater. [4.1 Name and function of control panel.]



[MS-33MH]



[MS-53MH]

- (9) Fan : Prevent the over-temp in the unit.
- (10) Socket for power cord : Put the power cord.
- (11) Foot : Prevent movement and sliding of the unit.

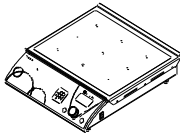
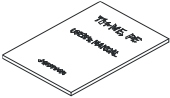
3.0 Installation

3.1 Unpacking and Checking

- (1) Check the packed unit has any harm.
- (2) Unpack the unit.
- (3) Check the harm before using the unit carefully.

3.2 Check the Unit

- (1) Unpack the unit and check the components.
- (2) In the case of omission of components, contact to JeioTech.

Item	Figure		Quantity	Description	
Main body			1	MS-33MH	MS-53MH
Power cord			1	-	
Fuse			1	Refer to 6.0 “Replacement of Fuse”	
Operation manual			1	-	

3.3 Environmental setting

Maintain the distance(more than 30cm) with other equipment.

 WARNING

- Place on flat surface, avoiding heating source or direct light.

3.4 Check list before use

- Use the unit on the flat surface, in the laboratory that is supplied with safety equipment.
- Do not use the unit in the place of that has a possibility of gas leakage.
- Do not use the unit near the equipment that generates strong high-frequency noise.
- Do not use the unit in the place of that has a possibility of current leakage, water leak, flooding.
- Do not use the unit in the place of that affected by harmful gas or metal dust.

3.5 Power connection

Supply the power refer to below steps

- (1) Set the power switch at the “OFF” before supplying the power.
(Push the front part of the power switch.)
- (2) Put the power plug into the power socket located in the rear part of unit.
- (3) Put the other side of power plug in to the socket.

WARNING

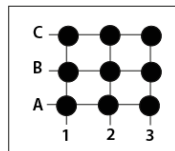
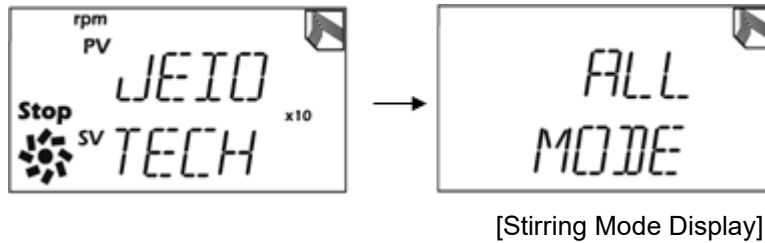
Electrical Shock Hazard.



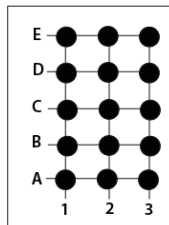
- Connect the right voltage, phase and current.
 - Do not use branch socket or double tap to prevent the over current related fire.
 - Inappropriate power connection causes severe injury or casualty.
 - Wear safe clothes when use the unit.
 - Do not touch cord or parts of the unit with wet hands.
 - Must use the power that is earthed.
-

3.6 Power on

- (1) Connect the power cord.
- (2) Once turn on the power switch, the fan operates and the below display is appeared with alarm beep.



[MS-33MH Point Display]



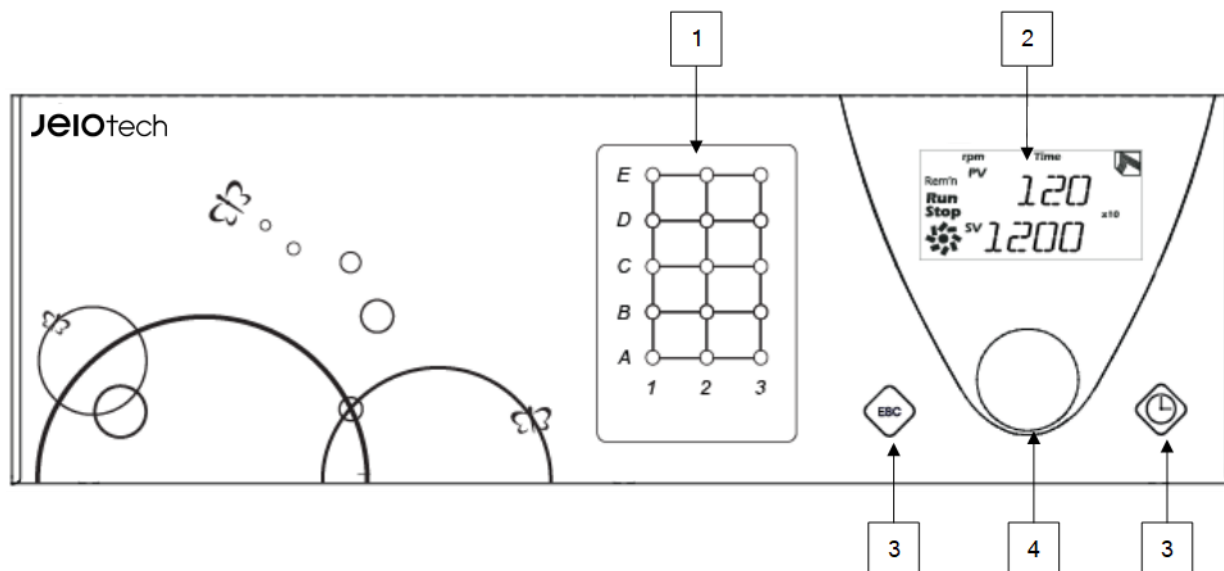
[MS-53MH Point Display]

NOTICE

- LED lamp on the point display shows which point is working.
- Column and row index of MS-33MH is A~C, 1~3, which has total 9 points.
- Column and row index of MS-53MH is A~E, 1~3, which has total 15 points.
- Noise can be generated when the power switch is on because of the fan.

4.0 Operation

4.1 Name and function of Control panel.



- (1) Point Display : Check the Point, Column, Row, displayed on the VFD
- (2) VFD(Vacuum Fluorescent Display) : Check the speed and timer.

A	Rem'n	Remaining time display.	
B	Run	Stirrer is under the operating.	
C	Stop	Stirrer stops.	
D			Stirrer is running.
E	rpm	Speed of stirrer.	
F	Time	Past time and remaining time.	
G	PV	Present speed (In the case of 1200 rpm, displayed as 120x10)	
H	SV	Setting speed	
I	x10	Conversion value of present rpm	

- (3) Touch Button : Touch button is divided into two, green and red. Activated one is displayed as a green. In the case of red, the button is locked.

A		ESC	Stop the stirrer or escape from the setting.
B		TIMER	Timer setting, remaining operating time and past time.

- (4) Dial Knob : Use the nob for stirring speed setting and temperature setting.

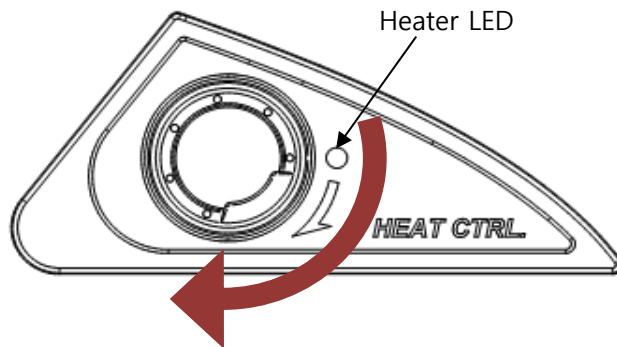
A	Stirrer Knob	Stirrer mode setting, speed setting, run and stop the stirrer, timer setting and stop.
B	Heater Knob [2.3 Structure (8)]	Heater setting, run and stop the heater.

4.2 Operation of the Heater

To activate the heater, turn the **heater knob** clockwise. With a 'click' sound, the heating starts immediately. Set the **heater knob** at the desired position.

Note : Please make sure the heater off to counterclockwise end. Because the heater is independently operating with stirrer, timer operating.

- (1) Turn the (product left side) **heater knob** clockwise. With a 'click' sound
(The **heater LED** will illuminate only when power is supplied to the heater.)
- (2) Adjust the heating power by turn the knob.
- (3) After heater used, please turn the **heater knob** counterclockwise until you hear the 'click' sound.



WARNING



- Please warning the high temperature of product surface when heater is operating or after operating.

CAUTION



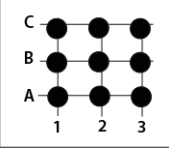
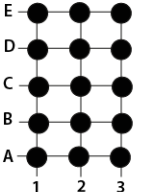
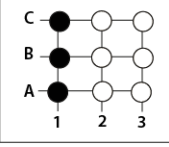
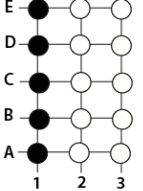
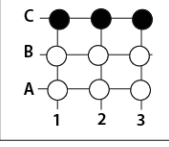
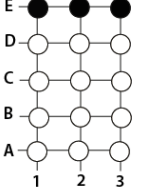
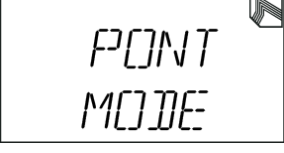
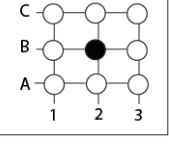
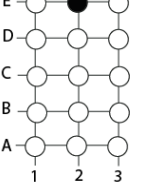
- Make sure the heater off condition before and after use.
- The all point of top plate is heated same temperature.
- The lamp will turn on during the heater operating.
In case of heater lamp is turn off and power cut off, the top plate is possible to hot temperature.

4.3 Operation of the stirrer

This instrument offer 4 different operating mode .

(All mode, Column mode, Row mode, Point mode)

Please operating the product, before magnetic bar put the flask and located stirring point.

Stirring mode selecting screen	Point display		Remark
	MS-33MH	MS-53MH	
			Stirring the same RPM and timer for all point.
			Stirring the same RPM and timer for each column.
			Stirring the same RPM and timer for each row.
			Stirring the same RPM and timer for each point.

CAUTION

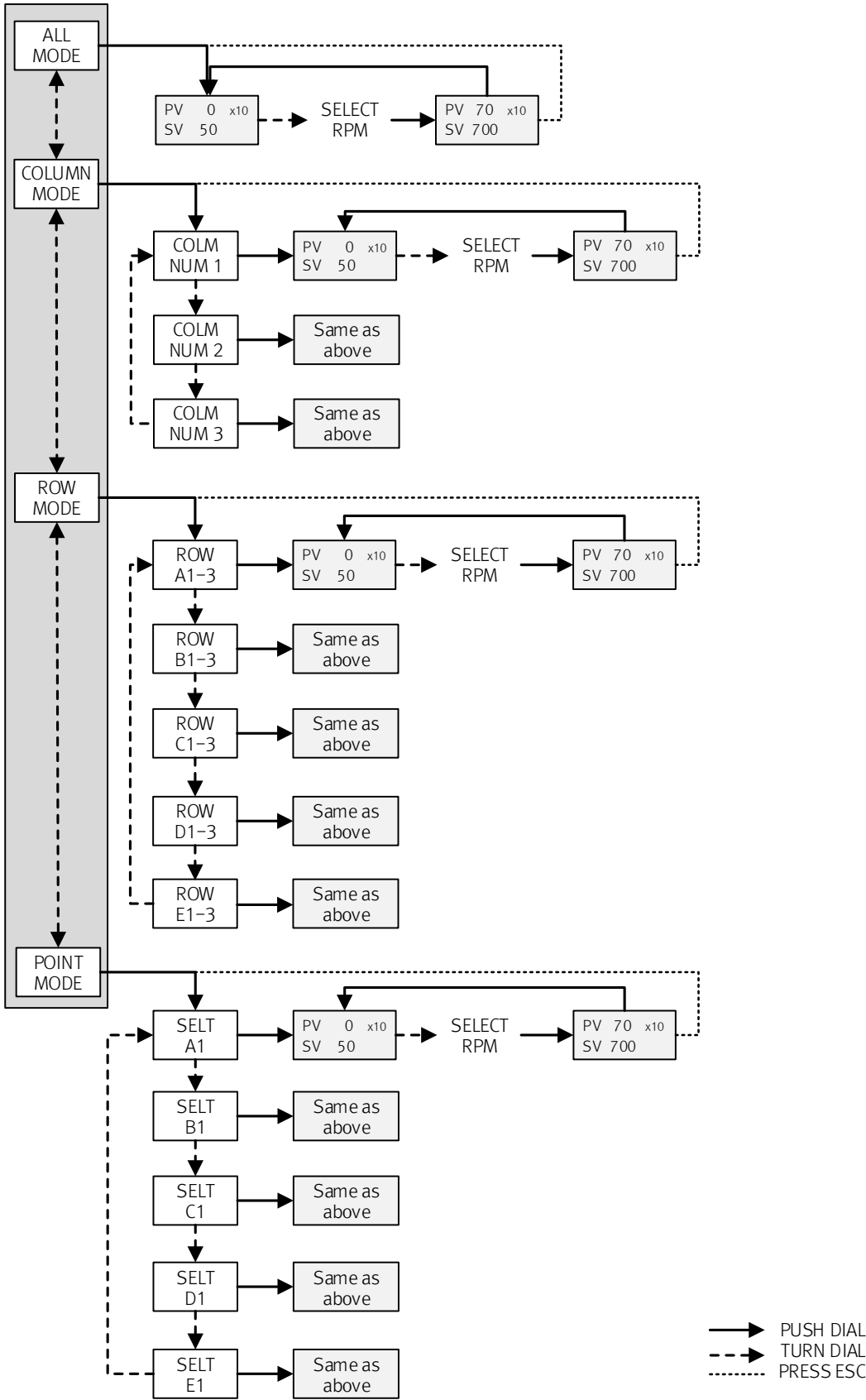


- There is a danger of liquid spills if containers are over-filled and stirred at high speed. Always ramp up stirrer speed slowly and never stir more rapidly than necessary.

NOTICE

- User can know VFD indicated information by illuminated LED lamp on point display.
 - The MS-33MH is showed 9 different stirring point on point display (from A1 to C3). The stirring point is organized column line(A~C) and row line (1~3).
 - The MS-53MH is showed 15 different stirring point on point display (from A1 to E3). The stirring point is organized column line(A~E) and row line (1~3).
 - Stirring control screen initial value is 50 rpm. User can adjust the speed 30~2000rpm by stirring knob.
 - During the stirrer value input, use of ESC button can be escape from the control screen.
 - During the stirring, pressing the TIMER button can be known the elapsed time. And press on more time, you can move to the timer set mode. [Refer 4.4 timer mode]
 - During the stirring, you can stop the stirring point by press knob. Or press ESC button can stop all stirring point.
-

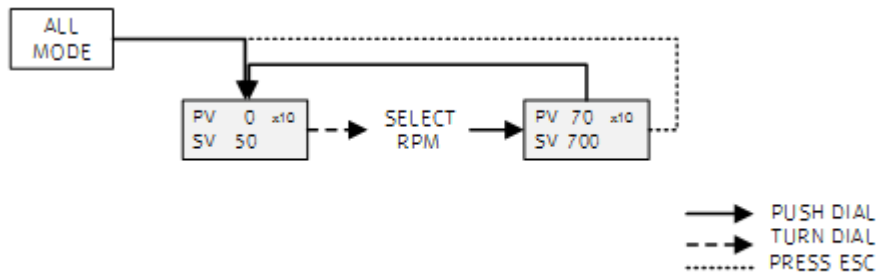
The following chart is the configuration of 4 stirring modes.



Operation for each mode.

4.3.1.1 All mode

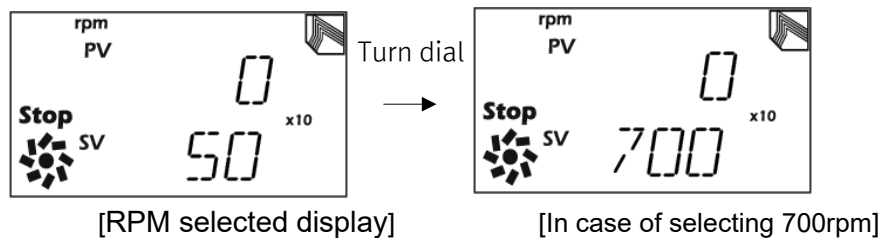
Set the same RPM for all points.



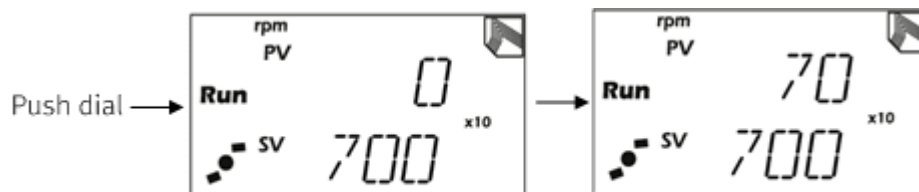
- (1) Select the “All mode” on the stirring mode screen.



- (2) Turn the knob left/right side to change RPM.

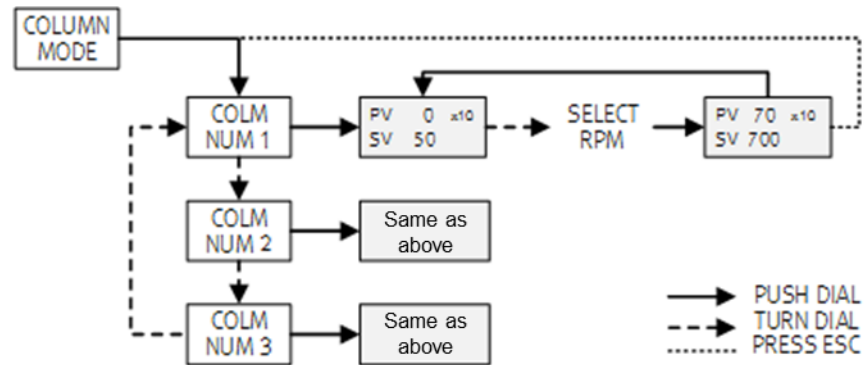


- (3) Press the knob to operating stirrer.

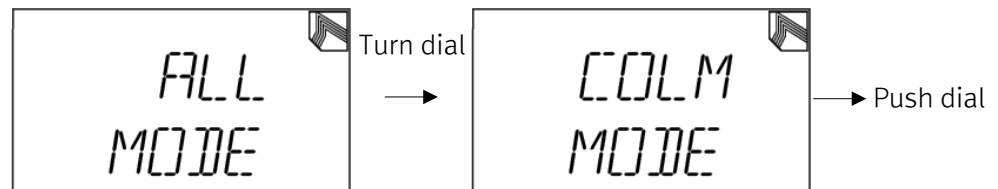


4.3.1.2 Column mode

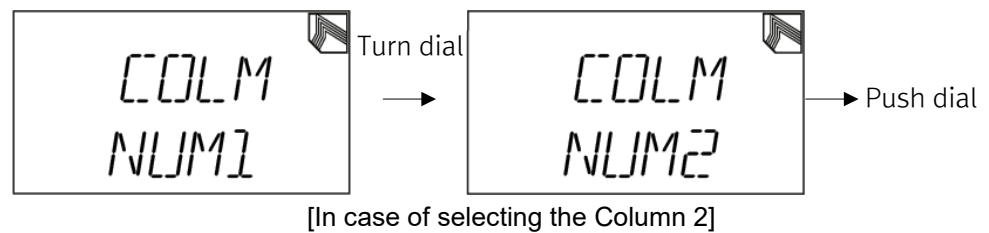
It is the function to stir with different RPM and stirring time for each column.



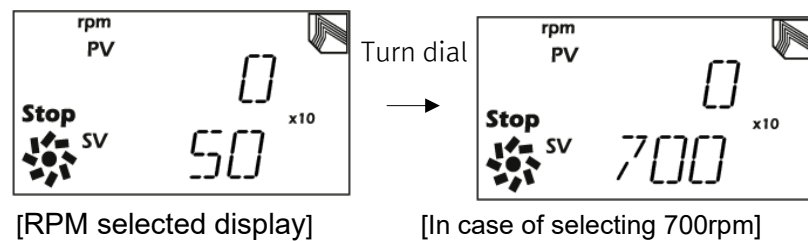
- (1) Select the "COLM MODE" on the stirring mode screen.



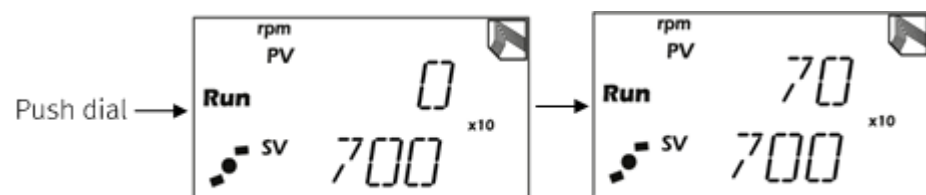
- (2) Select the stirring column line.



- (3) Turn the knob left/right side to change RPM.



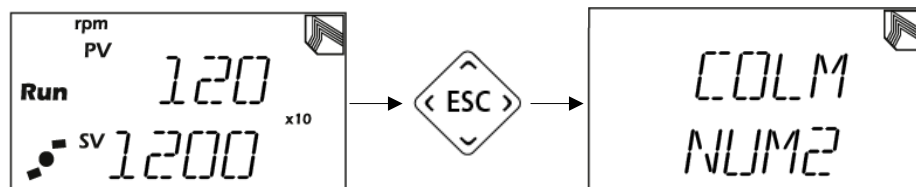
- (4) Press the knob to operating stirrer.



4.3.1.3 Add Column during the Column mode operating.

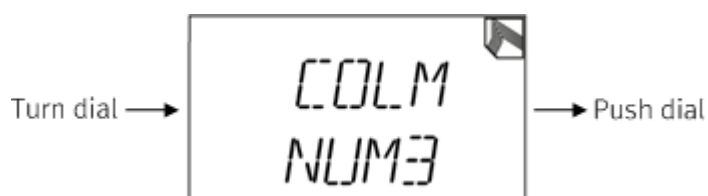
It is possible to operating additional Column with different timer during the Column mode operating.

- (1) Press the ESC button in column mode stirring screen.



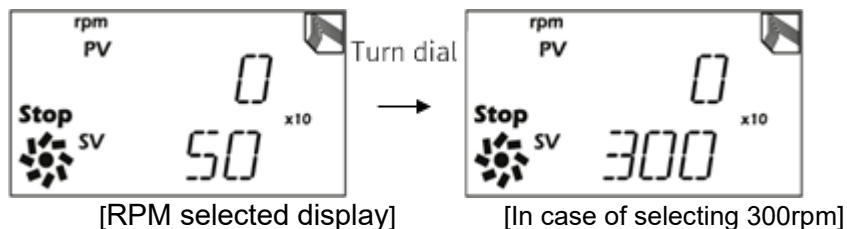
[Press ESC button during the Column 2 operating]

- (2) Turn to knob and select additional column.

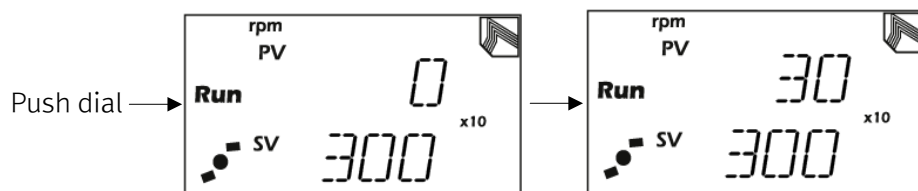


[Select column 3 during the Column 2 operating]

- (3) Turn the knob left/right side to input RPM.

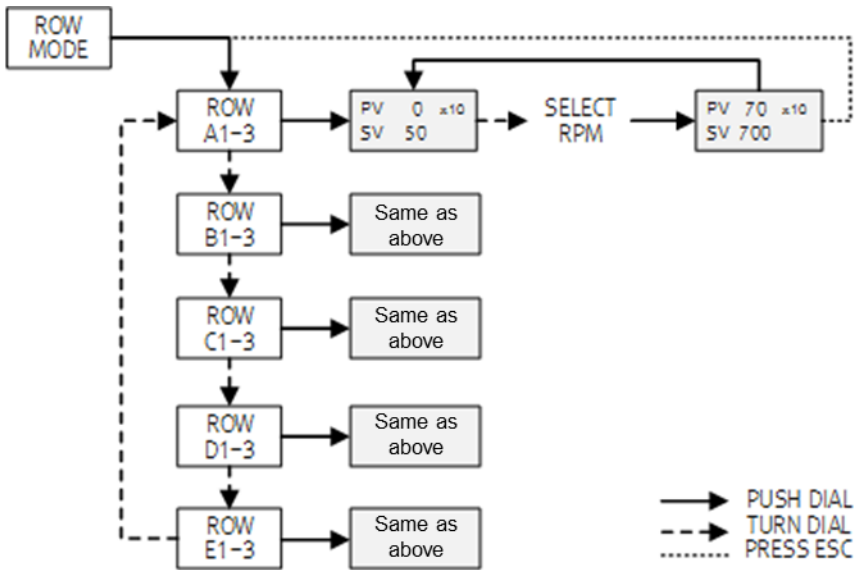


- (4) Press the knob to operating stirrer. Control the Column 2 and 3.



4.3.1.4 Row mode

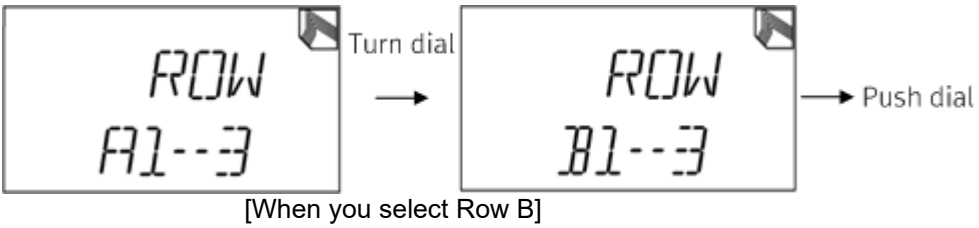
It is the function to stir with different RPM and stirring time for each row.



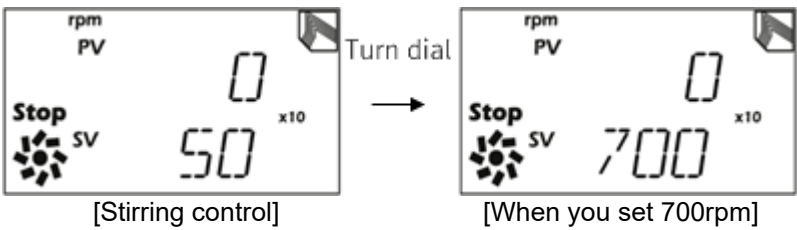
(1) Select “ROW MODE” on stirring mode selection.



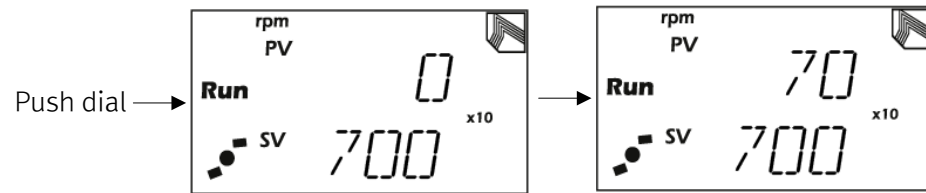
(2) Select any preferred Row by turning stirrer knob.



(3) Set RPM by turning stirrer knob.



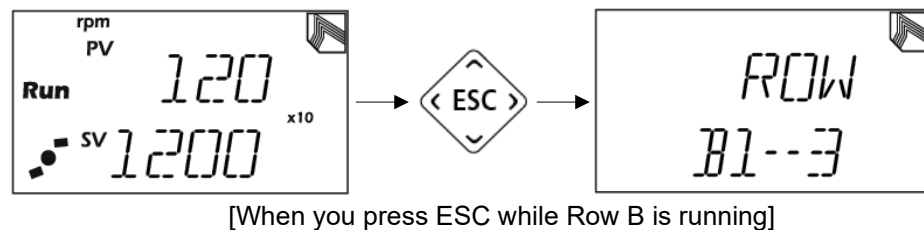
- (4) Push Stirrer knob to start stirring.



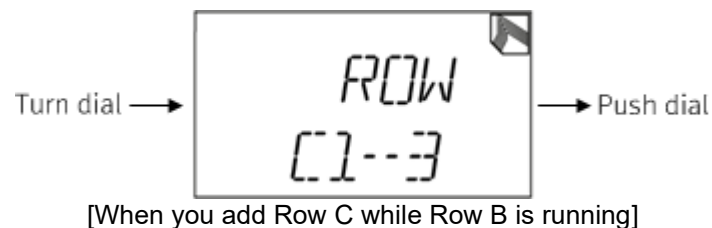
4.3.1.5 Row addition while Row mode is running.

While Row mode is running, User can add other Row for it's individual operation. Individual timer set is also possible for the Row.

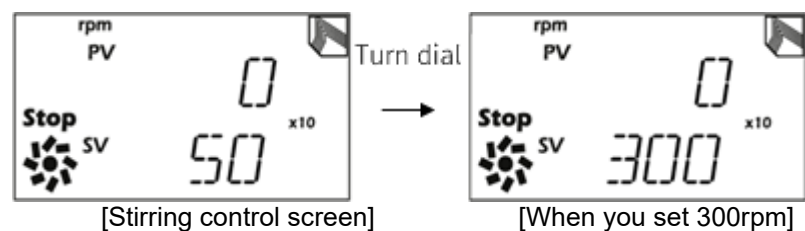
- (1) Press ESC on Row mode stirring control.



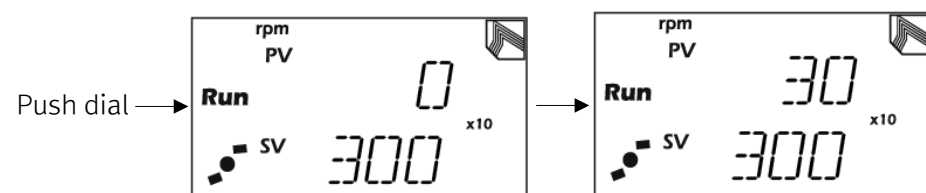
- (2) Select any preferred Row by turning stirrer knob.



- (3) Set RPM by turning stirrer knob.

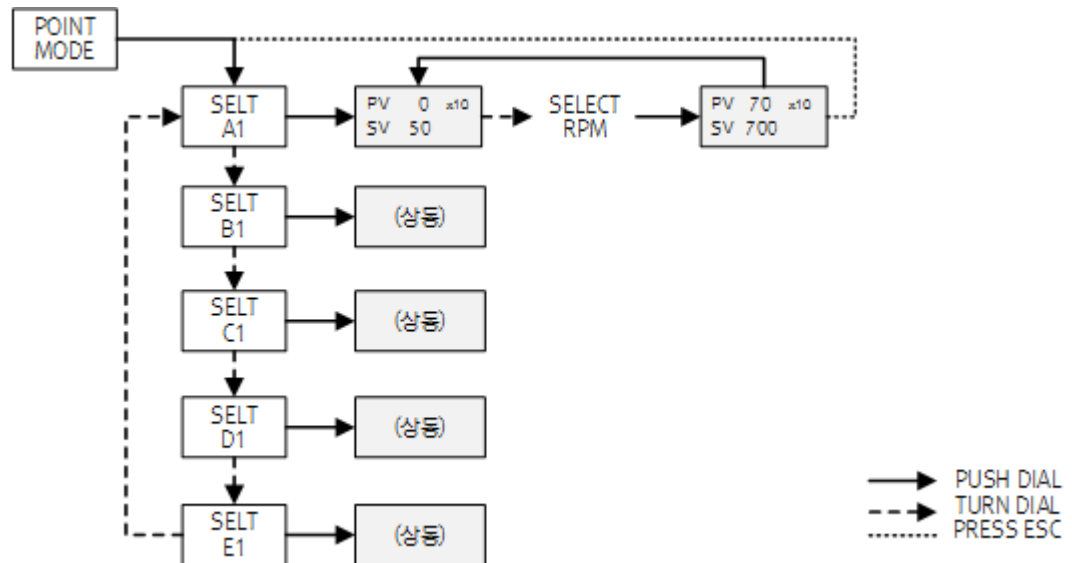


- (4) Push stirrer knob to start stirring. Stirring control starts on Row B and C.

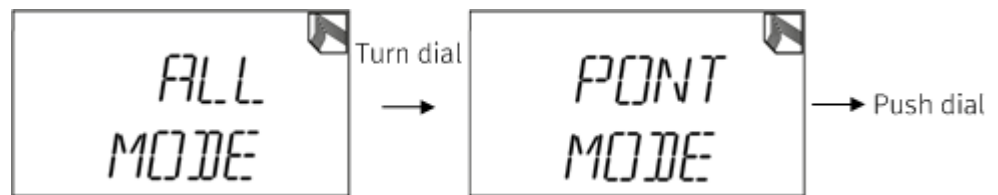


4.3.1.6 Point mode

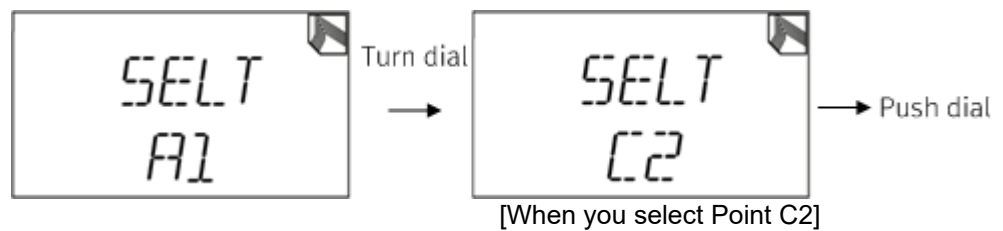
Timer set and view are available for each different RPM on each individual stirring point.



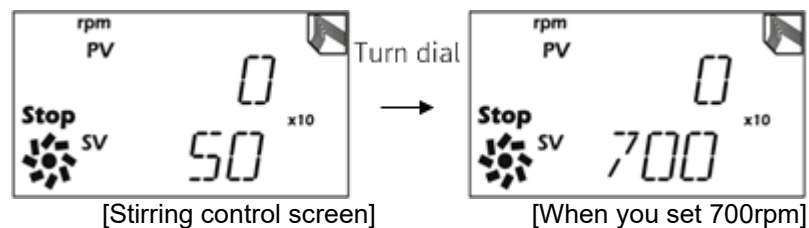
- (1) Select "PONT MODE" on stirring mode selection.



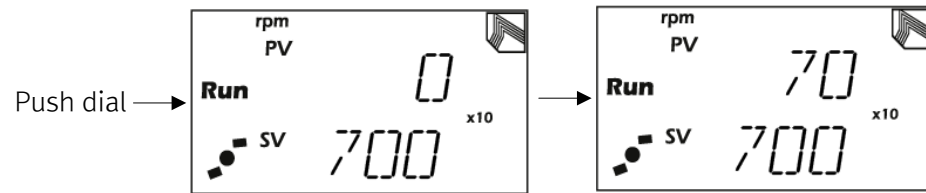
- (2) Select any preferred Point by turning stirrer knob.



- (3) Set RPM by turning stirrer knob.



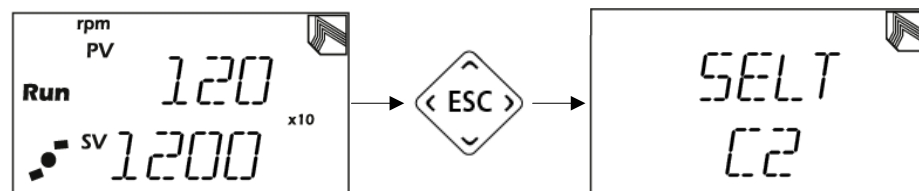
- (4) Push stirrer knob to start stirring.



4.3.1.7 Point addition while Point mode is running

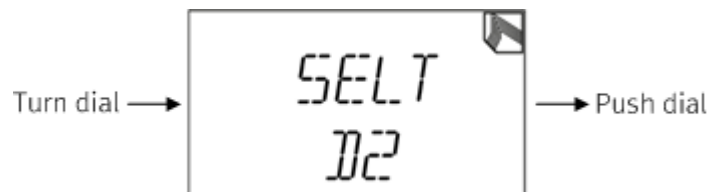
While Point mode is running, User can add other Point for it's individual operation. Individual timer set is also possible for the Point.

- (1) Press ESC on Point mode stirring control.



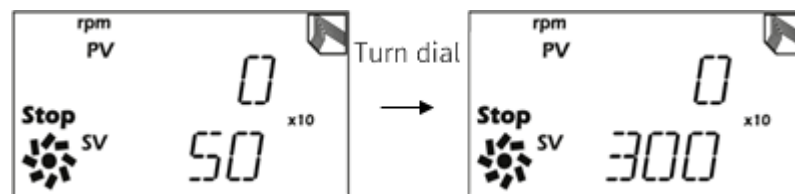
[When you press ESC while Point C2 is running]

- (2) Select any preferred Point by turning stirrer knob.



[When you add Point D2 while Point C2 is running]

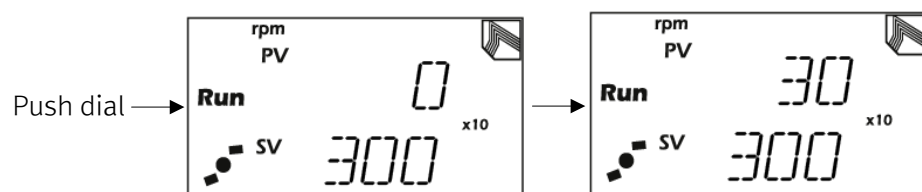
- (3) Set RPM by turning stirrer knob.



[Stirring control screen]

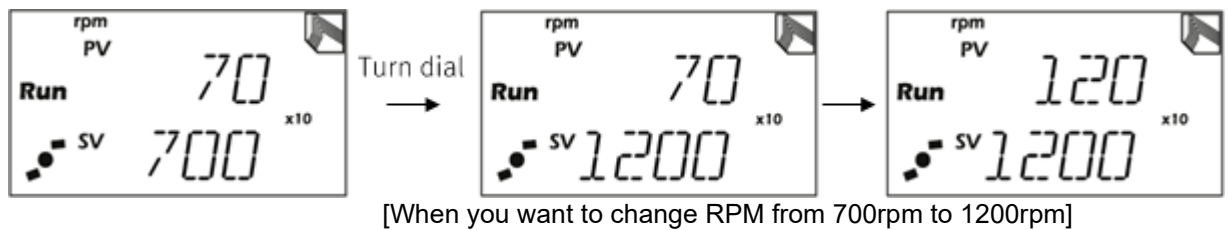
[When you set 300rpm]

- (4) Push stirrer knob to start stirring. Stirring control starts on Point C2 and D2.



4.3.2 RPM change during operation

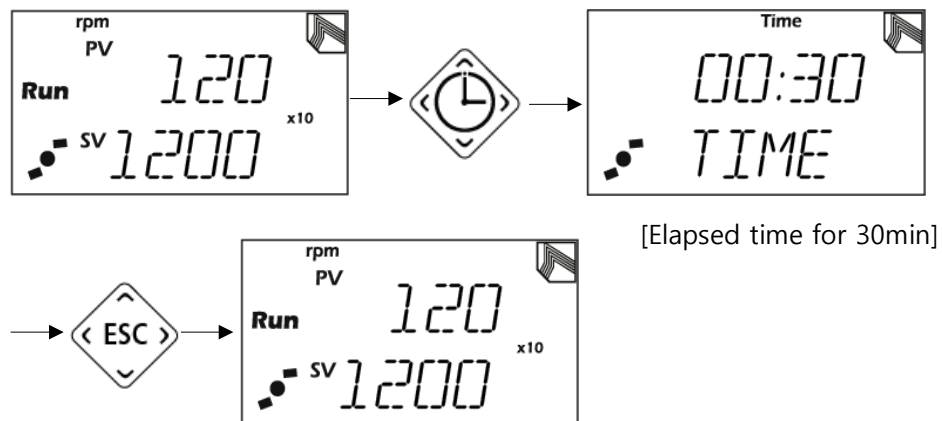
Simply turn stirrer knob to change RPM during stirring operation.



4.3.3 Stirring elapsed time check

Press TIMER on each mode's stirring control screen during stirring operation.

Press ESC after checking the time.



Press TIMER one more during elapsed time check to enter timer mode. [Refer to 4.4 timer mode]

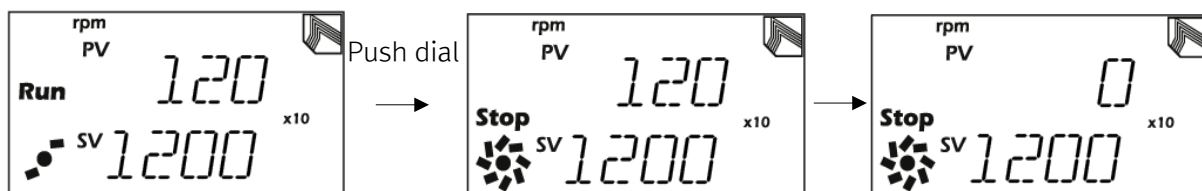
NOTICE

- Individual timer set, elapsed time check for each individual Column, Row, Point are available.

4.3.4 Stirring operation stop

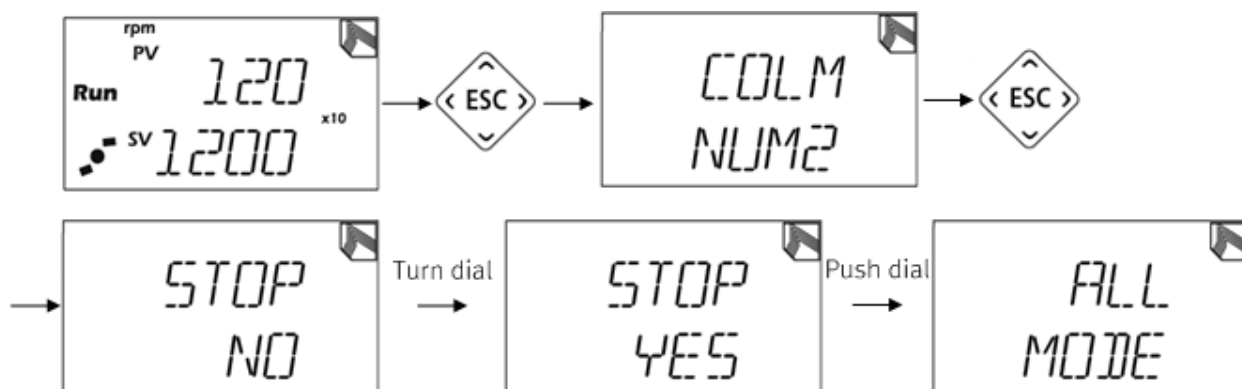
User can stop stirring on each mode such as Column, Row, Point one by one, or stop all stirring points at once.

- (1) When you want to stop stirring on each Column, Row, Point one by one, Push stirrer knob on the preferred stirring control screen.



- (2) Stirring stop at all points

Press ESC during operation to enter it's stirring mode selection screen. Press ESC again to stop stirring at all points.



[When you stop all stirring at Column mode, stirring stops and it enters stirring mode selection screen]

4.4 Timer Mode

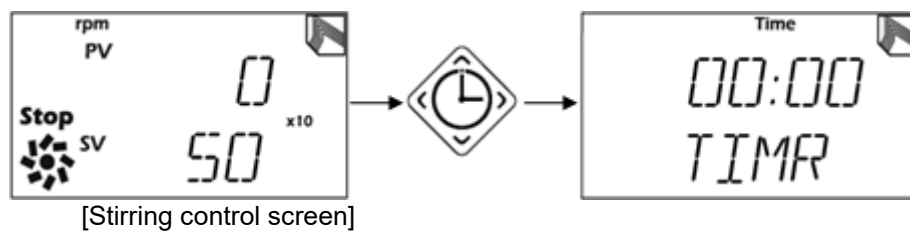
Timer set at each stirring mode is available before operation starts or during operation. Use TIMER button and stirrer knob to set timer. Timer range is from 1min to 99hr 59min.

NOTICE

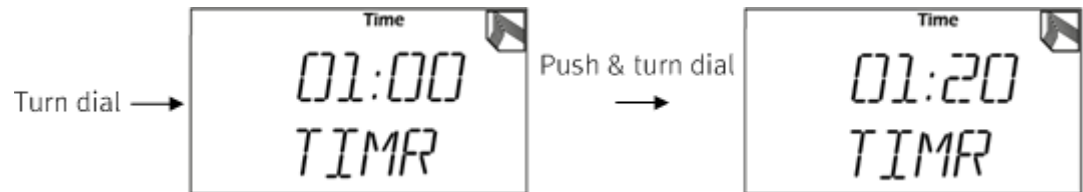
- Timer set is available before or during operation.
 - Press ESC to escape timer mode.
 - Stirring operation starts right after timer set. If you need it, set RPM first and timer in sequence.
 - Check elapsed time by pressing TIMER while timer is on. Press TIMER one more to enter timer mode.
 - Use stirrer knob to change RPM while timer is on.
 - Push stirrer knob or press ESC to stop timer while timer is on.
 - Even after power is OFF and ON, the last set timer value is saved.
 - Timer mode is only available for stirring mode. Even if timer is finished, heater is operating itself. Use heater knob to control heater.
-

4.4.1 Timer set

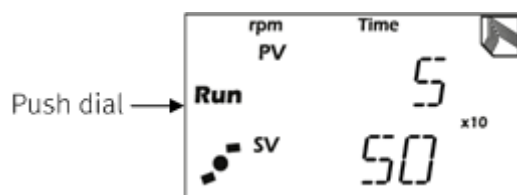
- (1) Press TIMER on the preferred stirring control screen.



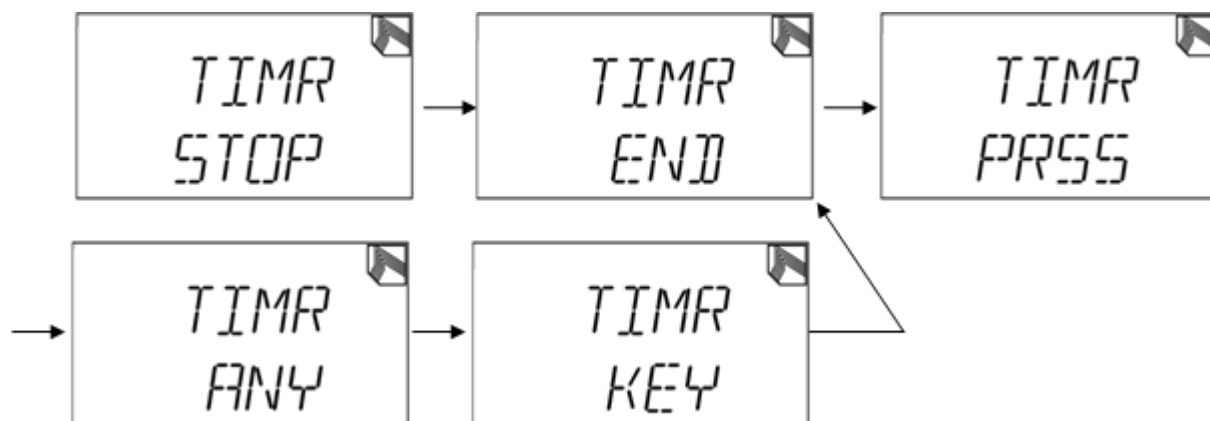
(2) Set timer in sequence of hour, minute by stirrer knob.



(3) Press stirrer knob to start stirring with timer.



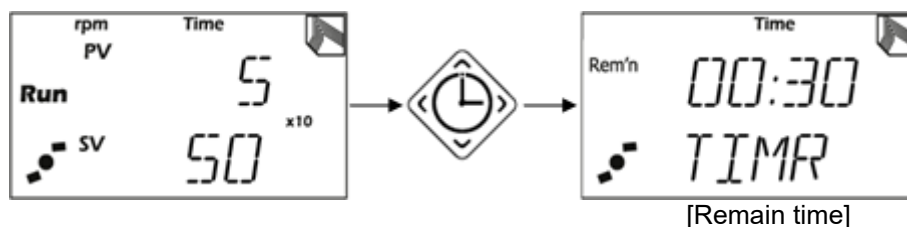
Timer operation stops with alarm and message.



Press any button to stop the alarm.

4.4.2 Check remaining time on timer

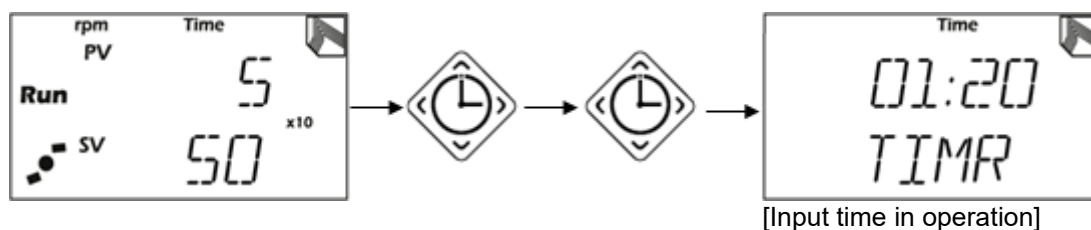
Press TIMER to check the elapsed time.



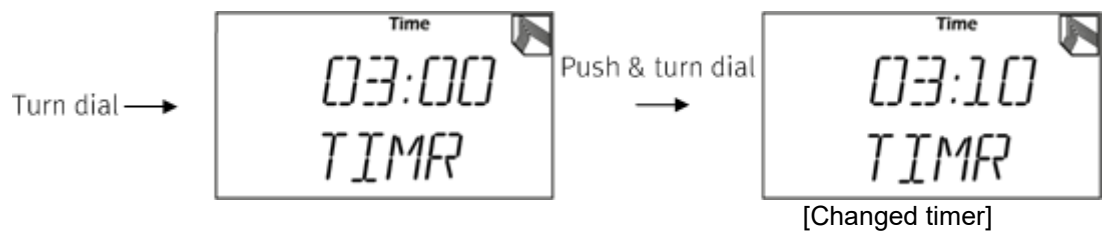
After checking the elapsed time, press ESC to enter to stirring control screen or press TIMER again to reset timer.

4.4.3 Re-set timer during the operation

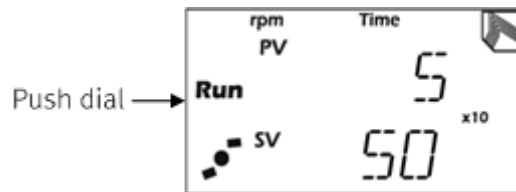
(1) Press button (TIMER) twice.



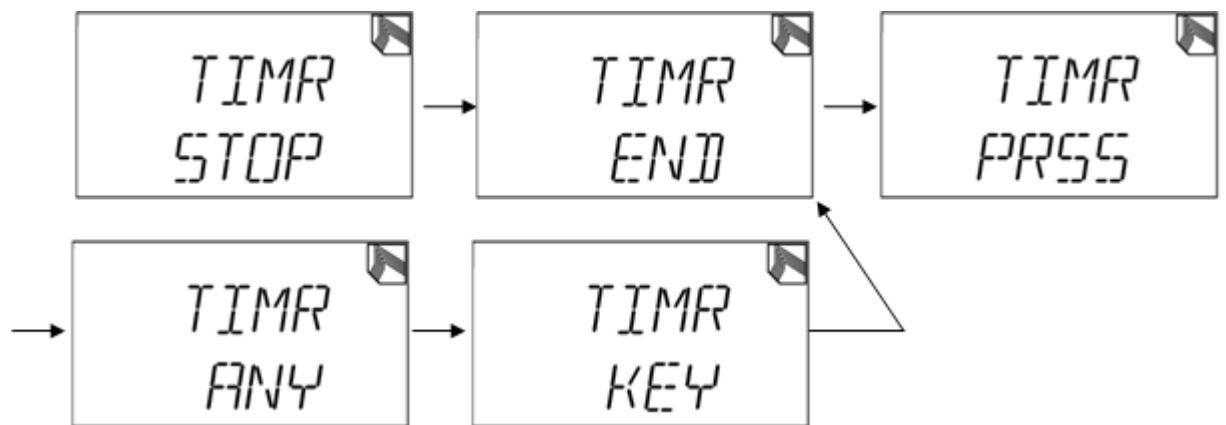
(2) Insert hour, minute sequentially by using stirrer knob



(3) The equipment starts as set timer changed by pressing stirrer knob.



The display show time condition as the picture with beep alarm after completion of setting timer.

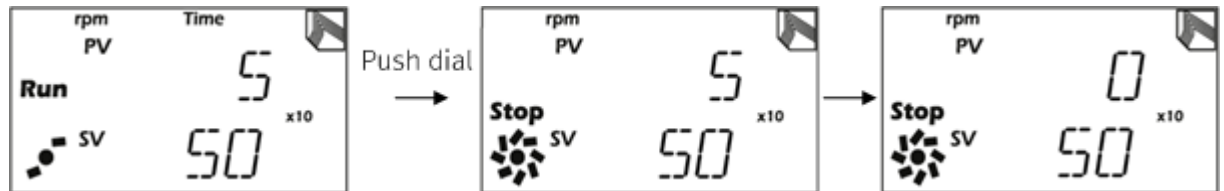


Press any button to confirm the end of setting.

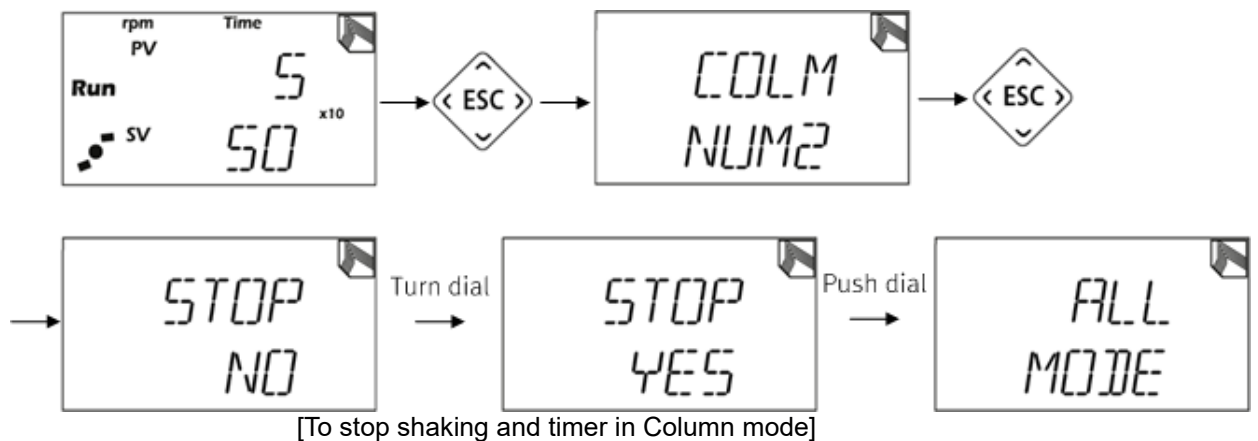
4.4.4 Stop equipment in timer operation.

Press stirrer knob to stop timer each point, all stirring and timer are stopped by pressing ESC.

- (1) Press stirrer knob at specific control side in case you need to stop specific column, specific row, specific point.



- (1) To stop stirring and timer
Press ESC, then selection mode will be showed up, And press ESC again to stop shaking and timer.



5.0 Safety device

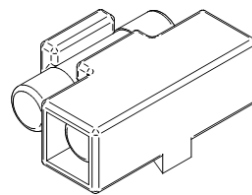
MS-33MH and MS-53MH are equipped with a protection device that mechanically cuts off the power to the heater if the temperature of the top plate becomes excessively overheated due to a circuit malfunction.

At this time, even if the heater power is turned off, the heater lamp stays on, and when the top plate cools down sufficiently, the heater automatically restarts.

6.0 Replacement of Fuse

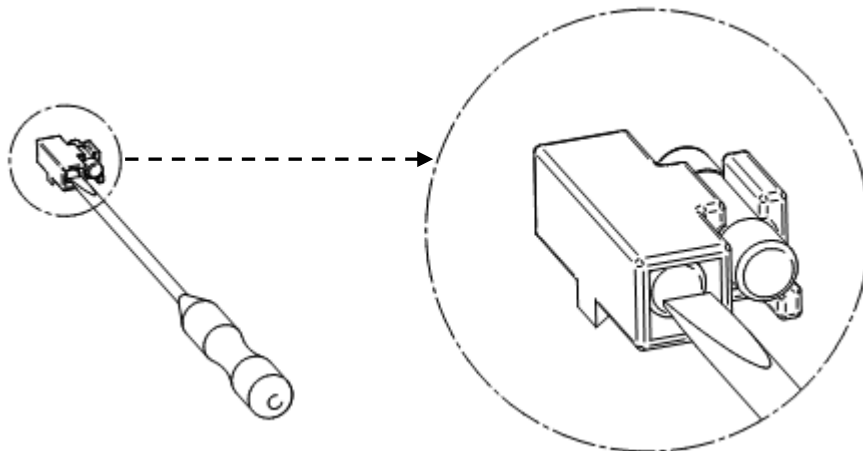
If overcurrent occurs, the built-in fuse is short-circuited and the device is turned off. In this case, refer to the method below and replace it with the extra fuse built into the device.

- (1) Turn off the power by pushing the power switch.
- (2) Insert the “-“ driver into the upper groove of the power input terminal and separate the fuse holder.



[Fuse holder]

- (3) Replace the shorted fuse into spare fuse.



- (4) Insert the fuse holder into unit.

7.0 Maintenance

7.1 Inspection cycle

Classification	Inspection cycle frame	
	Daily	Weekly
Inspect the power cord connection	•	
Inspect the power cord damaged condition (Wet, Peel off, Cut)	•	
Damages or cleanliness of top plate		•
Cleanliness of main body and accessories		•
Damages in switches, buttons, LED's, dial knobs		•
Inspect the controller operating and function	•	
Inspect the motor operating and ON / OFF	•	
Inspect the top plate heater operating	•	

7.2 Product cleaning

The unit maintains the best condition and operates with full efficiency and extend the life expectancy, only satisfied with periodical cleaning. We suggest that checking cleanliness every day, cleaning the inside unit once a week, cleaning the surface of the unit once a month. And immediate cleaning is required when the unit is contaminated.

7.2.1 Unit main body cleaning

Check the foreign substance attaching on the material before use and rub the accessories with dry towel to prevent foreign substance attaching and maintain the cleanliness.

CAUTION

- Never immerse this instrument in water.
- Be caution on the damage of parts inside of unite and system.
- Do not use acid liquid, benzene, sharp stuff, soap water, cleaner, and hot water. It causes color change or damage on the unit surface. Rubber and plastic parts could be changed in color, shape, and feature. Especially do not use the volatile materials. Use the neutral detergent only with towel. And dry it completely.
- Do not use chlorine bleach, ammonia-based cleaners, abrasives, ammonia, or metal scouring pads when cleaning.
- Disconnect the power cord from the power outlet when you do not use the product.
- Do not move the device with the power cord connected.

7.2.2 Accessories

Check the foreign substance attaching on the material before use and rub the accessories with dry towel to prevent foreign substance attaching and maintain the cleanliness.

7.3 Relocation

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

CAUTION

- When moving the product, make sure to plate is enough to cool or reducing the temperature.
 - Damages caused by mechanical shock or vibration may result in injury.
-

7.4 Storage

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

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

8.0 Troubleshooting Guide

Check the below statement and take action according to the instruction.

If the unindicated problems arise or you cannot solve the problem with the instruction, contact Jeio Tech Service part and solve the problem.

8.1 Power Troubles

Problem	Cause	Instruction
No power on	• Power supplied with wrong voltage and hertz	• Check the voltage, phase and hertz.
	• Power failure or circuit breaker shuts down	• Find out the causes of power failure and recovery.
	• The power cord inserted not perfectly	• Insert the cord perfectly
	• Damage on consent, plug, cable	• Replace the damaged consent, plug and cable.
	• Inner circuit damage	• Request service.
	• Fuse shorts inside product.	• Replace the fuse. • Request service.
Circuit breaker is shorten constantly	• Too many cord plugged	• Remove all the plugs inserted and use the consent in the allowed current volume.
	• Inner circuit damage	• Request service.
Power on but, no operation	• Over heating causes protection system and cut off the power.	• Once over heating generated on the inner circuit, the unit off the heater power.
	• Inner circuit damage	• Request service.
Do not displayed on the VFD	• Power outage condition.	• Make sure the power outage.
	• The power cord is not connected perfectly.	• Re-connect the power cord and make sure the connecting condition.

8.2 Problem generating during the operation

Problem	Cause	Instruction
Heater doesn't work	Not tripping the switch of Heater Knob.	Trip the switch of Heater Knob
	internal circuit failure	Register service
	Heater Knob failure	Register service
Magnetic bar is out of position.	Too much solution(solvent) in flask.	Reduce volume of solution(solvent) or increase RPM slowly.
	High density of solution(solvent) in flask..	From low speed it raises a rotation speed slowly at high speed and find a proper speed.
	The magnetic force of magnet bar becoming weak.	Replace the magnetic bar
Magnet stirring bar does not rotate	The low-speed rotation speed set which does not hold in control scope.	Find the suitable stirring speed.
Dial button doesn't operate well or doesn't work out	Knob troubles.	- Re – assemble the knob and re operating. - Request service.
Heater lamp does not lamp on.	internal circuit failure	Request service.
No LED on Point indication	LED troubles	Request service.
VFD screen is garbled.	VFD troubles	Request service.
Makes bumping noise when operating	Magnetic bar inside the machine troubles	Request service.

9.0 Accessories

Designation		Order No.	Description (L x D, mm)
Magnetic stirrer bar	Cylindrical magnetic bar	BCW0011138	13 x 8
		BCW0011156	15 x 6
		BCW0011208	20 x 8
		BCW0011258	25 x 8
		BCW0011308	30 x 8
	Plain magnetic bar	BCW001215	15 x 4.5
		BCW0012207	20 x 7
		BCW0012307	30 x 7
	Pivot ring magnetic bar	BCW0013138	13 x 8
		BCW0013158	15 x 8
		BCW001325	25 x 6
	Octahedral magnetic bar	BCW001513	13 x 8
		BCW001515	15 x 8
		BCW001522	22 x 8
		BCW001525	25 x 8
		BCW001528	28 x 8
	Oval magnetic bar	BCW001610	10 x 5
		BCW001615	15 x 6
		BCW001620	20 x 10
		BCW00162510	25 x 10
		BCW001630	30 x 16

※ To exchange the accessory or to purchase other type and size of magnetic bar, please contact Jeio Tech or branch.

10.0 Appendix

10.1 Technical Specification

Item / Model		MS-33MH	MS-53MH
Stirrer	Speed range (rpm)	30 ~ 2,000 (Guarantee 50~2000)	
	Speed control	Digital PID Control	
	Capacity, at 2000rpm (H ₂ O, ml)	250	
	Speed Stability (%)	±3 (over 300rpm)	
	Stirrer mode	4 mode (All, Column, Row, Point mode)	
	Stirring Positions	9	15
	Stirring Point Distance (W x D ,mm/inch)	117 x 90 / 4.61 x 3.54	
	Display	VFD(Vacuum Fluorescent Display)	
	Motor type	BLDC	
	Motor rating input / output (W)	2.9/1.6	
	Magnetic bar, Max. (L x D, mm /inch)	30 x 8 / 1.18 x 0.31	
	Timer	1 min. to 99 hours 59 min.	
Heater	Temperature range (°C/°F)	Max. 120 / 248	
	Heating control	Scale	
	Heater output, max. (W)	600	1000
Load, Max (kg/lbs)		30 / 66.14	
Safety device		Over temperature protection, Over current detection	
Control panel		VFD(Vacuum Fluorescent Display), Touch keys, Dial knob	
Material	Top plate	Aluminum	
	Body	Powder coated steel	
Permissible ambient temperature (°C)		+5 ~ 40	
Permissible relative humidity (%)		up to 80%	
Electrical requirements (VAC, Hz)		230, 50/60	230, 50/60
Current consumption (A)		4.1	5.8
Electrical requirements (VAC, Hz)		120, 60	120, 60
Current consumption (A)		8.0	11.2
Dimensions	Top plate (W x D, mm / inch)	385 x 328 / 15.16x12.91	385 x 493 / 15.16x19.41
	Body (W x D x H, mm / inch)	395 x 450 x 104/ 15.55x17.72 x 4.09	395 x 614 x 104/ 15.55x24.17 x4.09
Weight (kg/lbs)		10 / 22.05	15 / 33.06

※ Standard condition : 25°C, 60%R.H.

※ We made this technical specification by using the 30 x 8mm magnetic bar.

※ Technical specifications can be changed by improvement of quality and performance.

10.2 Disposal of the product



Before disposing of equipment or any of its components

1. This equipment should be cleaned and decontaminated to protect the person in charge of disposing the equipment and taking over the equipment also environment because this equipment has potential biological, chemical or radiological risk from exposure.

2. Please contact your governing body and check for regulations regarding disposal of electrical, electronic, material. If you request to outside, we recommend to contact our distributor, seller or enterprise who can dispose laboratory equipment and its components properly.

10.3 Warranty

10.3.1 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.

- | |
|---|
| <ul style="list-style-type: none">• Date of purchase:• Customer name / address / phone number / E-mail:• Fault status• Model• Serial number |
|---|

10.3.2 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

10.3.3 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.