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Magnetic Stirrer

MSM204D / MSM208D
MSD24 / MSD50

MANUAL

Thank you very much for selecting Mi-sung products.
For your safety, please read the following before using.

Main products

- Temp controller
- ▣ Heating Tape
- Hot plate
- Digital
- ▣ Mantle, Analog
- Mantle, Rota Mantle
- ▣ Digital Stirrer
- Analog stirrer

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General Information

Unpack your item carefully and inspect for damage and report such damage or missing parts to your supplier right away.

Read your instruction manual carefully. Take time to save time while working with your item.

Make sure that every user has read and understood the instruction manual.

Please store the instruction manual in a place easily accessible to every user.

Safety Information

Please comply with all safety and accident-prevention regulations as in force for laboratory work!

Use extra care when working with flammable substance; refer to safety data sheets.

When connecting your item with your local power supply, please make sure your item is designed for your local supply voltage; go by data plate on the item.

Turn your power switch OFF whenever the item is not used, or before disconnecting the plug.

Use extra care when working in the vicinity of flammable and explosive substances. Motor are non-sparking type, however, the item itself is not explosion proof.

Please do not connect your instrument without a protective ground outlet.

Your item requires a solid stand.

Warning

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from power supply before servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials; fire or explosion may result.
This item contains components which may ignite such materials.
2. Keep the item clean. Use non-abrasive cleaner. Alkali spills, hydrofluoric acid spills or phosphoric acid spills may damage the item and lead to thermal failure. Unplug unit and remove spills promptly. Do not immerse unit for cleaning.
3. Do not remove or modify grounded power plug. Use only properly grounded outlets to avoid shock hazard.
Not rated for use in hazardous atmospheres.
4. Use appropriate hand and eye protection when handling hazardous chemicals.
5. Do not use in highly corrosive atmospheres; corrosive fumes and spill may damage your item and internal components,

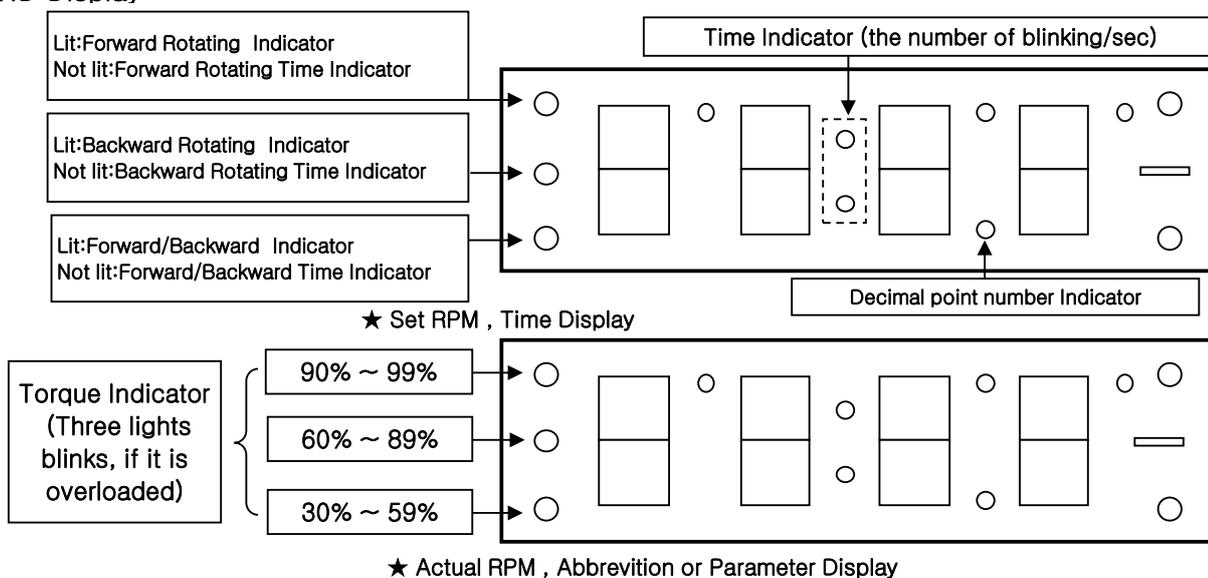
Caution

Space instrument 12 inches away from combustible materials under any conditions.

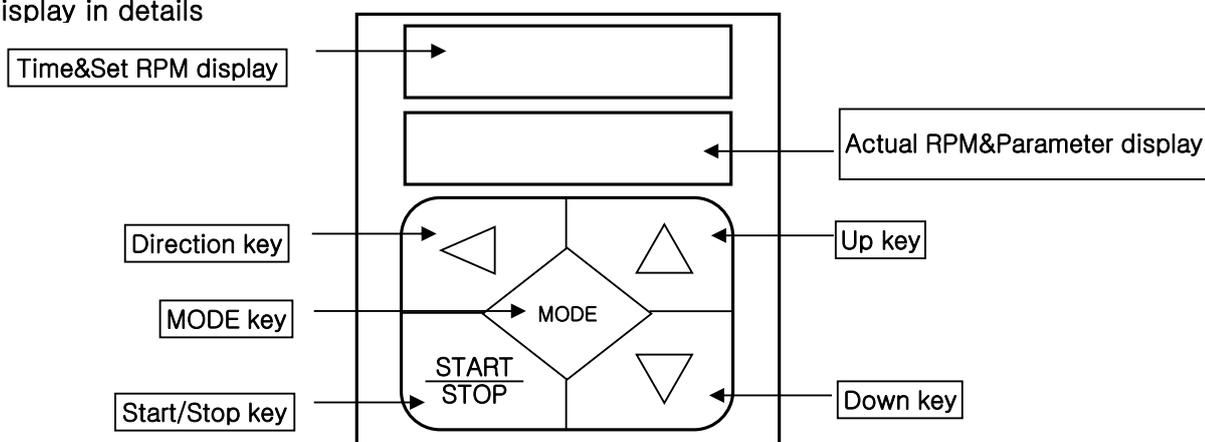
1. Specifications

MODEL		Magnetic Stirrer			
		MSM204D	MSM208D	MSD24	MSD50
Stirring Positions		4 Positions	8 Positions	4 Positions	1 Positions
Stirring	Motor (Brushless)	DC motor 40W			DC motor 60W
	Speed	150 ~ 1500rpm		12 ~ 120rpm	120 ~ 1200rpm
	Speed display	Digital			
	Rotation	1.Right / 2.Left (Operation) / 3.Auto reverse (Reverse time setting)			
	Timer	99hr 59min			
	Capacity(H2O)	Max, 500ml			
Distance between stirring places		110 mm		-	
Speed controller		Feedback control			
Plate		Stainless steel			
Dimensions	Plate area (mm)	210 x 250	210 x 470	330 x 330	360 x 360
	Overall(WxDxH)(mm)	214 x 330 x 80	214 x 550 x 80	330 x 340 x 90	360 x 370 x 100
Electrical supply		AC220V 50/60Hz			

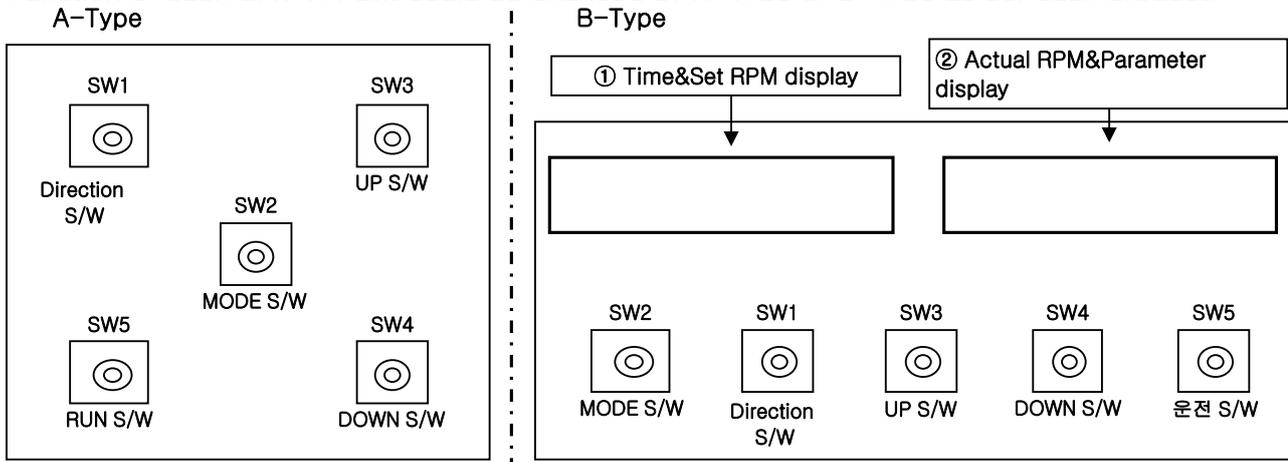
2. FND Display



3. Display in details



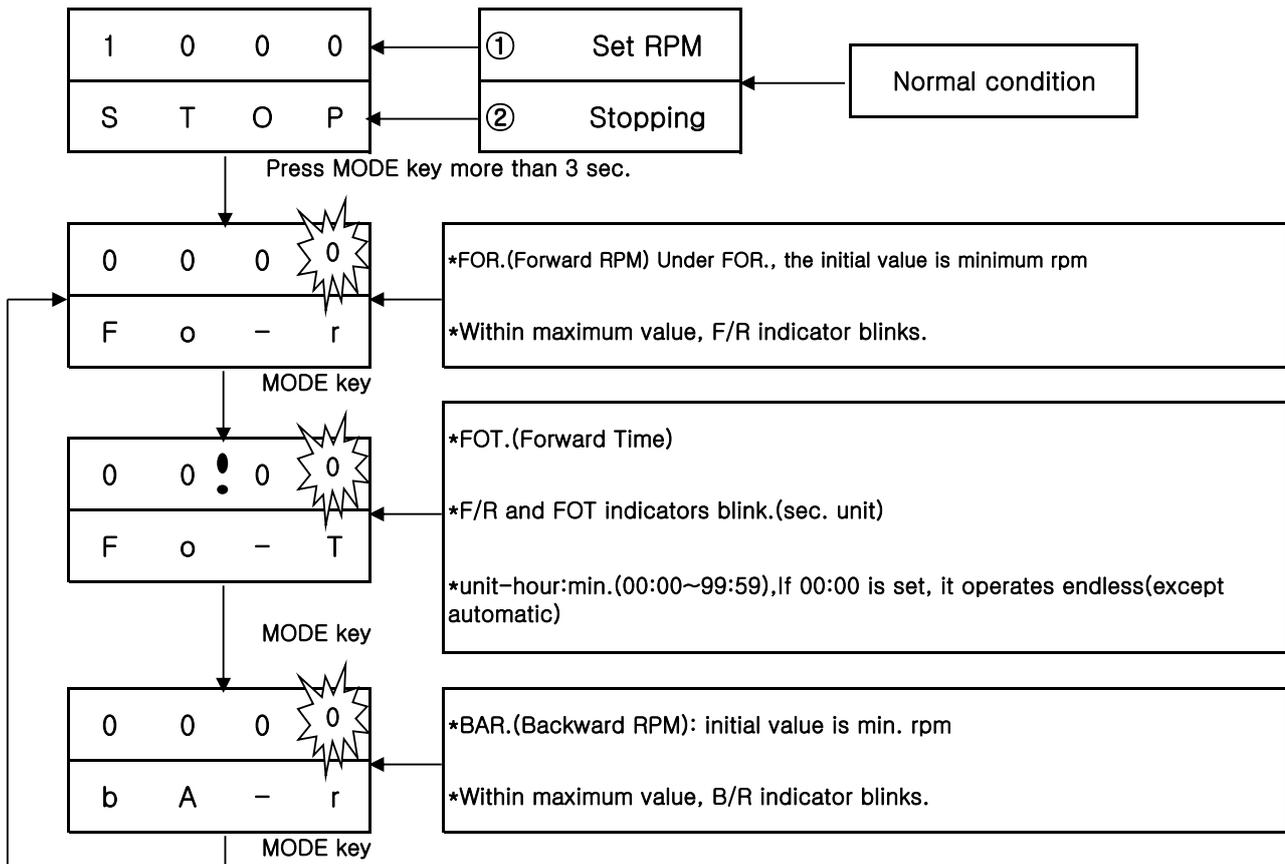
4. Function of each S/W TYPE(It could be changed by A-Type or B-Type as per each product)

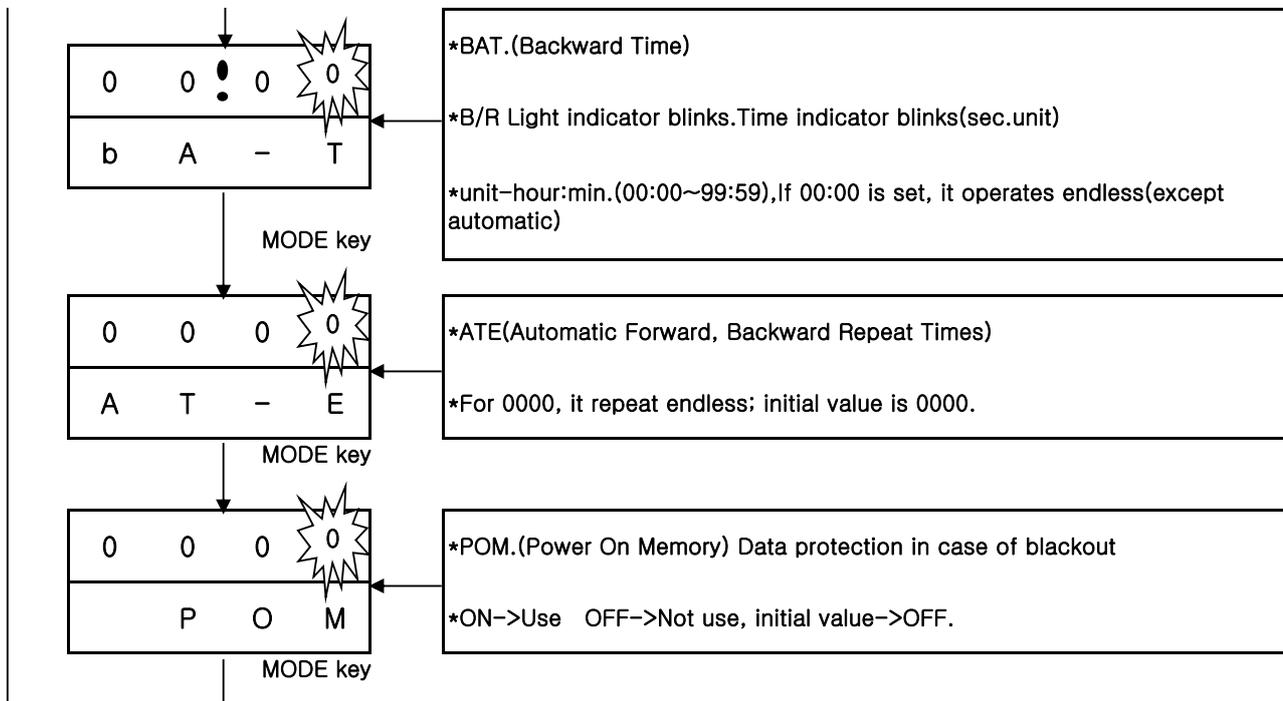


1. 'Direction' key : This key alters numeral line changes at the setting phase.
Under normal motor phase, the 'Direction' key alters the display from remaining time to set RPM in turns.(vise versa)
2. 'Mode' key : This key can be applicable to every mode.
Under normal phase, at stop mode, this key allows to change the mode from forward, backward, automatic operation systematically.
3. 'UP' key : Set mode can be increased.
4. 'Down' key : Set mode can be decreased.
5. Start/Stop key : This key can operate or stop the motor.

5. Description of each parameter

* Turn on power, then last set RPM will be displayed on forward rotation.





- * Direction key 4, Up key 5 and Down key 6 can alter the mode.
- * To return to normal phase, press MODE Key more than 3 sec.(memory function)

6. Operation

1. Forward Rotating Mode(F/R Mode)

- 1)To execute F/R mode, press Mode S/W, F/R and Operating S/W orderly.
- 2)By pressing UP/DOWN S/W, you can modulate rpm under operation(to maximum rpm).
- 3)Under operation, it is possible to see remaining time by pressing direction S/W.
- 4)If set time is 00:00, there is no time limitation for consecutive operation.
- 5)Under a pause phase, you can see operating time by pressing direction S/W right.(a min unit)

2. Backward Rotating Mode(B/R Mode)

- 1)In order to execute B/R mode, after pressing mode S/W, chose B/R, then press Operating S/W.
- 2)By pressing UP/DOWN S/W, you can modulate rpm under operation(to maximum rpm).
- 3)Under operation, it is possible to see remaining time by pressing direction S/W.
- 4)If set time is 00:00, there is no time limitation for consecutive operation.
- 5)Under a pause phase, you can see operating time direction S/W right.(a min unit)

3. Automatic Operating Mode

- 1)To execute this mode, press mode S/W, automatic operating, operating S/W in order.
- 2)If FOT, BAT is not set, Error-1 occurs.
- 3)Under automatic operation, you cannot modulate rpm.
- 4)Under operation, it is possible to see remaining time and repeating times(F/B rotating) by pressing direction S/W.
- 5)If set time is 00:00, there is no time limitation for consecutive operation.
- 6)Under a pause phase, you can see operating time and repeating times by pressing direction S/W.(min/times)

7. Description of Operation

*Turn on power, then last set RPM will be displayed on forward rotation.

In forward rotating operation

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting

Normal Action(Forward rotation)

Display	F/R Indicator is lit.
Time executed	The number of blinking/sec (display)
Press Direction key; remaining time -> set RPM (in truns)	
Motor --> Forward rotating with 900RPM(1 min.later, the motor stops).	

In backward rotating operation

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting

Normal Action(Backward rotation)

Display	B/R Indicator is lit.
Time executed	The number of blinking/sec(display)
Press Direction key; remaining time -> set RPM (in truns)	
Motor --> Backward rotating with 500RPM(5 min.later, the motor stops).	

In automatic rotating operation -1

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting
ATE 0000 setting

Normal Action

Display	A/R indicator is lit.(For F/R, F/R Indicator is lit. For B/R, B/R Indicator is lit.)
Press 'Direction' key; remaining time -> set RPM (in truns)	
Motor --> F/R for 1 min. with 900RPM; 5 sec later, 1 min of B/R 900rpm; 5 sec.later F/R again.. Unlimited repeat	

In automatic rotating operation -2

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting
ATE 0005 setting

Normal Action

Display	A/R Indicator is lit(For F/R, F/R Indicator is lit. For B/R, B/R Indicator is lit.)
Time action	F/B Rotating time blinks(when motor executed)
Press 'Direction' key; remaining time -> set RPM (in truns)	
Motor --> F/R for 1 min. with 900RPM; 5 sec later, 1 min of B/R 900rpm; 5 sec.later F/R again.5 times of F/R puls B/R, it pauses.	

8. Display of each parameter

RAT(Ratio)	rA7
RPM(MAX.RPM)	rPn7
FOR(Forward Operating RPM)	Fo-r
BAR(Backward Rotating RPM)	bA-r
ATE(Automatic Total Times)	A7-E
POW(Motor Power)	PouJ

PAU (Pause)	PAU
SAT(Soft start time)	SA7
FOT(Forward Operating Time)	Fo-7
BAT(Backward RotatingTime)	bA-7
Power failure compensation	Pon7
STOP	StoP

M-R(Max.RPM of motor)	n r - r
Error-1	Er - 1
ON	on

PERCENT(%)	Pro
Error-2	Er - 2
OFF	off

9. Miscellaneous [Key explanation in details and other operating sets]

1. Description of each S/W

1) S/W1 : Direction S/W

Condition	Operation mode	Description of operation	Remark
Operation	Forward rotating	Display of remaining time==>Display of setting RPM (Repeat)	
	Backward rotating	Display of remaining time==>Display of setting RPM (Repeat)	
	Automatic Mode	Remaining Time for Forward(Backward) Rotating==>Repeated Remaining Time for Forward(Backward) Rotating==>Remaining Time for Forward(Backward) Rotating (Repeat)	
Stop	Forward rotating	Forward rotating==>Forward rotating Set rpm indicator (repeat)	It indicates operating time and F(B)/R repeating times before pausing.
	Backward rotating	Forward rotating==>Forward rotating Set rpm indicator (repeat)	
	Automatic Mode	F/R==>B/R rpm==>B/R Time ==>F/B Repeat Times==>B/R rpm Indicator (repeat)	

2) S/W2 : MODE S/W

① When S/W2 is pressed under a pause mode: backward => automatic => forward rotating will be displayed in turns.

3) S/W3,S/W4 : UP/DOWN S/W

① There is no function under pause mode.

② Under F/B rotating (but automatic), this key allows to increase/decrease set rpm.

③ Rpm modulation limit is from min.rpm to max.rpm.

④ Even if rpm was modulated under operation, a stop mode alters it to previously set rpm.

4) S/W5 : Operating/Stop S/W

① When the motor executes, this key stops it. (vice versa)

② Under automatic mode, if F/B rotating time is not set, it causes Error-1. (see Error)

③ In case of every error, it does not allow operation.

10. Explanation for error message and solution

1. Error-1: Set-time Error

1) It occurs when F/B rotating time (under automatic operation) is not set.

2) To solve the problem, set operation time.

2. Error-2 : MOTOR Over-current Error (PROGRAM Sensing)

1) It occurs when motor executes more than 91% over its capacity, consecutively 10 seconds.

2) The output is different from motor to motor (or from RPM to RPM).

3) To solve the problem, turn off the motor first, then turn on again.

3. Error-3 : Reach out of Minimum RPM

1) It occurs when minimum RPM cannot be achieved within 10 sec. of operation.

2) Stirer=100RPM (Output RPM=100/gear rates)

3) To solve the problem, turn the motor off/on again.

4. Error-4 : If motor stops during the operation, Error-4 will be displayed.

- 1) Sense works only under rotating process.
- 2) Sense delay time: before set RPM– within 10 sec. after set time– 0.2s.
Set RPM is less than 500(Motor)– after 5sec.after Set RPM executed.
- 3) If rotating is not occurs from beginning of operation, it can categorize in Error–3.
- 4)To solve the problem, turn the motor off/on again.

5. Error–5 : Motor sensor error

- 1) Motor sense output problem
- 2) To solve the problem, turn the motor off/on again.

6. Error–6 : MOTOR Over–current Error (HARDWARE Sensing)

- 1)FET(MOTOR output device) Error or MOTOR Interior Problems
- 2) Soon after sensing problems, error occurs.
- 3) To solve the problem, turn the motor off/on again.
- 4) For consecutive errors, check motor or PCB.

11. Miscellaneous

1. If there is no input for more than 60 sec. at MODE or PARAMETER lebel ,then the display will return to the standard phase.
- 2.Under normal operation, RPM changes are available by pressing Up/Down Key(Maximum RPM Setting).
--> This function is not available under automaitc operation. Set–time is not chaged.
3. Under automaitc operation, by pressing 'Direction' Key, the display will be turn AUTT time to Set RPM.
- 4.For PARAMETER setting, press MODE Key more than 3 sec.
5. At the beginning of setting, by pressing MODE Key, the display will be chage for the follwing turns;
Forward Rotating–> Backward Rotating–> Automating Operation.
6. When over–loaded, 3EA of torch(more than 90%) will blink at the same time, After 5 sec. it pauses.
--> Within 5 sec(less than 90%), it execute normaly.; In order to reset, turn off/on the motor.
- 7.Numerical valvue chagnes; for upward, 0–>1–>2–>3…8–>9–>0–>1. for downward, reverse turns.