



# OPERATION MAUNAL

## Overhead Stirrer

Models : MSD-0420, MSA-0420  
Manual No. :373225L002 Version :0.0



---

**⚠ 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.**

## Quality Management System



Jeio Tech Co, Ltd. is dedicated to providing world-best product quality and customer satisfaction. To ensure we maintain this commitment we have developed and implemented a total quality program, which conforms to the requirements according to DIN EN ISO 9001:2008 for the design, development, production, sales and servicing of biotechnology, environmental chemical engineering related products, and reliable measuring equipment for electric and electronics (ovens, incubators, constant temperature humidity chambers, constant temperature baths, refrigerating bath circulators, heat exchangers and shakers

Visit our Web site at [www.jeiotech.com](http://www.jeiotech.com) to view a copy of our certificate.

<http://www.jeiotech.com>

## Disclaimer

Jeio Tech Co., Ltd. is committed to a continuing program of product development and improvement, and reserves the right to change information, such as specifications, appearance, and dimensions, described in this document without notice.

## Copyright

No part of this manual may be reproduced or transmitted in any form or by any means, including photocopying, recording, or using information storage and retrieval systems, for any purpose other than the purchaser's own use, without the express written permission of Jeio Tech Co., Ltd.

©2015. All Rights Reserved. Jeio Tech Co., Ltd.

Any other product names and services identified in this manual are trademarks or registered trademarks of their respective owners. No such use, or the use of any trade name, is intended to convey endorsement or other affiliation with Jeio Tech Co., Ltd

## CONTENTS

1.0	Safety .....	1
1.1	How to use the Manual .....	1
1.2	Symbols used in this Manual .....	1
1.3	Exemption for responsibility .....	2
1.4	Warning statement .....	2
1.5	Caution statement .....	3
2.0	Functional Description .....	4
2.1	Introductions .....	4
2.2	Features .....	4
2.2.1	Excellent performance .....	4
2.2.2	Safety .....	4
2.2.3	Convenience .....	4
2.3	Construction .....	5
3.0	Installation .....	6
3.1	Components .....	6
3.2	Preparing before installation .....	7
3.2.1	Environmental setting .....	7
3.2.2	Space requirements .....	7
3.3	Installation of main body .....	8
3.3.1	Attaching rod connection .....	8
3.3.2	Fixing it to stand .....	8
3.3.3	Assembling the impeller .....	8
3.4	Power connection .....	9
4.0	Operation .....	1 0
4.1	MSD-0420 .....	1 0
4.1.1	Touch panel & Dial knob .....	1 0
4.1.2	Operation .....	1 1
4.1.3	Stop operating .....	1 1

4.1.4	Verification of Power, temperature, and elapsed time.....	1 2
4.1.5	Limit of setting and see pause display.....	1 3
4.1.6	User configuration.....	1 4
<b>4.2</b>	<b>MSA-0420 .....</b>	<b>1 5</b>
4.2.1	Controller – Name and function.....	1 5
4.2.2	Operation and stop.....	1 6
<b>5.0</b>	<b>Safety function.....</b>	<b>1 7</b>
<b>5.1</b>	<b>MSD-0420 .....</b>	<b>1 7</b>
5.1.1	Overload protection.....	1 7
5.1.2	Overheating Protection.....	1 7
5.1.3	Overheating occur .....	1 7
5.1.4	Overheat protect function activate/deactivate.....	1 8
<b>5.2</b>	<b>MSA-0420 .....</b>	<b>1 8</b>
5.2.1	Overload protection.....	1 8
5.2.2	Overheat protection.....	1 8
<b>6.0</b>	<b>Maintenance .....</b>	<b>2 0</b>
<b>6.1</b>	<b>Inspection cycle .....</b>	<b>2 0</b>
<b>6.2</b>	<b>Cleaning of product.....</b>	<b>2 0</b>
6.2.1	Cleaning the Unit.....	2 0
6.2.2	Accessories .....	2 0
<b>6.3</b>	<b>Storage .....</b>	<b>2 1</b>
<b>7.0</b>	<b>Trouble shooting .....</b>	<b>2 2</b>
<b>7.1</b>	<b>Power.....</b>	<b>2 2</b>
<b>7.2</b>	<b>Malfunction on operation.....</b>	<b>2 3</b>
<b>8.0</b>	<b>Accessories.....</b>	<b>2 4</b>
<b>8.1</b>	<b>Advanced dial stand .....</b>	<b>2 4</b>
8.1.1	Parts for advanced dial stand.....	2 4
8.1.2	Optional parts for advanced dial stand .....	2 4
8.1.3	Assembly of advanced dial stand and main unit.....	2 5
<b>8.2</b>	<b>Basic stand.....</b>	<b>3 1</b>
8.2.1	BS-01 Stand accessories.....	3 1

8.2.2	BS-01 Optional accessories.....	3 1
8.2.3	BS-02 Stand accessories.....	3 2
8.2.4	BS-02 Optional accessories.....	3 2
8.2.5	BS-03 Stand accessories.....	3 3
8.2.6	BS-03 Optional accessories.....	3 3
8.2.7	Assembly of basic stand .....	3 4
8.3	Impeller.....	3 7
9.0	Exclusive S/W (MSD-0420 only).....	3 9
9.1	Installation of Monitoring Program.....	3 9
9.2	Program operation and equipment connection.....	4 1
9.3	Communication protocol.....	4 2
9.3.1	Physical Layer.....	4 2
9.3.2	System number of each model .....	4 2
9.3.3	Modbus Protocol Address Definition.....	4 2
10.0	Appendix.....	4 4
10.1	Technical Specification .....	4 4
10.2	Disposing of products.....	4 5
10.3	Warranty .....	4 5
10.3.1	Terms of Warranty Service.....	4 5
10.3.2	Warranty exception.....	4 5
10.3.3	Service and technical advice.....	4 6
<b>FAX:</b>	<b>+82 2 3143 1824.....</b>	<b>4 6</b>

# 1.0 Safety

## 1.1 How to use the Manual

This operation manual describes the important subjects to maintain the product's functions and to use it safely. Especially, be sure to read <Safety Precaution> carefully before you use this equipment.

Please keep this manual close to the equipment to use it after reading through it once. Please place it where the new user can find it easily for the safety use when you hand over or lend the equipment to others.

## 1.2 Symbols used in this Manual

- (1) The alert marks are for safety operation and protect user and instrument from Damage.
- (2) Signal word panels are a method for calling attention to a safety messages or property damage messages and designate a degree or level of hazard seriousness.
- (3) Pay attention enough to the contents of alert marks.

Signal word panels	Uses
	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 statement



Observe all warning labels.

DO NOT remove warning labels.

DO NOT move machine during the operating.

DO NOT use or keep flammable gases near the product.

DO NOT install the Product near environments where flammable gas may leak.

DO NOT use the machine near environments where explosion can occur due to organic evaporating gases.

Do not inject any liquid and inflammable things inside of product.

Check the power voltage, phase (Phase), capacity and connect it correctly.

Be sure to use the power it has been ground.

DO NOT expose the Product to direct sunlight.

DO NOT expose the Product to direct heat sources.

DO NOT install the machine in the high humidity or water leakage place.

DO NOT use the machine near environments in industrial toxic gases, smoke, metal dust.

DO NOT operate the Product when there is strange sound, smell and smoke coming from the unit.

DO NOT disassemble, fix or change the Product other than for those items described in this operating manual.

## 1.5 Caution statement

 <b>CAUTION</b>
Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

After use, be sure to turn off the main power switch and unplug the power cord after.

Do not put heavy things on the power line. Do not put the machine on the line.

Do not touch it with wet hands and put the main plug correctly.

Do not inject any Conductive thing and inflammable things inside of product.

Do not pure water or put liquid on the top of the product when cleaning.

Do not install the product near machinery generating high frequency noise

Do not sprinkle insecticide or flammable spray on the product. Use smooth cloths.

Please power off while product cleaning.



Electrical shock



Do not take the device apart deliberately.



No water.



No corrosive fluid or cleaners.



Wear goggles.



Wear a face mask.

## 2.0 Functional Description

### 2.1 Introductions

This MSD/MSA **series** usually allows to use mixture and homogenization in cosmetics manufacturing, pharmaceutical, manufacturing of paints field; property of liquid matters, fine powder and liquid with the viscosity of the material.

### 2.2 Features

#### 2.2.1 Excellent performance

- (1) Best effort function intelligently manages its stirring speed to keep stirring even workload is out of its capacity. (MSD only)
- (2) During the operating, the products designed by minimize heat generation for efficient radiant heat.
- (3) Aluminum die-casting body is sturdy and efficiently emits the heat generated.
- (4) During sample viscosity change, the product provide the uniform RPM by feedback control.
- (5) We are used the standard “Modbus Protocol”. Also when user use Jeiotech exclusive S/W, Using USB port to check product condition and external control by computer. (MSD only)

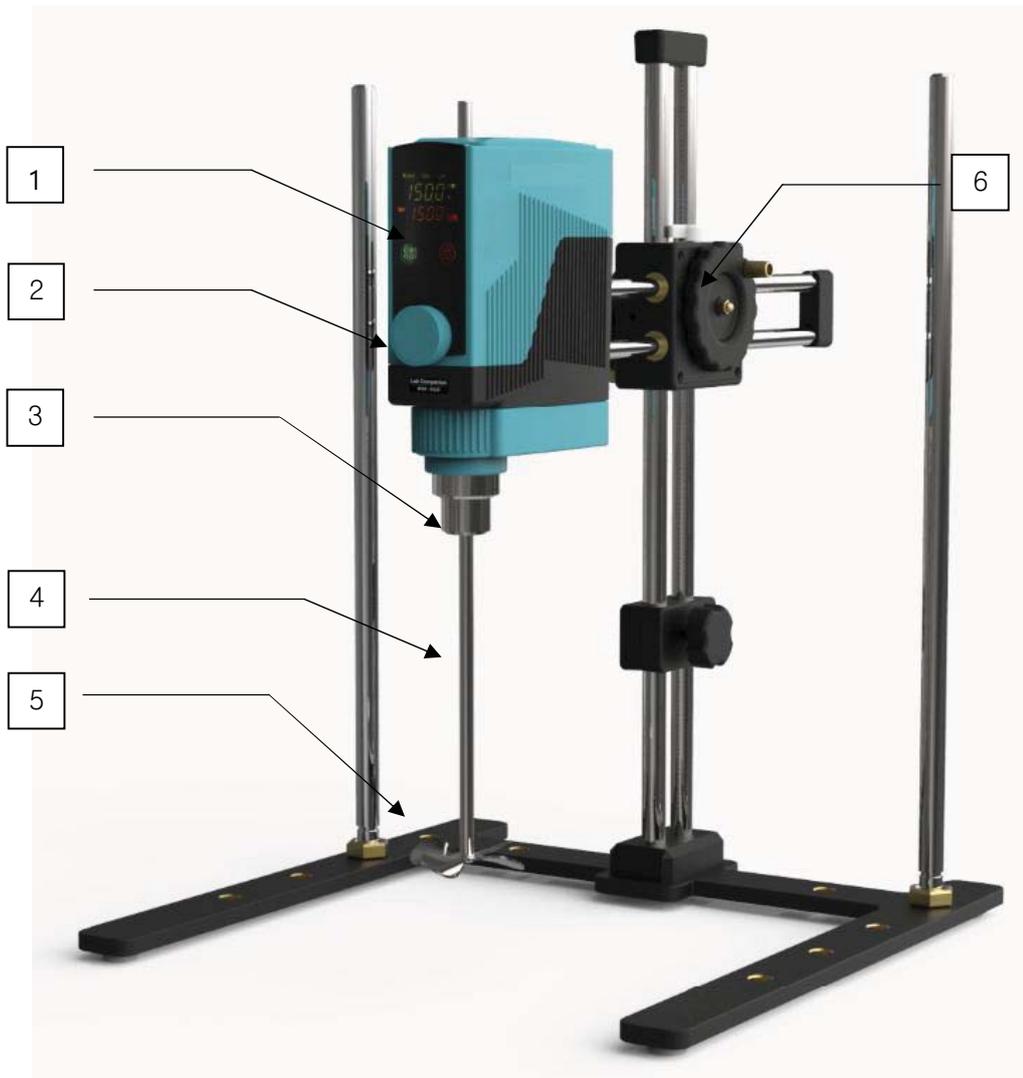
#### 2.2.2 Safety

- (1) Motor temperature condition is indicated on display for protecting the motor. When the motor is overheated, it stops stirring operation step by step. (MSD only)
- (2) To protect the product from overheating and over current.
- (3) Smooth start function prevents spills from sample.

#### 2.2.3 Convenience

- (1) Compact and slim head design offers convenience in the experimental setup.
- (2) Communication serial port and USB port are provided. (MSD only)
- (3) Various accessories are available such as basic stand, dial stand, impellers, and external controller. (optional)

## 2.3 Construction



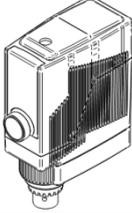
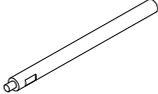
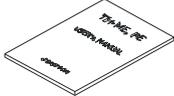
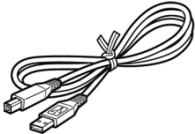
- (1) **FND Display & Controller**  
: to check the operating status and condition.
- (2) **Dial Knob:** Set of rotating speed and operating.
- (3) **Chuck:** Assembling the Impeller' Shaft.
- (4) **Hollow shaft:** Hole that impeller shaft passes through.
- (5) **Impeller:** Function as adjusting fluid flow and stirring. (optional, refer to Acc. lit)
- (6) **Dial stand:** While operating equipment it can make deliberate height by using dial knob.(optional, refer to Acc. lit)

### 3.0 Installation

#### 3.1 Components

After unpacking, please check the contents to ensure you have received all of the following unit components. Also, check the identification plate on the side of the unit to make sure you received the model number your ordered.

If you didn't receive one or more of the components or if the model is incorrect, contact your local Jeio Tech office, or the distributor from which the unit was purchased. Refer to 10.3 Warranty for Jeio Tech office information.

Item	Figure	Quantity	Description
Main body		1	-
Chuck handle		1	-
Attaching rod		1	-
Spanner		1	10mm/13mm
Operation Manual		1	
JEIOTECH SOFTWARE CD		1	MSD only Including Cable for Communication (USB)
Cable for Communication (USB)		1	-

## 3.2 Preparing before installation

### 3.2.1 Environmental setting

The unit can be operated properly under the following environmental conditions for a long time running without any problem.



No direct sunlight.



Please keep Ambient temperature 5°C~40°C

(The Optimum temperature is 25 °C)



Relative humidity not to exceed 80%



Altitude not to exceed 2000m (6,562 feet)

### 3.2.2 Space requirements

- (1) Please install on the sturdy surface laboratory which is set safety facility and make sure horizontal align correctly.
- (2) When you install it, minimum space (over than 30 Cm in usual) required from other objects.
- (3) Do not use the Product near environments where flammable gas may leak.
- (4) Do not use the Product near machinery generating high frequency noise.
- (5) Do not use the Product in short-circuit, leakage, and flooding place.
- (6) Do not use Product in environments that contain industrial oil smoke and metallic dust.

---

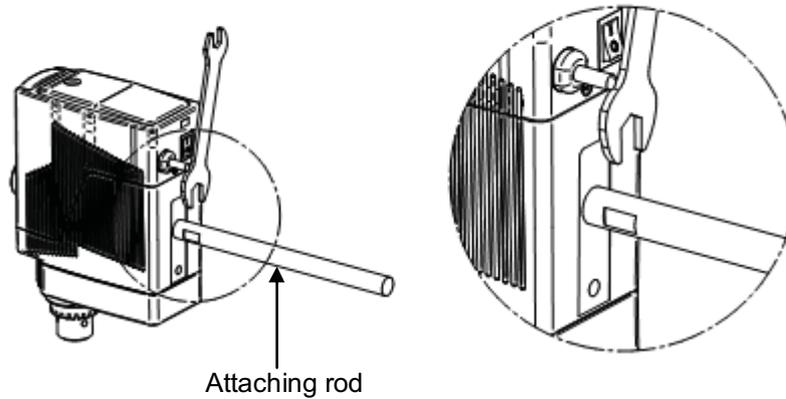
## **WARNING**

Avoid use in places where the heat source or direct sunlight. It can cause abnormal equipment operation or performance degradation.

---

### 3.3 Installation of main body

#### 3.3.1 Attaching rod connection



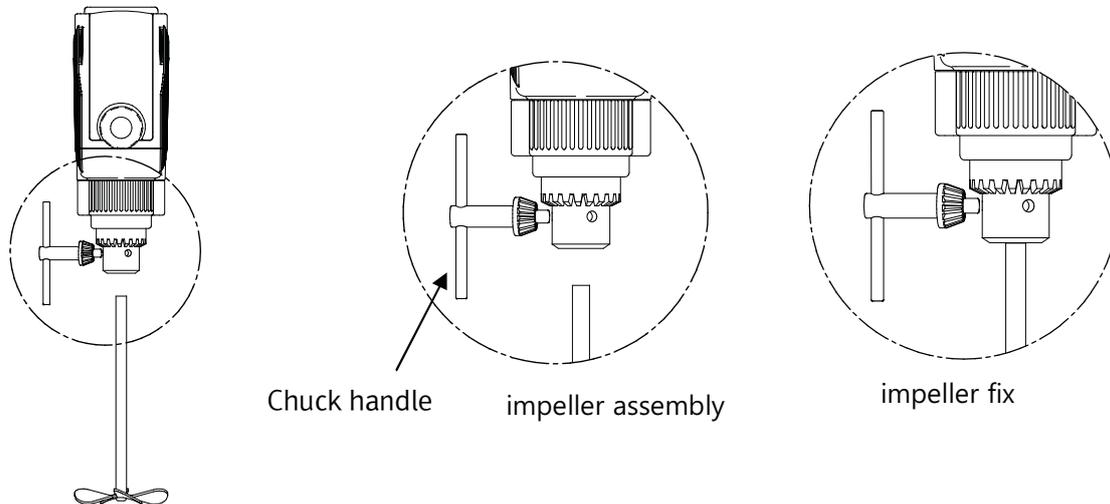
As above, one basic shaft must be turned on the right and fixed it tight by using spanner 13mm. In case of dial stand use, it must be connected to the specialized attaching rod.

#### 3.3.2 Fixing it to stand

Fix the the joint port of attaching rod and the main body by clamp at the proper position. (Refer to 8.0 Accessories)

#### 3.3.3 Assembling the impeller

As the figure, loosen the jaw of the chuck counterclockwise by using chuck handle. As the figure, insert the impeller into the chuck, and turn it up clockwise until it's fixed tight by using chuck handle



---

**⚠ CAUTION**

Imbalance of the impeller and the chuck and in particular the stirring tools can lead to uncontrolled resonant vibration behavior of the unit and the whole assembly. Take care to ensure that the center of the impeller is positioned properly to the chuck.

---

**NOTICE**

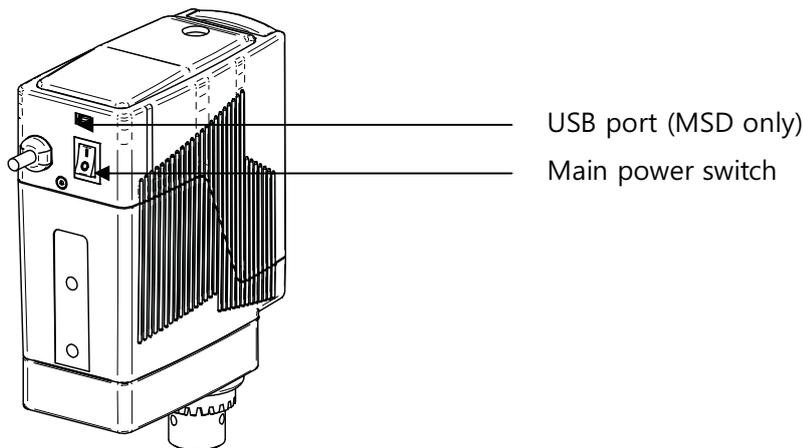
There are 3 holes in the chuck. As above, turn it up in 3 holes turns in the chuck until locking when assembling.

---

### 3.4 Power connection

Connect the electric power to the unit according to the following process.

- (1) Turn off the switch before power supply.
- (2) Connect DC plug of the power cord on the socket located on the back side of the unit.
- (3) Connect the power cord to the consent..



---

**⚠ WARNING****Electrical Shock Hazard.**

- Check to make sure that the correct line voltage, phase and capacity correspond to them specified on the identification plate.
- Do not use the branch socket, extension tap. It cause of cable damager, fire by overcurrent.
- Incorrect power line will cause the product damage or personal injury.
- Do not touch the unit or plug with wet hands.
- Make sure the power should be connect second grade ground



## 4.0 Operation

This machine is not affected by viscosity of fluid, maintaining consistent RPM in the rated current while stirring.

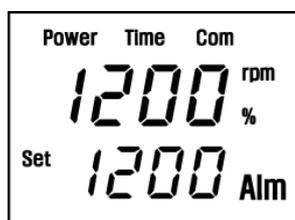
### 4.1 MSD-0420

#### 4.1.1 Touch panel & Dial knob

Using the dial knob to operate the product rotating speed (RPM). Also user can check easily product condition. (Motor output power value or temperature, product operating time)



(1) **FND Display:** Setting and status of control can be verified.



- A. **Power:** Display output of motor
- B. **Time:** Display elapsed time from starting stirring
- C. **Com:** Display status of communication interface
- D. **Set:** Display set RPM
- E. **rpm:** Display a stirring unit
- F. **%:** Display an output unit of motor
- G. **Alm:** Display status of warning

(2) **Mode Button**



To verify RPM, Temperature, Power, and elapsed time during stirring.

(3) **Lock Button**

 If this button is touched, all functions does not work except stop function of dial.

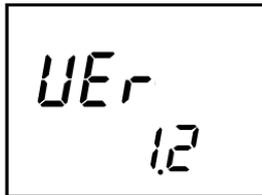
(4) **Dial Knob**

RPM can be set with dial.

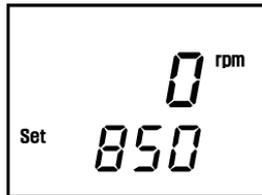
Pause stirring : Press the dial during stirring. To stir again during pause : Press the dial.

4.1.2 Operation

**STEP 1:** Press main switch to ON. [3.4 Refer to main connection]

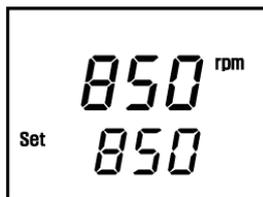


[Booting (**displayed** Version)]



[Stand by]

**STEP 2:** Press the dial knob 1 time, product will start to operate, steadily. To set the user operate RPM to rotating the dial knob..



Operating rpm

Setting rpm

**STEP 3:** Check display whether RPM reaches set point or not.

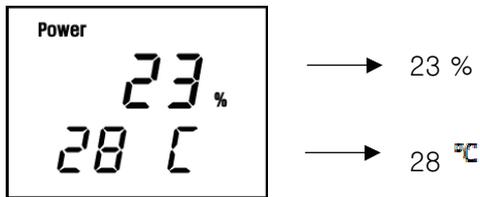
4.1.3 Stop operating

Press dial knob 1 time again, during operation.

#### 4.1.4 Verification of Power, temperature, and elapsed time

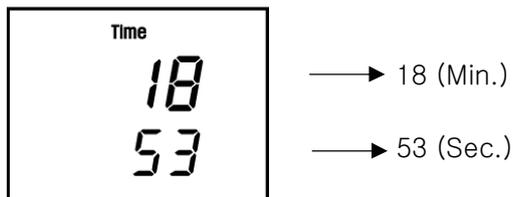
**STEP 1:** To verify Power and Temperature  
Press Mode button at RPM display

Power displays on the left top. And the value of power displays by % indication.  
Temperature displays the below line by °C indication.



**STEP 2:** To verify elapsed time  
Press Mode button at Power and temperature display.  
Or press Mode button 2 times at RPM display.

- Minute of elapsed time : On the top (Max. to 9999)
- Second of elapsed time : On the bottom (Max. to 59)



---

### NOTICE

The display returns to RPM after 10 seconds lapse.

---

#### 4.1.5 Limit of setting and see pause display

**STEP 1:** Press Lock button around 3 second.  
Color of Lock button will be changed in Red and blinks condition.

---

### NOTICE

If you press Lock button at Power, Temperature, or elapsed time display, display does not return to RPM display and either Power and Temperature or elapsed time keeps displaying.

---

**STEP 2:** To release Lock function.  
- Press and hold Lock button for 3 seconds

---

### NOTICE

Functions with dial and touch button stops once Lock function is set. But, stirring can pause by pressing dial knob.

---

---

### CAUTION

Please stop the unit and decrease speed if sample splashes or the unit vibrates.

---

---

### WARNING

Do not stir explosive sample.

Electric reaction could be happened between stirring sample and shaft of output. The unit should be used in experiment not to occur any surplus energy during stirring or other ways.

---

#### 4.1.6 User configuration

Set the product configuration

Turn power switch on during press the dial knob.

When user see the "CONF USER" on screen. Press knob 1 time again, you can change the configuration..

	Display	Meaning	Descriptions
1		SV resolution	In case of shaking speed setting, increased or decreased by setting unit • 1~100, default : 5
2		Sound	Select of system sound mute • ON, OFF, default : 5
3		Ramp up	Shaking increase speed control value • 1~10, default : 5
4		Ramp down	Shaking decrease speed control value • 1~10, default : 5
5		Direction	Select of rotation direction • CW(Clockwise rotation), CCW(Counter clock wise) , default : CW

## 4.2 MSA-0420

### 4.2.1 Controller – Name and function



(1) FND Display: Setting and status of control can be verified.



- A. Set : Display Set rpm
- B. rpm: Display present rpm
- C. Alm: Display the warning status

(2) Product start / stop and alarm button

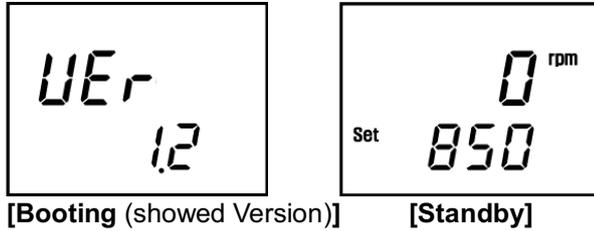
-  Stop and restart stirring.
- It blinks when overload occurs.

(3) Dial Knob

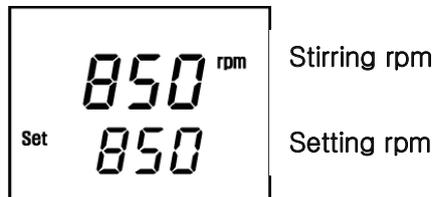
RPM can be set with dial. (270°)

#### 4.2.2 Operation and stop

**STEP1:** Press main switch to ON. [Refer to 3.4 power connection]



**STEP 2:** Press the operation and stop button, product will operate steadily.  
Adjust dial to set RPM.



**STEP3:** If you want to stop the product please press the operation and stop button.

---

### **CAUTION**

Stop stirring and decrease RPM for the following cases;

- Splashes occurs due to high speed.
  - Equipment does not work smoothly.
  - Equipment vibrates too much.
-

## 5.0 Safety function

Generally motor raise overload problem as following cases;

- Long term stirring of a sample with high viscosity that exceeds stirring capacity.
- Stirring an excess of proper capacity.
- Rapid increase of viscosity of sample during stirring.

Proper visible warning and indication with audible warning sound are applied to the unit to protect from damage of unit caused by overheated motor due to overload.MSD-0420

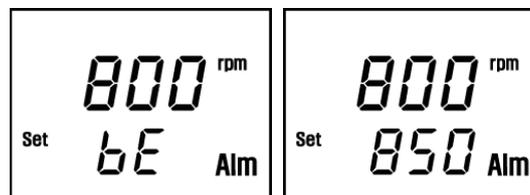
### 5.1 MSD-0420

#### 5.1.1 Overload protection

**There are 2 steps of control when system detects overload.**

**STEP1:** Over load(visible warning) blinks when overload occurs.

The unit can be operated while finding the most proper RPM. (Alarm blinking - on going)



**STEP2:** under the condition of step 2, in case of over the limit available control range, warning sound and lock button blinks and the equipment operating is stopped. Alarm can be canceled by pushing the operating button

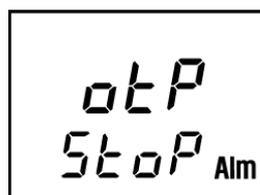


#### 5.1.2 Overheating Protection

Visible warning blinks when motor is overheated due to overload. Operating also stopped immediately. The unit should be operated after getting rid of reason of overheat and chilling for a while. Without enough chilling and cooling, Protect Function can occur again and machine can be turned off.

#### 5.1.3 Overheating occur

If the overheat occur, the lock button will blinking while warning sound while screen noted on Stop sign(otp stop: over temperature protection stop). It can be deactivated by pushing the operating button.



#### 5.1.4 Overheat protect function activate/deactivate

Turn off the switch make the machine cool for a while and turning on again. If cooling is not proceeded enough protect function can be activate again. (turning off) take a proper time to give some rest to machine.

## 5.2 MSA-0420

### 5.2.1 Overload protection

With warning sound, button blinks and display noted stop sign on the screen like (ocp stop: over current protection stop) Alarm can be deactivated by pushing the operating button.



### 5.2.2 Overheat protection

Continually working with overloaded condition, overheat can occur. With warning sound, button blinks and display noted stop sign on the screen like (otp stop: over temperature protection stop). Alarm can be deactivated by pushing the operating button.



전 Turn off the machine and make it cool for a while. And re-operating. When the cooling time is not enough protect function can be re-activate.

---

## NOTICE

- When protect function occur, turn off the machine and get proper time for cooling. If the time is not enough, the function can be activated again.
  - When the alarm sound occur, turn off the machine and plug out. Get proper time for cooling.
-

---

**⚠ WARNING**

Do not stir explosive sample.

Electric reaction could be happened between stirring sample and shaft of output. The unit should be used in experiment not to occur any surplus energy during stirring or other ways.

---

---

**⚠ CAUTION**

- The unit is designed for stirring or mixing sample with low or medium viscosity. Equipment and impellers must be chosen in consideration of viscosity and stirring capacity. And equipment should be fixed with suitable stand for proper usage..
  - Container could be broken or relocated if accessories and container are fixed and located firmly.
  - Check out the equipment and accessories whenever you use. Do not use any equipment and accessories with faulty.
-

## 6.0 Maintenance

### 6.1 Inspection cycle

Classification	Inspection cycle	
	Daily	Weekly
Inspect power cord connection at unit and receptacle.	•	
Inspect power cord for wear, cracks or cuts	•	
Stand and accessories cleaning		•
Surface cleaning on the unit		•
Controller function		•
Motor on/off checking	•	
Motor speed checking	•	
Attachment assembly checking	•	

### 6.2 Cleaning of product

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 chamber once a week, cleaning the surface of the unit once a month. And immediate cleaning is required when the unit is contaminated.

#### 6.2.1 Cleaning the Unit

Unplug the power cord and clean it with soft and dry towel. Rub the unremoved part, using alcohol solvent (methanol, ethanol) with towel.

#### CAUTION

- Do not immerse the unit in water to clean up
- 
- Please take notice not to get damage with parts inside or system
- Please take notice that main body is not being contact from Strong acids or strong alkalis or acetone, benzene, phenol, toluene, chloroform, cresol, affiliate acetic acid, affiliate chlorine.
- Do not use detergent which includes chlorine, abrasive, ammonia
- Please unplug when it is not used.
- Please move it after unplug.

#### 6.2.2 Accessories

Keep the unit clean always by cleaning the unit with a dry soft cloth before and after using.

## 6.3 Storage

### **In case of not using long time**

- (1) Unplug the unit from the main power.
- (2) Clean the unit with a soft cloth neatly.
- (3) Store in a dry place after packing

## 7.0 Trouble shooting

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

### 7.1 Power

Trouble	Causes	Solution
The unit does not turn on	<ul style="list-style-type: none"> <li>Incorrect electric power</li> </ul>	<ul style="list-style-type: none"> <li>Compare power source and voltage on the ID plate and make sure they are the same. ID plate is found on the back of unit.</li> </ul>
	<ul style="list-style-type: none"> <li>Power failure or circuit breaker shuts down</li> </ul>	<ul style="list-style-type: none"> <li>Find out the causes of power failure and recovery. also find the cause of power failure and recovery when break circuit is down</li> </ul>
	<ul style="list-style-type: none"> <li>Main plug not seated properly.</li> </ul>	<ul style="list-style-type: none"> <li>Check the electrical cord connection at the unit to ensure it is fully seated.</li> </ul>
	<ul style="list-style-type: none"> <li>Socket / plug / main power line might be cut</li> </ul>	<ul style="list-style-type: none"> <li>If the socket / plug / main power line are cut, request service.</li> </ul>
	<ul style="list-style-type: none"> <li>PCB has damaged by reagent</li> </ul>	<ul style="list-style-type: none"> <li>Request service.</li> </ul>
Room circuit breaker trips often when the unit is turned on or running	<ul style="list-style-type: none"> <li>Too many plugs connect at the same time</li> </ul>	<ul style="list-style-type: none"> <li>Check the circuit breaker size along with the voltage and current supplied to it.</li> <li>Check that several similar units are inserted together, if so you should not use overly.</li> </ul>
	<ul style="list-style-type: none"> <li>Internal circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>Asking after sales service</li> </ul>
It does not work even though Power is supplied	<ul style="list-style-type: none"> <li>Working Overheat protection system</li> </ul>	<ul style="list-style-type: none"> <li>Restart after cooling.</li> </ul>
	<ul style="list-style-type: none"> <li>Internal circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>Asking after sales service</li> </ul>

## 7.2 Malfunction on operation

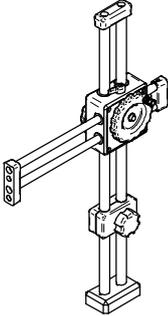
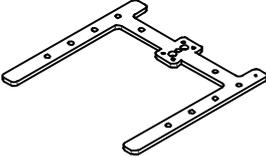
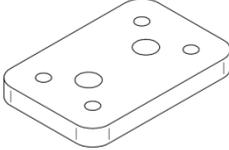
Trouble	Causes	Solution
Solution cannot be mixed well	<ul style="list-style-type: none"> <li>• Too much solution</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the volume or rpm speed up</li> </ul>
	<ul style="list-style-type: none"> <li>• Solutio in flask is high density</li> </ul>	<ul style="list-style-type: none"> <li>• Use product which has a motor suitable for high density solution</li> </ul>
Operation stop	<ul style="list-style-type: none"> <li>• Overheat protection system is on</li> </ul>	<ul style="list-style-type: none"> <li>• Unplug, cool the unit and restart</li> </ul>
Mechanical noise in the unit	<ul style="list-style-type: none"> <li>• Offcenter – Rotation support is fault</li> </ul>	<ul style="list-style-type: none"> <li>• Request service</li> </ul>
Dial knob does not work properly	<ul style="list-style-type: none"> <li>• Knob fault</li> </ul>	<ul style="list-style-type: none"> <li>• Disassemble, assemble the knob and restart</li> <li>• Request service</li> </ul>
Touch screen error	<ul style="list-style-type: none"> <li>• 'Button Lock' status (MSD only)</li> </ul>	<ul style="list-style-type: none"> <li>• Check if 'Lock' is on</li> </ul>
	<ul style="list-style-type: none"> <li>• Damage by chemicals or overheat</li> </ul>	<ul style="list-style-type: none"> <li>• Request service</li> </ul>

## 8.0 Accessories

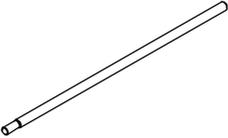
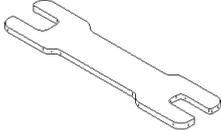
### 8.1 Advanced dial stand

- (1) It is made of Cast Iron and can be adjusted the height slightly along with 2 axes installed on the solid frame using dial knob.
- (2) The position can be adjusted slightly by dial knob and fixed with small stopper tightly while using it.
- (3) The stand bar for constructing can be fixed firmly on the Main Frame processed several supports with M14-tap. (Optional)

#### 8.1.1 Parts for advanced dial stand

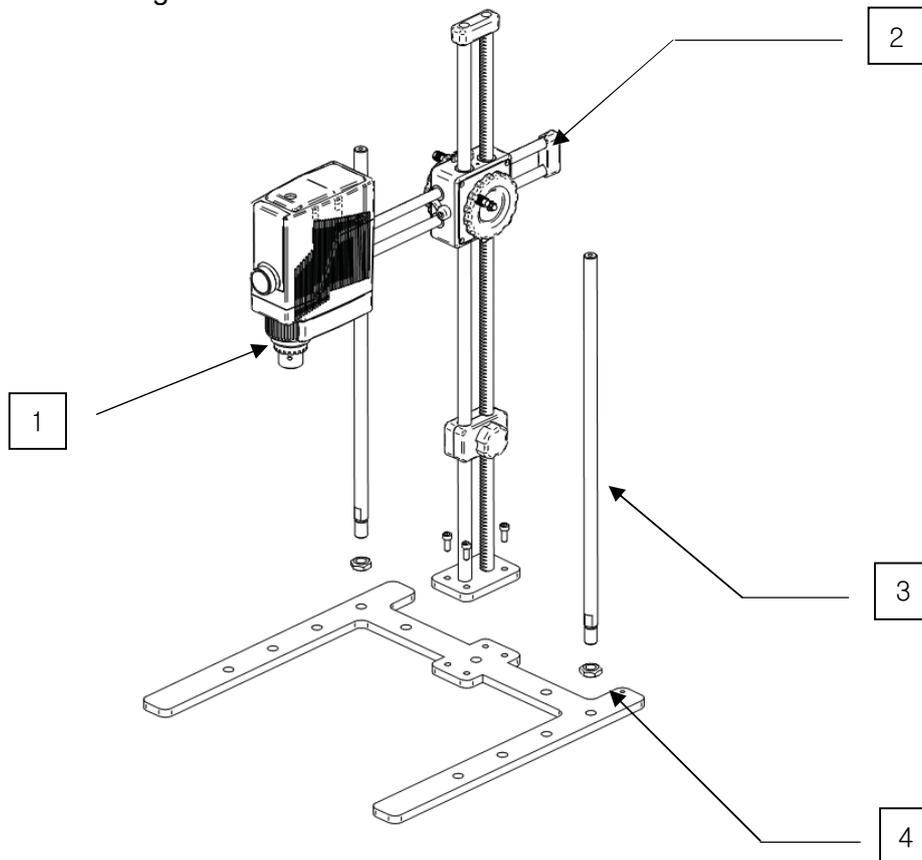
Dial stand	Base plate	Base block
		
Wrench bolt	Wrench	
 <p data-bbox="352 1294 507 1352"><b>M8 x 10 2ea</b> <b>M6 x 15 4ea</b></p>	 <p data-bbox="767 1249 831 1308"><b>5mm</b> <b>6mm</b></p>	

#### 8.1.2 Optional parts for advanced dial stand

Support-500mm	Bolt	Wrench
 <p data-bbox="323 1783 507 1841"><b>Ø15, Ø18, Ø20</b> <b>(option)</b></p>	 <p data-bbox="778 1767 815 1794"><b>M6</b></p>	 <p data-bbox="1098 1787 1262 1814"><b>13mm/10mm</b></p>

### 8.1.3 Assembly of advanced dial stand and main unit

#### 8.1.3.1 Deal drawing



- (1) Main unit (Head)
- (2) Dial stand
- (3) Support (500mm-Optional)
- (4) Base plate

[Figure 8-1]

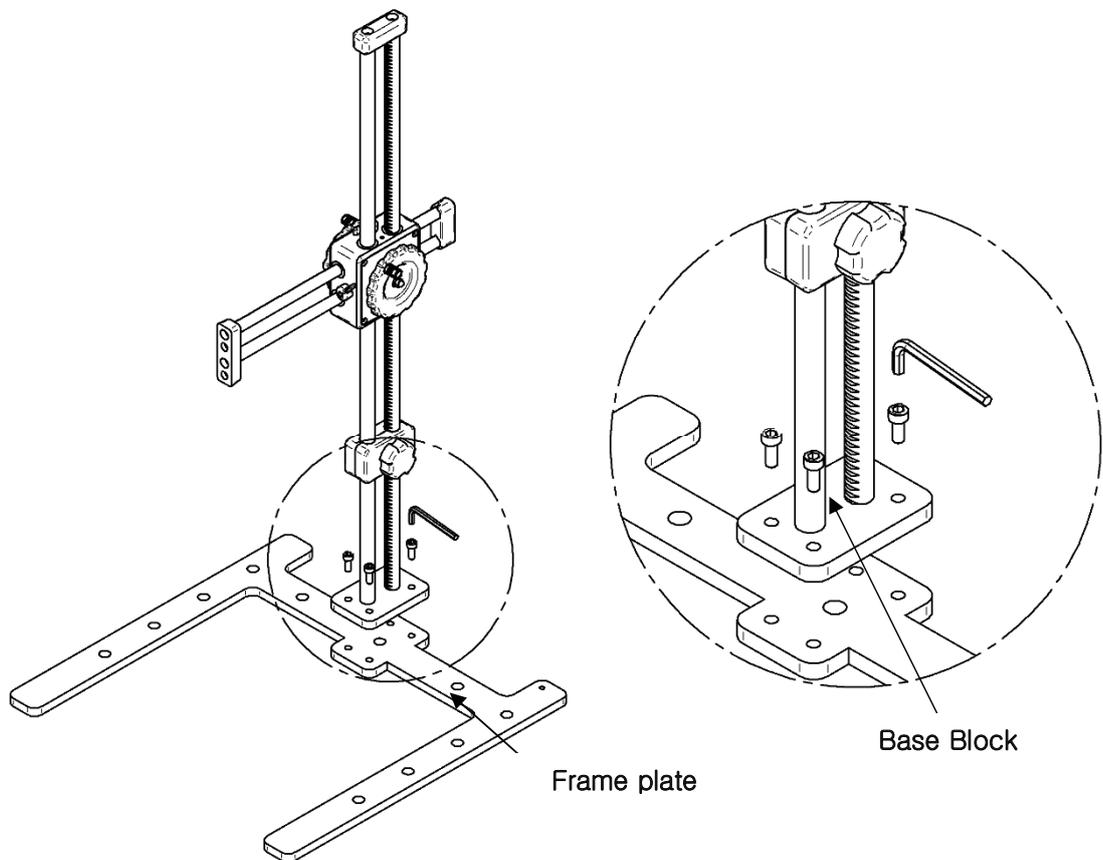
---

**⚠ CAUTION**

Please install the unit on a flat, dry and fireproof floor.

---

### 8.1.3.2 Assembly of Dian stand



[Figure 8-2]

- (1) Position the Base block and base plate of dial stand as shown [figure 8-2]
- (2) Assemble them with 5mm wrench and 4ea wrench bolts (M6X15)

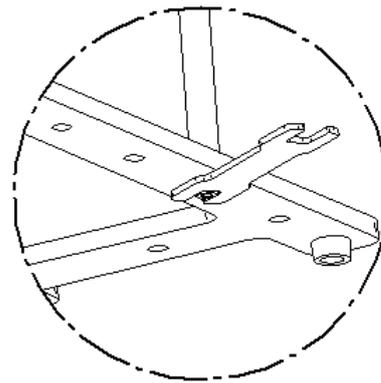
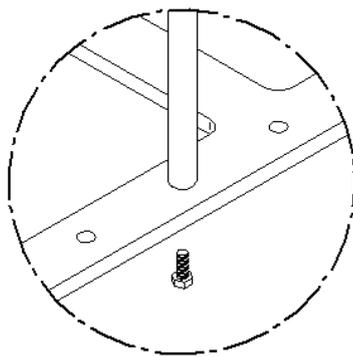
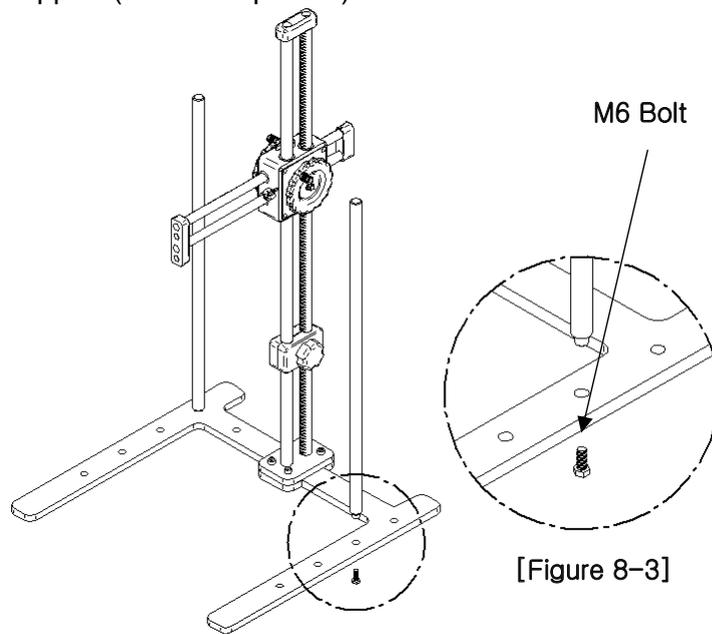
---

**⚠ CAUTION**

When you tighten the wrench bolt (M6X15) up, please make sure that 4 bolts are tightened equally. Vibration may occur if the assembling is unbalanced.

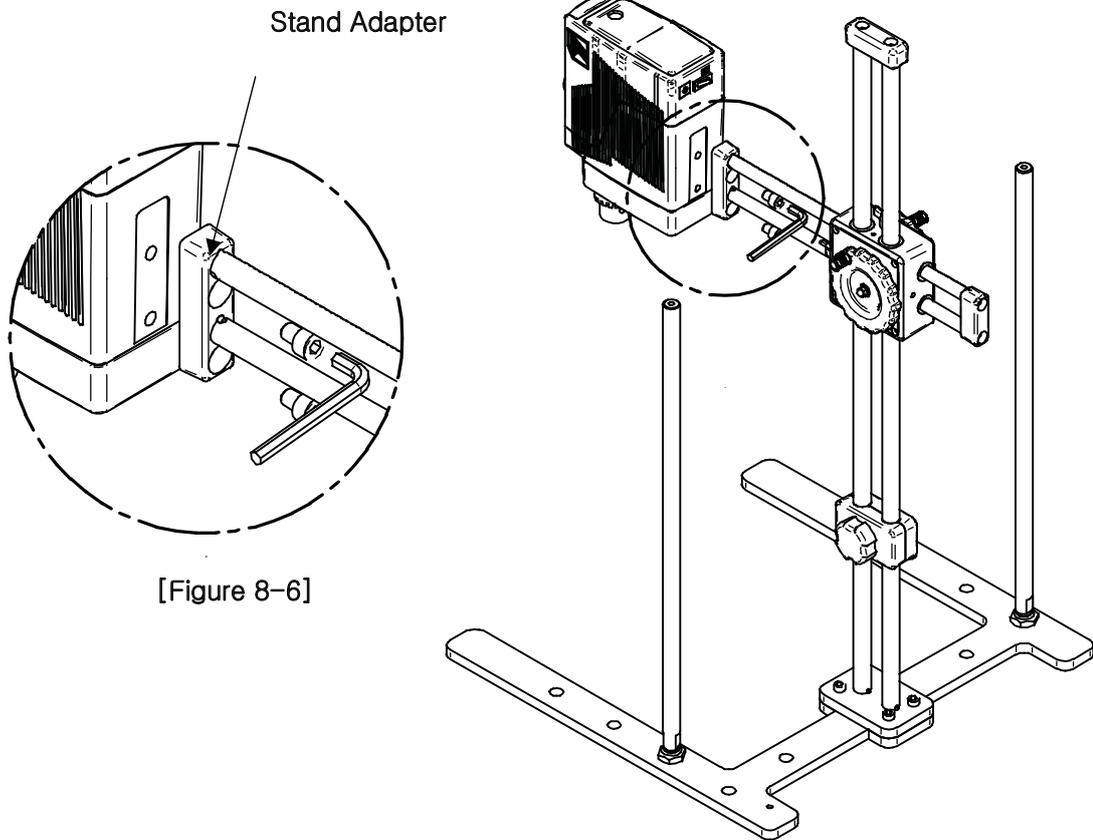
---

### 8.1.3.3 Assembly of support (500mm-Optional)



- (1) Position M6 Bolt under the base plate and support on the base plate as shown [Figure 8-3]
- (2) Assemble them by bolting M6 Bolt as shown [Figure 8-4]
- (3) Tighten M6 Bolt again with 10mm spanner so the base plate and support can be fixed well as shown [Figure 8-5]  
(Please be careful not to tip down the dial stand when you bolt them by spanner)

### 8.1.3.4 Assembly of Main body



- (1) Using a 6 mm wrench handle, insert bolts (M8X10) in the stand adapter and match the stand adapter holes with the (2) holes located at the backside of the head as shown in [Figure 8-6] located above.

---

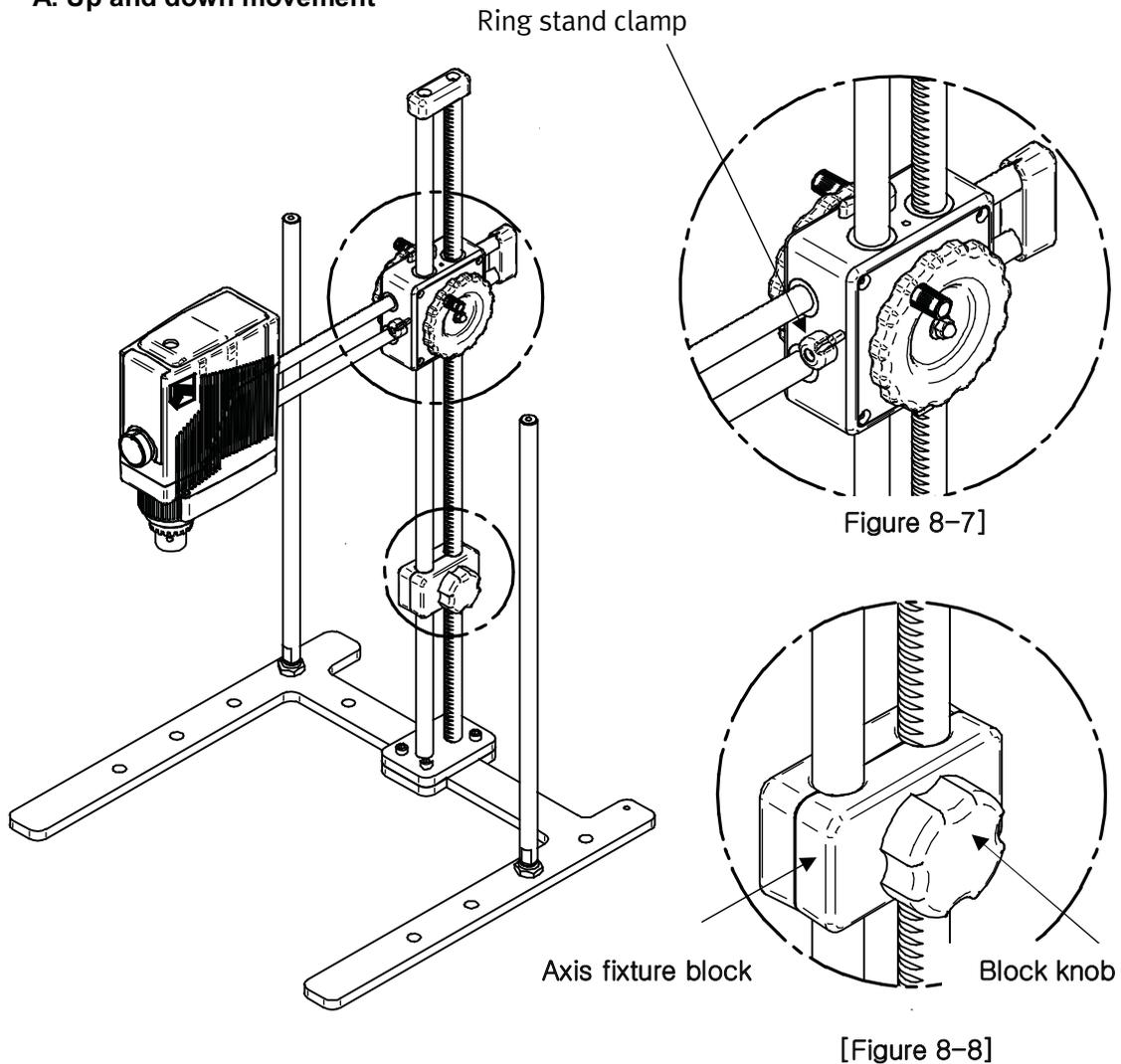
 **CAUTION**

Safe operation can be guaranteed only with accessories supplied by Jeio Tech.  
Please unplug power before you mount accessories.

---

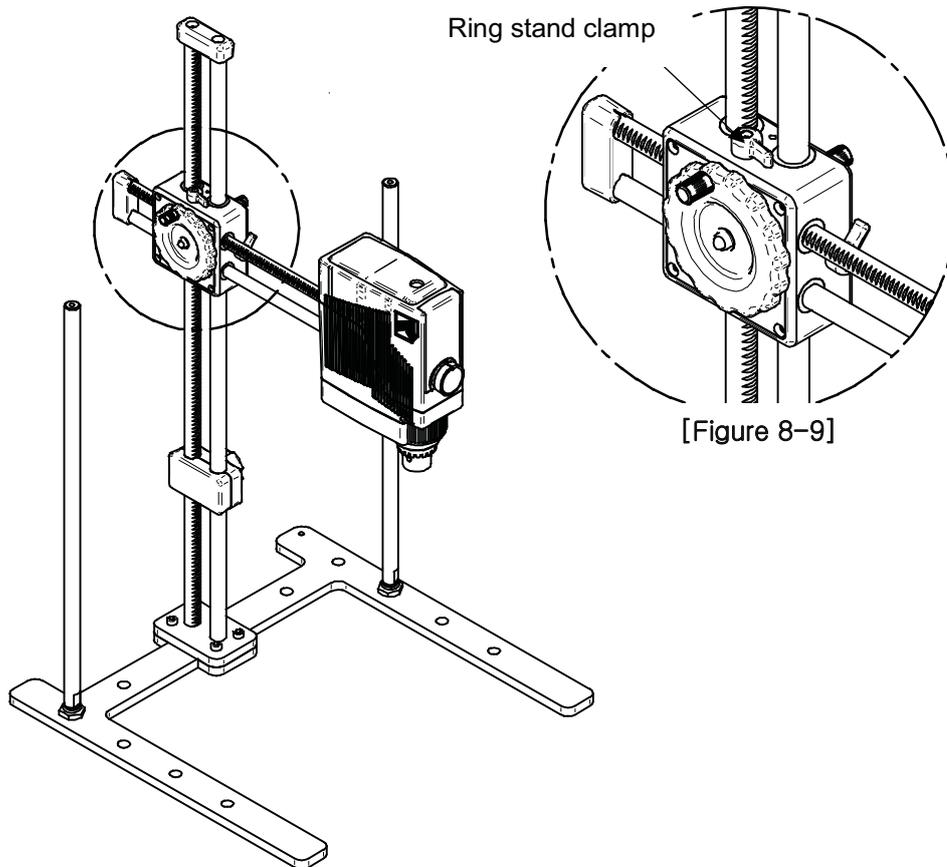
### 8.1.3.5 How to use advanced type of dial stand

#### A. Up and down movement



- (1) Turn the knob clockwise as shown [Figure 8-7] above
- (2) You can position the main body up and down by using dial knob as shown [Figure 8-7] It moves upwards by turning the knob to the right and downwards by turning it to the left
- (3) After set the head in a proper position, fix it tightly by turning the knob Counterclockwise.
- (4) Turn the block knob of Axis fixture block counterclockwise as [Figure 8-8] above, and position it in the middle between the knob and frame plate.

## B. Forward/backward movement



- (1) Turn the knob fixture clip counterclockwise as [Figure 8-9] above.
- (2) Head can move to upward and downward by dial knob as [Figure 8-9]  
It moves to upward if the knob is turned clockwise and downwards if the knob is turned counterclockwise.
- (3) After set the head in a proper position, fix it tightly by turning the knob counterclockwise as [Figure 8-9] above.

---

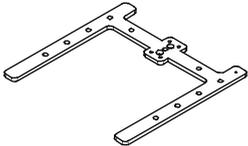
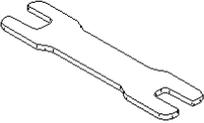
### CAUTION

Safe operation can be guaranteed only with accessories supplied by Jeio Tech.  
Please unplug power before you mount accessories.

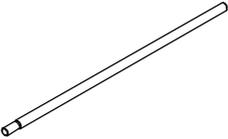
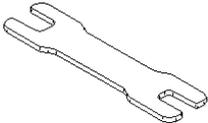
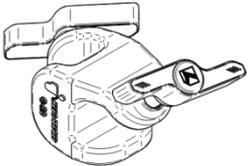
---

## 8.2 Basic stand

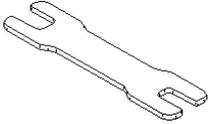
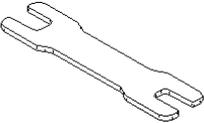
### 8.2.1 BS-01 Stand accessories

700mm support	Base plate	M6 Bolt
		 <b>M6</b>
Spanner		
 13mm / 10mm		

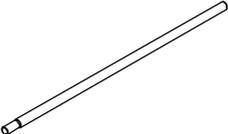
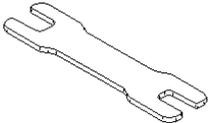
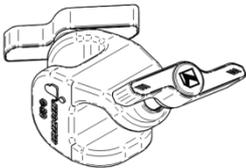
### 8.2.2 BS-01 Optional accessories

Support-500mm	M6 Bolt	Spanner
 <b>Ø15, Ø18, Ø20 (option)</b>	 <b>M6</b>	 <b>13mm / 10mm</b>
Clamp		
 <b>(option)</b>		

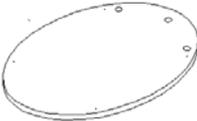
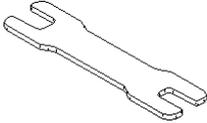
### 8.2.3 BS-02 Stand accessories

700mm-Support	Base plate	Spanner
		 <b>13mm / 10mm</b>
Spanner		
 <b>13mm / 10mm</b>		

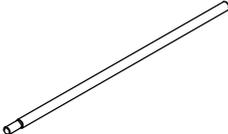
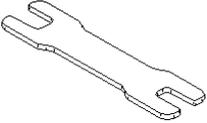
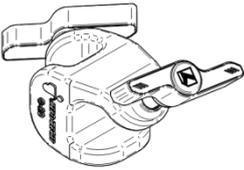
### 8.2.4 BS-02 Optional accessories

Support-500mm	M6 Bolt	Spanner
 <b>Ø15, Ø18, Ø20 (option)</b>	 <b>M6</b>	 <b>13mm / 10mm</b>
Clamp		
 <b>(option)</b>		

### 8.2.5 BS-03 Stand accessories

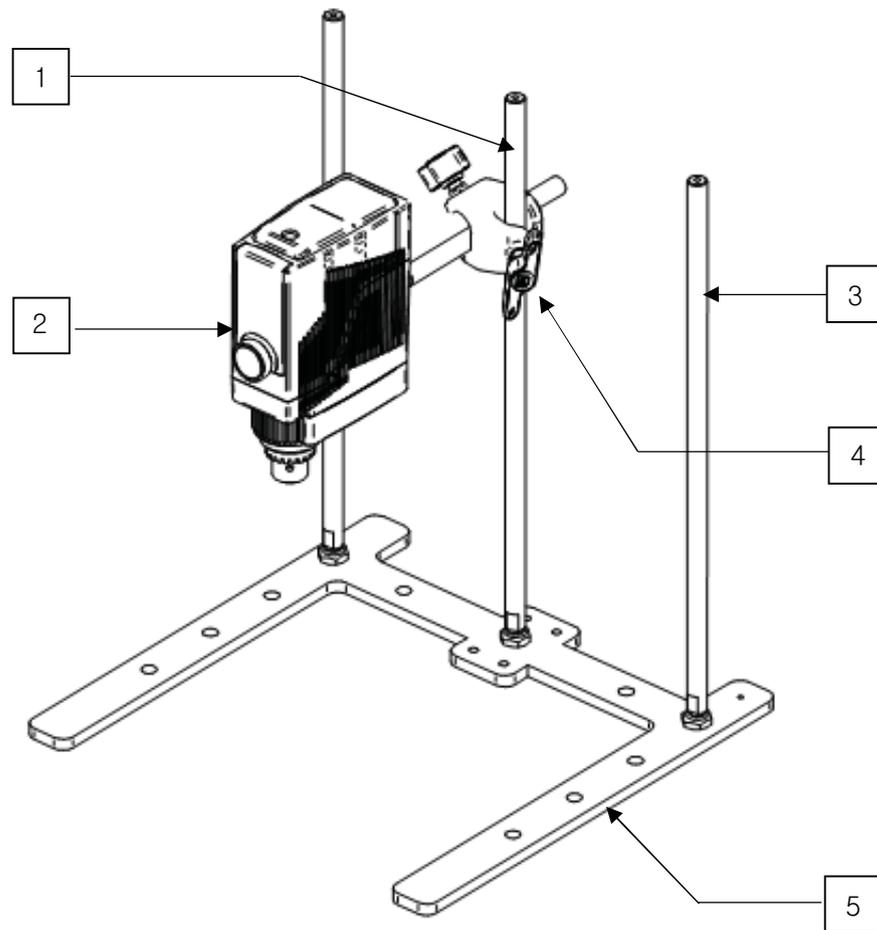
700mm support	Base plate	M6 Bolt
		 <b>M6</b>
Spanner		
 <b>13mm / 10mm</b>		

### 8.2.6 BS-03 Optional accessories

Support-500mm	M6 Bolt	Spanner
 <b>Ø15, Ø18, Ø20 (option)</b>	 <b>M6</b>	 <b>13mm / 10mm</b>
Clamp		
 <b>(option)</b>		

## 8.2.7 Assembly of basic stand

### 8.2.7.1 Deal drawing



- (1) Support (700mm)
- (2) Main body (Head)
- (3) Support (500mm-optional)
- (4) Clamp (Optional)
- (5) Base plate

[Figure 8-10]

---

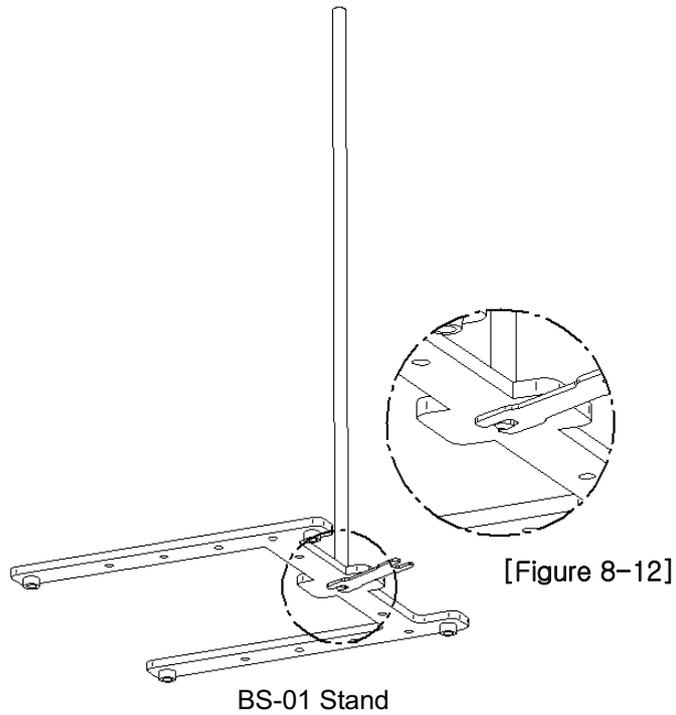
**⚠ CAUTION**

Please install this unit on a flat, dry and fireproof floor

---

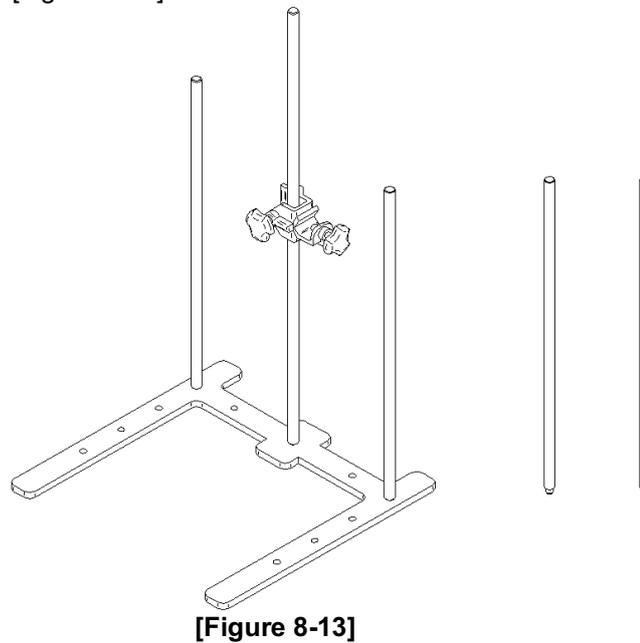
### 8.2.7.2 Assembly of basic stand

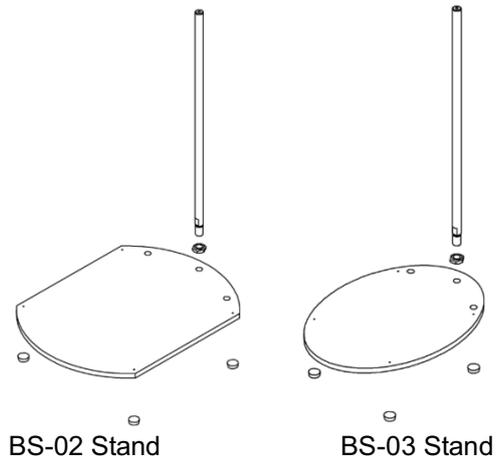
- (1) Bolt support (700mm) to the plate with 13mm/10mm spanner and M6 bolt as shown [Figure 8-11,12]



[Figure 8-11]

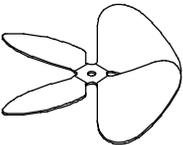
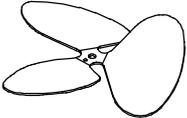
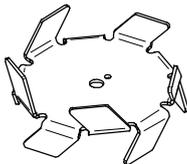
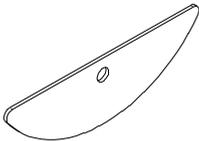
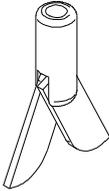
- (2) You can use optional  $\varnothing 15$ ,  $\varnothing 18$ ,  $\varnothing 20$  support(500mm) and optional clamp assembling with the base plate as shown [Figure 8-13] below.

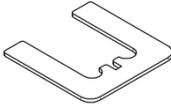
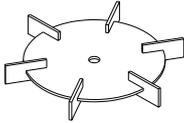
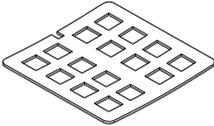




[Figure 8-14]

### 8.3 Impeller

Designation	Materials	Description	Impeller Shaft
	SUS	4 bladed 50mm 4 bladed 70mm 4bladed 100mm	8Ø, 400mm
	PTFE	4 bladed 50mm 4 bladed 70mm	8Ø, 500mm
	SUS	3 bladed 50mm 3 bladed 70mm 3 bladed 100mm	8Ø, 400mm
	SUS	Dissolve 35mm Dissolve 55mm	8Ø, 400mm
	SUS	Half moon 65/20mm Half moon 90/25mm	8Ø, 300mm 8Ø, 500mm
	PTFE	Half moon 60/18mm	8Ø, 500mm
	SUS	Centrifugal 50mm Centrifugal 80mm (can be folded)	8Ø, 500mm
	PTFE	Centrifugal 76/17mm	8Ø, 500mm

Designation	Materials	Description	Impeller Shaft
	SUS	Anchor 45mm Anchor 60mm	8Ø, 300mm 8Ø, 500mm
	PTFE	Anchor 80/40mm Anchor 80/50mm	8Ø, 500mm
	SUS	Turbine 40mm Turbine 70mm	8Ø, 500mm
	PTFE	Turbine 70mm	8Ø, 500mm
	SUS	Paddle 70mm	8Ø, 500mm
	PTFE	Paddle 70mm Paddle 78/80mm	8Ø, 500mm

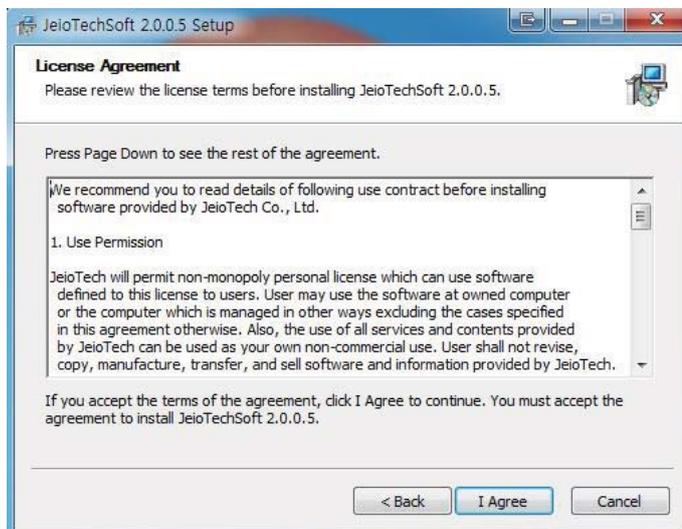
## 9.0 Exclusive S/W (MSD-0420 only)

### 9.1 Installation of Monitoring Program

- (1) The software is automatically installed. When user put the “Next” button, the screen showed “License Agreement” page.



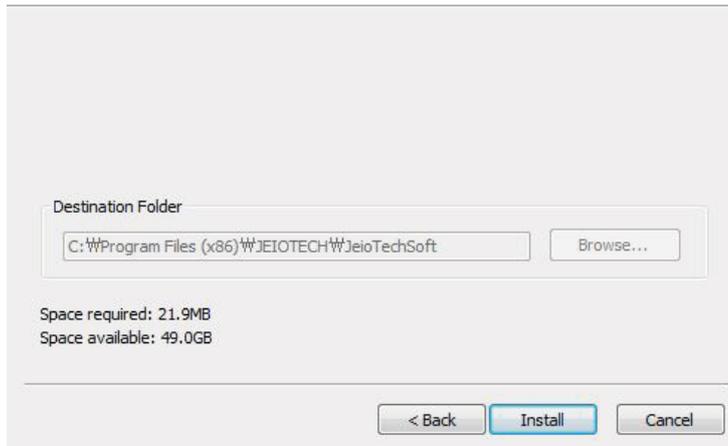
- (2) Check the details and click the “I agree”



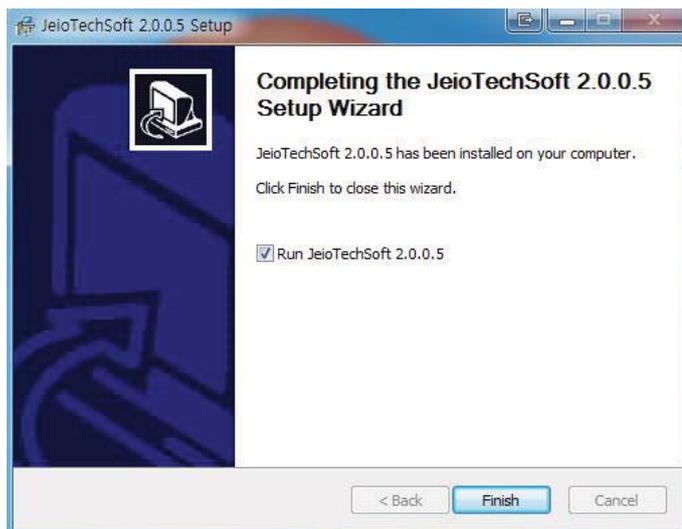
- (3) Click “Intall” and install the program.

### Choose Install Location

Choose the folder in which to install JeioTechSoft 2.0.0.5.

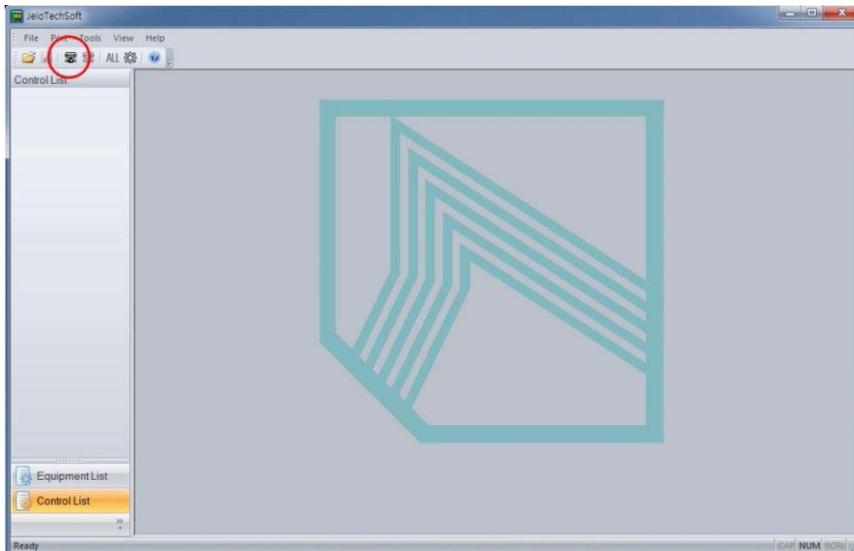


- (4) Once the program is installed, below window is up and JeioTechSoft icon is generated on the background.  
Check the Run JeioTechSoft 2.0.0.5 or double click the icon then the program starts.

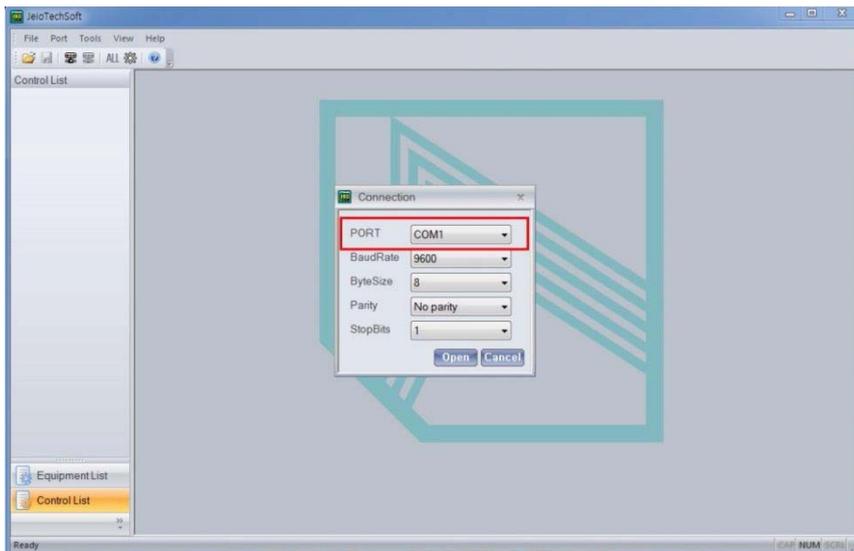


## 9.2 Program operation and equipment connection

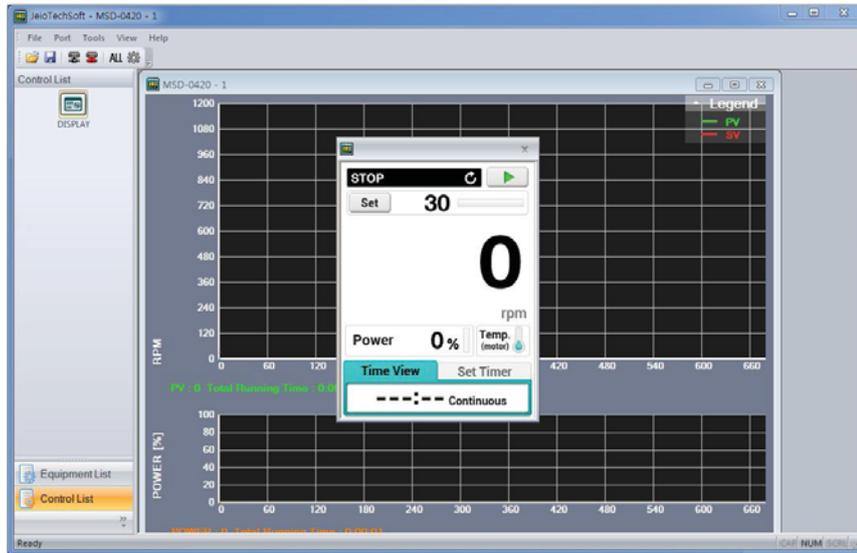
- (1) Double Click the operating file (  ) in installed Program folder
- (2) Click the connection icon



- (3) Select the connected communication port



- (4) When the communication connecting is successful, you can see the screen below



### 9.3 Communication protocol

It is possible to communication from this product to external device by USB port. Providing JeioTech software can be supported the both way communication, check the operating status, data recording, and data saving. In addition, if you want to modify the software, please refer below communication protocol and communication reference.

Communication Reference :

[http://www.modbus.org/docs/Modbus\\_Application\\_Protocol\\_V1\\_1b3.pdf](http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b3.pdf)

#### 9.3.1 Physical Layer

- Communication port : USB

#### 9.3.2 System number of each model

ITEM	System Number	System	Model Number
Overhead Stirrer series	A220H	-	MSD-0420

#### 9.3.3 Modbus Protocol Address Definition

	Register	ModBus Adress (DEC)	Send Real Adress (DEC)	Description	Data	Data Length (byte)
W	WS	1	0	Beep - Test, Sound off	1	2
				Beep - Key sound	2	2
R	RH	2	1	Model Name	Don't Care	2
W	WS	3	2	System Reset(Watch Dog)	Don't Care	2
W	WS	4	3	System Reset	Don't Care	2
W	WS	5	4	Torque offset	0: Clear, 1: Apply	2

W	WS	6	5	Escape Stop State	Don't Care	2
---	----	---	---	-------------------	------------	---

R	RH	7	6	Model Name	Don't Care	2
R	RH	8	7	F/W Version	(ex) 2.5 <=> 0x0205	2
R	RH	9	8	Min rpm	Min rpm	2
R	RH	10	9	Max rpm	Max rpm	2
R	RH	11	10	Max Torque	Max Torque / 10.0	2
R	RH	12	11	Reserved	Reserved	2

R/ W	WS, WM, RI	13	12	Timer Set	Min.	2
R/ W	WS, WM, RI	14	13	Timer On/Off	0: off, not 0: on	2
R/ W	WS, WM, RI	15	14	Motor run/stop	0: stop, not 0: run	2
R/ W	WS, WM, RI	16	15	SV	Min rpm ~ Max rpm	2
R/ W	WS, WM, RI	17	16	Calibration Value	/10	2

R	RH	18	17	PV		2
R	RH	19	18	Torque	Data / 10	2
R	RH	20	19	Motor Temperature	Integer( 0~ 60 )	2
R	RH	21	20	Time Tick (Hour)	Hour	2
R	RH	22	21	Time Tick (Min, Sec)	High Byte: Min, Low Byte: Sec	2
R	RH	23	22	Shot Time Tick (Hour)	Hour	2
R	RH	24	23	Shot Time Tick (Min, Sec)	High Byte: Min, Low Byte: Sec	2
R	RH	25	24	Status		2

## 10.0 Appendix

### 10.1 Technical Specification

Models		MSD-0420	MSA-0420	
Technical data	Stirring capacity, Max (H <sub>2</sub> O,L)		20 (~2,000rpm)	
	Max. RPM at corresponding viscosity*	5,000(cP)	2000	
		10,000(cP)	1200	
		30,000(cP)	300	
		50,000(cP)	200	
	Speed control		Feedback control with PID 80~2,000rpm	
	Speed accuracy (No Load)		300~2,000rpm±1.0%	
	Speed display resolution		<ul style="list-style-type: none"> <li>Setting : user selectable increment(1~100rpm)</li> <li>Display : 1rpm</li> </ul>	<ul style="list-style-type: none"> <li>Setting : 5rpm</li> <li>Display : 1rpm</li> </ul>
Rated torque (N·cm)		19		
General data	Motor efficiency		40/90 x100%	
	Control panel		FND(Flexible Numeric Display), Touch key Digital knob	FND(Flexible Numeric Display), Touch key 270° Analog knob
	Feature		<ul style="list-style-type: none"> <li>Display: Motor temp, Elapsed time, Power%</li> <li>Selectable cw/ccw</li> <li>Constant current</li> </ul>	N/A
	Safety		Thermal protection/ current protection	
	Communication port		USB	N/A
	Chuck range(mm/inch)		3 to10 / 0.1 to 0.4	
	Overall Dimensions (W x D x H, mm/inch)		75 x 150 x 215 / 2.9 x 8.5 x 5.9	
	Net. Weight (kg/lbs)		2.8 / 6.2	
	Electrical requirements		AC 200~240V, 50/60Hz	
	Material	Main body	Cast aluminum alloy, powder coated	
Cover		PP		

\* Using 3-bladed propeller impeller, 50Ø

※ The standard value is recorded by 25°C, 60%R.H. conditions.

※ Above spec. can be changed without prior notice.

## 10.2 Disposing of products



Before you dispose product or the components

1. The equipment should be cleaned and decontaminated to protect workers servicing the equipment, the environment or the public purchasing surplus equipment because the incubated shaker can potentially be contaminated with biological material, chemicals or radioisotopes. Check with your institution or laboratory for individual policies and procedures for disposal of laboratory equipment.

2. Please contact your local governing body for regulations regarding disposal of electrical, electronic, metal (brass, aluminum, steel and stainless steel), refrigeration and rubber components. Jeio Tech recommends the user find a local scavenger or laboratory equipment recycler to properly dispose of the unit and its components.

## 10.3 Warranty

### 10.3.1 Terms of Warranty Service

(1) The warranty period of 24 months, covering for defects in workmanship and material when used under recommended as set forth in the operating manuals for such equipment.

(2) Please let me know as below for better and quick service when service needs.

- Purchasing date
- Serial number on Identification plate.
- Defect and trouble
- Application and using condition.

### 10.3.2 Warranty exception

Customer can't get free warranty service in case of as below.

- If the product is broken due to the user's fault.
- If the product is broken due to improper operation or storage.
- If the product is broken due to improper modify or repairing.
- If the product is broken due to overuse of voltage or earthshock.
- If the product is broken without taking care of the "Notice" alerted on the manual.

### 10.3.3 Service and technical advice

We, Jeiotech Co., Ltd. are doing best to give best support based on customer service system.

When we get the symptoms, fault states, contact number by customer, we offer after sales service.

➤ **International Sales Head Office (Korea)**

#1005, Byucksan Digital Valley 6-cha, 219, Gasan digital 1-ro, Geumcheon-gu, Seoul, Korea

153-704

**Tel:** +82 2 2627 3816    **E-mail:** [overseas@jeiotech.com](mailto:overseas@jeiotech.com)

**FAX:** +82 2 3143 1824

➤ **The Americas (U.S.A. Branch)**

19 Alexander RD Unit #7, Billerica MA 01821, U.S.A.

**Tel:** +1 781 376 0700    **E-mail:** [info@jeiotech.com](mailto:info@jeiotech.com)

**FAX:** +1 781 376 0704

➤ **Europe (U.K. Branch)**

Unit 3, Tower Business Park, Warpsgrove Lane, Chalgrove, Oxfordshire, OX44 7XZ, United Kingdom

**Tel:** +44 1865 400321    **E-mail:** [labcompanion@medlinescientific.com](mailto:labcompanion@medlinescientific.com)

**FAX:** +44 1865 400736

➤ **China (Shanghai Branch)**

B-705, Jingting Bldg. No.1000 Hongquan Rd, Minhang district, Shanghai, P.R.CHINA 201103

**Tel:** +86-21-5108-9161, 5414-8389    **E-mail:** [longjuncao@jeiotech.com](mailto:longjuncao@jeiotech.com)

**FAX** +86-21-5168-5414

➤ **South East Asia (Malaysia Branch)**

No 57-59, Jalan Adenium 2G/6, Pusat Perniagaan Adenium, 48300 Bandar Bukit Beruntung, Selangor Darul Ehsan , Malaysia

**Tel:** +60 3 6021 6880    **E-mail:** [labcompsea@gmail.com](mailto:labcompsea@gmail.com)

**FAX:** +60 3 6021 7880