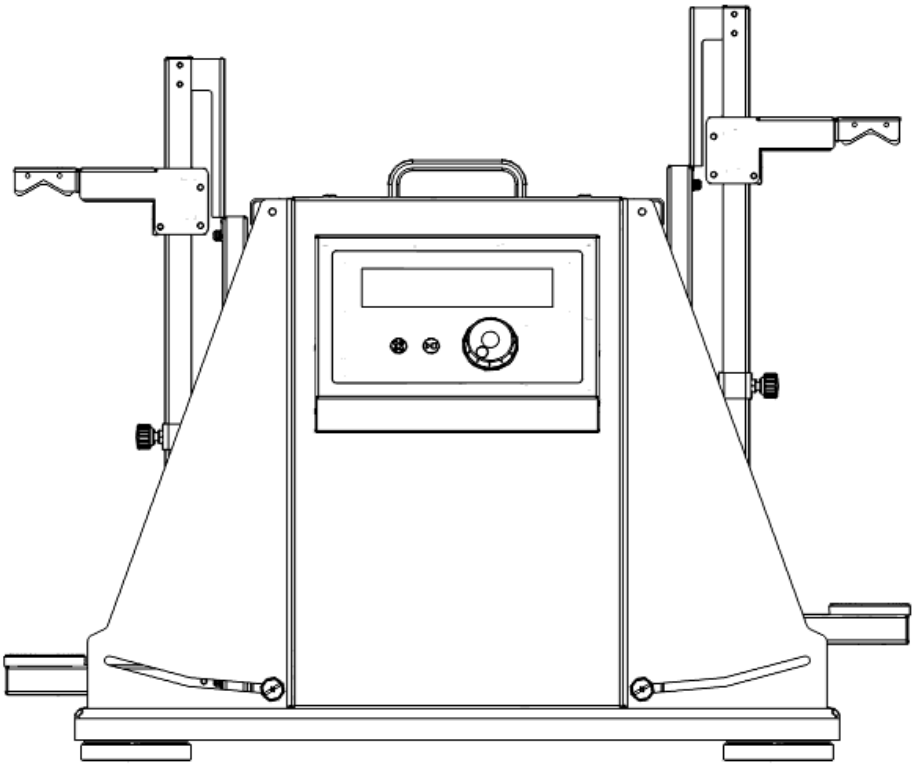


User Manual of
Separatory Funnel Shaker

Model : RS-2

Manual no. : 32021L002 Version : 3.0

JEIOtech



⚠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 their safety. Failure to follow these guidelines may result in serious injury or damage to their property.

Thank you for purchasing JeioTech's products.

JeioTech Co., Ltd. is committed to offering the customer service including product sales, Technical service, and follow-up management. If you have any question about this user manual, please contact our sales department.

Quality Management System ISO 9001



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You can download the above image by visiting the following JEIOTECH site.
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Disclaimer

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1 Safety

1.1 How to Use the User Manual

This user manual contains instructions on how to use the product properly and safely. Please make sure to read and be aware of the safety warnings and precautions before use. Also, be sure to keep the user manual close to the product so that you can always use when needed. Also, please place the user manual in a prominent place on the product body so that new users can know how to use it safely and properly when transferring or leasing the product.

1.2 Safety Signs for Safe Use of the Product

(1) We use safety signs to help control a hazard. They ensure safe use of the product and to prevent the potential accidents or damages.

(2) The safety signs have been classified by the degree of hazards.

(3) Please read carefully and understand the contents of the safety signs.

Safety Signs	Contents
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death, fatal injury, or property damage
⚠WARNING	Indicates a hazardous situation which, if not avoided, could result in death, serious injury, or property damage
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
NOTICE	Notifies you careful actions that are not relevant to your injury

1.3 Disclaimer of Warranties

(1) We do not accept any warranty or liability for this product except for the specified in the company's assurance terms.

(2) This company is not responsible for any case where a user or third party has damaged directly or indirectly due to an unpredictable defect or natural disasters.

1.4 Warnings for safe use of the product

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

This product should be installed in a laboratory equipped with safe facilities for accidents. Also, install the product on a solid, flat floor and please take a special care for fire and toxic gases.

When handling samples that may cause combustible materials or toxic gases, make sure that safety equipment is installed beforehand, and use them carefully in accordance with the safety regulations.

Do not install the product where flammable gases may leak, or explosion by organic vapor gas may occur.

Hazardous materials may vaporize within the workspace, causing them to ignite and explode. Materials such as superacid, ester, nitro compounds are explosive, and materials such as peroxidizing salts, inorganic peroxides, superacids, and organic solvents are combustible.

Do not use the product in humid or flooded areas.

Before installing the product, please check the voltage, phase, and capacity of the ID Plate (nameplate attached to the bottom of the product) to connect correctly. Make sure use a separately dedicated wire to install the power source.

Make sure to use grounded power source.

Non-grounding can cause serious damage to the equipment and the operator's body. Also, never

ground to a gas or water pipe.

Unplug the power plug immediately if it makes sounds, smells or smokes. Stop using the product and request for a technical service.

Do not disassemble, repair or modify the product randomly.

The product may function improperly, and may cause electrical accidents. Moreover, you may not receive a technical service according to the product warranty regulations.

1.5 Caution Statement for Safe Use of Products

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

Make sure to turn off the product's power switch, and then unplug the power after use.

Safety rules for users are explained as following.

Make sure the cord is not pressed under the product or other heavy objects.

The cover of the power line may be peeled off, which may cause electric shock or fire.

Make sure that the power plug is correctly and stably engaged and that it is not touched by wet hands.

If the connection is unstable, there is a risk of fire, electric shock, or injury.

Do not insert any energized, flammable objects into the air outlet formed inside or outside of the product.

Do not cause a strong shock or vibration to the product.

They may cause damages and malfunction of the product. The performance of the product may be degraded and inaccurate experimental results may be produced.

Do not install the product near high-frequency noise generating equipment.

When installing, avoid high-frequency welders, high-frequency sewing machines, or large-capacity SCR controllers.

Do not wash the equipment with a strong solvent, but please use a soft cloth.

Strong detergent can cause fire, discoloration, or deformation, therefore wipe it with a sponge or a soft cloth soaked with neutral detergent.

Be sure to unplug the power cord when cleaning the product.

It might cause electric shock or fire.



Wear protective gloves.



Wear eye protection.



Avoid water



Avoid corrosive materials



Warning for electrical shock.



Warning for flammable material use



Warning for foot crush.



Warning for hand crush or pinch.



Warning for lifting hazard.



Do not take the device apart randomly.

2 Functional Description

2.1 Product Introduction

The separatory funnel shaker is an instrument that can simultaneously shake multiple samples under the same conditions in chemical or pharmaceutical laboratories. It can be used for extracting solvent from water, extracting organic solvents, and extracting soil components. This instrument offers accurate control of shaking speed, and safety both for the instrument and the users through the following features.

2.2 Features

2.2.1 Excellent Performance

(1) We embedded an 'included reciprocal (90°~70°)' function to widen shaking area for suitable mixture even for the smaller RPMs. For 2-liters separatory funnel, if the inclination is set as 20°, you can increase the shaking speed up to 250 RPM (maximum).

(2) Each funnel of different capacity (50 ~ 2,000 ml) can be loaded simultaneously on left, right, or both sides.

2.2.2 Enhanced Convenience

(1) A vacuum fluorescent display (VFD) enhances the visibility of the controller of the instrument. It is tilted 20° from the main body, so you can check the operating information more conveniently compared to other companies' products even if you place it on the floor.

(2) A user-friendly controller knob (knob) enables the users to operate instrument status intuitively.

(3) The timer of the instrument determines the instrument's operation time. You can set it up to 999 hours 59 minutes.

(4) You can easily monitor and operate the instrument via your iOS & Android smart device in a real time (available after connecting LC GreenBox through the RS232 port).

(5) This instrument has an automatic power outage recovery system that the instrument restores the operation right before the power outage so that it can continue the previously saved process when the power turned on.

(6) This instrument is equipped with a constant force spring structure that enables a convenient removal and attachment of the separatory funnel.

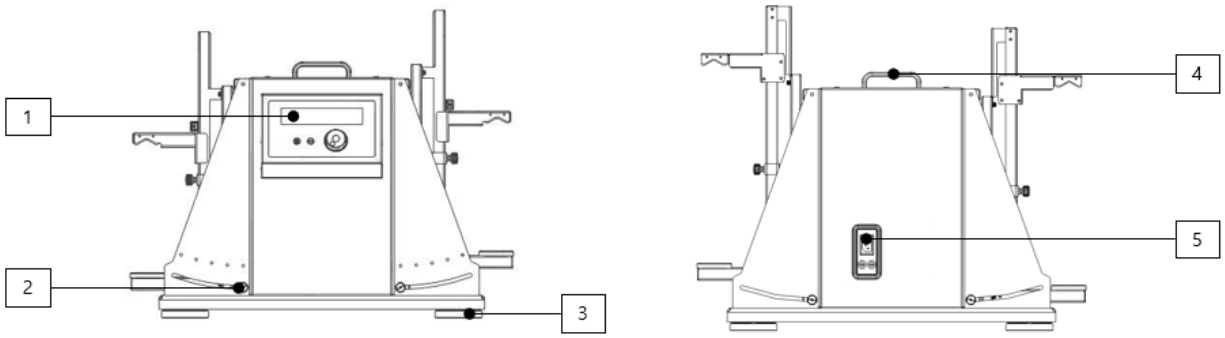
2.2.3 Improved safety

(1) We optimized the instrument’s movement by eliminating unnecessary motions under high shaking speed, therefore you can perform a safe experiment.

(2) The instrument displays the vibration rate digitally, and a stable vibration can always be reproduced regardless of voltage change by the motor’s feedback control. You can freely switch the vibration speed from low to high.

(3) We minimized the sample's leakage while shaking through gentle start and stop of the operation. Therefore, the safety of the researchers has been improved.

2.3 Structure



(1) Control Panel

This is the main control part. We enhanced the visibility and convenience of the use through the vacuum phosphor display (VFD) and the control knob. There are buttons for starting/stopping and for setting up the features.

(2) Inclined Handle

You can adjust the angle of the funnel shaker by loosening the knob and gently moving it from side to side.

(3) Foot

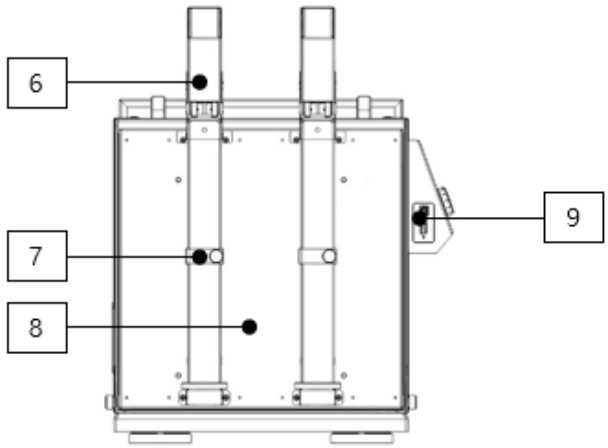
Foots are mounted on the left and right corners to support the product rigidly during the shaking operation.

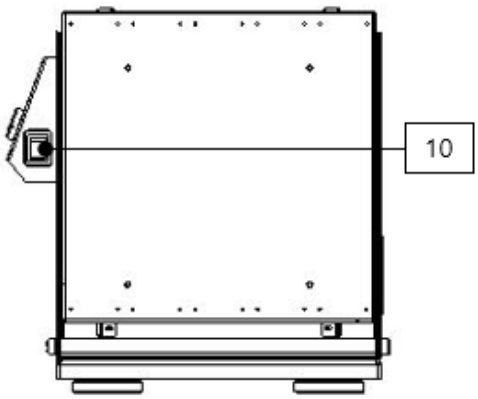
(4) Transfer Handle

The transfer handle enables you to move the instrument easily.

(5) Main Power Code

This is an outlet for 220V power connection.





(6) Separatory Funnel Holder

You can load various size of the separatory funnels from 50 ml to 2,000 ml through a constant-force spring structured holder.

(7) Separation Prevention Lever

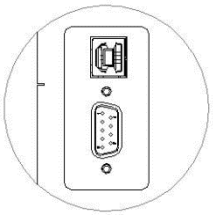
This lever is to prevent secondary accident due to sudden separation of the separator funnel in the holder during shaking.

(8) Shaker Base

A shaker base allows up to five separatory funnel holders to be installed through screw tightening.

(9) Computer Interface

This instrument can be connected to a computer or smart device via the USB port and RS232 port. When connected, you can monitor or operate the product on the computer or smart device. If you connect both ports at the same time, the USB port will be recognized firstly.



(10) Power Switch

This switch turns the instrument's main power on/off.

3 Installation

3.1 Unpacking and Transporting the Instrument

(1) Please check the instrument if any damage is found when it is still packed.

(2) Disassemble the package.

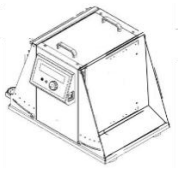
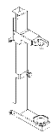
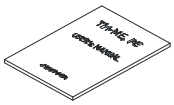
(3) Before using the instrument, please check carefully the damages in transit.

(4) If there is any problem with the instrument, please contact our JEIOTECH sales department or the seller.

3.2 Confirmation of the Separatory Funnel Shaker

(1) Please check the following components after unpacking the instrument.

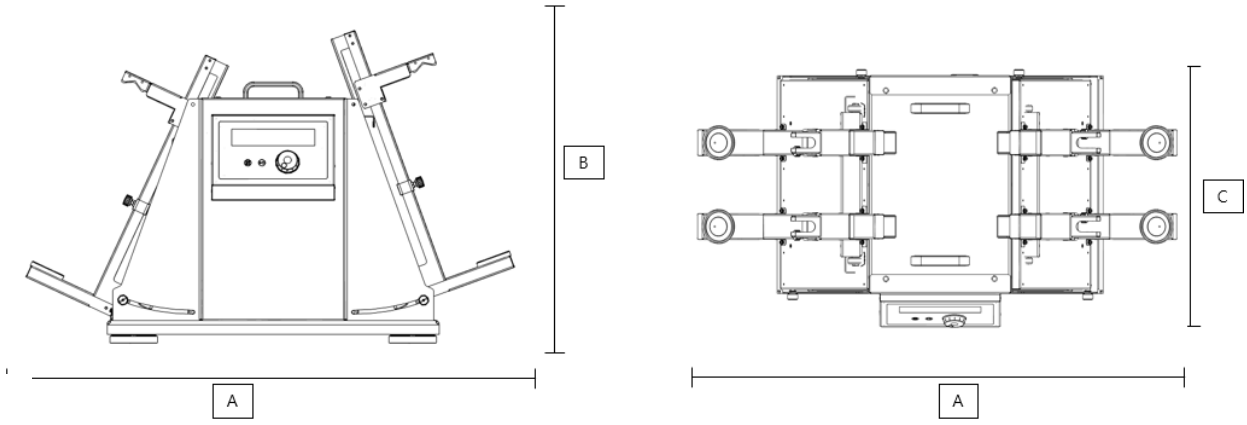
(2) If damaged or missing components are found, please contact the JEIOTECH sales department or seller.

Item	Figure	Quantity	Description
Main Body		1	RS-2 Main Body
Separator Funnel Holder		4	RS-2 Holder
Power Cord		1	-
Operation Manual		1	-

3.3 Installation Conditions for the Separatory Funnel Shaker

3.3.1 Minimum Required Space

When installing this instrument, you need to figure out the Shaker’s size and rotational radius precisely. When installing this instrument, adjust the main body's angle firstly. Then, you need to consider the power cord space of the rear of the main body and the separatory holder's space that is mounted on the main body. Please check the free space size of the instrument's each model.



Required installation space according to the separatory holder's slope

Dimension (mm) / Model	A	B	C
RS-2, Vertically stand up the Separatory holder (90°)	773	670	490
RS-2, Inclined the Separatory holder for 70°	900	620	490

NOTICE

- For 2,000 ml-level separatory funnel, the required installation space is 480 mm high and ϕ155. The cocks are designed to be accommodated to the instrument's separatory holder's base with ϕ166 of diameter.
- For the 2000ml-level funnel, the maximum height of space B is shown when the instrument is placed at the upward direction.

3.3.2 The environment condition of the Instrument's Installation

When installing the instrument, please satisfy the conditions as shown below.

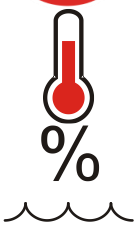
⚠WARNING



• Install the instrument on a solid and flat floor in a safe laboratory facilitated with safety equipment.
• Do not install the instrument where flammable gas may leak.



- Do not expose it to direct heat sources or direct sunlight.



- Maintain a temperature between 5°C and 40°C (41°F to 104°F).

- Keep the relative humidity below 80%.



- Maintain an altitude less than 2,000 m (6562 ft) above sea level.



- Make sure to use grounded power.

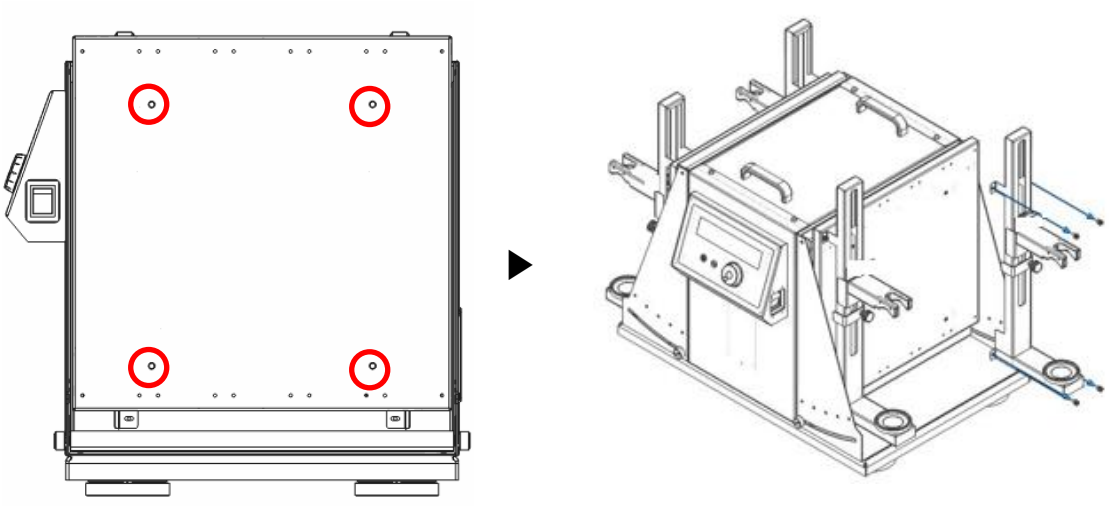
3.4 Installation of Separatory Funnel Holder

3.4.1 Additional Separatory Funnel Holder Installation

(1) To prevent loosening of each bolt, insert the washer provided as shown below. To fix one funnel holder to the shaker base, you need four bolts to be inserted.

(2) When installing the funnel holder to the shaker base, align it to the desired place and insert the washer to the upper and lower sections of the two bolts respectively.

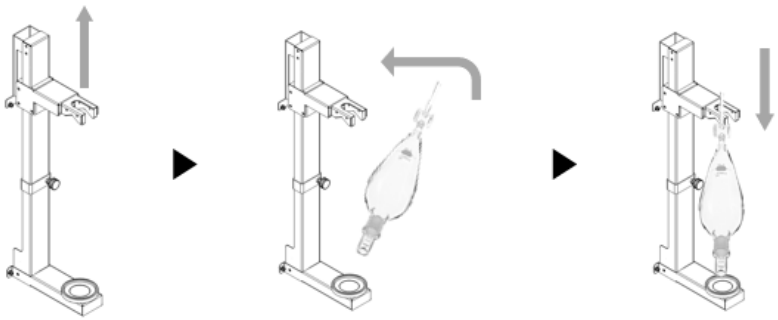
(3) When the installation is completed, now it is time for you to experience the efficient shaking using RS-2.



NOTICE

- Check the number of loadable separatory funnels per capacity at a time in chapter 7.1.1 (page 26).

3.4.2 How to Use the Separatory Funnel Holder

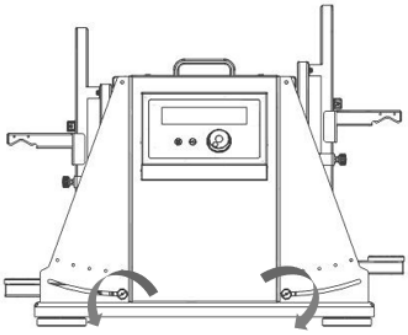


(1) Lift up the fixing plate of the separatory funnel holder to the top of the column.

(2) Place the separatory funnel on a silicon rack and make it stand perpendicular to the separatory funnel holder.

(3) Place the top of the fixation plate to the separatory funnel holder and lock the separation prevention lever and then check the fixing state of the funnel.

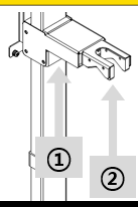
(4) Loosen the knob located at the bottom of the front of the product, adjust the inclination of the separator funnel, and lock the knob for adjust the angle of the separator funnel.



NOTICE

- The locking/unlocking directions of the angle adjustment knob used for tilt adjustment operate oppositely on both sides.

⚠CAUTION



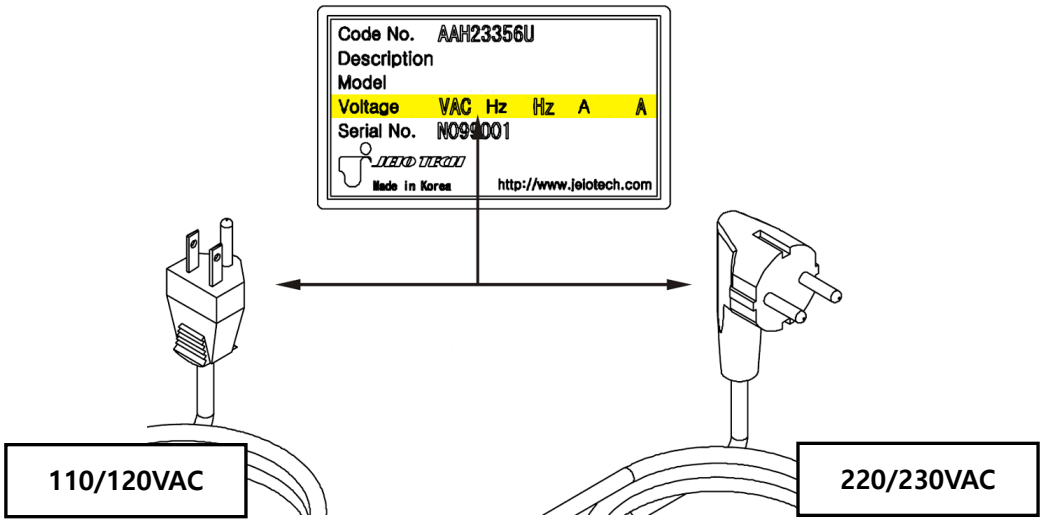
When lifting the fixing plate to fix the separator funnel, moving the part ①. The fixing plate include special design is applied to prevent safety accidents, so if you hold ② part with your hand and lift it, the fixing plate does not move.

⚠ CAUTION

- When removing the separator funnel from the product, place the angle adjustment knob back in the vertical direction (90°), and isolate the separator funnel. At this time, be sure to assist the separator funnel by hand to prevent impact.

3.5 Power Connection

The shaking incubator manufactured by JEIOTECH has a single-phase grounding plug. As shown in the figure below, please check the identification label of the instrument and use the appropriate plug for the voltage used. The voltage is ±10 % of the applied voltage.



⚠ WARNING

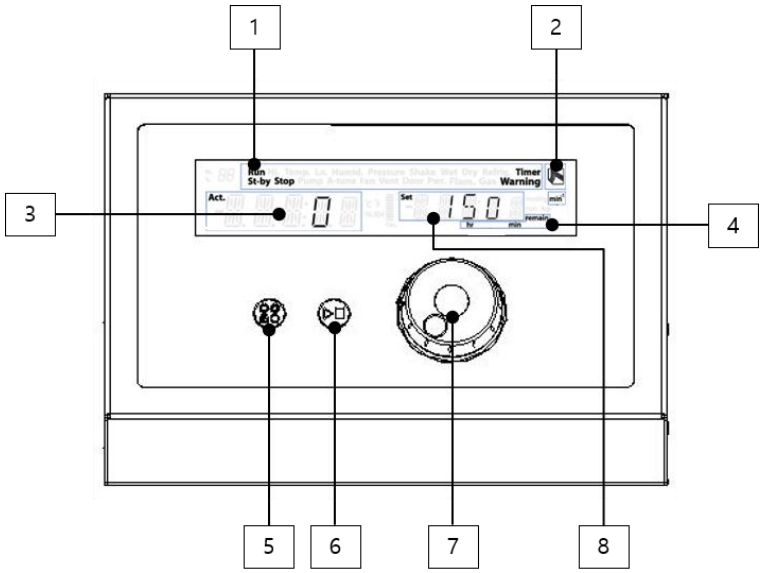


• Before installing the product, you should check the voltage, phase and capacity of the power source and connect it correctly.
• Never use branch sockets or double taps.
: Over-currents can cause damage/fire to cables or instrument.
• Be sure to use a grounded power source.

4. Operation

4.1 Name and Functions of Control Panel

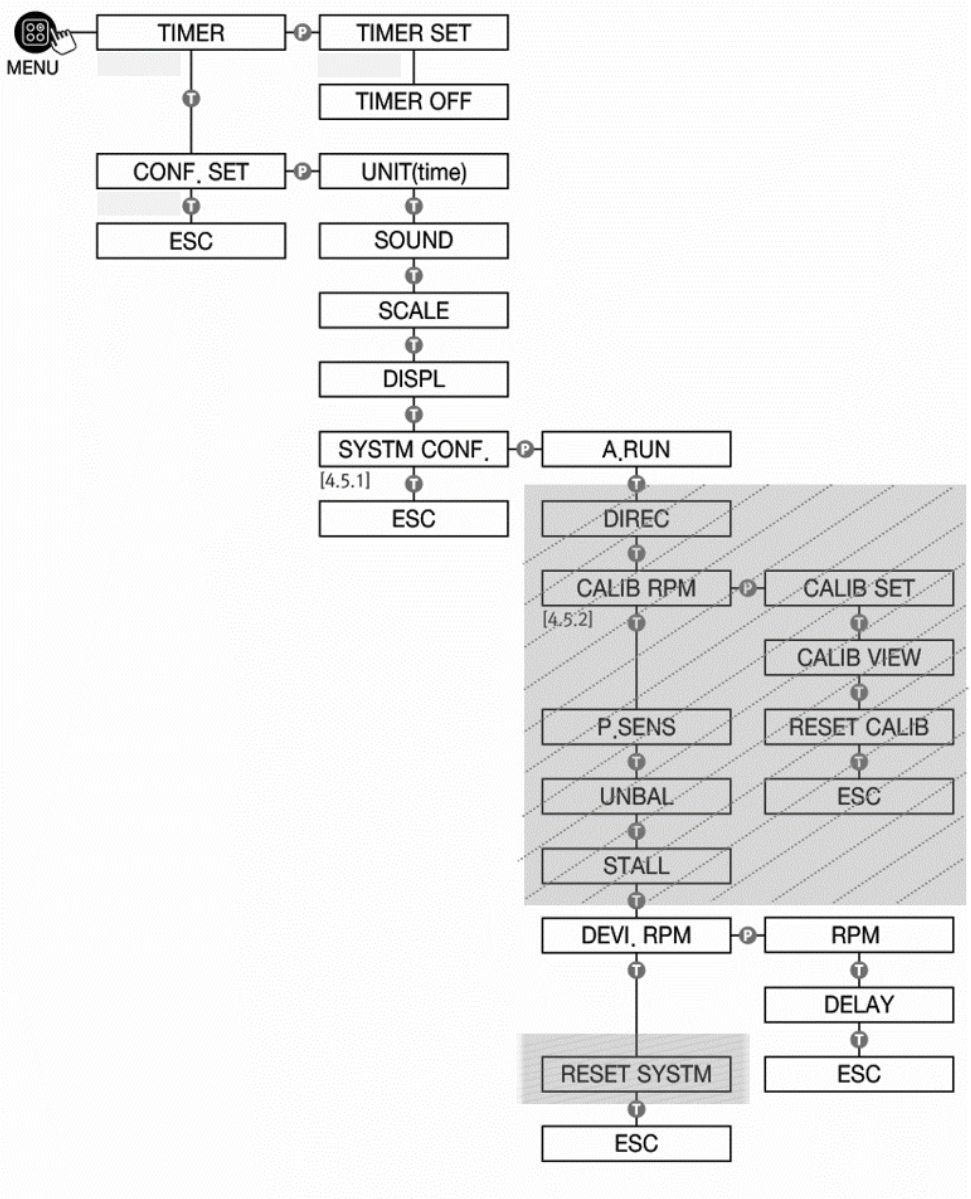
The control panel for this instrument consists of the default display (VFD), Dial Knob and Membrane buttons for setting the equipment's operation. When you power the instrument, the home screen will appear as below.



1	Status Display	Displays the operating status of the current instrument • Run : the instrument is running • St-by : the instrument is in stand-by status • Stop : the instrument is stop • hr /min: display the time in hr/ min • remain : display the remaining time of the Timer
2	Logo(Lab Companion)	The Lab Companion's logo will flash when the communication protocol is connected.
3	Actual Display	• Display the current instrument's shaking speed • Display item when setting the menu
4	min^{-1}	Display the number of rotation per minute (= rpm)
5	Menu Button	• Timer and preference settings of the instrument • Cancelling the setting
6	Start/Stop Button	Start/ Stop the instrument
7	Control Knob	Knob TURN • During the operation: To set the value of display (Set RPM or operating time). • Setting the value • To explore the menu Knob PUSH • To input the selected item • To check the status
8	Set Display	Display the shaking speed or set value of the menu

4.2 Menu Structure

The setup of the instrument has the following structure.



⚠ CAUTION

- DIREC, CALBI RPM, P.SENSE, UNBAL, STALL, DEVI.RPM, RESET SYSTEM in the “SYSTM CONF.” are the items that are not related to this instrument (RS-2). Please do not modify the set values.

4.3 The Basic Operation

4.3.1 Supplying the Power

All the LED of the VFD will be illuminated when you turn on the power switch, and the main display will appear after “JEIOTECH” logo displays for 3 seconds.

4.3.2 Start and Stop the Shaker

(1) When the instrument is stopped, check the shaking speed (RPM) in the display.

(2) Press the Start/Stop button in the instrument's stopped status, to reach to the target shaking speed.

(3) Press the Start/Stop button in the instrument's running status, to decrease the shaking speed or stop the shaking operation.

4.3.3 Setting the RPM

(1) If you press the control knob (a.k.a knob) one, the value of the display will be blinking.

(2) Rotate the knob to change the setting value.

(3) Press the knob to save the changed value.

⚠WARNING

- When changing the separatory funnel, wait until the instrument is completely stopped.
- Do not leave the instrument until the shaking speed reaches to the target value.
- The maximum shaking speed (RPM) could be different from the set value depending on the loaded separatory funnel capacity.

Category	Separatory Funnel Capacity	Minimum RPM	Maximum RPM	
			Vertical(90º)	Inclined(70º)
Double side	2ℓ x 2, 2ℓ x 2	30	300	250
	2ℓ + 1ℓ, 2ℓ + 1ℓ	30	300	250
	2ℓ, 2ℓ	30	300	250
	1ℓ, 1ℓ	30	300	250
	No Load	30	300	250
Single side	2ℓ x 2	50	300	250
	2ℓ + 1ℓ	40	300	250
	2ℓ	30	300	250
	1ℓ	30	300	250

4.3.4 Checking the target shaking speed and the operation time

(1) When the instrument is in the basic operation, the target shaking speed will appear in the display. If you would like to know the operating time, turn the knob to the right.

(2) The time for displaying the operating time can be changed by setting the menu [4.5 Instrument Settings]>> DISPL.

Return	Return to the display the target shaking speed after 3 seconds.
Fix	Return to the display the target shaking speed only after rotating the knob to the left.
Auto	Display the target shaking speed and operating time in rotation every 3 seconds.

NOTICE

- Press MENU button to cancel the operation while setting the shaking speed.
- If you change the shaking speed during the operation, the instrument will instantly change its shaking speed according to your input. Complete the settings by pressing the knob.
- If there is no input for 50 seconds while you are setting the value, the instrument will automatically save the current shaking speed.
- However, if the instrument is stopped intuitively by a user or intuitively by power outrage, the shaking speed which was changing will not be saved.

4.4 Timer Operation

You can stop the instrument automatically by setting the timer. Set the value by pressing the menu button. Then, the “Timer” will appear to the top right corner of the VFD.

4.4.1 Setting the Timer

(1) Press the Menu button once. The “TIMER” will appear to the display.

(2) Enter the timer setting menu by pressing the knob.

(3) Press the knob after selecting the menu “TIMER SET”. Then, the ‘hour’ value will be blinking.

(4) After changing the ‘hour’ value, press the knob to set the ‘hour’ value, then the ‘minute’ value will be blinking.

(5) After changing the ‘minute’ value, press the knob to set the ‘minute’ value. When the timer setting is completed, you can check the value of the timer.

(6) You can escape the timer settings menu by pressing the ‘menu’ button, or by rotating the knob to the right, or by selecting the ‘ESC’ item.

(7) Press the ‘Start/Stop’ button to operate the instrument with the timer you have set.

NOTICE

- If you cancel the timer settings during the ‘minute’ setting, the ‘hour’ value of the timer setting will also be cancelled. The ‘hour’ value cannot be saved solely.
- The timer’s unit of (2) and (3) is “HHH:MM”. You can set the timer’s unit as “MMM:SS” to set the minutes and seconds respectively.
- When the timer is started, the default displaying value will be the remaining time of the timer. (Please be aware that it will not be the shaking speed.) You can simply rotate the knob to check the shaking speed.
- You can set the timer even while the instrument is operating. The process is same as the above process (1) ~ (6). If you escape the menu after setting the timer’s value, the timer will be started.
- If you change the timer’s value while the timer is already activated, you are changing the previous timer’s value. Therefore, the remaining time will be re-calculated by subtracting the operated time from the newly input value. If you would like to use a completely new timer that starts with the point you change the value, you need to re-set the timer after turning off the current timer.

4.4.1 Turning off the Timer

(1) Press the ‘menu’ button once. The currently saved timer value will be displayed.

(2) Enter the timer settings by pressing the knob.

(3) Press the knob after selecting the “TIMER OFF” item.

(4) Escape the menu by pressing the “TIMER” button, by selecting the “ESC” item, or by pressing the knob.

NOTICE

- If you turn off the timer while the timer is activated, the instrument will start with the basic operation mode.

4.4.2 Termination of the Timer

(1) After a timer’s set period of time, the operation of the shaker will be stopped and “TIME END” will appear with an alarm sound.

(2) Go to Main screen by pressing the knob.

4.5 Instrument Settings

After pressing the “MENU” button, you can set the instrument’s operating environment in the “CONF. SET” menu.

1	“UNIT” (Time Unit)	Timer and the timer’s unit settings (“HHH:MM” or “MMM:SS”)
2	“SOUND”	Setting the system’s electronic sound to be activated or to be mute
3	“SCALE”	When setting the value of shaking speed (RPM), the increase or decrease the value in its units • Unit: 1, 5, 10
4	“DISPL” (Run Display)	The type of displaying information to the Set Display during the operation (shaking speed, operating time) [Refer to Chapter 4.3.4 (Checking the target shaking speed and the operation time)] • **Return**: Return to the “Default Display” screen 3 seconds after rotating the knob. • **Fix**: Fixing the display that the user selected with the knob’s operation. • **Auto**: Displaying the shaking speed and the operation time in turns every 3 seconds.
5	“A.RUN” (Auto Run)	Set up the Power-cut Back-up Feature • When the power outage is happened during the instrument’s operation, the system settings can be returned with the back-up system. (The time information will not be restored) * Default :ON
6	“RESET” (System Reset)	Factory initialization of the set up values that the user manipulated.

NOTICE

- If you press the MENU button while changing the set-up values, you will go to the previous step. If you press the MENU button while navigating the MENU, you will go to the Main screen.

⚠WARNING

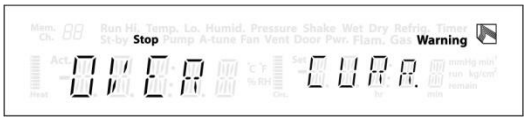
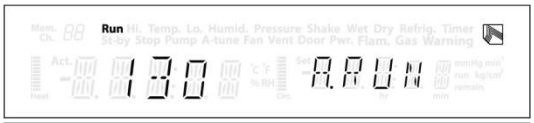
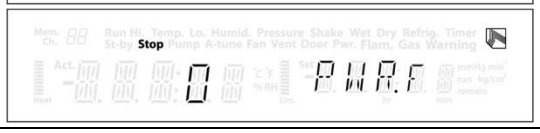
- NEVER use the RESET feature. If you use the RESET function, both the settings you want to change and the factory-set values will be initialized, causing the instrument’s problems. If you see the ERROR message because of the RESET function, please contact the JEIOTECH customer service department.

4.6 Warning and Fault Messages

This instrument has an exception handling feature by notifying the user when it detects an abnormal situation. The instrument uses audiovisual alerts to the user. The abnormal states can be notified with either Warning or Fault Messages depending on its severity.

4.6.1 Warning Messages

When the Warning Messages are generated with audiovisual alerts, the instrument continues its operation. If you press the knob, the alarming sound will disappear and the visual notification persists until the problem is resolved.

1	Over Current	The instrument will stop its operation for protecting the equipment when the system consumes more current than the allowed current. The main causes of the over current are heavy-shaking operation, or entrapment of objects in the shaker, etc. 
2	Auto Start	Notifying that the power has been resupplied after its outrage while the instrument was running. In the environment settings, if you set the A.RUN as ON, “A.RUN,” will appear to the display, while “PWR.F” will appear if you set it as “OFF.”  

NOTICE

If you set up the Sound as OFF in the Configuration, the warning sound will not be alarmed.

5. Maintenance

5.1 The Inspection Cycle

Category	Inspection Cycle				
	Daily	**Weekly**	**Monthly**	**Quarterly**	**Yearly**
Power related					
Checking the connection between the instrument and the power	•				
Checking the damage of the power cord	•				
External cleanliness		•			
System-related Items					
Checking the main body and the funnel holder's the connection and their assembly	•				
Check for shaker's abnormal operation			•		
Check the synchronization when the instrument is connected to a smartphone device	•				
Check controller's functionality and timer operation				•	

5.2 Cleaning the Instrument

(1) When cleaning the instrument, unplug the power cord from the power outlet. Wipe out only the contaminated part with a low boiling point alcohol solution (methanol, ethanol) using a soft, dry towel.

(2) Do not use acid solutions, benzene, sharp objects, soapy water, cleaning agents, or hot water, etc. This can cause discoloration or damage to the surface of the instrument. Rubber or plastic parts can be distorted discolored. In particular, never use volatile substances. Be sure to wipe it with a dry cloth when using a neutral detergent. It has to be completely dried after the cleaning.

(3) Do not pour the water to the instrument directly while cleaning the surroundings (especially socket and the controllers). It can cause short-circuit problems.

(4) In case of cleaning or decontamination of the instrument in a way other than those specified in this manual, the user should check the appropriate method with JEIOTECH to prevent damage to the equipment.

(5) When handling the electrical components inside the instrument, it must be handled by a JEIOTECH employee or a person delegated by JEIOTECH.

(6) If parts exchange is required, only genuine products should be used.

(7) Failures beyond the normal limits may not maintain the technical repair.



⚠WARNING

- Do not soak the instrument into the water, or spray water to the equipment.

⚠ CAUTION



- Do not wipe the entire instrument with chlorine bleach or chlorine-containing detergents, abrasives, ammonia, iron loofah, and low boiling point alcohol solvents (methanol, ethanol).

6. Troubleshooting

6.1 Troubleshooting for Abnormal Situations

Trouble	Probable Cause & Solution
Power is not coming in.	① Make sure that the power cable is plugged in tightly. ② Check for the power loss. ③ If it is not resolved by the above methods, refer to the customer service.
The controller is not illuminated even when the power switch is turned on.	① Check the connection of the power plug. ② Check the switch breaker, restore it to its original state if needed, and turn on the power. ③ If the display board or the main board is defective, refer to the customer service. ④ If the power switch is defective, apply for the customer service.
Shaker-related Abnormality	① If the instrument vibrates severely or operates slowly during the operation, make sure that the samples are not tilted to one side and, if necessary, reposition the samples in a well-balanced manner. ② Make sure the samples are not overloaded by checking the maximum load per shaking speed in chapter 7.1.1. ③ If the shaker does not start when you press the Start button, please check for the door switch. ④ If the shaker does not start when you press the Start button, make sure the timer is not in the "End" state and, if necessary, cancel the timer settings. ⑤ If the "Warning" message appears during the operation, please check the causes and change the settings by referring to the chapter 4.6.1 if necessary. ⑥ If none of the above solutions do not work, please contact the customer service.

In case the noise is loud	① Check the fixation of the samples in the separatory panel holder. ② Make sure the samples are not tilted to one side and position them in a balanced position. ③ If the solutions above do not work, please refer to the customer service.

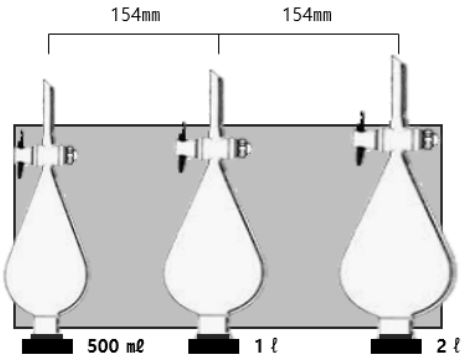
7. Accessories

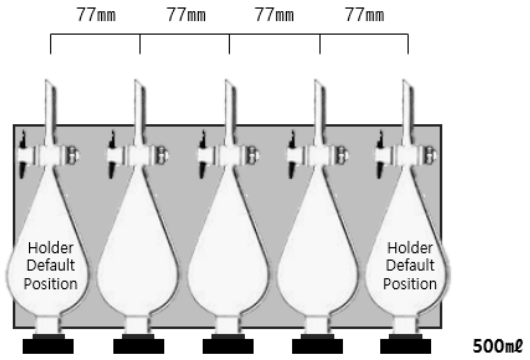
7.1 Accessory

Category	**Device**	**Cat. No.**
Holder	Separatory funnel holder	AAA32502

※ For an Accessory exchange, please visit the JEIOTECH website (http://www.JeioTech.com) or contact the sales department or the seller.

7.1.1 Specification of Separatory Funnel Holder





100㎖ ~ 2,000㎖ based on funnel flask are different for each manufacture, it is necessary to check the dimensions when using more than 1,000㎖.
Holder can be installed on one side of a total of 5 pieces and we will provide 2 pieces on one side as standard.

Category	Cone type	Cylindrical type
under 500㎖	6 ~ 10 ea	6 ~ 10 ea
500㎖	6 ea	6 ea
1,000㎖	6 ea	6 ea
2,000㎖	4 ea	4 ea

There are maximum number of loadable funnels depending on the funnel holder's capacity.

Category	**Number of Loadable Cone type**	**Number of Loadable Cylindrical type**
Less than 500㎖	6 ~ 10	6 ~ 10
500㎖	6	6
1,000㎖	6	6
2,000㎖	4	4

7.2 LC GreenBox (Option)

LC GreenBox is a device that connects several instruments manufactured by JEIOTECH into a single network enabling an experimenter to operate the equipment more efficiently.
After connecting the instruments to LC GreenBox, you can use the LC Connected service which enables mobile mentoring and control of the equipment's current operating status and faults.
(You can connect up to four devices to one LC GreenBox.)



Item	Cat. No.	Dimension (W x D x H, mm)	Figure
LC GreenBox	AAAQ1011	156 x 94 x 100 (with antenna)	

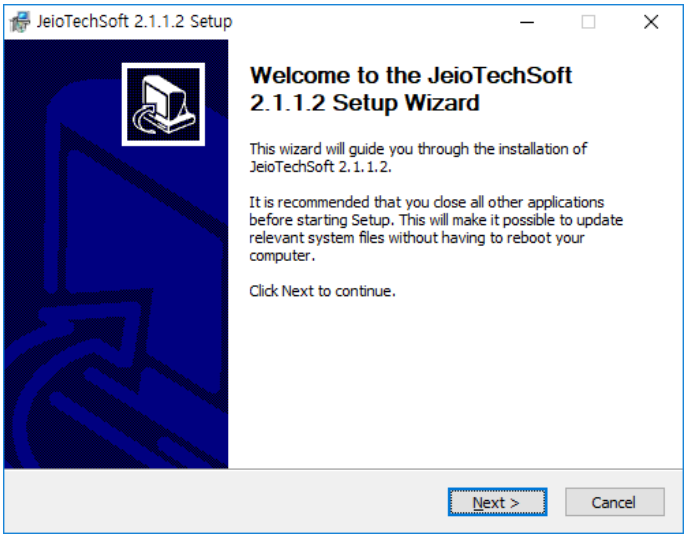
8. Dedicated Software

8.1 Installing the Monitoring Program

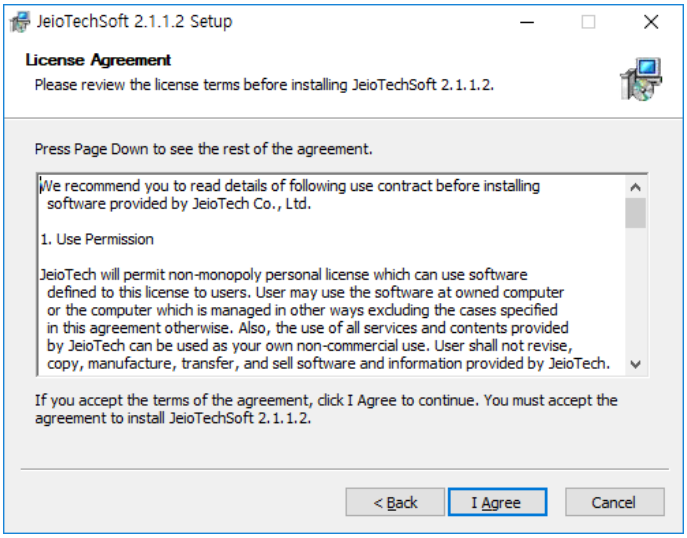
(1) Insert the installation CD into the CD-ROM drive and the installation program will automatically start. Alternatively, download the installation program from the JeioTech website and run the installer.

Visit the website below and go to the “Software Download Page” to download the “JeioTechSoft” installer.
JeioTech website : www.JeioTech.com

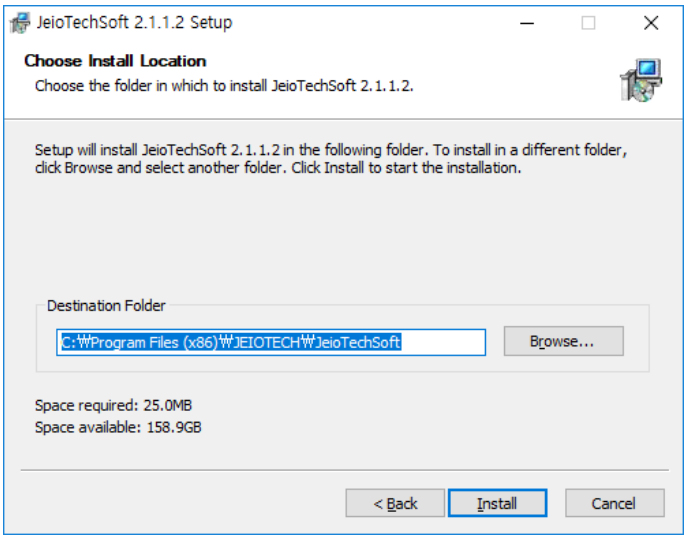
(2) Click the “Next” button to switch to the License agreement screen.



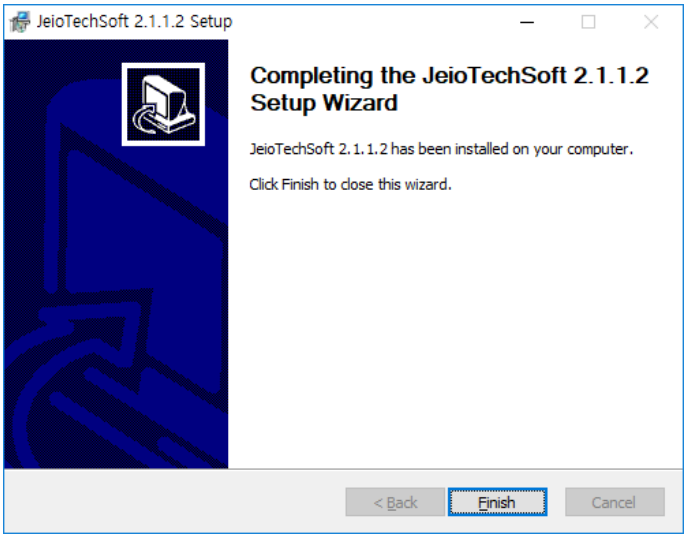
(3) Before installing JeioTechSoft, review the contents of the License and click the “I agree” button.



(4) After specifying the save path, click the “Install” button to start the program installation.

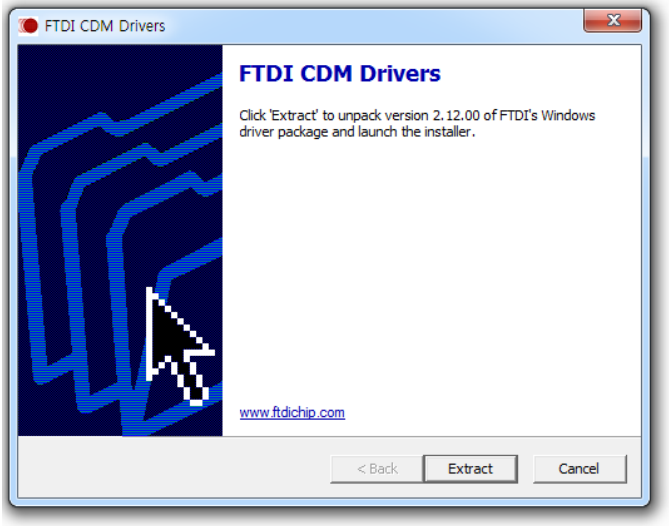


(5) When program installation is completed, the following will be displayed and JeioTechSoft icon will be created on the desktop.
Check the list box of “Run JeioTechSoft 2.1.1.2” or double-click the icon on the desktop to run the program.



(6) When the instrument and PC are connected with the USB cable provided with the equipment, the USB driver used by the equipment is automatically installed on the PC connected to the network. If the PC is not connected to the network or the automatic installation does not work, find the USB driver installation file (CDM vx.xx.xx WHQL Certified.exe) in the S/W CD provided and install it as follows. The USB driver installation file is software provided by FTDI, and JEIOTECH Co., Ltd is not related to any direct or indirect damages caused by installation and use.

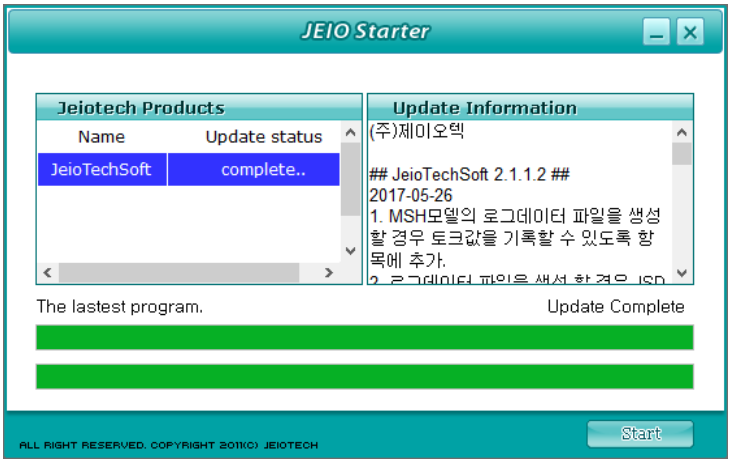
The URL below is the website where you can download the driver.
http://www.ftdichip.com/Drivers/D2XX.htm



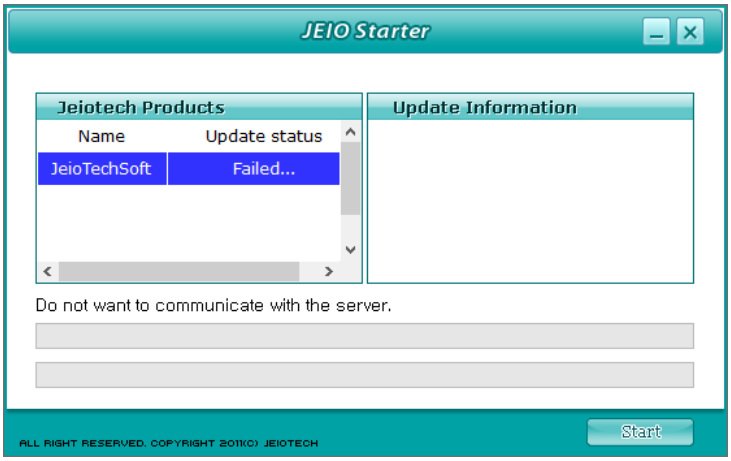
8.2 Program Execution and Equipment Connection

(1) Double click the “JeioTechSoft” icon ( ).
If the update is needed by checking the current version, the update will proceed.

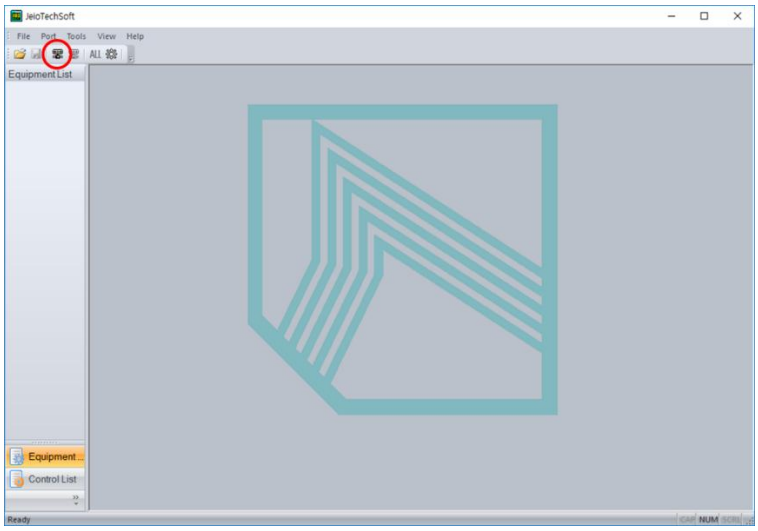
- If the update is successful, “complete” appears. Click the “Start” button to start the updated version of the program.



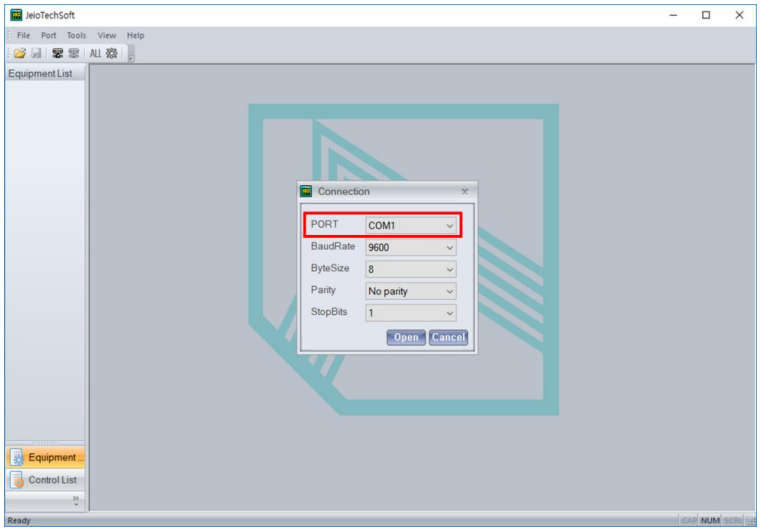
- If the update fails, “Failed” appears. After clicking the “JeioTectSoft” item, press the “Start” button to start the existing version of the program.



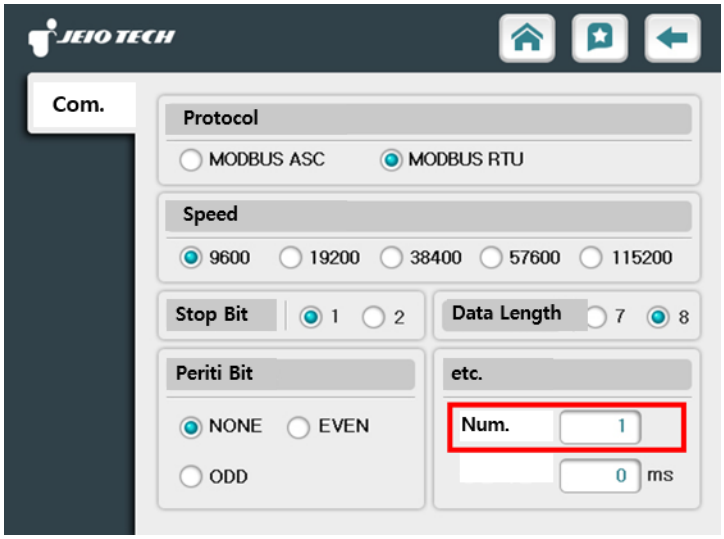
(2) After connecting the equipment and PC, click the connect icon.



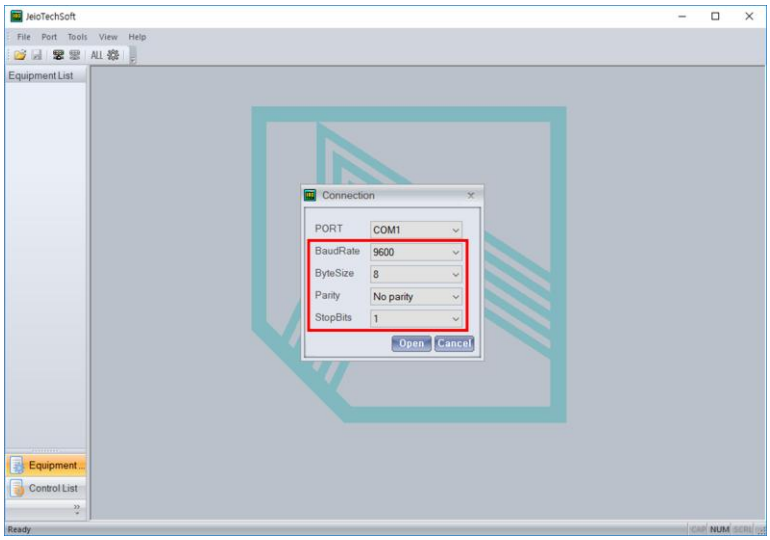
(3) Select the communication port (PORT) connected to the equipment.

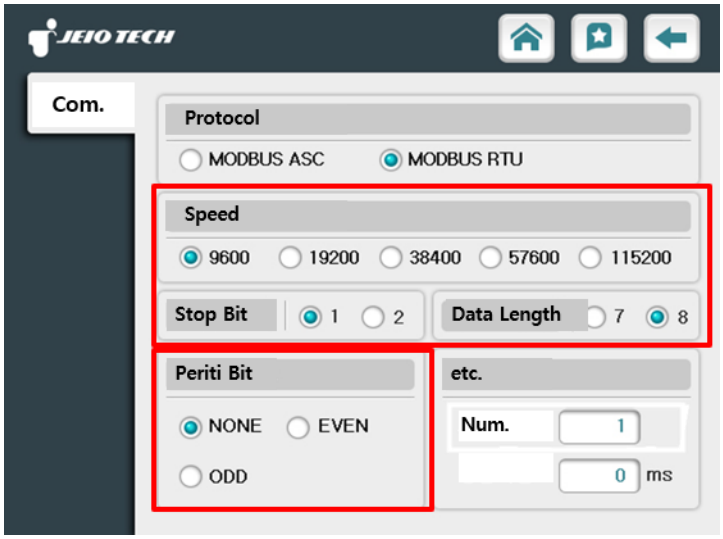


(4) Go to Environment Setting > Communication, then enter the “Device number” as the same number to the PORT number selected from (3).

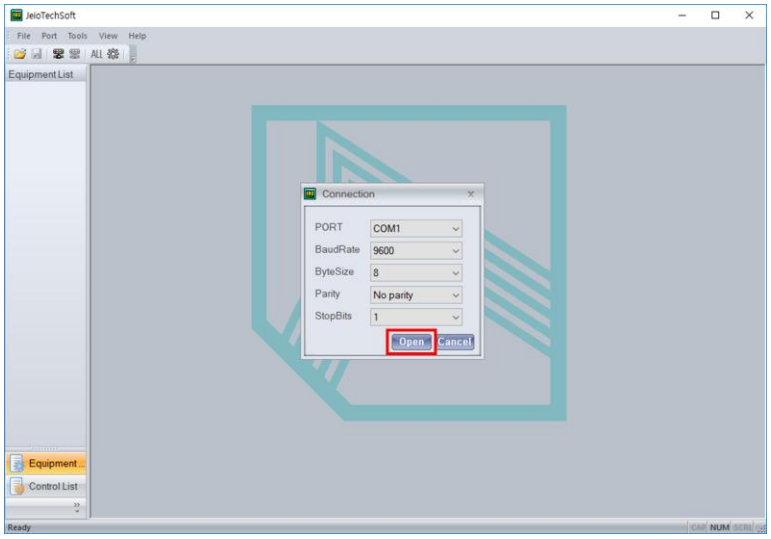


(5) In the JeioTechSoft program, enter the values of “BaudRate”, “ByteSize”, “Parity”, “StopBits” same as the values of “BaudRate”, “ByteSize”, “Parity”, “StopBits” that are saved in ‘Environment Settings> Communication.’





(6) Click the “Open” button in the “JeioTechSoft” program.



(7) Once the communication is connected successfully, you will see the same device image on your personal computer.

9. Appendix

9.1 Technical Specifications

Product Name		**Funnel Shaker**
Model		**RS-2**
Shaking System		
Motion Type		Vertical & Inclined Reciprocal (90°~70° variable)
Speed Range(rpm)		Vertical: 30 to 300 Inclined: 30 to 250
rpm control at 100rpm(± rpm)		1
Amplitude, recip. Stroke length(mm)		40
Timer		999hr 59min
Dimension		
Exterior (W x D x H, mm)		600 x 460 x 470 mm
Max. load per each side (kg)		5
Net Weight (kg)		51.5kg (The total weight of main body and the four separatory funnel holders) (each separatory funnel holder, 750g)
Electrical data & Ordering No.		
100~240V 50/60Hz		0.88A MAX.
Cat. No.	Main body RS-2	AAA32021
	Separatory funnel holder	AAA32502

9.2 Disposal of the Instrument

Before disposing a product or its component, please be aware of the followings.



(1) This product is potentially hazard when exposed to biological, chemical, or radioactive materials, so it must be cleaned up to protect disposal personnel, waste collectors, and environment.

(2) Please contact a person who is in charge of disposing of the products to check the electrical, electronic and material disposal standards. When you request externally, it is recommended that you contact to your company's vendor or a testing equipment manufacturer that can properly dispose the laboratory equipment and its components.

9.3 Warranty

9.3.1 Warranty period

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

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

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

9.3.2 Technical Service Contact Points

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

9.3.3 Certificate of Product Warranty

This is a guide to the product quality warranty and service terms provided by JeioTech 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, JEIOTECH 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, JEIOTECH's liability under this warranty is limited to replacing the product or refunding the original purchase price at JEIOTECH'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 JEIOTECH Co., Ltd. Additionally, the warranty period is not extended due to free repairs. JEIOTECH 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 JEIOTECH Co., Ltd.
* Malfunctions caused by using consumables or optional components not specified by JEIOTECH Co., Ltd.
* Repairs performed by personnel other than JEIOTECH 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 JEIOTECH 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.
• JEIOTECH 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.
• JEIOTECH 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 JEIOTECH unless explicitly labeled as a "Warranty Amendment" and signed by an authorized representative of JEIOTECH.

• 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 JEIOTECH.
• This warranty does not apply to consumables and is non-transferable.

• The contents of this manual can be changed without prior notice to improve product performance and deliver accurate information.
• The copyright of this manual belongs to JEIOTECH.