

Operation Manual

Clean Bench

Model : BC-01B, BC-11B, BC-21B

Manual No. : B1331L002 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.

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

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1.0 Safety

1.1. How to use manual

1.1.1. Introduction

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

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

1.1.2. Chapter summary

The Functional Description chapter outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the unit.

The Operation chapter includes a description of controller features, key name, product operation information

Maintenance sections are included a description of product cleaning, moving, storage.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, warranty and Jeio Tech technical support contact information

1.1.3. Model number nomenclature

The following describes the model number nomenclature used in throughout the manual.

Clean benches	BC-B type series		
Model	BC-01B	BC-11B	BC-21B

1.2. Responsibility

This unit has been designed to ensure maximum safety of the user, when used under normal conditions and in compliance with instructions during operation.

All users are required to run the device according to this manual. The user of the device should be fully aware of the safety rules marked on the equipment and all the attention • Warning • Risk on the manual should be complied.

1.2.1. General Liability

In any case, safety is the first priority. The owner of the machine, user, and/or maintenance personnel must be fully aware of the safety which is the most important part of our everyday business.

If you are concern about the loss in efficiency, remember that accidental impact is always negative for the effediveness of covering human resources and property. Effective safety program is the most obvious way of increasing efficiency and productivity.

Ensuring and maintaining the safety of the equipment by checking it daily in addition to the regular maintenance of the unit is a shortcut to improving the productivity. The users must read this manual describing the functions and safety points of each part as a guided for safe operation.

1.2.2. Responsibility of the users

Users' responsibility does not end with efficient experiments and production.

Users are most well- known for the machine's performance and the limit because they are the ones running the machine most of the time. The safety of the user's maybe be easily be forgotten by the needs of efficiency or familiarity of using the device for a long time. Precautions with regards to safety in the manual, or by other displayed safety information do not protect the users from injury while they are using the device.

Always read the safety instructions and run the unit safely. In addition, the potential for dangerous situations always should be reported immediately to colleagues and superiors

Things to read

- Do not touch any part of the body to the dangerous part of the device.
- Make sure the supply power voltage, Phase, and capacity.
- Do not operate or service, adjust the device until you receive adequate training or are fully aware of the capabilities of the device.
- Remove unnecessary things, sample, or chemicals from this unit
- When the unit does not operate normally or are neglected from use for a long time check all the settings before operating the equipment.
- Make sure that the unit is operating normally when you move the equipment, or re-use after a long period.
- Stop operating immediately and report to the managers when you find the following states;
 - Unsafe operation and status
 - Shorts
 - Improper maintenance
- When you operating the machine, do not wear loose clothing or jewelry, tie long hair or use hair
- When not in use, turn off the power switch or cut off the power to the instrument by disconnecting the power plug.

1.2.3. Preventative Maintenance

Proper maintenance is essential for safety. The maintenance personnel must be aware of the importance of safety in maintenance of the equipment for effectiveness of the unit.

Before removing or adjusting parts of the device, shut off all the electrical supply, remove accessories. The unit must display a warning that it is working.

Please ensure that the device is properly connected to a grounded outlet

After repair and maintenance, check the work performed and clean tools.

Do not apply the power to the unit until all workers clean the area. The device must be checked if there are no problems with the unit before operating the machine.

1.3. Symbols used in this Manual

The following signal word panels, safety symbols and non safety symbols are used to alert you to potential personal injury hazards or information of importance. Obey all safety messages that follow these symbols to avoid possible personal injury or death.

1.3.1. Signal word panels

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. It consists of three elements: a safety alert symbol, a signal word and a contrasting rectangular background. The following signal word panels are in accordance with ANSI Z535.4-2007 and ISO 3864 standards.



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

1.3.2. Safety symbols

Safety symbols are graphic representations of a hazard, a hazardous situation, a precaution to avoid a hazard, a result of not avoiding a hazard, or any combination of these messages intended to convey a message without the use of words. The following safety symbols are used in this manual.

Mandatory



Read Manual.



Wear a face mask.



Wear gloves.



Wear goggles.

Prohibition



No direct sunlight



No high frequency noise



No corrosive fluids or cleaners



No water

Warning



Electrical shock



Hand crush or pinch



Flammable



Foot crush



General caution



Sharp points



Lifting hazard



Do not take the device apart deliberately.



Check the UV lamp turned off before opening the door.

1.3.3. Non-safety symbols

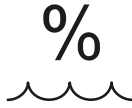
The following graphic representations are intended to convey a message without words or to bring your attention to important information about the use of the Clean bench or a feature.



Permissible ambient
temperature



Altitude



Relative humidity



Earth Ground

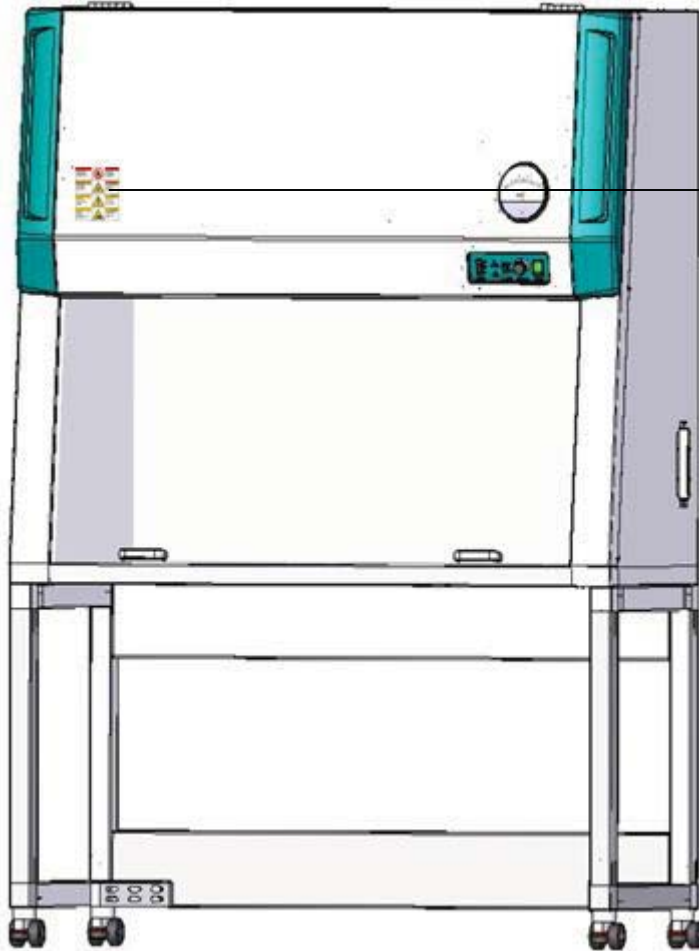


Note

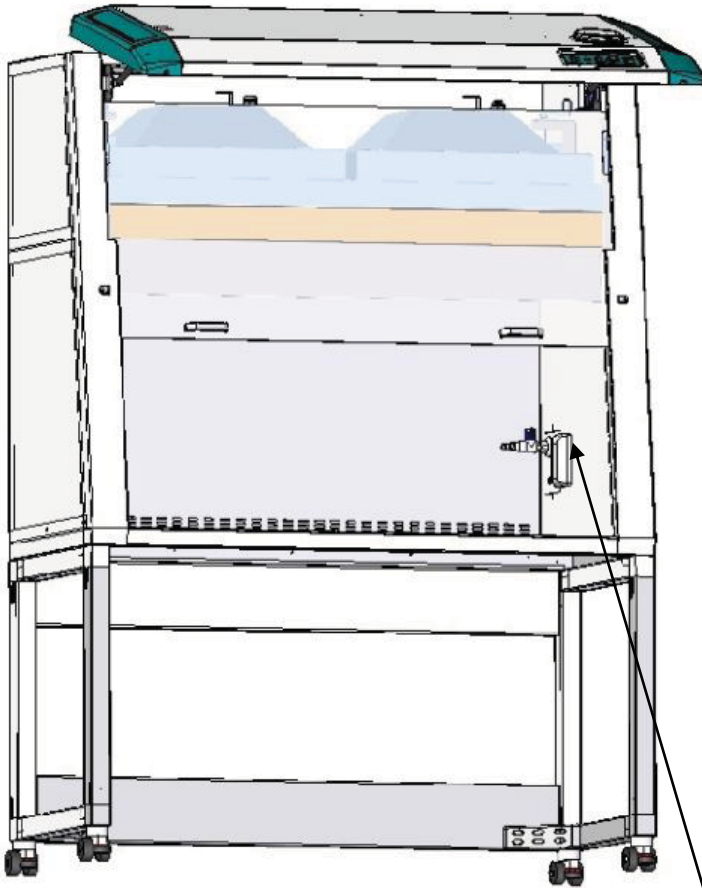
1.4. Labels on the unit

The safety labels are attached to the Clean bench to provide important information about potential hazards and how to avoid them. All users must read this operating instruction carefully to operate the product properly.

The following illustrations show where the safety labels should be attached to the chamber until service of the product is discontinued. If the safety labels are damaged, please contact your local Jeio Tech office or distributor to request new labels.



⚠ 위험 가연성 물질이나 폭발성 물질을 저장하지 마세요.		⚠ DANGER NOT FOR FLAMMABLE STORAGE.
⚠ 경고 문을 열 때는 UV가 꺼졌는지 확인하세요.		⚠ WARNING CHECK THE UV LAMP TURNED OFF BEFORE OPENING THE DOOR.
⚠ 주의 고장 위험 임의로 분해하지 마세요.		⚠ CAUTION BREAK DOWN Do not take the device apart.
⚠ 주의 손조심 문을 닫을 때 손을 주의하세요.		⚠ CAUTION HAND INJURY Hand crush or pinch.



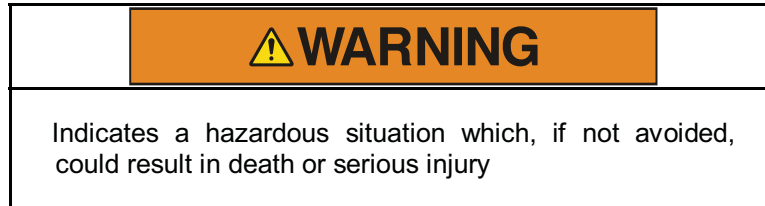
 **CAUTION**
Max. Rated Current : 5A

1.5. Precautions for Your Clean bench (required reading)

Our Clean bench is designed to provide safe and reliable operation when installed and operated within design specifications. Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, contact our Sales Department.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this auto clever, use good judgment and follow these safe practices.

1.5.1. Warning statements



Observe all warning labels.

DO NOT remove warning labels.

Check the voltage, phase and capacity of the power supply and connect properly.

Do not ground the Clean bench to gas pipes or water pipes.

Do not insert multiple plugs into the outlet at the same time.

DO NOT operate equipment with damaged line cords.

DO NOT handle or touch electrical cord and electrical parts with wet hands.

DO NOT move the Clean bench while it is plugged into the power source.

DO NOT use or keep flammable gases near the Clean bench.

Do not install the Clean bench 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 put explosive and flammable chemicals (Alcohol, Benzene, and etc) into the chamber.

DO NOT let moisture, organic solvents, dust, and corrosive gas enter the control panel.

Do not expose the Clean bench to direct sunlight.

Do not expose the Clean bench to direct heat sources.

Do not use the Clean bench in places where moisture is high and flooding can occur.

Do not install the Clean bench near machinery generating high frequency noise

Do not use Clean bench in environments that contain industrial oil smoke and metallic dust.

DO NOT operate damaged or leaking unit.

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

Do not disassemble, fix or change the Clean bench other than for those items described in this operating manual.

When connecting the gas, the connecting should be set by country qualified engineer. Also, gas leaks should be check periodically.

Prohibis the harmful exeriments for human. (Toxic gas generation, Occurrence redioactive substances or wave, biological hazard etc.)

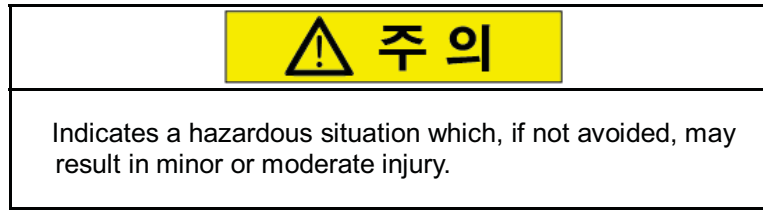
: The air flow is form inner chamber to experimenter. So, the air flow is related with experimenter and laboratory.

DO NOT see UV lamp directly, when lamp is turn on

: Even the UV lamp is automatically turn off, when door open. (User should plug out to check UV lamp). It is possible to get serious damage for user eye when user see the UV lamp, directly



1.5.2. Caution statements



Please install on the sturdy surface laboratory which is set safety facility and make sure horizontal align correctly.

Do not let the product take any strong shock or vibration.

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

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.

Installation power outlet near instrument and may be convenient.

Do not sprinkle insecticide or flammable spray on the product

Please power off while product cleaning.

Do not pour water directly on the outside of product.

Do not clean product by solvent and harsh detergents, please use neutral detergent and smooth cloths.

Do not inject any flammable objects, and conductive objects outside of product hole or vent.

Contact expert when you replace HEPA FILTER

Do not put something on Prefilter and not to close prefilter

Do not work around Clean bench as much as possible during UV Lamp on

Do not give too strong power when you open sliding door

After installation, fix the unit by using stopper

Do connect Plug tightly



Safety symbols are graphic representations—of a hazard, a hazardous situation, a precaution to avoid a hazard, a result of not avoiding a hazard, or any combination of these messages—intended to convey a message without the use of words. The following safety symbols are used in this manual

2.0 Functional Description

2.1. Introduction

The Clean bench filters 0.3 μm with 99.99 % through Leak-tight HEPA Filter and supply vertical Laminar Flow to work surface as Vertical Type Clean Bench) and has excellent performance with UV, automatic keeping velocity, and to know replacement time by checking Hepa filter & UV Lamp.

Applications are as below in the Lab.

- Electronics Inspection / Repair
- General Forensics
- Non-biohazard [Tissue] Culture Maintenance
- Non-toxic IV Solution Preparation
- Plant Tissue Culture Maintenance
- QA/ QC Testing
- Sterile Media Preparation
- Syringe Filling
- Tissue Fixation / Staining Preparation

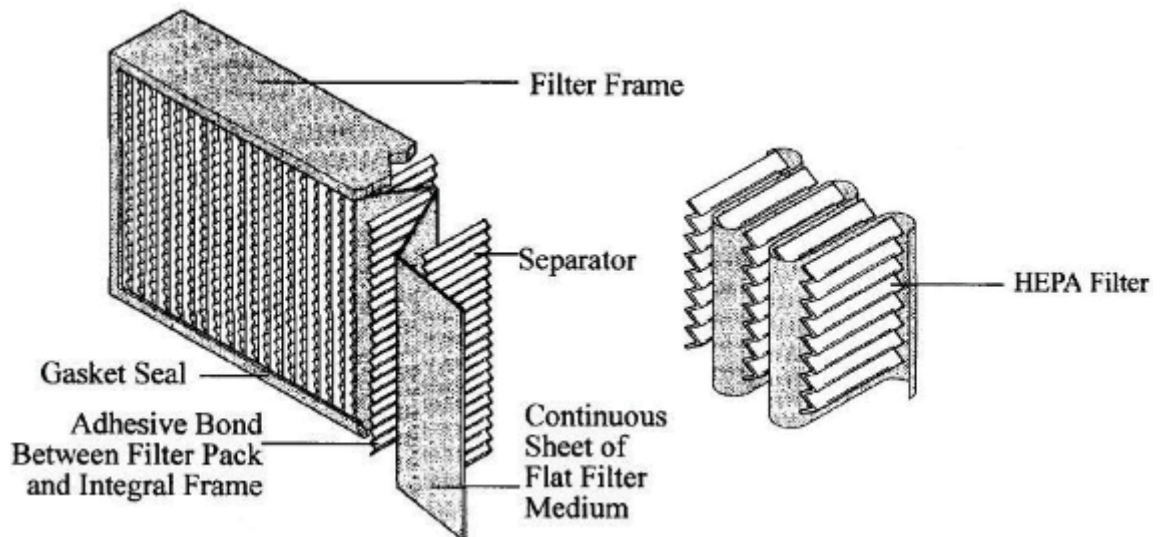
HEPA Filter

HEPA filter is composed of Micro Glass Fiber and remove diameter 0.3 μm particulates with 99.99 % (refer to features) There are some factors which affect to filter's performance that are diameter of fiber, thickness of filter, face velocity.

Contaminated materials should be removed by 5 mechanism that are Sedimentation, Electrostatic attraction, Interception, Impaction, diffusion. But can be removed not gas but particles.

The life of HEPA filter is different from how using it, but normally approximate 10,000hours.

HEPA filter can be broken easily, if filter get damage on the surface of filter, you have to replace the filter or take test for the performance.



Vertical Laminar Flow

Vertical Laminar Flow is way to discharge clean air from filter on the upper side to work surface by forming vertical regular air current.

If there is big sample on the work surface, there is no inhale external air from out side.

Because front door can make positive pressure.

FEDERAL STANDARD 209E, Class 100

It is designed by FEDERAL STANDARD 209E Class 100

Cleanliness class for stardars is below table.

Standard		FEDERAL STANDARD 209E		ISO 146441-1		KS M 9901		KGMP	
Cleanliness class		Class 100		Class4		Class 5		1A (Class 100)	
standard		piece/ft3 (liter)		piece/m3		piece/m3		piece/m3	
Particle	diameter (µm)	0.5	5 0	0.3	0.5	0.3	0.5	0.5~5.0	5.0
	Particle count(piece)	100(3.5)	0	10,200	3,520	10,100	3,500	3,500	0

2.2. Features

2.2.1. Excellent performance

- (1) High reliable clean environmental supply
Removing 0.3 μm particulates with 99.99 % by Leak-tight HEPA Filter.
- (2) High quality Laminar Flow forming
Applied Diffusing Muffler makes forming high quality Laminar Flow.
To go smooth Flow, Slot on the down and inner side of chamber is supposed to shut off by Strip Shield when blower stops. And minimize possibility of contamination in the work space.
- (3) Front Access
To easy regular validation, we designed the unit for easy maintenance.
In additions, there is inlet of GAS(DOP.PAO etc) in front side for test performance of HEPA.
Filter replacement methods is Cartridge type in easy way. (Patent Reg. No. 20-0446561).
- (4) Differential Pressure Gauge
The pressure gauge displays the contamination measure. When the gauge indicates 25mm H₂O more than the first use, replace the filter.
- (5) Silent operation
Noisy level is under 65 db.

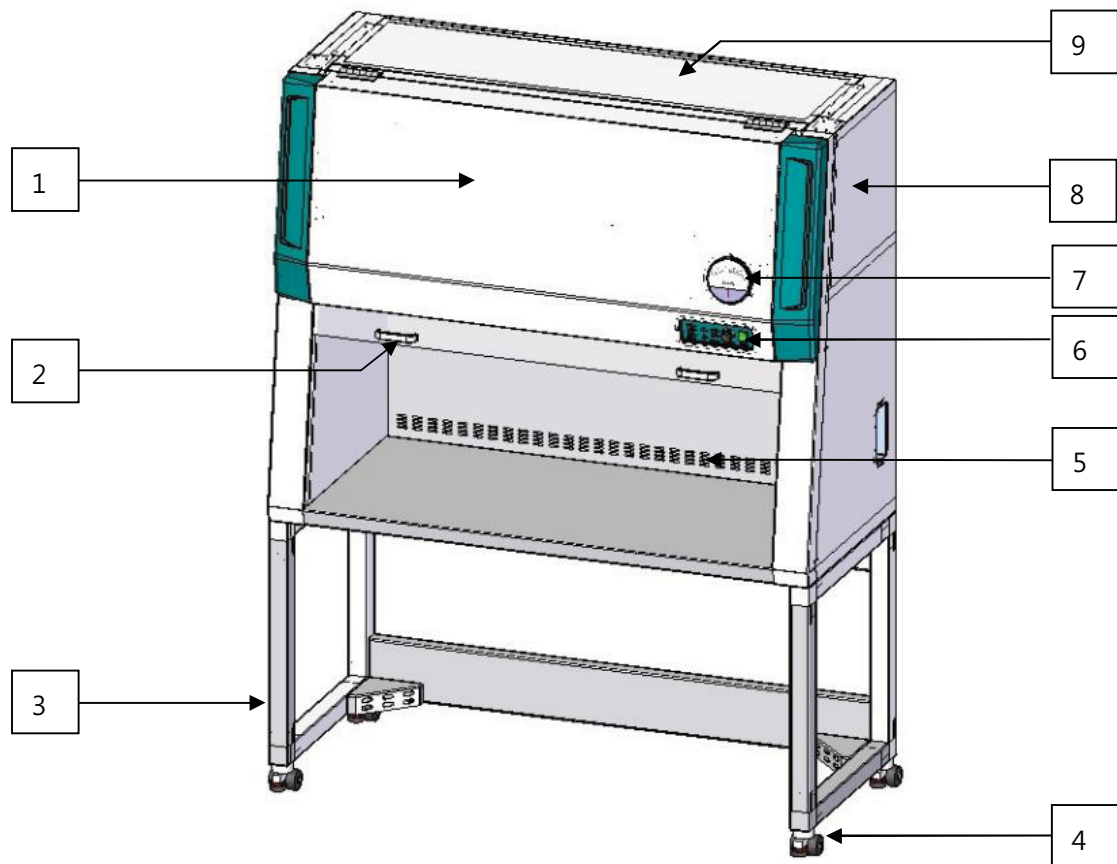
2.2.2. Improved ease of use

- (1) Smart Door System (Patent application)
- (2) It's designed to activate the switch of UV, FL and Blower in UV sterilization mode for ease of use. Instead of a series of actions for the UV lamp on, fluorescent lamp on and blower switch on, only to open the sliding door gently is needed to activate all of actions. Each action including opening the door can be also operated by touching each buttons independently.
- (3) The recessed outlet, valves and nozzles for Gas & air inside of the unit for ease of use are arranged to facilitate use of space.
- (4) Stopper is equipped with wheels which make it easy to move and secure

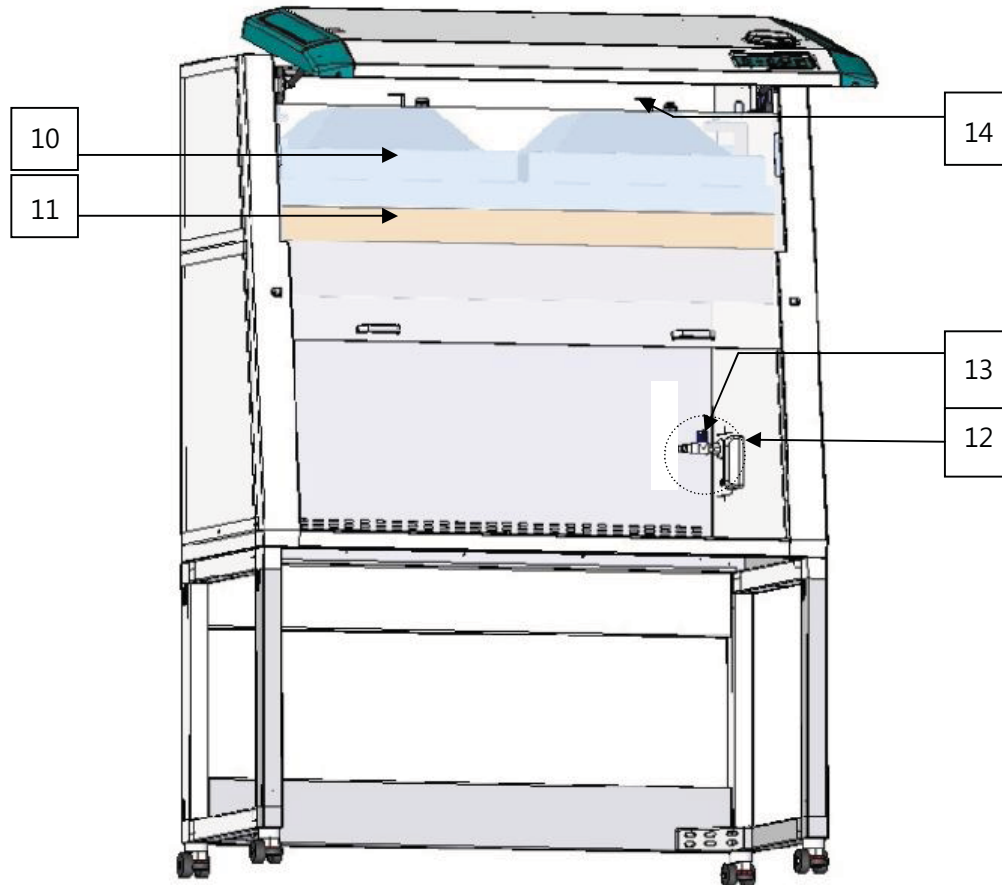
2.2.3. Improved safety

- (1) Auto switching off of UV fertilization lamp is not allowed to get the skin burn of users when the door opens by accident.
- (2) The tempered glass which blocked the UV rays on the front door is to make it strong against a strong impact and easily broken into pieces to prevent personal injury

2.3. Structure



- (1) **Front Cover**
It consists of HEPA filter and Blower unit.
- (2) **Sliding door and knob**
It's made of tempered glass which blocks the UV ray, and makes it easy to open and close. And also enable to look thru it in the working surface.
- (3) **Stand(optional)**
Supports the unit.
- (4) **Wheel**
Easy of movement, and easy of fixing the unit with stopper on the wheel.
- (5) **Air Slot**
It makes it air out to the rear of the unit thru this hole without formation of turbulence.
- (6) **Control Panel**
It mainly consists of power switch and buttons for operating UV / FL lamps.
- (7) **Differential Pressure Gauge**
The pressure gauge displays the contamination measure. When the gauge indicates 25mm H₂O more than the first use, replace the filter.
- (8) **Panel cover**
Make sure service person open this cover to replace the part like fuse, electric parts.
- (9) **Pre-filter**
Filtered airborne dust as the first filter.



(10) Blower Unit

It consists of motor and ventilator which intake the outside air and sends it the HEPA filters.

(11) HEPA Filter

This high-pass filter filters out 99.99% of 0.3 μm particles.
Easy to replace to pulling it forward.

(12) Power consent

The recessed safe consent with cover can be used to power in the workspace.

 **CAUTION**

- Only 5A or less can be connected to the unit.

(13) Gas cock (optional)

The valve and nozzle for gas and air required for operation can be used.

(14) Connector for test

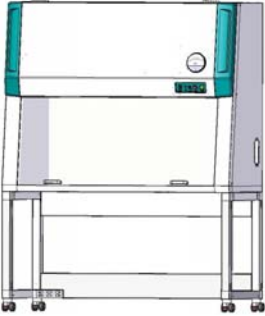

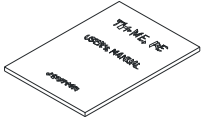
A spare test connector is useful for performance evaluation (Validation Test).
Please close the cap when not in use.

3.0 Installation

3.1. Unit components

After unpacking, please check the contents to ensure you have received all the following components. Kindly check if the model is correct on ID label according to your purchase order.

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 by referring to the distributor list #8.6.

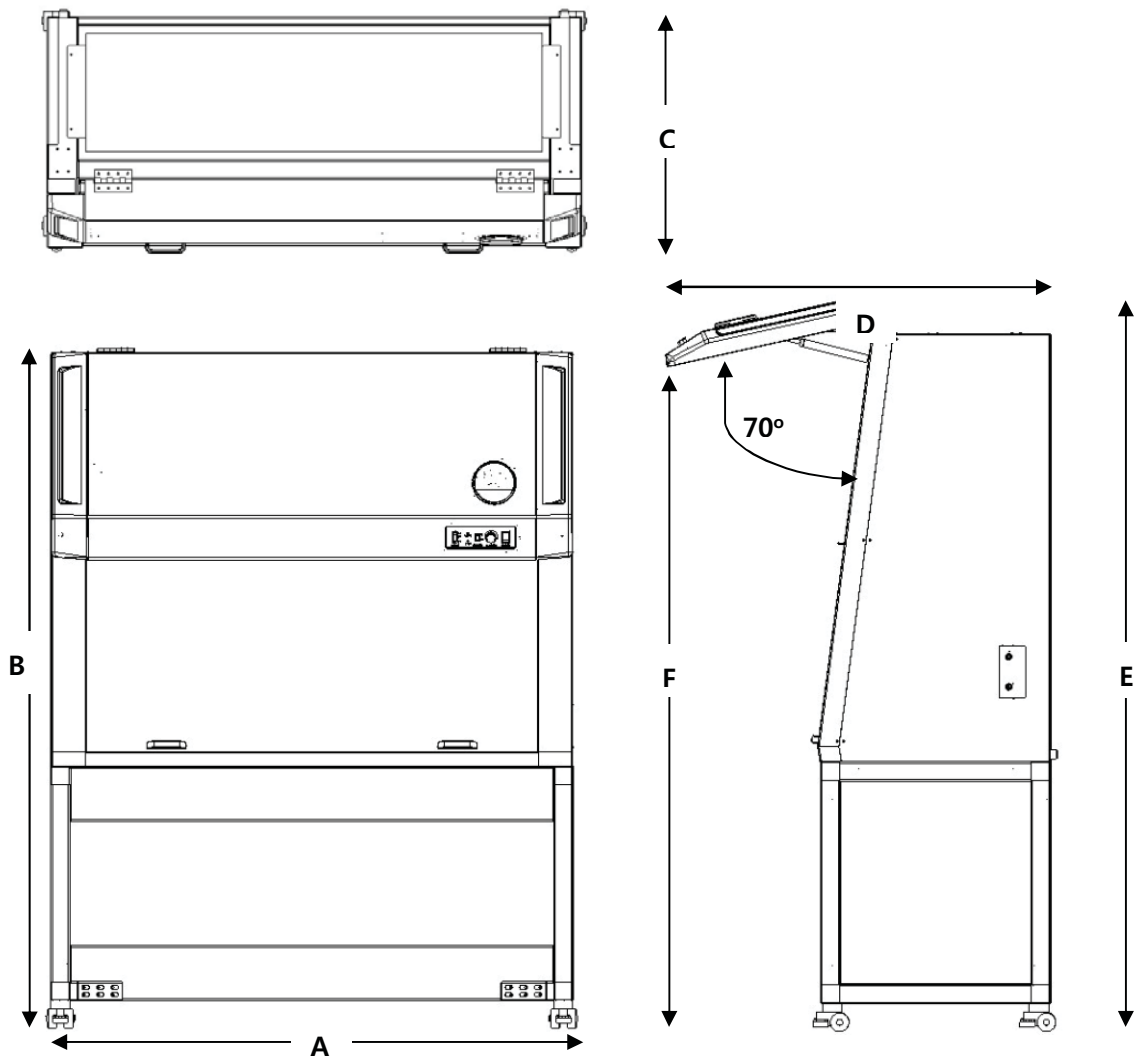
Item	Figure	Quantity	Description
Main body (Unit)		1	Stand : Optional
Fuse (Spare) :250V, 10A		2	-
Operation manual		1	-

3.2. Preparation for installation

3.2.1 The minimum required space

In order to install the unit correctly, please identify the size and turning radius first.

Please consider the installation space for gas and air when installation, and keep a distance between the unit and the wall for the proper operation as shown in the following pictures.



Dimension unit : mm(inch)

Model	A	B	C	D	E	F
BC – 01B	1135(44.7)	1870(73.6)	647(25.5)	1025(40.4)	1965(77.4)	1775(70.7)
BC – 11B	1435(56.5)	1870(73.6)	647(25.5)	1025(40.4)	1965(77.4)	1775(70.7)
BC – 21B	2035(80)	1870(73.6)	647(25.5)	1025(40.4)	1965(77.4)	1775(70.7)

3.2.2. Installation conditions

The unit can be safely operated when the following environmental conditions are satisfied.



Prevent from the direct sunlight.



Keep it the environmental temperature at 5°C~40°C.



Keep it under 80% relative humidity.



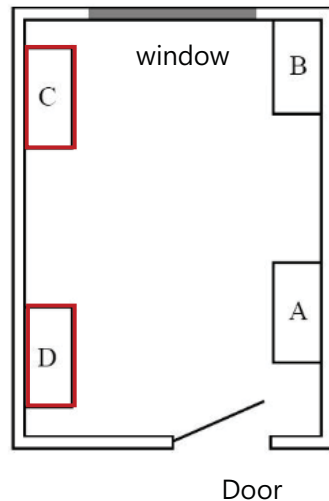
Keep it under below the altitude 2,000m.



Check earth ground.

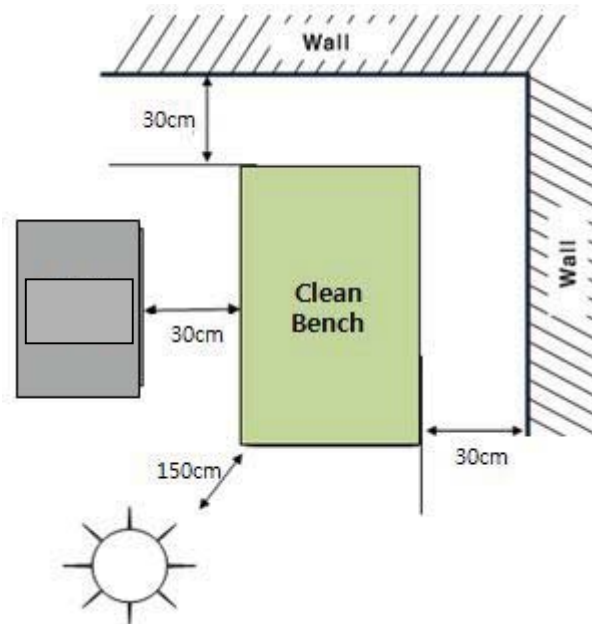
3.2.3. Location conditions

- (1) The clean bench should be located away from entrance, fans, fume hood, high traffic areas and doors that could interfere with its airflow patterns. All windows in the laboratory room should remain closed. See the proper location.

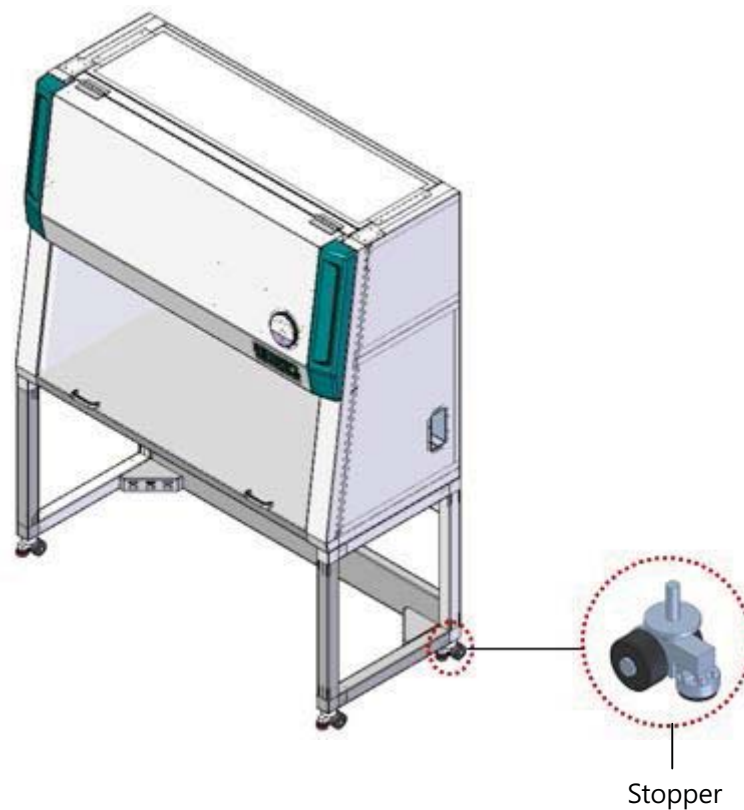


A, B: Improper location
C, D: Proper location

- (1) Install the unit on the robust and flat floor.
- (2) Keep away from Fan, Humehood, Air conditioner or other similarities.
- (3) Keep a distance of 30cm from the wall or other laboratory equipments.



Fix the stopper to the wheels after installing of the unit.
The wheel will be fixed when the stopper is turned clockwise, and one will be released when the stopper is turned anticlockwise.



WARNING

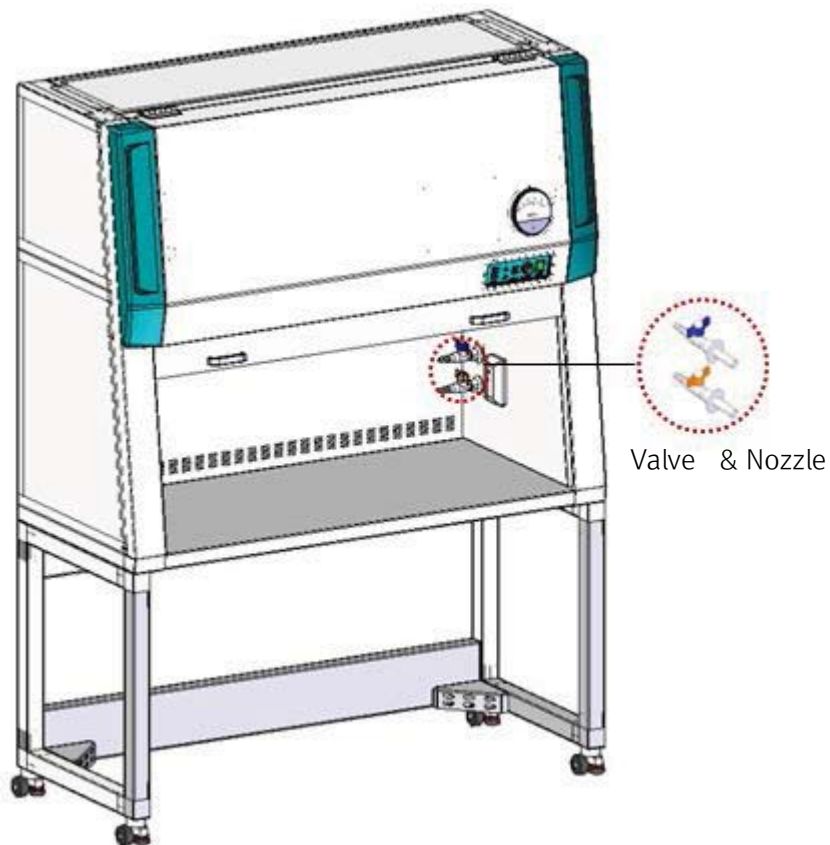
- Read Warning message of manual 1.5.1 (p 10~11)

 **CAUTION**

- Install the unit according the correct level. UV lamp does not work if the door is not close completely due to the unmatched level of the unit.
- Read the instruction of manual 1.5.2 (p 12)

3.2.4. Connection Gas cock(Optional)

The valves for gas and air are located on the right side of the unit and which can be connected to gas, air and aspirator during the operation. The valve for gas is in blue, the one for air is in orange for easy of distinction.



If you use the valve, you should install the Emergency gas shutoff valve the nearby location for the safe operation.
Before connecting the Gas, you have to close the valve which located inside.
After using it, you should close the valve to prevent the Gas leak and check the Gas condition periodically.

WARNING

- If you connect the LPG or inflammable gas, it should be installed by technical expert with certified by the government.
- If you use the valve, you should use Gas and Air as separately to prevent the possibility of taint.
- We recommend the Gas leak check once a month cycle.

3.2.5. Power supply

Jeio Tech Clean Bench Series are designed as single-phase power with grounding. You can find the voltage and electric current capacity in the attached ID Label. You should check the ID Label and use felicitous power. It is possible to use $\pm 10\%$ power.

After checking the power and you should check the socket as the picture. You should use exclusive socket for this unit. If you have wrong electric cord, please contact to seller or Jeio Tech.

If the power cord is short, you can use extension cord which is suitable for power voltage and observed IEC60320 standard. It is possible to use extension cord which has over 1.5 times capacity than maximum power (IEC60320 standard)

Please follow below step to connecting power.

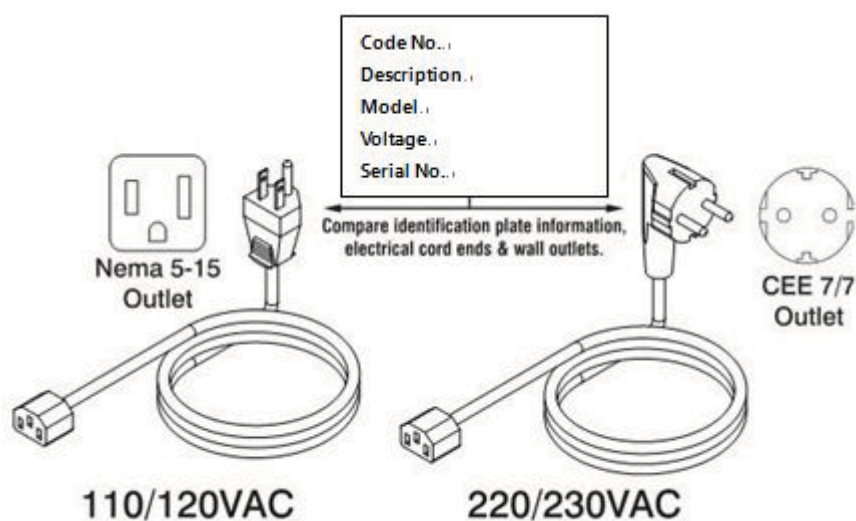
Step 1 : Please check the voltage and electric current capacity (ID Label)

Step 2 : Please check the socket.

Step 3 : Before supplying the power, you should power switch Off.

(Power switch located at the low right in Front Cover)

Step 4 : You can connect the main power cord in socket.



 **WARNING**



Electrical Shock
Hazard.



- Please check the power voltage, Phase, electric current capacity and connect properly.
 - Do not use divergence socket or double tap. Over voltage can cause damage or fire of Cable.
 - Improperly power connection can cause damage of machine or serious injuries in body and even death.
 - Do not touch the electric parts or power cord with your wet hands.
 - You have to use power with grounding certainly.
-

3.3. The First operation

3.3.1. Check list before using the machine

- (1) Power connection.
- (2) Fixing condition with stopper.
- (3) Horizontal of machine.
- (4) Enough space for the safety operation.
- (5) Check the foreign material in Pre-filter.
- (6) You should remove the surrounding environment of air flow that can make the strongly disturb.
- (7) You should remove inflammability or exposiveness liquid in surrounding environment.
- (8) When you operate the machin first time, you should do the HEPA Filter Leakage Test or Particle Count Test, Down Flow Velocity Test.
- (9) Please check the efficiency of Blower, HEPA Filter and UV Lamp first time. Then you can compare the present efficiency of Filter and UV Lamp.

3.3.2. Start of the machine

- (1) Connect the power cord.
- (2) Turn on the power switch in control pannel of Front cover.
- (3) Main power switch ON.

 **CAUTION**

- When you turn on the power switch, please check the OFF condition of LIGHT, BLOEWR, BLOWER SPEED.
-

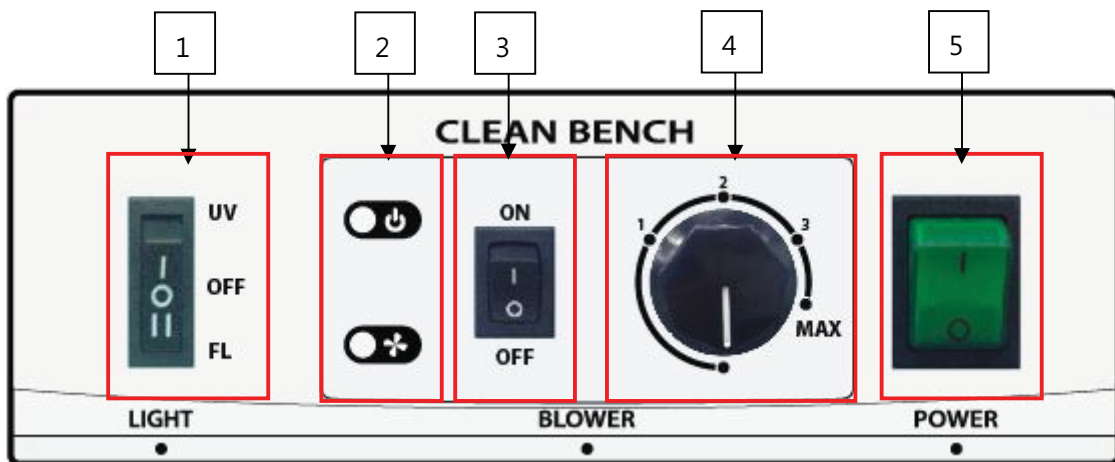
3.3.3. End of the machine

- (1) After finishing the operation, you should clean up the work face.
- (2) Do not turn off the Blower immediately, after closing the door and operating it about 5 minute s. Using this process, you can remove the inside of pollutant and prevent the entering the outside of pollutnant.
- (3) After 5 minute, turn off the Blower and fluorescent light.
- (4) For the next user, nomarly you can turn on the UV lamp, But is you do not use it long time, turn off the power.

4.0 Operation

4.1. Name and function of control panel

Consist of Main power switch, Blower part, UV / FL Lamp switch.



1	Light switch	UV	UV Lamp ON
		OFF	UV / FL Lamp OFF
		FL	FL Lamp ON
2	Blower power / motion LEDs		Blower power LED
			Blower motion LED (When you increase the Blower velocity, LED light will be getting brighter.)
3	Blower switch		Blower ON / OFF
4	Blower velocity adjuster		Adjust the velocity of Blower
5	Main power switch		Main power ON / OFF

4.2. How to use the Clean Bench

Below is summary of how to operate the clean bench.
Please follow this procedure.

- (1) Main Power switch ON.
- (2) FL lamp switch ON in LIGHT switch.
- (3) BLOWER switch ON.
- (4) Set the Blower velocity by using the Blower velocity adjuster.
- (5) Record the pressure in differential pressure gauge.
- (6) Before starting the work, please tick over the machine about 5 minute to stable an air current.

NOTICE

- When necessary, you can sterilize the workspace and experiment equipment by using a UV lamp before you work.
-

4.3. How to use the differential pressure gauge & check the HEPA Filter

4.3.1. 0 point adjustment & Record the Pressure

Replacement of HEPA filter depends on the first time of differential pressure measurement. You can follow below step for 0 point adjustment & Record the Pressure in Off condition.

STEP 1 : Adjust 0 point before Operation the unit..

STEP 2 : Open the door about 20cm

STEP 3 : Main power switch ON.

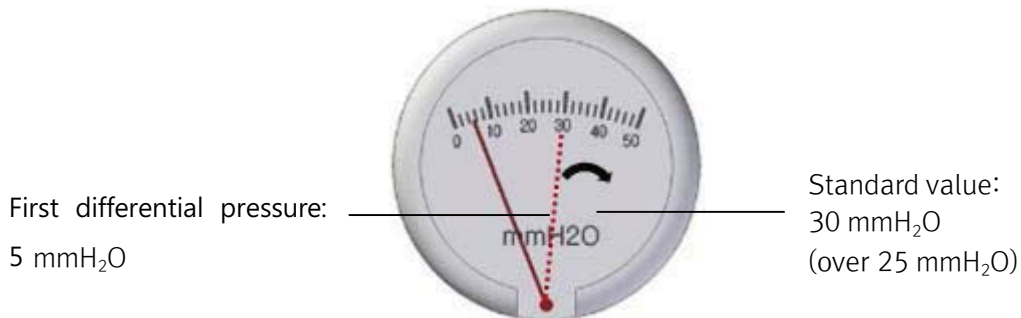
STEP 4 : Blower switch ON.

STEP 5 : Operate the Blower as maximum

STEP 6 : Record the Pressure.

4.3.2. The time of HEPA filter Replacement

- (1) As the time passes, HEPA filter will collect the fine dust and pollutants gradually. So the differential pressure will be increased between the top and bottom of the HEPA filter.
- (2) At that time, if you want to get a same velocity, you should speed up the blower.
- (3) You should test the quality of velocity periodically according to increased differential pressure. Please refer to Jeitech service details (8.5).
- (4) You can check the differential pressure after opening the door about 20 cm (4.2.1) and operate the blower as maximum. If the value of the gauge is over 25mm H₂O than the first measured value, replace the HEPA filter.



[Example]

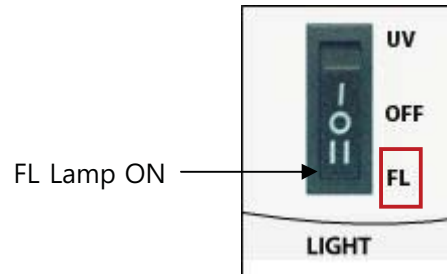
CAUTION

- Replace time of HEPA filter can be different according to working time and working features. Replacing time is 2 to 4 years in normal conditions.
- Do not use defected HEFA Filter!!.
- HEPA filter is fragile. Plase contack with us for replacement and maintenance.

4.4. How to use FL lamp & UV lamp

4.4.1. FL lamp

If you push FL button, FL lamp is switched on.

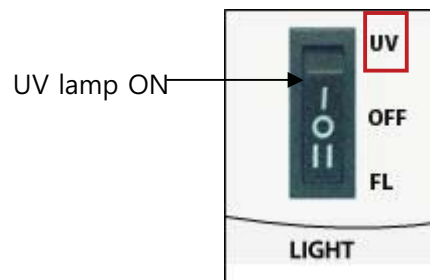


If you push in the middle of LIGHT switch, FL Lamp is switched off.

4.4.2. UV Lamp

When Aseptic conditions is needed, You turn it on in advance for sterilization and then you can work..

UV Lamp is not worked on the conditions that Door is open.



STEP 1 : Close door completely

STEP 2 : switch on main power switch

STEP 3 : push LIGHT switch for UV

UV Lamp is switched off automatically if door is open during operation.

If you need, you can operate Blower during UV sterilization

CAUTION

- UV Lamp does not work if Door is open.



- You have to make horizonlity exactly for working UV Lamp.

- UV Lamp does not work if Door is open.

NOTICE

- UV Lamp and FL lamp is not switched on at the same time to avoid burning.
 - The intensity of UV Lamp is over $150 \mu\text{W}/\text{cm}^2$. (New UV lamp)
 - The Minimum intensity of UV Lamp is at least $40 \mu\text{W}/\text{cm}^2$. (Ref. 5.12 of NSF Standard 49)
 - The Minimum density for sterilization is $30000 \mu\text{W}/\text{cm}^2$.
{ UV dosage amount(= UV dosage intension * dosage time) > $30000 \mu\text{W}/\text{cm}^2$ }
 - UV wavelength is the most sterilization around 253 nm .
-

4.5. How to use Door

This unit's sliding door was designed by connect to operation with UV, FL and Blower in UV sterilization mode concerning user convenience and safety. i.e. During the UV sterilization and if you open the door, UV lamp will be off automatically and Fluorescent lamp will be on with operating the blower. So you don't need to separate button controls.

CAUTION



- Please open door smoothly.
 - Please use handle of door to open the door!
 - Do not open the door more than 20cm !!.
 - You have to make horizonlity exactly to avoid not opening properly.
 - Close the door when it is not operated.
-

4.6. Blower

4.6.1. How to use Blower

You can adjust speed of Blower by below methods

- (1) Turn on main power switch
- (2) Turn on Blower switch
LED should be lighted
- (3) Please turn and set dial of Blower speed!
LED of Blower should be lighted and Blower start working as set speed.

To get velocity more 0.3m/s at HEPA down-stream face according to KS M 9901 standards, Please adjust speed of adjust knob refer to below table when door is open about 20cm.

BC-B series is different from velocity according to angle of speed adjust knob as below.



[Blower speed adjust knob]

Model	Blower Angle of speed adjust knob	Velocity at 100mm of HEPA down-stream face
BC-01B	2~3	More 0.30 m/s
BC-11B	1~2	More 0.30 m/s
	2~3	More 0.45 m/s
BC-21B	2~3	More 0.30 m/s

 **CAUTION**



- Please operate it after using blower 5 to 15 minutes!
- Please put the sample from 10cm from the door!
- Please put it where clean air is circulated well!
- Please do not stack the samples high under HEFA Filter!
- Please be careful not to come out samples or arm of experimenters to outside!
- Please isolate clean material and contaminated materials and put contaminated materials close to front side.
- Please operate it after using blower 5 to 15 minutes!
- Please wear gloves, goggles, mask and lab coat!
- Please not to put something on the upper side of unit not to cover Pre-filter. And clean Pre-filter regularly.
- Please be careful to use LPG gas, Air and flammable materials!. Laminar flow can be interrupted by flame, Gas and Air.

4.6.2. How to use Blower when UV sterilization

As needed, you can operate blower during UV sterilization at the same time.

4.6.3. How to use Blower fully!

You can use blower fully to clean the work space to remove contaminated materials.

STEP 1 : Open door

STEP 2 : switch on main switch

STEP 3 : turn on Blower switch

STEP 4 : adjust Blower speed volume fully.

Internal contaminated materials should be removed

STEP 5 : after 10 minutes, please turn of Blower switch and Speed volume and close door when internal air is clean.

4.6.4. Stop Blower

You can stop blowe by adjusing Blower speed volume.

5.0 Maintenance

5.1. Inspection Interval

Classification	Inspection Interval				
	Daily	Weekly	Monthly	6 month	Yearly
General					
Power cord					
Power cord's connection with the unit	•				
Power cord's sheath condition	•				
Inner cleanliness	•				
Outer cleanliness		•			
System					
Pre-filter cleanliness		•			
Blower performance check		•			
Device self check of HEPA Filter			•		
HEPA Filter Particle count Test				•	
HEPA Filter Leakage Test					•
Check the UV Lamp condition		•			
Check the sliding door condition		•			
Power switch, VFD, Control buttons		•			
Check the wheels and stopper			•		
Gas valve			•		
Performance testing of equipment (Cleanliness, wind, noise, illumination, vibration)					•

5.2. Cleaning

Always make sure to keep the equipment and accessories clean. Dirt and other foreign substance can cause fire or electric shock. The surface should be cleaned weekly and the inner chamber should be cleaned daily. Before cleaning, disconnect the power cord from the power outlet and ensure that the equipment is cool enough.

5.2.1. Cleaning in case of pollutants during operation

Step 1 : Stop operation immediately and turn off the blower

Step 2 : In case of spilled is hazardous material, user should wear production equipment such as productive clothing, gloves, and glasses.

Step 3 : Carefully remove the spilled materials and residue for preventing additional contamination.

Step 4 : Contaminated test material and residue material should be disposed with prevent contamination process.

Step 5 : Clean the working surfaces by disinfect material.

Step 6 : Before resuming operation, user should operate (depending on contamination level) blower to 5~10 min for remove contaminants.

5.2.2. Clean the outside of unit

After removing the power plug, wipe by dry cloth lightly.

Check the upper pre-filter is contaminated by foreign substance, make sure clean or replace.

(1) General condition

Step 1 : Should wear chemical resistant gloves, and wipe the outside of unit by soft dry cloth with using neutral detergent.

Step 2 : Wipe the front of unit plastic part by soft dry cloth with using neutral detergent.

(2) Contamination condition

In case of contaminating unit by toxic chemical or toxic gas, please follow cleaning procedures;

Step 1 : Should wear chemical resistant and mask.

Step 2 : To clean slowly unit surface by soft dry cloth.

Step 3 : To clean unit surface by new soft dry cloth with neutral detergent.

5.2.3. Clean the inside of the unit

Step 1 : Remove stuff and facility from inside of unit.

Step 2 : Wipe the unit working surface and inside of walls by soft dry cloth with neutral detergent.

Step 3 : Also, wipe the using again facility by soft dry cloth with neutral detergent. But only wipe UV lamp and FL lamp by UV soft dry cloth without neutral detergent.

Step 4 : Make inside empty condition, Close sliding door and tune on the UV lamp to sterilize the inside.

Step 5 : Reset again using facility after sterilization by Autoclave, disinfectant, or UV lamp.

(In case of using UV lamp, should be sterilized several time without UV does not reach sterilized parts)

⚠ CAUTION

- Do not clean the unit by spreading water.



- Do not use chlorine bleach, detergents, abrasives, benzene, volatile substances, acids, or solvents.



- Do not clean with disassemble.
-

5.3. Accessory replacement

Switch the power off and disconnect the power cord before accessory replacement.

5.3.1. Pre-filter replacement

Pre Filter replacement cycle depends on contamination level in interlining place, but normally we recommend the pre-filter replacement cycle is 3 months.

When user wants to replacement pre filter, please request our company, branch, or seller with refer 7.1 accessory specifications.

5.3.2. HEPA Filter replacement

User can know filter replacement by HEPA filter performance check. If the value of the gauge is over 25mm H₂O than the first measured value, replace the HEPA filter.

HEPA Filter replacement cycle depend on using time, contamination level in interlining place, but normally we recommend the HEPA replacement cycle is 2~4 years

When user wants to replacement HEPA filter, please request our company, branch, or seller. And the filter should be installed by the qualified technician working

5.3.3. UV Lamp replacement

Please replacement the UV lamp

- UV lamp is not operated. Because of laft spen is finlised.
- The intensity of illumination is gone to under the standard (40 $\mu\text{W}/\text{cm}^2$, Ref. 5.12 of NSF Standard)

When user wants to replacement UV lamp, please request our company, branch, or seller. User should replace standard UV lamp refer 7.1 accessory specifications

5.3.4. FL Lamp replacement

The FL lamp does not working because of spend all life, and the intensity of illumination is less than constant value (650Lux, KS M 10103 standard). Please replace the FL lame for smooth operation. Please refer 7.1 accessory specifications and replace the correct standard FL lamp.

5.3.5. Fuse replacement

In case of the equipment main power is gone because of blown fuse, please replace fuse.

The each equipment is included 1 spare fuse to use replacement. When user need to replace, please use it. If user want to use additional fuse, please refer bottom chart and request our company, branch, or seller.

Model	Voltage	Current consumption	Fuse
BC-01B	250V	1.2A	10A
BC-11B	250V	1.5A	10A
BC-21B	250V	2.0A	10A

5.4. Relocation and Storage

- (1) When movement, disconnect the power cord from the power outlet
- (2) Pack the equipment and accessories into the original packaging or any other suitable container before moving. Raise caster's stopper for moving
- (3) If you don't use this equipment for an extended period of time, disconnect the power cord from the power outlet and clean the equipment with soft cloth. Pack the equipment properly and make sure to store it in dry place.

CAUTION

- Disconnect the power cord from the power outlet when the equipment is not use for long time.
 - Do not move the equipment by the power cod connected.
 - Pay attention to avoid mechanical shock or vibration while moving the equipment. Damages caused by mechanical shock or vibration may result in injury or fire.
-

6.0 Troubleshooting

6.1. Troubleshooting

Please follow below guidelines for troubleshooting. For problems which are not listed below, contact with your local agent or Jeiotech for service.

6.2. Power Troubles

Symptoms	Causes	Solutions
The equipment is not on	The plug is not inserted completely	Put a plug into the socket again.
	Socket/plug/power lines are damaged	Check the socket/plug/power lines and replace with new one if they are damaged.
	Wrong electric standard	After check the ID plate on the unit whether it is fit to the socket power, supply proper voltage and frequency for the power.
	Circuit breaker is off or power failure	Check if the power is off. If the circuit breaker is off, fix it and operate the equipment again.
	Fused are disconnected.	Open electrical wiring panel to confirm fuse's breakage and replace the included fuse
	Inner circuit malfunction	Request service.
Circuit breaker is often shorted	Too many plugs are connected	<ol style="list-style-type: none"> 1. Check the voltage capacity supplied t the circuit breaker. 2. Check many similar types of equipment are connected on the socket. Use separate socket not exceeded of voltage capacity.
	Inner circuit malfunction	Request service.

6.3. Operation Troubles

Symptoms	Causes	Solutions
Blower does not rotate	Do not press button (or press 2 times) on control pnel.	Check the lamp color is change or not when you press Blower button. (stand by :green, operating: light orange)
	Blower Motor malfunction	Request service.
	Inner Blower malfunction	Request service.
	Inner circuit malfunction	Request service.
Heavy noise during Blower operating	Full of life because of HEPA Filter clogged.	Check the HEPA Filter condition and request replacement
	Blower Motor malfunction	Request service.
Unit vibration	Blower Motor malfunction	Request service.
Do not operate FL lamp, UV lamp or blink	Full of life the FL lamp, UV lamp.	Exchange new lamp.
	Inner circuit malfunction	Request service.
Contamination in the clean bench	Incomplete disinfection and operation, improper surroundings and work environment	Work environment and to track the cause reorganization process.
	Weak intensity germicidal UV lamp	After check the UV lamp disinfection intensity, adjust disinfection time or replace the UV lamp.
	HEPA Filter damage, or over lifespan.	Validation or request service forreplace.
Door operating malfunction	Even close door, displayed "door Open"	Horizontal align correctly.
	Internal parts malfunction	Request service.

7.0 Accessories

7.1. Accessories

Designation	Model	Cat No.	Description
Pre-filter	BC-01B	AAAB1601	966 X 359.5 X 20 mm
	BC-11B	AAAB1602	1266 X 359.5 X 20 mm
	BC-21B	AAAB1603	1866 X 359.5 X 20 mm
HEPA Filter	BC-01B	AAAB1611	965 X 460 X 85 mm
			21.5 CMM at 25.4 mm H ₂ O
	BC-11B	AAAB1612	1265 X 460 X 85 mm
			28.2 CMM at 25.4 mm H ₂ O
	BC-21B	AAAB1613	1865 X 460 X 85 mm
			41.6 CMM at 25.4 mm H ₂ O
UV – C Lamp	BC-01B(230V)	AAAB1631	-
	BC-01B(120V)	AAAB1632	-
	BC-11B(230V)	AAAB1633	-
	BC-11B(120V)	AAAB1634	-
	BC-21B(230V)	AAAB1635	-
	BC-21B(120V)	AAAB16336	-
Stand with Casters	BC-01B	AAAB1621	-
	BC-11B	AAAB1622	-
	BC-21B	AAAB1623	-
Differential Pressure Gauge	BC-21B	AAAB1571	-
Gas Cock	All Models	AAAB1561	-

7.2. Accessory setting and replacement

Refer to 5.3 Accessory replacements.

8.0 Appendix

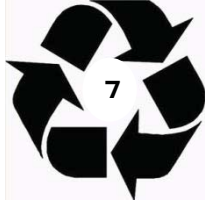
8.1. Technical Specifications

Model		BC-01B		BC-11B		BC-21B	
Air	Airflow Type	Vertical Laminar Flow					
	Pre-filter	Polyester Fibers with an Efficiency of 85% (AFI TEST)					
	HEPA Filter	Typical Efficiency of 99.99% at 0.3 μm					
	Average Airflow Velocity (m/sec/fpm)	0.3/59		0.45/89		0.3/59	
Noise Level (dB)		< 65					
Dimensions	Internal (W x D x H, mm/inch)	945×585×670/ 37.2×23.0×26.4		1245×585×670/ 49.0×23.0×26.4		1845×585×670/ 72.6×23.0×26.4	
	External without Stand (W x D x H, mm/inch)	1135×620×1140/ 44.7×24.4×44.9		1435×620×1140/ 56.5×24.4×44.9		2035×620×1140/ 80.1×24.4×44.9	
	External with Stand (W x D x H, mm/inch)	1135×620×1860/ 44.7×24.4×73.2		1435×620×1860/ 56.5×24.4×73.2		2035×620×1860/ 80.1×24.4×73.2	
	Weight(Body)(kg/lbs)	140/308.6		185/407.9		225/496	
	Weight(Body+Stand) (kg/lbs)	170/374.8		215/474		255/562.2	
	Sliding Door Max Opening (mm)	450		450		450	
Light	FL (W)	30x2ea		30x2ea		32x2ea	
	UV-C (W)	25x1ea		30x1ea		25x2ea	
	Fluorescent Lamp Intensity (Lux)	> 650					
Electricity	Electrical Requirement (230V/1ph,A)	60Hz/2.0	50Hz/2.2	60Hz/2.46	50Hz/2.6 6	60Hz/3.0	50Hz/3.2
	Electrical Requirement (120V/1ph,A)	60Hz/3.38		60Hz/4.26		60Hz/5.34	
	Internal Electric Socket Inlet	220V Socket, 10A					
	Power Consumption(W)	260		330		430	
Material	Main Body	Epoxy Powder coated Steel					
	Working Surface	STS 304, Hairline Treatment					
	Front Sliding Door	UV absorbing tempered Glass (Thickness: 5.0t)					
Permissible Environmental Condition		Temperature 5°C to 40°C, Relative Humidity 10% to 80% Altitude up to 2,000m					

※ If we do not mention on specifications, all specifications are under ambient temperature 25°C, 60%R.H.

※ Above specifications can be changed without prior notice.

8.2. Equipment Disposal



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

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

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

8.3. Warranty

8.3.1. General

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

8.3.2. Warranty exception

This warranty does not cover any unit even under warranty period.

1. Fire, water, power outage, power surge, lighting, or other acts of nature.
2. Damage as the result of not following operational voltage.
3. Abuse, misuse, neglect, accident.
4. Surface damage as the result of organic solvent such as thinner, benzene.
5. Damage as the result of not being complied by manual.
6. Improper application, repair or attempt repair not authorized by Jeio Tech.
7. Damage as the result of user's mistake.

8.3.3. Service request

Please fill out and submit the form with below information included for immediate service.

1. Date of purchase
2. Name / Address / Phone / E-mail
3. Serial Number(refer to the ID plate on the side of the unit)
4. Damage condition

8.4. Technical assistance

➤ **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

FAX: +82 2 3143 1824

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FAX: +44 1865 400736

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FAX: +86-21-5168-5414

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

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Tel: +60 3 6021 6880 **E-mail:** lcomp99@pojaring.my

FAX: +60 3 6021 7880

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