Operation Manual

BLVR-202

Vertical Laminar Airflow

Thank you for Choosing Biolab products. Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation.

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01 Unpacking, Installation and Debugging

Please firstly check if the packing box is in good condition. If the packing box is damaged, please take photos.

1.1 Unpacking

Choose the proper unpacking method and tools as shown in the below picture

For wooden box:

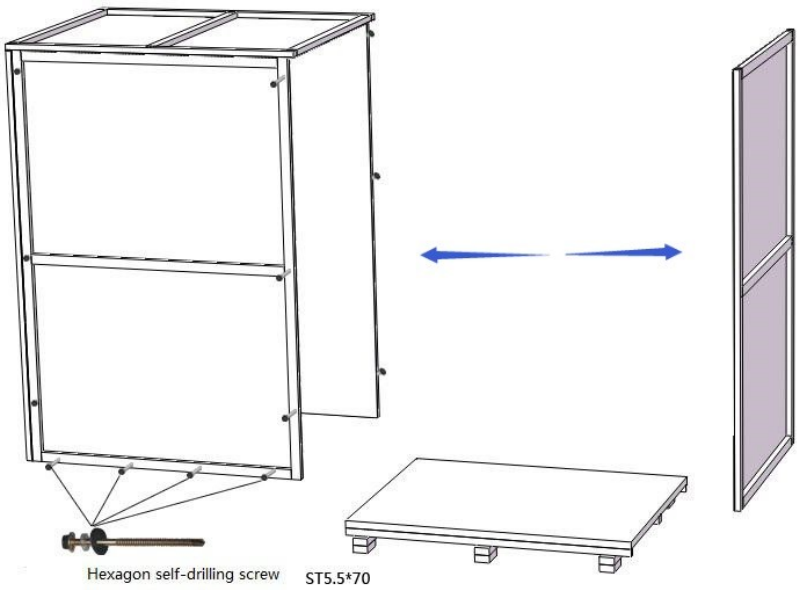
1) Method 1 Necessary tools for unpacking: Electric drill with hexagon dead M8 (Picture 1).

Picture 1

2) Method 2 Use M8 Wrench to unpack (Picture 2).

Picture 2

The following diagram demonstrates quick unpacking procedures (Picture 3). Remove the screws as shown in the below diagram, then remove the wooden sheet to right and wooden box to left.



Picture 3

1.2 Accessories Checking

Refer to the packing list and check the accessories.
The spare parts as back up, it can be normally used after unpacking.

Packing list (BLVR-202)

Items	Quantity	Position
Main body	1 unit	Wooden box
Base stand	1 set	Connected with cabinet body
Power cord	1 pc	Packaging Bag（On top of main body）
Fuse (5A)	1 pc	Packaging Bag（On top of main body）
UV Lamp（T6 20W）	1 pc	Paper Packing（On top of main body）
User manual	1 pc	File Packet（On top of main body）
Inspection report	1 pc	File Packet（On top of main body）
Certification of quality	1 pc	File Packet（On top of main body）
Warranty Card	1 pc	File Packet（On top of main body）
Product acceptance certificate	1 pc	File Packet（On top of main body）

and installation report		
Training Certificate	1 pc	File Packet（On top of main body）

1.3 Installation Conditions and Operating Environment

Laminar Flow Cabinet shall be placed in the protective area of an air stream, and the working area of the Laminar Flow Cabinet cannot be right opposite to the door or window, and should be away from the air outlet of air conditioner to prevent the air flow from the ventilation system, air conditioning, door, window and personnel movement may cause airflow impact on the LAF.

At least 300mm gap must be kept in each side of the Laminar Air Flow for inspection.

Working environment:

1. Only applicable for indoor operation
2. Ambient temperature: 15° C～35° C
3. Relative Humidity: ≤75%;
4. Atmospheric pressure range: 70 kPa～106 kPa;
5. Electrical parameters: Adequate power supply to the laminar flow cabinet (See 2.1.4 Technical Parameters);
6. Power supply need to be grounded; (Judging method: Test the live wire and the neutral wire of the socket with multimeter. The voltage between live and ground should equal to the voltage of local electrical grid, and the voltage between neutral and ground should equal to 0. Otherwise the power supply is not grounded correctly).

1.4 Installation

a. Remove all the packing materials;
b. Check for Physical damage or scratch the surface of main body during transit. Make sure there is no damage, scratch, deformation on main body;
c. Confirm the complement of accessories according to the list;
d. The height of leveling feet can be adjusted. Counterclockwise the leveling feet, cabinet (or base stand)can be moved when the height of leveling feet is less than the height of caster; clockwise the leveling feet, cabinet (or base stand)can be moved when the height of leveling feet is larger than the height of caster;
e. The whole LAF Instrument must be moved to the final working place where it can be Installed.

Picture 4

1.5 Checking after Installation

First, check the electrical power supply, make sure the voltage and frequency match with the Instrument power supply rating, then check the follows items after power on:

Checking Items	Normal working status
Fan	Runs normally
Fluorescent Lamp	Lamp lights up after pressing button
UV Lamp	Lamp lights up after pressing button
Screen Buttons	All buttons work effectively

⚠ **If you have any questions, please contact Biolab or our agent to debug. Debugging method in the After-sale service manual.**

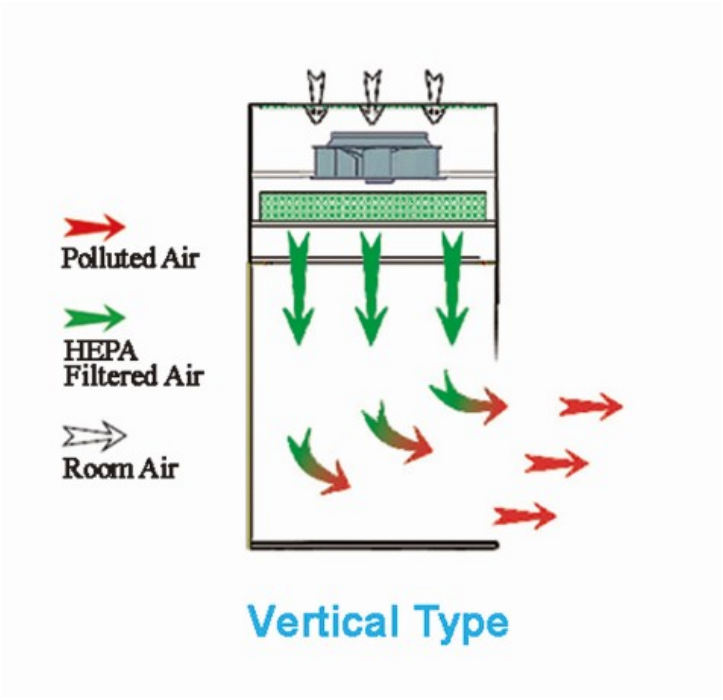
02 User Instructions

2.1 Functions

2.1.1 Product Concept

Laminar Flow Cabinet – LAF Cabinet is only for sample protection.
Laminar Flow Cabinet is a work bench or similar enclosure, which creates a particles-free working environment by taking air though a filtration system and exhausting it across a work surface in a laminar or unidirectional air stream. The laminar flow cabinet is enclosed on the sides and kept under constant positive pressure in order to prevent the infiltration of contaminated room air. BLVR-202 is vertical type Laminar Flow Cabinet.

2.1.2 Working theory/Air flow Pattern and Protected Area Figure



Picture 5

2.1.3 Protected Objects

Laminar flow cabinets are designed to protect samples and create partial particles-free environment. The main function is to make sure the accuracy of experiment at the operating area. However, it could not protect the environment or operators.

2.1.4 Technical Parameters

Model Parameters	BLVR-202
External Size (WxDxH)	802x650x1550 mm
Internal Size (WxDxH)	800x600x540 mm
Power Supply AC	220V±10% 110V±10%
Frequency	50Hz 60Hz
Consumption	≤350 W
Airflow Velocity	0.3～0.5m/s
UV Lamp Consumption	20W
Fluorescent Lamp Consumption	8W (LED)
HEAP Filter Efficiency	99.999% efficiency at 0.3um
Noise	<60dB

Note: the company reserves all the rights to changes in product design , if there are any design change, we will not inform in advance.

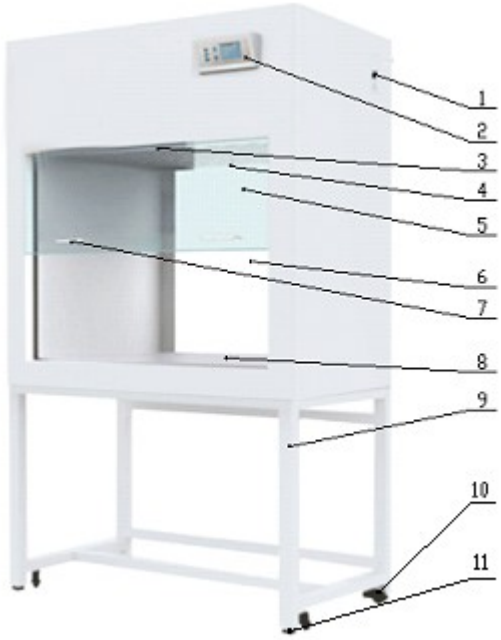
Vibration Amplitude:

The net vibration amplitude between frequency 10Hz and 10KHz should not exceed 5μm(rms).
Illumination
The average illumination is equal or more than 350 lux,
Electrical properties

The voltage increases to 1390V (AC) in 5s and keep for another 5s without breakdown.
Grounding resistance ≤0.1Ω.

2.2 Product Structure

2.2.1 Structural Composition of BLVR-202



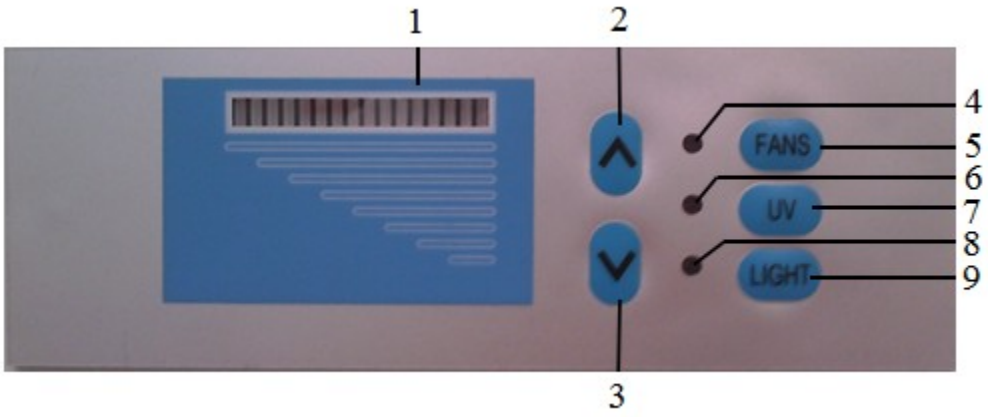
Picture 6

Picture 6

1. Socket
2. Control panel
3. LED light
4. UV lamp
5. Front window
6. Rear window
7. Handle
8. Work table
9. Base stand
10. Caster
11. Leveling feet

2.2.2 Structure Composition

1. Driving system of front window
2. Driving system consists of constant spring and front window.
3. Air filtration system
4. Air filtration system is the core system of laminar flow cabinet. It consists of blower and HEPA filter system. The main function of air filtration system is to transfer filtered air to work area, ensure the airflow velocity, and keep cleanness of work area.
5. UV lamp
6. The entire work zone could be sterilized effectively by the UV lamp located at the top of work zone. Emission of 253.7 nanometers could ensure the most efficient decontamination.
7. LED light
8. The laminar flow cabinet is equipped with LED light, which ensures the standard requirement of average illumination is met.
9. Control panel (Picture 7)



Picture 7

1.Gears Indicator
2.Increase Air Velocity
3.Decrease Air Velocity
4.Fans Indicator
5.Fans
6.UV Indicator
7.UV
8.Light Indicator
9.Light

a. Gear indicator

To see air speed gears of the equipment through gears indicator.

b. Soft touch buttons

1) Laminar flow cabinet's main functions are executed by touch-buttons.

2) LIGHT : To control fluorescent lamp.

3) UV : To control UV lamp(UV is interlocked with blower and fluorescent light,
4) which means that the UV lamp will auto off when blower or fluorescent light is opened)

5) FANS : To control blower working status.

6) Air velocity control(^ v) : During working, press ^ to increase air velocity; press v to decrease air velocity.

Fuse

The cabinet is equipped with main power fuse. Fuse label is corresponding to the relevant specifications, please refer to 3.5.1 Fuse Label. And refer to 3.2 Replacement of Fuse when replace

Structure

Cabinet body is made up of 1.2mm cold-rolled steel with anti-bacteria powder coating. The structural strength and stability are enhanced.
Work table is made up of 304 stainless steel which provides corrosion resistance as well as attractive appearance.

Base stand is made up of cold-rolled steel with anti-bacteria powder coating.
Control panel with soft touch buttons is user-friendly and multifunctional.

2.3 Instructions for Operation

2.3.1 Normal Operation Notice

1) Make sure input voltage is correct and stable. The rated load of main power socket should be higher than laminar flow cabinet consumption. Plug must be well grounded ;
2) Moving principles of different samples inside cabinet: When two or more samples need to be moved in, be sure that low-polluting samples should be moved first then high-polluting samples. Movement of items should also follow the principles of moving slowly and steadily.
3) The weight of items placed in the cabinet should not be more than 23Kg/25×25cm2 ;
4) Avoid vibration: avoid using vibration equipment (eg centrifuges, vortex oscillator, etc.) inside the cabinet. Vibration would cause lower cleanliness of operating area and affect operator protection.
5) NO FLAME: No flame is allowed inside the Laminar flow cabinet. Using of fire will lead to airflow disorder, and filter damage. If sterilization is required during the experiment, infrared sterilizer is highly recommended.
6) HEPA filter life: With the usage time increasing, dust and bacteria accumulate inside HEPA filter. Filter Resistance is getting bigger, when it reaches the maximum point, the speed requirements can’t be met. Then need contact Biolab service department to get a new one. The used filter should be processed as medical waste.
7) The fan and its underside is mute bellows, which is sealed strictly in the factory. The operator is not allowed to remove or loose screws of those parts. If necessary, please contact service personal or agent.
8) The maximum storage period is one year. If the period is more than one year, performance test should be done.
Serious declaration:
NOTE: Biolab WILL NOT BE RESPONSIBLE FOR ANY RISK OR DAMAGE ARISING FAILURE DURING USAGE BY UNTRAINED OPERATOR AND MISHANDLING THE LAF. THE OPERATOR OF THE LAMINAR FLOW CABINET SHOULD BE TRAINED ENOUGH BEFORE USING THE LAF.

2.3.2 Operation Process

a) Connect to a suitable power supply
b) Press relevant buttons and check if work normally(functions and operations, pls kindly refer to the instruction of 2.2.2); Checking the fan, UV lamp and Fluorescent lamp if work normally, the air velocity if meet standard requirements.

c) The cabinet should be sterilized by UV lamp for at least 30 minutes with the window fully closed before any experiment.

NOTE:
1) For safety of eyes and skin, people should leave the room during UV sterilization.
2) UV lamp should be checked regularly. It should be replaced when either the total working time reaches 600 hours or the intensity is lower than the requirement.
d) Please move up the front window to proper height above the work table and turn on the blower. Make sure the experiment should be started after fan working for at least 30 minutes.

NOTE:
For operating safety, please put testing materials inside the cabinet in advance. After finishing the experiment, please fully close the front window and make sure to sterilize the cabinet by UV lamp for at least 30 minutes before turning off the cabinet.

2.4 Daily Maintenance

A detailed daily record of operating time is recommended, as the accumulated using time will directly affect the plan of maintenance.

To avoid electric shock, please cut off ALL power before applying maintenance for the cabinet!
Preparation before Maintenance: Please remove all the items which are inside the cabinet
Material needed: soap, hot water or warm water, a piece of soft cotton cloth, a piece of dry cloth or towel, medicinal alcohol or other disinfectants.

2.4.1 Clean the Surface of Working Zone

Wipe the entire surface with a soft cotton cloth which has been soaked with concentrated liquid soap. Afterwards, wipe off the foam with another cotton cloth or towel which has been soaked with clean hot/warm water. At the end, wipe the entire surface with a dry cotton cloth or towel rapidly.
For the contaminated or dirty work surface and sump, use medicinal alcohol or other disinfectant to wipe.

Disinfectants used for wiping should not damage the 304 stainless steel.

2.4.2 Clean the External Surface and Front Window

Use a piece of soft cotton cloth or towel with non-abrasive household cleanser to wipe the surface.

2.4.3 Overall Maintenance Period

The recommended interval period for comprehensive maintenance is either one year or 1000 working hours.

2.4.4 Maintenance Methods

1) Weekly or daily maintenance
a. Disinfect and clean the operating area(Please refer to 2.4.1 Clean the Surface of Working Zone);
b. Clean the external surface and front window(Please refer to 2.4.2 Clean the External Surface and Front Window);
c. Check the various functions of the cabinet if abnormal;
d. Record down the maintenance result;
2) Monthly maintenance
a. Clean the external surface and front window(Please refer to 2.4.2 Clean the External Surface and Front Window);
b. Use towel with 70% medicinal alcohol or 1:100 dilution of household bleach to wipe the working table, the inner face of front window and the inner wall surface of the working area(exclude the top wind grid). Use another towel with sterile water to wipe those area to erase the remain of chlorine.
c. Check the various functions of the cabinet if abnormal;
d. Record down the maintenance result;
3) Annual maintenance
a. Check the front window tubular motor, make sure both of them are well connected to the motor with same tightness.
b. Check the UV lamp and LED light.
c. Apply for overall performance test of the cabinet annually to ensure that the safety meets requirements. User is responsible for testing costs.
d. Record down the maintenance result.

 Cut off the power during maintenance

2.4.5 Storage Conditions

Laminar flow cabinet should be stored in a warehouse with relative humidity no more than 75%, and temperature lower than 40℃. The warehouse with should have good ventilation performance, without acid, alkali and or other corrosive gas. Storage period shall not exceed one year. Laminar flow cabinet stored for more

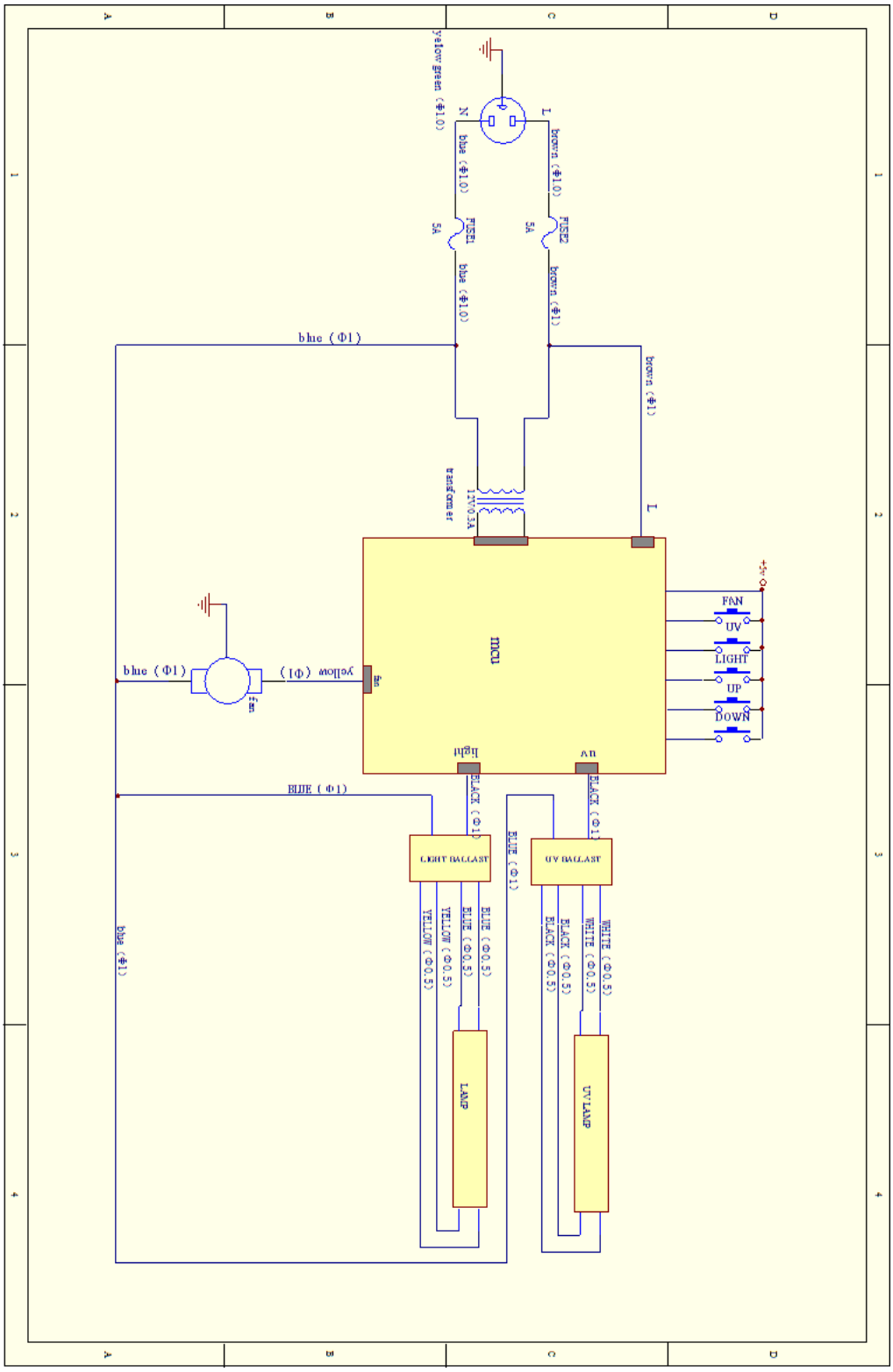
than one year needs to be unpacked and checked before selling and using. Only the tested and qualified cabinet could be sold.

2.5 Replacement Parts List

BLVR-202 replacement parts list

Number	Name	Specification
BH-01	Fuse	5A
BH-02	Lamp holder T8	LG13-01A
BH-03	UV lamp	T6 20W
BH-04	LED T5 stand	T5 8W
BH-05	UV lamp ballast	1xTL8-18W
BH-06	HEPA filter	720x430x50
BH-07	Fan	FS133C
BH-08	Control panel	Laminar flow cabinet control panel(Ten light pillar)
BH-9	Tempered glass	Size 748x580x5
BH-10	Common glass	Size 714x570x5
BH-11	Constant spring component	Constant spring,Nylon sleeve,Nylon set of baffle

2.6 Wiring Diagram



03 Trouble Shooting and Solutions

3.1 Common Failures and Solutions

Please confirm that the power is well connected, the power cord and fuse are in good condition(without any damage).

Failure	Checking parts	Measures
Fluorescent lamp fail to work	LED stand plug	Connect the plug and stand tightly
	LED stand	Replace stand
	Circuit	Check the circuit
	Control panel	Replace the control panel
UV lamp fail to work	Interlock	Check the blower and fluorescent lamp turn off or not
	Lamp holder	Connect the tube and lamp holder tightly
	Lamp tube	Replace the lamp tube
	Ballast	Replace the ballast
	Circuit	Check the circuit
	Control panel	Replace the control panel
Button fail to work	Control panel	Make sure the power is well connected and the fuse is in good condition
		Check if the button is broken
		Make sure the connecting wire is well connected
		Replace the control panel
Blower fail to work	Blower	Replace the blower if it is damaged
	Circuit	Check the circuit
	Control panel	Replace the control panel
No electricity in equipment	Power supply	Check whether the power supply is well connected
	Power cord	Check whether power cord is in good condition
	Fuse	Check whether the fuse is damaged
	Potential transformer	Check whether the transformer works normally
	Control panel	Replace the control panel
Display fail to work	Connection wires	Check connection wires if in good connection
	Display screen	Check whether the screen is in good condition
	Control panel	Replace the control panel

NOTE:

1) The above trouble shooting methods should be done by qualified electricians under safe conditions(cut off power supply). Other components should not be removed. Risk caused by failing to follow those instructions would be responsible by user.;
2) Please contact Biolab or our agent if a failure could not be traced or solved. Do NOT repair the equipment without a qualified electrician;
3) The trouble shooting and repair of this equipment only could be undertaken by trained and recognized technicians;
Please contact Biolab or our agent to order required component or part. The model number and the serial number of purchased cabinet need to be indicated.

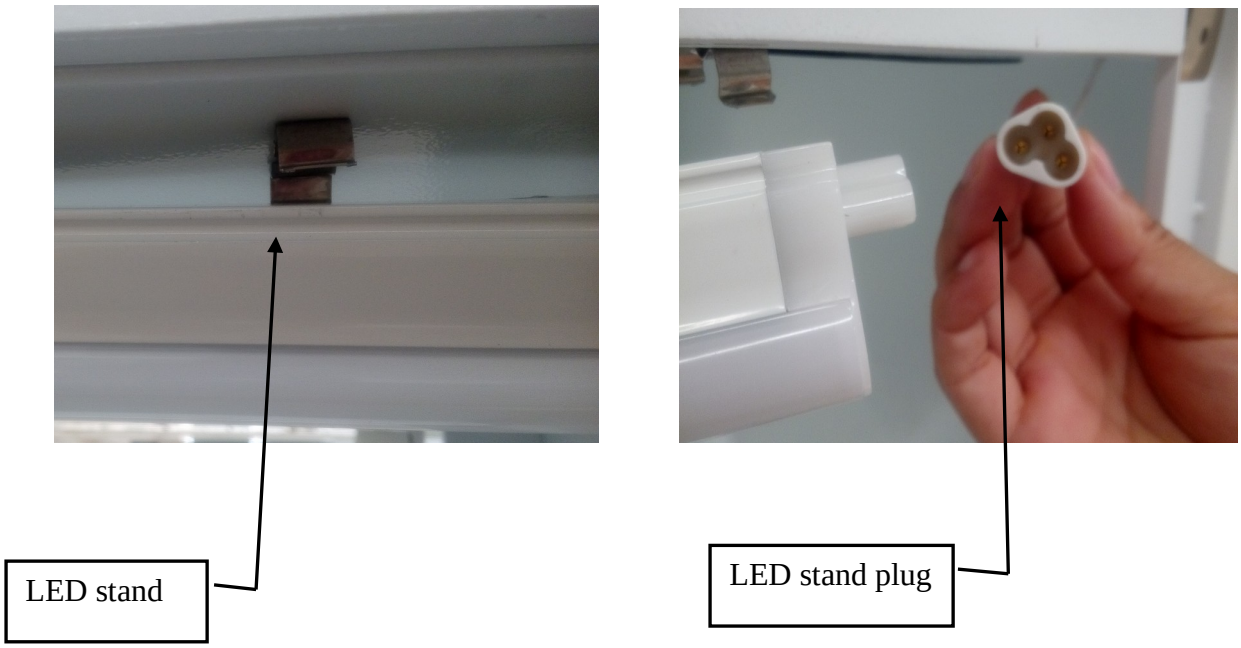
3.2 Replacement of Fuse

Replace the fuse using a flat-blade screwdriver socket pulled out of the fuse holder and replace, then press it back. (Picture 9)

Picture 9

3.3 Replacement of Fluorescent Lamp

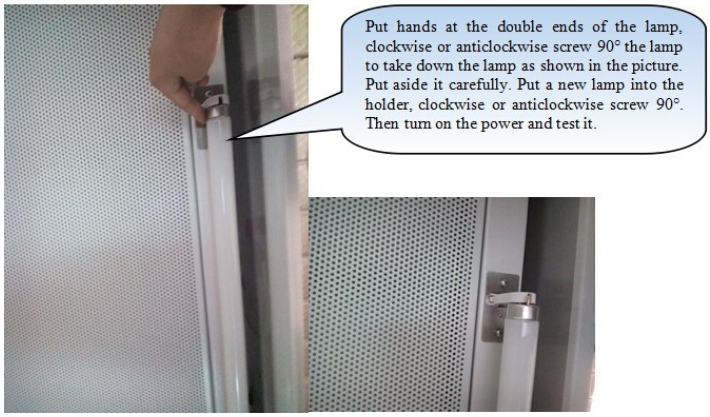
When the fluorescent light needs to be changed, turn off the power. Then remove the LED stand, unplug the right side, After replacing a new LED stand, inserted into the inclined slot.



Picture 10

3.4 Replacement of UV Lamp

Ultraviolet intensity should be tested regularly in order to achieve a good disinfection effect. We recommend use Ultraviolet intensity test card to confirm if we need to replace UV lamp. when using UV lamps reach to the time of 600 hours, we recommend to replace the lamp. When replacing, turn off the power, and then screw the lamp tube 90 ° and take it off, then replace the correspondence type of lamp, and put it to the lamp holder and and screw 90 ° in reverse direction.



Picture 11

3.5 Label Description

3.5.1 Fuse Label

(Picture 12)

Note: 5 A fuse label

3.5.2 Ground Label

(Picture 13)

04 Warranty

4.1 Warranty is 12 months from EX-factory date (excluding consumable accessories, UV and Fluorescent lamp, fuse).
4.2 Biolab would not be liable for any repair of damage caused by improper operation..
4.3 If the warranty has been expired, Biolab would still responsible for repair with relative charges.
4.4 Life time of laminar flow cabinet is 8 years from production date on the label.
4.5 Biolab would provide equipment drawings and necessary technical data for maintenance.

Warranty declaration:

One-year Warranty, Life-long Maintenance

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