

Operation Manual



BLHZ-201 & 202

Horizontal Laminar Airflow

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

Preface

Dear user:

The laminar flow cabinet is a kind of device that can make the local environment be with high cleanliness, air flow modes of which includes 2 types, namely horizontal type and vertical type. It is widely used in the semiconductor industry, precision instrument, meter, electronic component, optical instrument, chemical, smelting purification, magnetic material, microbiology research, medicine and health, scientific research and other departments, which plays a significant role in improving product yield, precision, stability, and reliability.

We sincerely hope that our products will bring the greatest help for your work. In order to make you have a better understanding of our laminar flow cabinet, please be sure to carefully read the manual before use. The content of this manual is very important for you to use this machine safely and correctly!

After you have read the manual carefully, please keep it in a convenient place for easy reference.

Statement

Biolab has the final interpretation of this manual.

The Company shall be responsible for the safety, reliability and performance of the product only if all of the following requirements happened:

- 1.Assembly operations, expansion, re-adjustment, improvement and repair by the Company recognized professionals.
- 2.All repairs involving replacement parts and supporting the use of accessories, supplies are original of the Company (original) or approved by the Company.
- 3.The related electrical equipment is according to national standards and the use of the manual requirements.
- 4.Product operation is carried out according to the instruction manual.

Disclaimer

Biolab shall not be liable for any equipment failure or damage, or for any direct or indirect damage that may occur during the use of the equipment.

1.Malfunction or damage due to violation of the instructions, precautions, and intended use of this manual.

2.Malfunction or damage caused by repair or alteration of the other company.

3.Malfunction or damage caused by use instruments of other company at the same time .

4.Malfunction or damage caused by operating environment not corresponding to the specified operating environment (power conditions, installation environment, etc).

5.Malfunction or damage caused by natural disasters such as earthquakes and floods.

6.Malfunction or damage caused by the company unaware of the movement or transfer (transport) after installation.

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01 Applicable Scope

The laminar flow cabinet is a box-type air purification equipment which is suitable for medical and health, medical science experiments, and can provide a local operating environment with a clean class of ISO class 5 (class 100) or higher.

Working environment:

- (1) For indoor use only;
- (2) Ambient temperature: 15°C~35°C;
- (3) Relative humidity: ≤ 75%;
- (4) Atmospheric pressure range: 70 kPa to 106 kPa.

02 Technical Parameters

The product is a horizontal laminar flow cabinet. The basic technical parameters are as follows:

Model	BLHZ-201	BLHZ-202
Technical parameters	BLHZ-201	BLHZ-202
Outer size (mm)	1100×808×1690	1500×808×1690
Internal size (mm)	1000×500×600	1400×500×600
Rated voltage	AC 220V	
Rated frequency	50 Hz	
Rated power	1200 W	1300W
Airflow velocity	0.30m/s~0.45m/s	
UV lamp power	18W	30W
LED lamp power	12W	16W
Filter efficiency	99.999% (for diameter of 0.3μm)	
Noise	≤65dB (A)	
Power supply	AC 220V 50Hz	
Motor power	90W	180W
Motor speed	1370rpm	
Filter specification	1020×630×69 (mm)*1	1420×630×69 (mm)*1
Service life	8 years	

Note: (1) The power consumption of the power supply includes the power of the operating area load (the load cannot exceed 500W);

(2) The company reserves the right to change the design of the product. The product is subject to change without prior notice.

03 Performance Index

3.1 Vibration Amplitude

The net amplitude of vibration between 10 Hz and 10 kHz does not exceed 5 μm (rms).

3.2 Illuminance

The average illuminance is greater than or equal to 300 lx.

3.3 Electrical Safety

The test voltage of the basic insulation part rises to 1390V AC within 5 seconds, keeping it for 5 seconds without breakdown.

Grounding resistance is $\leq 0.1\Omega$.

04 Product Features

4.1 Structure

- The box body is made of 1.0mm thick cold-rolled steel sheet and the surface is electrostatically sprayed to enhance the structural strength and the whole device is more stable.

- Work table is made of stainless steel, which is beautiful and corrosion-resistant.

- The bracket consists of metal and the surface is electrostatically sprayed.

- The control panel adopts a touch switch to make the machine beautiful in appearance and easy to operate.

4.2 Structure Composition

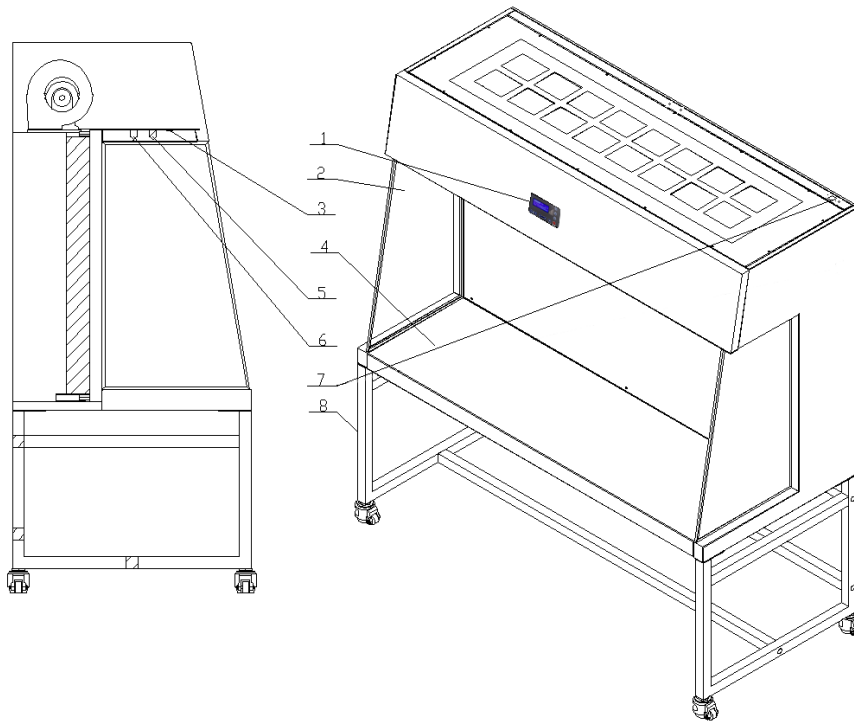


Figure 2

1. Control panel 2. Side Window 3. Water-proof socket 4. Work table 5. LED lamp
6. UV lamp 7. Power socket 8. Base stand

The product consists of cabinet body, fan, HEPA filter, caster, LED lamp, UV lamp and control system.

4.2.1 Air Filtration System

Air filtration system is the most important system to ensure the performance of this equipment, which consists of a fan and an air filter. The main function of the air filtration system is to continuously make the clean air into the operating area and ensure that the airflow velocity, and the cleanliness in the operation area meet the standard requirements.

4.2.2 UV Light Source

The UV lamp is located inside the operation area, ensuring that the UV light can fully irradiate all the space in the operation area to completely sterilize all the space.

4.2.3 LED Light Source

LED lamp can ensure that the average illumination in the operating area meets the standard requirements.

4.2.4 Waterproof Socket

A waterproof socket (IP44) is provided in the operating area to supply power to the equipment.



(1) The power of the equipment used on the socket shall not exceed 500W (rated voltage*rated current 220V*2.3A);

(2) The waterproof socket can play the waterproof role only when the front cover is lowered, and when the front cover is opened, the socket cannot be regarded as a waterproof socket.

Note: IP44 is the socket protection grade, according to the provisions of GB4208: to prevent the fixed foreign material with a diameter of not less than 1.0mm into the socket housing and contact the internal parts; to prevent the splash of water intrusion, to prevent the water splashing from all directions from entering the socket can causing damage.

4.2.5 Control Panel



Figure 3

1.Fan button 2.LED lamp button 3.UV lamp button 4. Power button 5.Socket

button 8. Air volume decrease button 9. Air volume increase button


Button 6 and 7 are for background debug.


a. Gear Display


Through the gear display, the user can understand the equipment's working wind speed gear


b. Soft Touch Button


The operation of the equipment is performed by a touch of a button.


(1) “  ” The power button: the main switch that controls other function button. Each time the button is pressed, the buzzer will sound once; at the same time, the status of the LCD display will change once, namely, from dark to light, or from dark to light. The system can also switch between standby mode and operating mode.


(2) “  ” The fan button: It is the control button of fan working status. Each time the button is pressed, the operating status and the status of the fan indicator on the control panel change once. The fan has memory function, that is, when the power of the fan is turned on, the gear of the fan is the gear when it is powered off last time, which avoids the trouble of adjusting the fan gear every time the power is turned on. The fan cannot be started when the glass door is closed.

(3) “  ” : LED lamp button, each time the button is pressed, the status of the LED lamp and the LED lamp indicator on the control panel are changed once, namely, from dark to light, or from dark to light.

(4) “  ” : UV lamp button, each time the button is pressed, the status of the UV lamp and the UV lamp indicator on the control panel change once, namely, from dark to light, or from dark to light. (The UV lamp is interlocked with the fan, LED lamp, and front window, that is, when the LED lamp, fan, front window is opened, the UV lamp is automatically turned off)

(5) “  ” Socket button, each time the button is pressed, the buzzer will sound once; the status of the socket on the display screen will change once, namely, from on to off, or from off to on; at the same time, the socket will also change between without power and with power.

(6) “  ” Air volume decrease button, when the fan is running, if the number of “■” is greater than 1, each time the button is pressed, wind speed of one gear can be decreased, and the buzzer will sound once until there is a “■”.

(7) “  ” Air volume increase button, when the fan is running, if the number of “■” is less than 9, each time the button is pressed, wind speed of one gear can be increased, and the buzzer will sound once until the image “■■■■■■■■■■” occurs.

(8) Show on display: After the power is turned on, from top to bottom, the displayed content are : ■■■■■■■■■■ FAN, indicating the working wind speed of the fan; the corresponding underneath displays the wind speed in the current state; the right displays the time (adjustment of time will be described below); UV

TIME is the working time of the UV lamp of this equipment; WORK TIME is the working time of the filter of this equipment.

(9) Adjustment of clock: In the standby state, pressing the LED lamp button continuously, there will be an alarm sound, then the clocking setting state is entered, at this time, the minute digit starts to flash. Adjust the minute digit by pressing the increase or decrease button. Then pressing the fan button and the hour digit starts to flash. Adjust the hour digit by pressing the increase or decrease button. When both the minute digit and the hour digit are adjusted to the current time, pressing the LED lamp button continuously again, there will be an alarm sound, then save the time.

4.2.6 Fuse

This equipment is equipped with a main power fuse, which is located next to the outlet of the power line on the side of the cabinet. For the model specifications of the fuse label, please refer to 8.2

05 Installation & Instructions for Use

5.1 Installation

- a. Remove all packaging components;
- b. Check if the outer surface of the main body has scratches, deformations or foreign objects;
- c. Carefully check the attachments and materials by referring to the user manual;
- d. Move the entire equipment to the place where it is going to be installed;

The base stand either has been installed before transportation or packed at the back of the main body, and it should be taken out before installation. Do not invert, disassemble or tilt the cabinet during transportation.

- e. Assemble the base stand

Refer to Figure 4 to assemble the base stand.

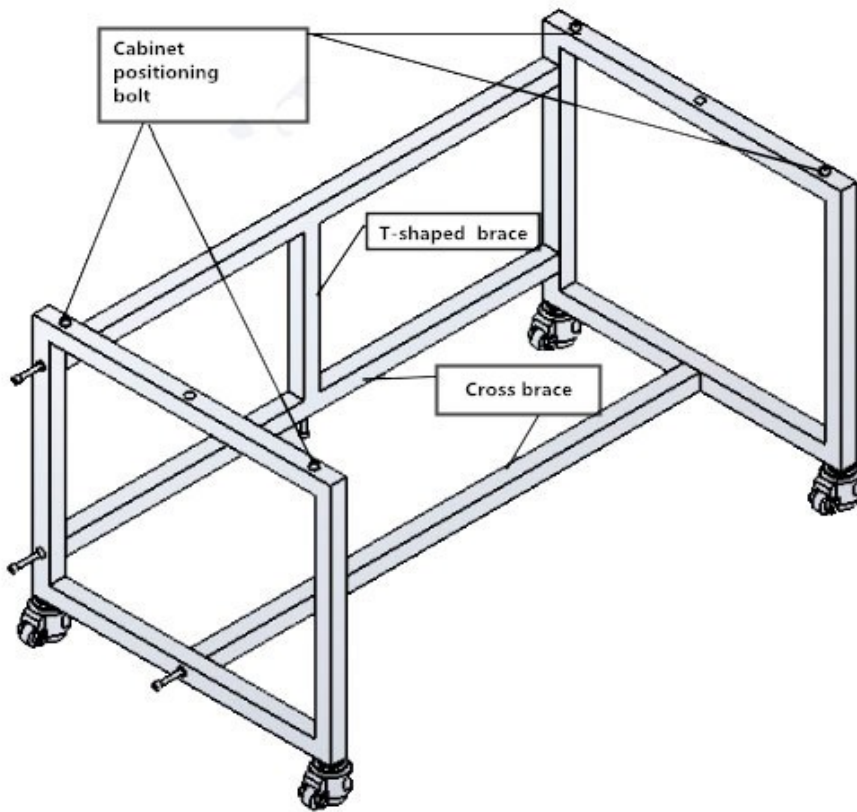


Figure 4

Remove the M10×50 stainless steel hex cylinder head bolt, flat washer10, spring washer 10 and cap nuts M10 from the accessory box. Assemble the base by referring to Figure 4 and tighten firmly.

f. Adjustment of Footmaster Caster

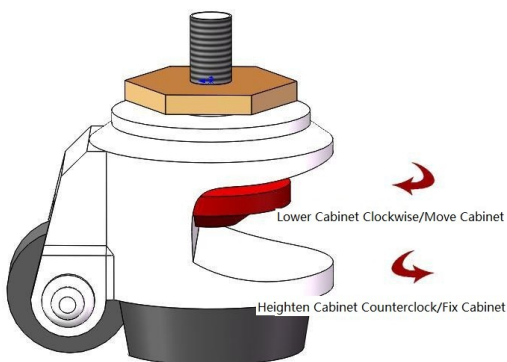


Figure 5

Clockwise rotate the red part of caster to lower the corresponding base foot and the height of the cabinet, lowering the height of the four casters simultaneously can move the cabinet; anticlockwise rotate the red part of caster to raise the corresponding base foot and the height of the cabinet, raising the height of the four casters simultaneously can fix the cabinet; adjust the four casters simultaneously to keep the cabinet in a stable state.

g. Placement of the equipment

The laminar flow cabinet should be placed in a protected area of air flow to prevent air flow coming from the ventilation system, air conditioner, doors, windows, and personnel movements from affecting the laminar flow cabinet. Do not place the cabinet in a position it is difficult to operate and at least 300 mm on each side of the laminar flow cabinet should be left for inspection.



- (1) The cabinet should be installed in a large and spare space;**
(2) When moving the cabinet, it is necessary to cut off the power and adjust the casters then move it slowly;

5.2 Instructions for Operations

- a. Connect to the power supply;
- b. Press the relevant function buttons (for the functions and operations for the relevant buttons, please refer to the instructions in 4.2.5);
- c. Before use, turn on the UV lamp, and disinfect for more than half an hour;



- (1) When disinfecting, people should leave the room to protect their eyes and skin from injury caused by inadvertent exposure;**
(2) The intensity of the UV lamp should be regularly tested according to the specifications of the manufacturer. It is recommended that it be changed once every quarter, and the unqualified UV lamp should be replaced immediately.

- d. After completing the use, turn on the UV lamp, and disinfect for more than half an hour, then power off the equipment;

5.3 Contraindication

None.

06 Maintenance & Common Fault Analysis

Since the statistics of the operation time will directly affect the judgment of the maintenance needs, we suggest that a detailed record of the operating time should be prepared for reference and query when using this equipment!

6.1 Clean the Cabinet Surface

6.1.1 Clean the Operating Area Surface

Wipe the whole surface with a soft cotton cloth soaked in a concentrated soap solution, then wipe the soap with another cotton cloth or towel soaked in clean hot water or warm water then dry quickly with a dry cloth or towel.

The work surfaces that are contaminated or marked, etc. can be wiped with medical alcohol or other disinfectants.



The disinfectant used cannot bring damage to 304 stainless steel.

6.1.2 Clean the Outer Surface and the Front Window

Any non-abrasive household cleaner, wipe off with a soft cotton cloth or towel.

6.2 Overall Maintenance Period

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

6.3 Maintenance Methods

6.3.1 Daily or Weekly Maintenance

- a) Disinfect and clean operating area (refer to 6.3.2);
- b) Clean the outer surface and front window around the operating area (refer to 6.1.2);
- c) Check the various functions of equipment ;
- d) Record this maintenance result ;

6.3.2 Monthly Maintenance

- Clean the outer surface and front window (refer to 6.1.2) ;
- Wipe the working table, inner wall surface of operating area (excluding the wind distributing grid of operating area) and the inner surface of glass door with 70% medical alcohol or household bleach which is diluted 1:100. Then wipe again with sterile water in order to eliminate the rest chlorine.
- Check the various functions of equipment;
- Record this maintenance result.

6.3.3 Annual Maintenance

- Check if the tightness of the front glass door drive is consistent.
- Check if the UV lamp and LED lamp work normally.
- Apply for testing the overall performance of the medical laminar flow cabinet every year to ensure the safety performance of the laminar flow cabinet. Testing costs shall be born by the user.
 - Record this maintenance result.

6.4 Common Fault Analysis

Before diagnosis, please confirm whether the power supply is connected properly, whether the power cord is obviously damaged, whether the fuse is in good condition and whether the switch is in the open state.

Fault	Checking Part	Solution
LED lamp doesn't work	LED Lamp	Replace the lamp
	Circuit	Check the circuit
	Control panel	Replace the control panel
UV lamp doesn't work	Interlock	Check if the fan and LED lamp are turned off
	Lamp holder	Check if the lamp and lamp holder are firmly connected
	UV lamp	Replace the lamp
	Ballast	Replace the ballast
	Circuit	Check the circuit
	Control panel	Replace the control panel
Button doesn't work	Control panel	Make sure the power is connected well and the fuse is in good condition
		Make sure the buttons are not damaged
		Make sure the connecting wire is well connected
		Replace the control panel
No electricity in equipment	Power supply	Power supply is not connected well
	Power cord	Check if the power cord is damaged
	Fuse	Check if the fuse is good
	Transformer	Check if the transformer works normally
	Control panel	Replace the control panel
Display doesn't work	Connection wires	Check if the connection wires are connected well
	Display screen	Check if the screen is in good condition
	Control panel	Replace the control panel



(1) The operation of the above electrical components must be performed by a qualified electrician under safe conditions (cut off the power supply). All other components must not be disassembled, otherwise the consequences will be borne by the user;

(2) Please contact Biolab or our agent technical department if a failure could not be traced or solved. Do Not repair the equipment without a qualified electrician.

(3) The maintenance of this equipment shall only be undertaken by trained and approved technical personnel;

(4) Please contact Biolab or our agent technical department or agent to order required component or part. The model number and the serial number of purchased cabinet need to be indicated.

6.4.1 Simple Accessories Replacement

1) Replace the fuse

The socket fuse ($\Phi 5 \times 20$ (5A)) and the neutral line fuse ($\Phi 5 \times 20$ (10A)) are located on the right side of the laminar flow cabinet. When replacing them, firstly turn off the power supply and remove the plug. Use a Phillips screwdriver to turn the fuse holder counterclockwise to remove the fuse in the holder and replace it with a new one, then use a Phillips screwdriver to turn the fuse holder clockwise; the live line fuse ($\Phi 5 \times 20$ (10A)) is also located on the right side of the cabinet, use a flat head screwdriver to remove the fuse from the holder and replace it with a new one, and then press it back.

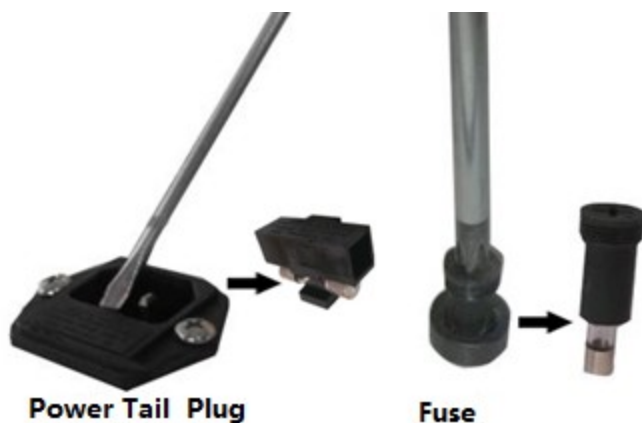


Figure 6

2) Replace the UV lamp

The cumulative operating time for the UV lamp (T8 30W) equipped with the product is 600 hours. To achieve a good disinfection effect, we recommend that the user periodically test the UV intensity. The user can use the UV intensity test

card to confirm whether he needs to replace the UV lamp. When replacing it, firstly turn off the power supply, then turn the lamp by 90° to remove the lamp, take a new UV lamp with the same specification, and place it on the lamp holder by turning 90° in the opposite direction.



Place both hands at both ends of the tube, close to the lamp holders on both sides, then turn the tube by 90° clockwise (or anti-clockwise) at the same time with both hands, then the tube can be removed, carefully set it aside and insert a new lamp into the holder, then turn the lamp clockwise (or counterclockwise) by 90° according to the above method. Then power on for test after the installation.

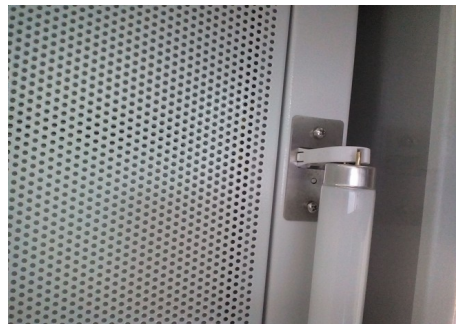


Figure 7

3) Replace the LED lamp

When the LED lamp of the laminar flow cabinet needs to be replaced, disconnect the power supply. Then tilt the LED bracket off, unplug the right plug and replace with a LED bracket and tilt it into the slot.

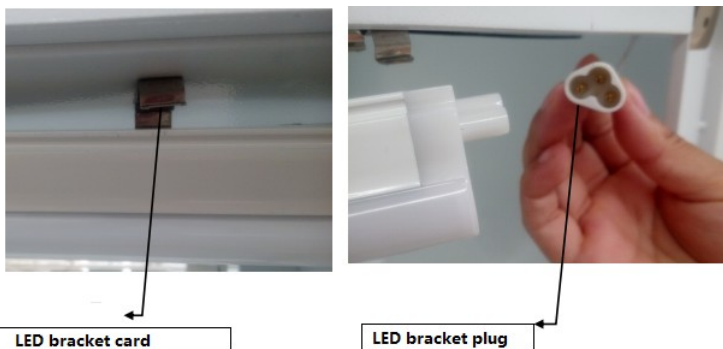


Figure 8

- (1) It is forbidden to wipe the lamp body with damp cloth when the power is on;**
- (2) It is forbidden to replace parts when the power is on**

6.5 Storage Condition

The laminar flow cabinet should be stored in a warehouse with a relative humidity of less than 75%, a temperature of less than 40°C. The warehouse should be with good ventilation performance, without acid, alkali or other corrosive gases. Storage period shall not exceed one year. The 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.

07 Precautions

- a. Make sure input voltage is correct and stable. The rated load of main power socket should be higher than cabinet consumption. Plug must be well grounded. This plug with a third foot, can only be used with grounded power outlet, which is a safety device. If socket can not plug in, please contact with your install a grounding type power socket by a electrician.
- b. Moving principles of different samples inside cabinet: When two or more samples need to be moved, be sure that low-polluting samples should be moved at first and then high-polluting samples. To avoid high pollution of the items in the process of moving producing a large area of pollution. Movement of items should also follow the principles of moving slowly and steadily.
- c. The weight of items placed in the cabinet should not be more than 23Kg/25×25cm² ;
- d. Avoid vibration: avoid using vibration equipment (e.g. centrifuge, vortex oscillator, etc.) inside the cabinet. The contamination might drop from the HEPA filter thus making the operation area cleanliness lower.

e. No flame: An open flame would create turbulence which disrupts the pattern of HEPA-filtered air supplied to the work surface. If sterilization is required during the experiment, infrared sterilizer is highly recommended.

f. 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. Otherwise it will affect the safety performance of the equipment. The used filter should be processed as medical waste.

g. Air duct has been sealed strictly. Please do NOT remove or loose the screws of those parts. To contact service personnel for special technical requirements

h. The maximum storage period is one year. A performance inspection should be done if the storage period exceeds one year.



Serious declaration: Biolab will take no responsibility for risks caused by improper operation and man-made damages!

08 Label Description

8.1 Fuse Label



Figure 10

Note : 10A/5Afuse label

8.2 LED Lamp Anti-Electric Shock Label



Figure 11

8.3 Grounding Label



Figure 12

8.4 UV Lamp Warning Label



Figure 13

8.5 Load Requirements Label

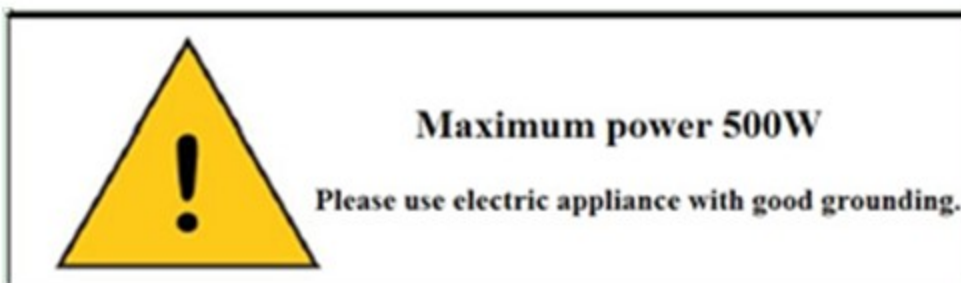



Figure 14

Note: In all cases marked with this symbol (), it is necessary to consult the

documentation in order to ascertain the nature of the potential hazard and any countermeasures that must be taken.

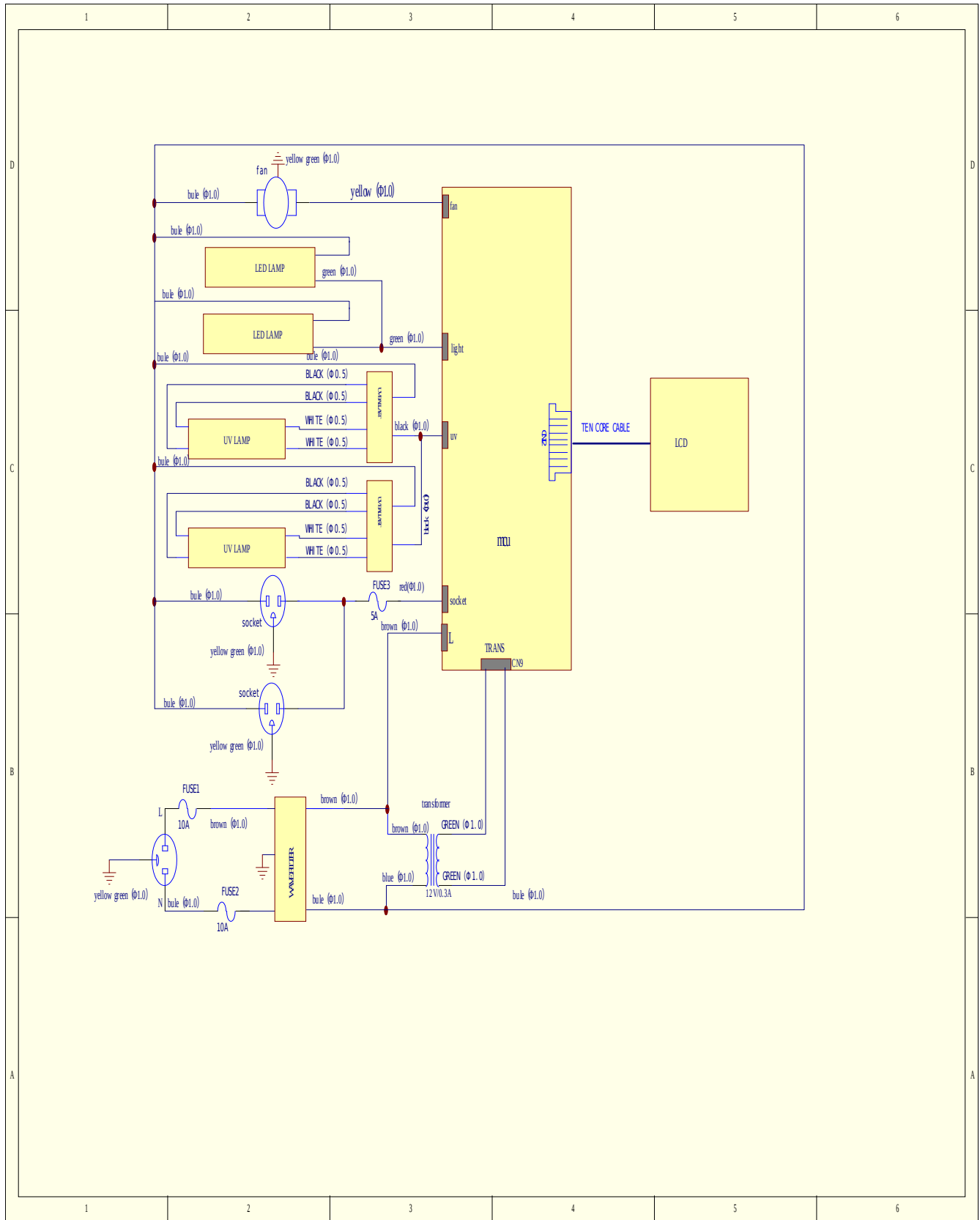
09 Electromagnetic Compatibility

- This equipment complies with the emission and immunity requirements of GB/T 18268.1-2010.
- This equipment is designed and tested according to Class A equipment in GB 4824. In the home environment, the equipment may cause radio interference and therefore, it should require protective measures.
- It is recommended that the electromagnetic environment should be evaluated before the use of the equipment.
- Do not use this equipment near strong radiation sources (such as unshielded RF sources), otherwise, it may interfere with the normal operation of the equipment.

10 Warranty

- Warranty is 12 months from EX-factory date (excluding consumable accessories, UV and LED lamp, fuse).
- We will take no responsibility for risks caused by improper operation and man-made damages.
- After the expiration of warranty, our company is also responsible for repairs, but the corresponding maintenance cost should be charged.
- Life time of the laminar flow cabinet is 8 years from production date on the label.
- We can provide equipment drawings and necessary technical data for maintenance companies or personnel trained by our company.

Appendix A Wiring Diagram



Appendix B Packing List

BLHZ-201 Packing List :

Item	Quantity
Main Body	1Set
RVV Power Cord	1pc
Fuse (10A)	1pc
UV lamp (T8 18W)	1pc
User Manual	1copy
Test Report	1sheet
Quality Certification Card	1pc
Warranty Card	1pc
Customer Satisfaction Questionnaire	1sheet
After-sales Service Contact Sheet	1sheet
Product Acceptance Sheet and Installation Report	1sheet
Training Certificate	1sheet

BLHZ-202 Packing List :

Item	Quantity
Main Body	1Set
RVV Power Cord	1pc
Fuse (10A)	1pc
UV lamp (T8 30W)	1pc
User Manual	1copy
Test Report	1sheet
Quality Certification Card	1pc
Warranty Card	1pc
Customer Satisfaction Questionnaire	1sheet
After-sales Service Contact Sheet	1sheet
Product Acceptance Sheet and Installation Report	1sheet
Training Certificate	1sheet



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