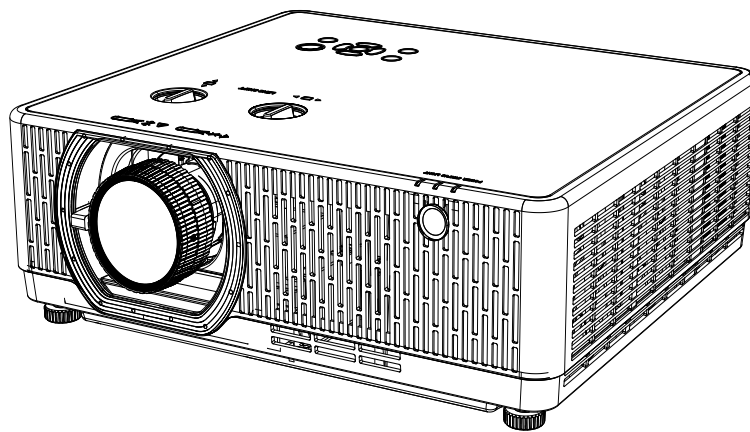




# Laser Projector Service Manual



**Model: EK-820LU**

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## Safety instruction

Technicians need to read and follow the "safety precautions" and "important safety tips" strictly in the service manual in the maintenance process.



### Caution

The service manual is only for experienced technicians, rather than the general public.

The service manual does not include the warning about the non-technicians or to inform the danger they may occur in the maintenance process.

When the product is powered on, it can only be repaired or processed by experienced professional technicians. Any other person who attempts to repair or repair the products involved in the service manual may result in serious injury or even death.

## Lead-free solder (Pb Free)

The projector uses the PCB board of lead-free solder.

Please use the PCB board of lead-free solder to prevent the harm to the global environment.

### Notes

- Lead-free solder: The Sn-Ag-Cu (tin - Silver - copper) is with a higher melting point (about 217 °C ) than the standard solder. in general, the melting point will be 30 °C to 40 °C higher. And you should select the soldering iron with temperature limit, and the temperature may reach 37 °C ± 10 °C .
- Lead-free solder precautions: The Sn-Ag-Cu lead-free solder (SN Ag Cu) will splash when it is heated to high temperature (at about 600 °C or higher).
- The PCB board about our product are all lead-free solder. When it is necessary to use leaded solder, please make sure to remove the lead-free solder before, or ensure that the lead-free solder will be heated to completely melt, and then coat with leaded solder.
- Please check whether there is excess solder material on the components' surface which may flow to the other side after welding PCB board into a double layer.

## Identification of PCB board for lead-free soldering materials






The logo just as shown in the figure below will be engraved or printed on the PCB board' surface or back when using the lead-free soldering materials.



## Safety Cautions

### Precautions

Please read this manual carefully before using your NEC projector and keep the manual handy for future reference.

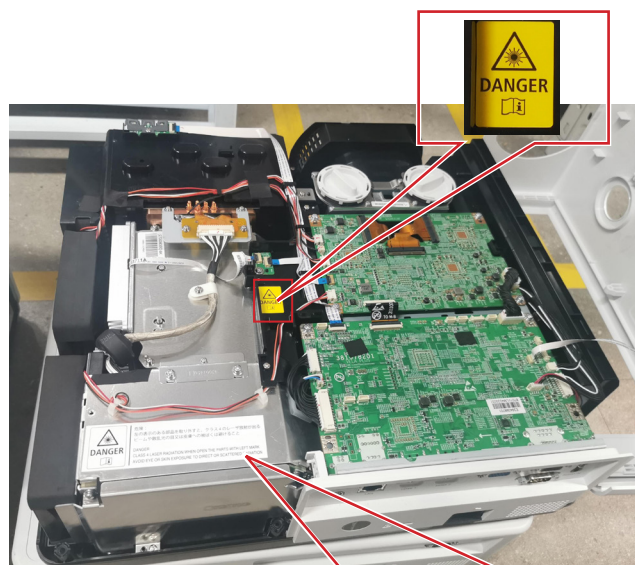
 Caution	Ignoring messages indicated by this symbol may lead to personal injuries or deaths due to human errors.
 Note	Ignoring messages indicated by this symbol may lead to personal injuries or property damage.
	High voltage inside with risks of electric shock.
	When turning on the projector, make sure no one is facing the lens within laser range. Do not peep at the lens when the projector is activated to avoid serious injury to the eyes.
	Never place goods in the projection window while working as it may overheat, burn or even catch fire. Press the Blank button through the remote controller for temporarily pause the projection.

### DANGER



CLASS 4 LASER RADIATION WHEN OPEN THE PARTS WITH LEFT MARK.  
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

**DO NOT DISASSEMBLE the Engine Module which is located the danger label as shown below.**



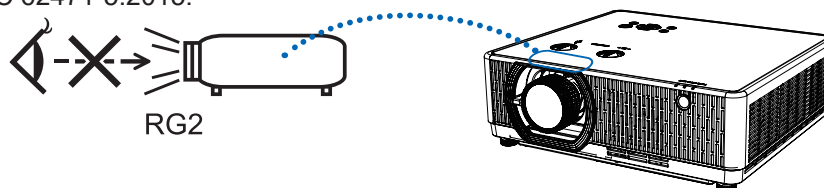


## PROHIBIT



### About the projector's light source

- Do not look into the projector's lens. Strong light that could damage your eyes is projected when the projector is operating. Be especially careful when children are around.
- Do not look at the projected light using optical devices (magnifying glasses, reflectors, etc.). Doing so could result in vision impairment.
- Check that there is no one looking at the lens within the projection range before turning on the projector.
- Do not allow children to operate the projector alone. When a child is operating the projector an adult should always be present and watch the child carefully.
- The below pictogram, that is indicated near the lens on the cabinet, describes this projector is categorized in the risk group 2 of IEC 62471-5:2015. As with any bright light source, do not stare into the beam, RG2 IEC 62471-5:2015.



### Caution

**Danger of electric shock  
DO NOT open this.**



Note: DO NOT remove the casing (or back cover) as this may result in electric shock. Users shall not execute any maintenance work on components within your projector. Call qualified maintenance personnel in case of any maintenance requirements.



High voltage inside with risks of electric shock.



Operation and maintenance tips about these components.

## CAUTION



To turn off main power, be sure to remove the plug from power outlet. The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible.

## WARNING:

- TO PREVENT FIRE OR SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. DO NOT USE THIS UNIT'S PLUG WITH AN EXTENSION CORD OR IN AN OUTLET UNLESS ALL THE PRONGS CAN BE FULLY INSERTED.

## Important Safeguards

These safety instructions are to ensure the long life of your projector and to prevent fire and shock. Please read them carefully and heed all warnings.

### Installation

- Do not place the projector in the following conditions:
  - on an unstable cart, stand, or table.
  - near water, baths, or damp rooms.
  - in direct sunlight, near heaters, or heat radiating appliances.
  - in a dusty, smoky or steamy environment.
  - on a sheet of paper or cloth, rugs or carpets.
- If you wish to have the projector installed on the ceiling:
  - Do not attempt to install the projector yourself.
  - The projector must be installed by qualified technicians in order to ensure proper operation and reduce the risk of

bodily injury.

- In addition, the ceiling must be strong enough to support the projector and the installation must be in accordance with any local building codes.
- Please consult your dealer for more information.
- Do not install and store the projector in the below circumstances. Failure to do so may cause of malfunction.
  - In powerful magnetic fields
  - In corrosive gas environment
  - Outdoors
- If intense light like laser beams enters from the lens, it could lead to malfunction.

### CAUTION



This equipment is designed to be used in the condition of the power cord connected to earth. If the power cord is not connected to the earth, it may cause electric shock. Please make sure the power cord is earth ed properly.

Do not use a 2-core plug converter adapter.

## NOTE

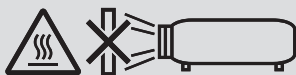
### Preventive measures:

- Please make sure to set the High land off when using the projector at altitudes above 1700 meters, or it may shorten the life of internal components or even cause functional failure.
- Please make sure to set the High land on when using the projector at altitudes above 1700 meters but below 3000 meters, or it may shorten the life of internal components or even cause functional failure.
- Never install the projector in a place higher than 3000 meters, or it may shorten the life of internal components or even cause functional failure.
- Some more details about operation guidance, please refer to the projector setup menu.
- Please consult the dealer or authorized service center for preventive measures if you want to use the projector in high altitude area.

## Cable information

### WARNING

- Operation of this equipment in a residential environment could cause radio interference.
- Do not cover the lens with the lens cap or equivalent while the projector is on. Doing so can lead to melting of the cap due to the heat emitted from the light output.
- Do not place any objects, which are easily affected by heat, in front of the projection lens. Doing so could lead to the object melting from the heat that is emitted from the light output.



- Do not use a spray containing flammable gas to get rid of accumulated dust and dirt on the filter and the projection window. It may cause of fire.



### Fire and Shock Precautions

- Ensure that there is sufficient ventilation and that vents are unobstructed to prevent the build-up of heat inside your projector. Allow at least 4 inches (10 cm) of space between your projector and a wall.
- Prevent foreign objects such as paper clips and bits of paper from falling into your projector. Do not attempt to retrieve any objects that might fall into your projector. Do not insert any metal objects such as a wire or screwdriver into your projector. If something should fall into your projector, disconnect it immediately and have the object removed by a qualified service personnel.
- Do not place any objects on top of the projector.
- Do not touch the power plug during a thunderstorm. Doing so can cause electrical shock or fire.
- The projector is designed to operate on a power supply of 100-240V AC 50/60 Hz. Ensure that your power supply fits this requirement before attempting to use your projector.
- Keep any items such as magnifying glass out of the light path of the projector. The light being projected from the lens is extensive, therefore any kind of abnormal objects that can redirect light coming out of the lens, can cause unpredictable outcome such as fire or injury to the eyes.
- Do not place any objects, which are easily affected by heat, in front of a projector exhaust vent. Doing so could lead to the object melting or getting your hands burned from the heat that is emitted from the exhaust.

- Do not splash water over the projector. Doing so can cause electrical shock or fire. If the projector gets wet, turn off the projector, unplug the power cord and have the projector serviced by a qualified service personnel.
- Handle the power cord carefully. A damaged or frayed power cord can cause electric shock or fire.
  - Do not use any power cord other than the one supplied with the projector.
  - Do not bend or tug the power cord excessively.
  - Do not place the power cord under the projector, or any heavy object.
  - Do not cover the power cord with other soft materials such as rugs.
  - Do not heat the power cord.
  - Do not handle the power plug with wet hands.
- Turn off the projector, unplug the power cord and have the projector serviced by a qualified service personnel under the following conditions:
  - When the power cord or plug is damaged or frayed.
  - If liquid has been spilled into the projector, or if it has been exposed to rain or water.
  - If the projector does not operate normally when you follow the instructions described in this user's manual.
  - If the projector has been dropped or the cabinet has been damaged.
  - If the projector exhibits a distinct change in performance, indicating a need for service.
- Disconnect the power cord and any other cables before carrying the projector.
- Turn off the projector and unplug the power cord before cleaning the cabinet.
- Turn off the projector and unplug the power cord if the projector is not to be used for an extended period of time.
- When using a LAN cable:  
For safety, do not connect to the terminal for peripheral device wiring that might have excessive voltage.
- Lens shift, focus and zoom operations.
  - When shifting the lens or adjusting the focus or zoom, do so from either behind or to the side of the projector. If these operations are performed from the front, your eyes could be exposed to strong light and get injured..
  - Keep your hands away from the lens area when performing the lens shift operation. If not, your fingers could get caught in the cap between the cabinet and the lens.

## Safety precautions

### 1.1 General policy:

- DO NOT attempt to make a circuit modification for the sake of safety for long.
- Unplug the power cord from the power outlet before removing the projector.
- Please use the random supply line correctly, and make sure that the line must be earthed.
- Use insulation transformer on the ac power cord before maintenance.
- DO NOT touch any rotating parts of the projector (cooling fan, etc.) when the lid is removed and the power is powered on.
- Please pay attention to the original layout of the wire in the maintenance process. Once there is a short circuit, please replace all the pin the maintenance process parts that are overheated and damaged due to short circuit.
- Please check for the leakage after the maintenance is completed to prevent customers from electric shock.

### 1.2 Leakage check:

1. Be ready to measure circuit in figure 1 below.  
Make sure your voltmeter are of the same properties as described in table 1.
2. Connect the circuit as figure 2 shows. Plug the power cord into an electrical outlet.
3. Connect M1 to T1 as figure 2 shows, and measure the voltage.
4. Connect M1 to T2, and measure the voltage again.
5. The read value of the voltmeter in step 4 must be 0.375 volts or less in step 3 and 4. This means that the current must be 0.75 mA or less.
6. If the read values exceed the above criteria, the projector must be repaired and re-examination in order to prevent the risk of electric shock before returning to the customer.

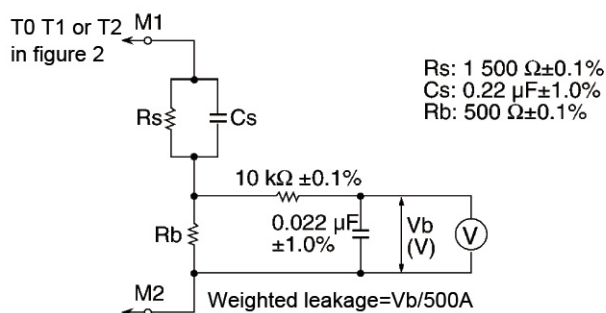
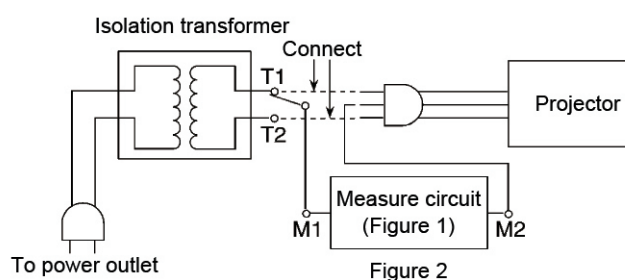


Figure 1



	Property	
Voltmeter (rmsvalue)	Accuracy	$\leq 2\%$
	Input resistance	$\geq 1M\Omega$
	Input capacitance	$\leq 200pF$
	Frequency range	15hz to 1MHZ

Table 2

# Specification

Mechanical properties	Dimensions (W×H×D)(mm)	405 x 358 x 137
	Net Weight(Kg)	7.9
	Adjustable foot	3.5°
LCD resolution	LCD system	0.64"x3 TFT, active matrix
	LCD resolution	1920 x 1200
Compatible signal	Color standard	PAL、SECAM、NTSC、NTSC4.43、PAL-M、PAL-N、PAL-60
	HDTV signal	PAL, SECAM, NTSC 4.43, PAL-M, PAL-N, PAL-60, 480i, 480p, 576i, 576p, 720p, 1080p, 1080i
	Scanning frequency	Vertical frequency 15~100 KHz, Horizontal frequency 24~85Hz
Optical elements	Image size (diagonal lines)	(30"-300"), adjustable
	Throw Ratio	EK-820LU/: 0.765-12.885
	Projection distance	EK-820LU: 1.2 (wide)-2.0 (tele)
	F	EK-820LU: 1.5~2.08
	f	EK-820LU: 17.2~27.7mm
	Light source power	125W
Terminal	VGA IN	D-sub 15pin x1
	VGA OUT	D-sub 15pin x1
	HDMI1	HDMI A type 19 pin
	HDMI2	HDMI A type 19 pin
	LAN	100 Base-TX(100Mbps)/10 Base-T(10Mbps), RJ45
	USB-B	USB connector (B type x1)
	USB-A	USB connector (A type x1)
	RS-232	D-sub 9 pin x1
	AUDIO IN	Mini Stereo 3.5mm x1
	AUDIO OUT	Mini Stereo 3.5mm x1
Power	Voltage and power consumption	4.5A Max. 50/60 Hz
	Projection power	435W (Normal) 285W (ECO1) 235W ( ECO2)
	Fuse	10A/250V
	Speaker	16W x 1

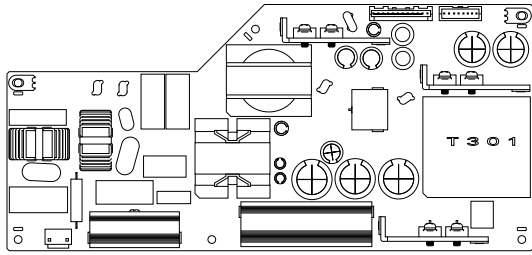
## Specification

Operating Environment	Operating temperature	0°C ~40°C ( High land :1700m~3000m) 0°C ~50°C ( High land :0m~1700m)
	Operating humidity	20%-85%
	Storage Temperature	-10°C ~50°C
	Storage humidity	10%-85%
	High land(m)	3000
	Noise	39dB(Normal ) 31dB( ECO1) 29dB( ECO2) 【* The testing environment temperature is $23 \pm 2$ °C , and the testing standard is ISO 7779:2018】
Remote control	Battery	AA lkaline type x 2
	Operating Range	$\pm 15^\circ$ About 6 meters, straight line about 8 meters
	Dimensions(LxWxH)(mm)	110 x 50 x 20
	Net Weight (g)	38
Accessories	Remote control and batteries	X 1
	AC power cord	X 1
	HDMI cable	X 1
	Quick Start Guide(electronic version)	X 1
	Wireless module (optional)	-

- The aforesaid specification is subject to change without prior notice.
- Liquid crystal panel is made on the basis of high standard, where 99.99% of the pixels are effective.  
Due to the nature of the liquid crystal panel, a fraction of the pixels (0.01% or less) may be ineffective.

## Circuit protection

The projector has the following security operation circuit protection functions. If there is any abnormal in the inside of the projector, one of the following protection circuit action will make your projector shut down automatically .

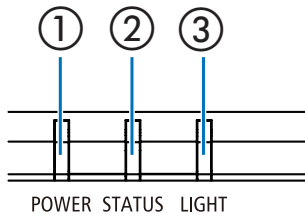


### How to replace the power board

Remove the case, the main board , AV board and speaker bracket as the steps in "Mechanical Disassembly" .

## Indicator status

When the temperature inside the projector is too high or the cooling fan stops rotating or loss of power, the projector will shut down automatically.



① POWER indicator

This indicator informs the power status of the projector.

② STATUS indicator

























This indicator lights/blinks when a button is pressed while the CONTROL PANEL LOCK function is utilized, or while performing the specific operations.

③ LIGHT indicator

This indicator informs the state of light source, usage time of the light source and the status of ECO MODE.

### Indicator Message (Status message)

Check light indicator to learn status of your projector.

POWER	STATUS	LIGHT	Projector status
 Off	 Off	 Off	Power is off.
 Orange (Blink*2)	 Off	 Off	In the state of Standby (Standby mode is Normal standby).
 Orange (Light)	 Off	 Off	Standby state (Standby mode is Network standby).
 Orange (Blink*1)	 Off	 Off	In the state of Standby (Standby mode is Sleep standby).
 Blue (Light)	 Off	 Green (Blink*3)	Powered state (ECO mode:On).
 Blue (Light)	 Off	 Green (Light)	Powered state (ECO mode:Off).
 Green (Blink*4)	 Off	 Off	In the state of Cooling.
 Green (Light)	 Off	 Off	In the state of Sleep.

\*1 Repetition to light on for 1.5 seconds / off for 1.5 seconds

\*2 Repetition to light on for 1.5 seconds / off for 7.5 seconds

\*3 Repetition to light on for 2.5 seconds / off for 0.5 seconds

\*4 Repetition to light on for 0.5 seconds / off for 0.5 seconds

• When the thermal protector is activated:























































When inside temperature of the projector becomes too high or low, the POWER indicator start to red blink in a short cycle. After this happened, the thermal protector will activate and the projector may be turned off.

In this case, please take the below measures:




- Pull out the power plug from the wall inlet.
- Place the projector in cool place if it has been placed in high ambient temperature.
- Clean the exhaust vent if dust has accumulated on.
- Leave the projector for about one hour until inside temperature gets lower.



## Indicator Message (Error message)

POWER	STATUS	LIGHT	Projector status	Procedure
 Off	 Orange (Light)	 Off	A button has been pressed while the KEY LOCK is activated. ID numbers for the projector and the remote control do not match.	The projector's keys are locked. The setting must be canceled to operate the projector. Check the control IDs
 Red (Blink*4)	 Green (Light)	 Red (Light)	When LD-driver current value is too low	Please check the LD-driver board.
 Red (Blink*4)	 Green (Blink*4)	 Red (Light)	When LD-driver SPI communication error	Please check the main board and power board.
 Red (Blink*4)	 Green (Light)	 Red (Blink*4)	When LD-driver 55V error	Please check the LD-driver board and power board.
 Red (Blink*4)	 Green (Blink*1)	 Red (Light)	When LD-driver 13V error	Please check the main board and LD-driver board.
 Red (Blink*4)	 Green (Light)	 Red (Blink*1)	When LD-driver output current is abnormal	Please check the LD-driver board.
 Red (Blink*4)	 Green (Blink*3)	 Red (Light)	When LD-driver is not ready	Please check the main board and power board.
 Red (Blink*4)	 Green (Light)	 Red (Blink*3)	When LD-driver error	Please check the main board and LD-driver board.
 Red (Blink*4)	 Green (Blink*3)	 Red (Blink*3)	When Laser Cover switch Error	Please check the main board and LD-driver board.
 Red (Blink*4)	 Off	 Off	When Temperature status is error	Ambient temperature is out of the operation temperature. Check if any obstruction stays near the exhaust vent.
 Red (Light)	 Orange (Light)	 Off	When Fan-1 status is error	Please check the Fan-1 connection line and FAN 1.
 Red (Light)	 Orange (Blink*4)	 Off	When Fan-2 status is error	Please check the Fan-2 connection line and FAN 2.
 Red (Light)	 Off	 Orange (Blink*4)	When Fan-3 status is error	Please check the Fan-3 connection line and FAN 3.
 Red (Light)	 Orange (Blink*1)	 Off	When Fan-4 status is error	Please check the Fan-4 connection line and FAN 4.
 Red (Light)	 Off	 Orange (Blink*1)	When Fan-5 status is error	Please check the Fan-5 connection line and FAN 5.
 Red (Light)	 Orange (Blink*3)	 Off	When Fan-6 status is error	Please check the Fan-6 connection line and FAN 6.
 Red (Light)	 Red (Blink*4)	 Off	When power status is error	Please check the main board and power board.
 Red (Blink*4)	 Red (Blink*4)	 Off	When phosphor wheel status is error	Check the main board and LCD -driver board.
 Red (Light)	 Red (Blink*3)	 Off	Filter over time Waring	Please clean up the filter and set filter counter reset. (→ Page 15)

## Circuit protection

POWER	STATUS	LIGHT	Projector status	Procedure
 Red (Light)	 Red (Light)	 Off	High altitude error	Set the High Altitude option to On.

\*1 Repetition to light on for 1.5 seconds / off for 1.5 seconds

\*2 Repetition to light on for 1.5 seconds / off for 7.5 seconds

\*3 Repetition to light on for 2.5 seconds / off for 0.5 seconds

\*4 Repetition to light on for 0.5 seconds / off for 0.5 seconds

- When the thermal protector is activated:

When inside temperature of the projector becomes too high or low, the POWER indicator start to red blink in a short cycle. After this happened, the thermal protector will activate and the projector may be turned off.

In this case, please take the below measures:

- Pull out the power plug from the wall inlet.
- Place the projector in cool place if it has been placed in high ambient temperature.
- Clean the exhaust vent if dust has accumulated on.
- Leave the projector for about one hour until inside temperature gets lower.

## Maintenance

This section describes the simple maintenance procedures you should follow to clean the filter, the lens, the cabinet, and to replace the light source and the filter.

### Cleaning the Filter

The air-filter sponge keeps dust and dirt from getting inside the projector and should be frequently cleaned. If the filter is dirty or clogged, your projector may overheat.

#### WARNING

- Please do not use a spray containing flammable gas to remove dust attached to the filter, etc. Doing so may result in fires.

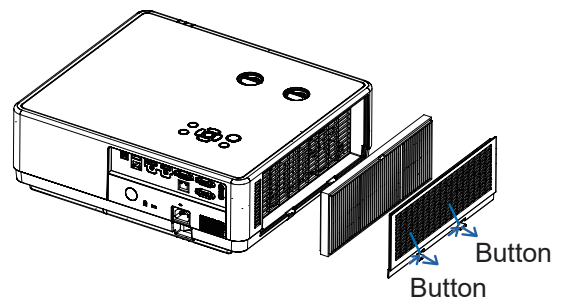
**NOTE:** The message for filter cleaning will be displayed for one minute after the projector is turned on or off. When the message is displayed, clean the filter. The time to clean the filter is set to [10000 H] at time of shipment. To cancel the message, press any button on the projector cabinet or the remote control.

To clean the filter, detach the filter unit and the filter cover.

#### CAUTION

- Before cleaning the filter, turn off the projector, disconnect the power cord and then allow the cabinet to cool. Failure to do so can result in electric shock or burn injuries.

#### 1. Push button to release the filter unit and pull it out.



#### 2. Remove the filter.

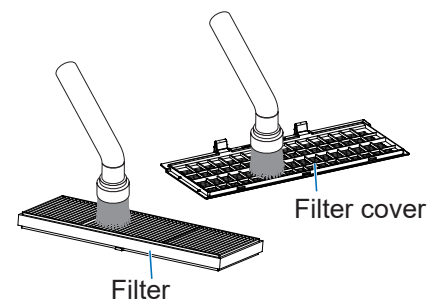
- Remove the filter from the filter cover.

#### 3. Remove dust from the filter and the filter cover.

- Clean both outside and inside.

##### NOTE:

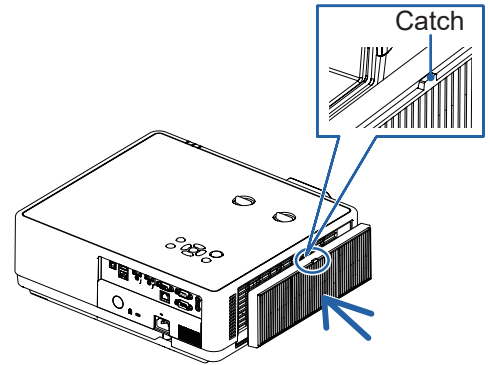
- Whenever you dust the filter, use the soft brush attachment to dust. This is to avoid damage to the filter.
- Do not wash the filter with water. Doing so can result in filter clogging.



### 4. Attach the filter to the filter cover.

#### NOTE:

- When installing the filter, please make sure that the catch of the filter is facing outwards, otherwise the installation is reversed.



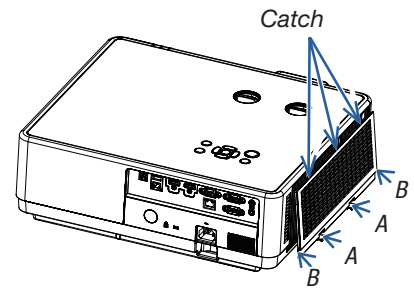
### 5. Put the filter cover back to the projector cabinet.

Insert the three catches of the tip of the filter cover into the groove of the cabinet, and then push the A button to close the filter cover.

- Push the filter cover until it clicks into place.

#### NOTE:

- After installing the filter cover to the cabinet, please press the left and right ends (B) of the filter cover manually to ensure that it is fully installed.



### 6. Clear the filter usage hours.

Plug the power cord into the wall outlet, and then turn on the projector.

Plug the power cord into the wall outlet, and then turn on the projector.

From the menu, select [Filter] → [Filter counter reset].

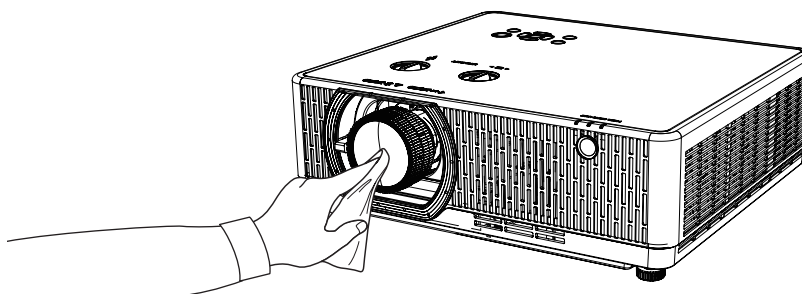
The interval time to clean the filter is set to [1000H] at time of shipment. When using the projector as it is, you do not clear the filter usage.

## Cleaning the Lens

- Turn off the projector before cleaning.
- The projector has a plastic lens. Use a commercially available plastic lens cleaner.
- Do not scratch or mar the lens surface as a plastic lens is easily scratched.
- Never use alcohol or glass lens cleaner as doing so will cause damage to the plastic lens surface.

### WARNING

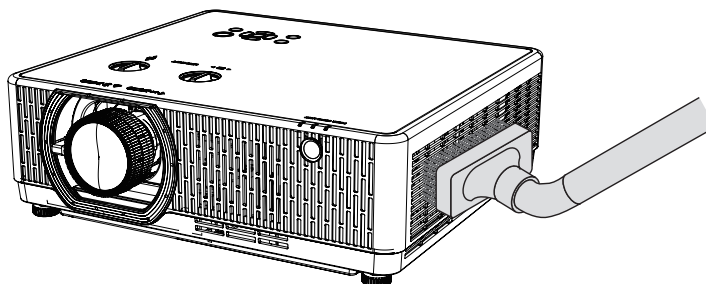
- Please do not use a spray containing flammable gas to remove dust attached to the lens, etc. Doing so may result in fires.



## Cleaning the Cabinet

Turn off the projector, and unplug the projector before cleaning.

- Use a dry soft cloth to wipe dust off the cabinet.  
If heavily soiled, use a mild detergent.
- Never use strong detergents or solvents such as alcohol or thinner.
- When cleaning the vents or the speaker using a vacuum cleaner, do not force the brush of the vacuum cleaner into the slits of the cabinet.



Vacuum the dust off the vents.

- Clogged vents may cause a rise in the internal temperature of the projector, resulting in malfunction.
- Do not scratch or hit the cabinet with your fingers or any hard objects.
- Contact your dealer for cleaning the inside of the projector.

NOTE: Do not apply volatile agent such as insecticide on the cabinet, the lens, or the screen. Do not leave a rubber or vinyl product in prolonged contact with it. Otherwise the surface finish will be deteriorated or the coating may be stripped off.

## How to check the light source usage time

It is time to replace the light source when the light source usage time (Corresponding value) comes to 20,000 hours. Use the following formula to calculate the light source time.


Light source usage time (Corresponding value) =  $T_{eco2} + T_{eco1} + T_{normal}$

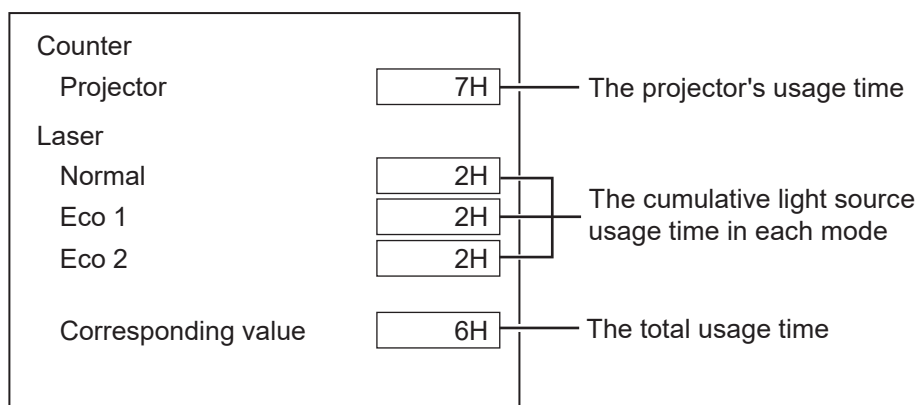
$T_{normal}$  : Usage time in normal mode

$T_{eco1}$  : Usage time in ECO 1 mode

$T_{eco2}$  : Usage time in ECO 2 mode

Follow steps below to check the light source usage time.

- 1) Press the POWER  button more than 20 seconds in the projector or on the remote control.
- 2) The projector's usage time and light source usage time will be displayed on the screen, just as follows:



## Safety function instruction

---

This projector provides Closed caption, Key lock and PIN code lock ensure your projector's operation safety. Only when users enter the correct password can you open your projector when you has set up the three security features. You won't start the projector without password. In case of the above issues, please reset such three security features according to the following reset procedure, and then re-check.

Function	Description
Key lock	Prevent unauthorized personnel from operating your projector. Initial Password: 111
PIN code lock	Prevent unauthorized personnel from changing the LOGO. Initial Password: 111

## Standby mode instruction

The projector has two kinds of standby mode, namely Eco.mode and the Normal mode. In the two mode, the following functions will be limited as shown in the table. Please switch to Standby mode on the Setting menu.

**Sleep .....**Although the power consumption on this mode is higher than on the [Network standby] mode, this mode spends less time to turn on the projector from standby condition via LAN compared to the [Network standby] mode.

To control the projector by using our application software NaViSet Administrator 2, select the [Sleep] mode.

**Network standby.....**Although the power consumption on this mode is higher than on the [Normal] mode, this mode allows you to turn on the projector from standby condition by using the Wake on LAN feature (hereafter referred to as WoL) via LAN.

Consult your network administrator for more information about WoL.

**Normal.....**Although the power consumption on this mode is lower than on the [Network standby] or [Sleep] mode, when this mode is selected, only the POWER button on the top control panel or the remote control will work.

Once you select the sleep mode, some function will be limited.

### Limited functions in standby mode


Function	Sleep mode	Normal	Network mode
Serial control	✓ *1	✓ *1	✓ *1
Network	---	✓	---
Monitor output	---	---	---
Audio output	---	---	---
Auto startup	✓	✓	✓

\*1 :Only be effective when plugged into power.



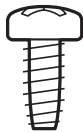

# Mechanical disassembly

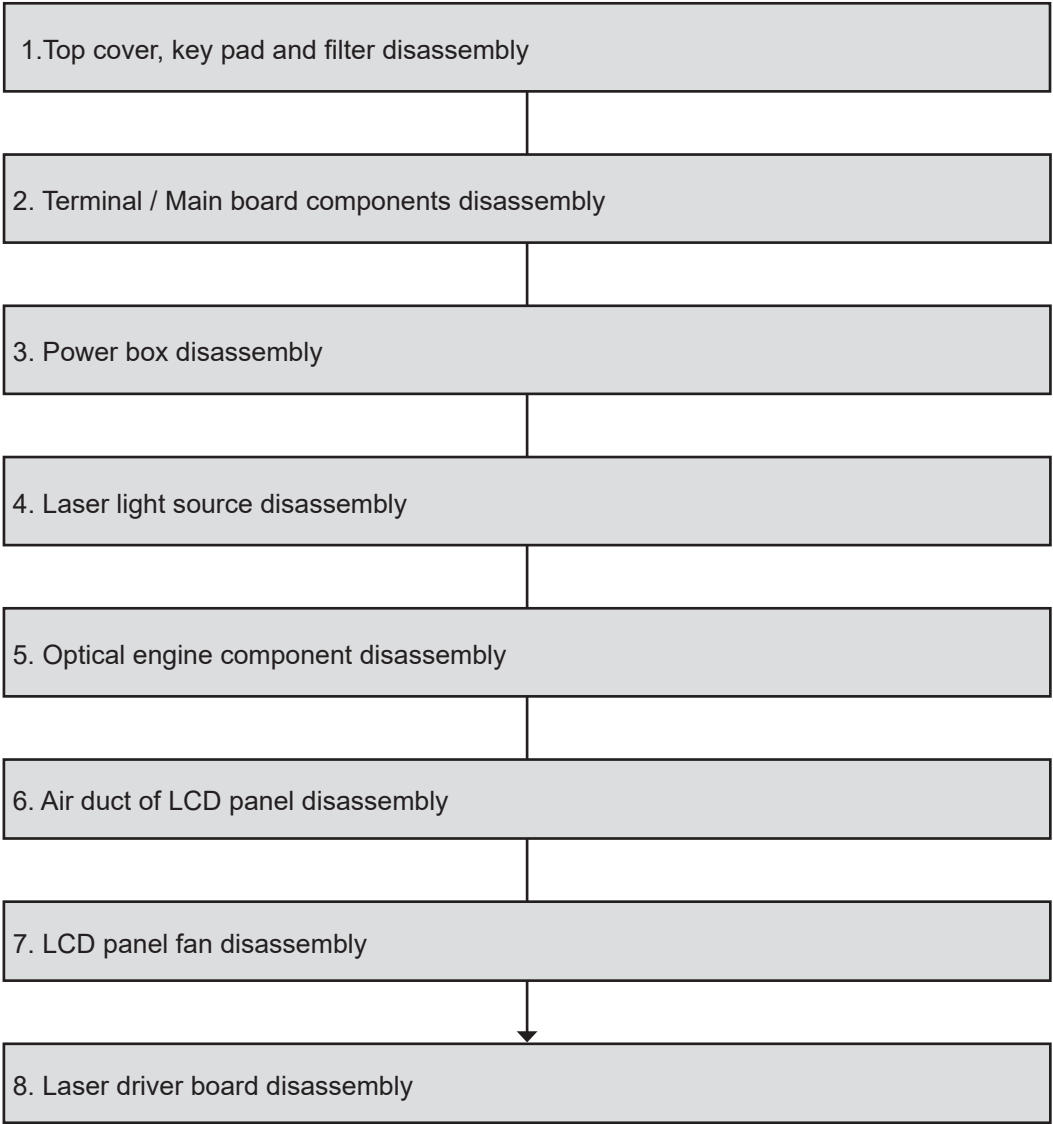
Remove the mechanical groups according to the following procedure.  
The following steps are the basic processes and some unnecessary steps may be ignored.



Note:

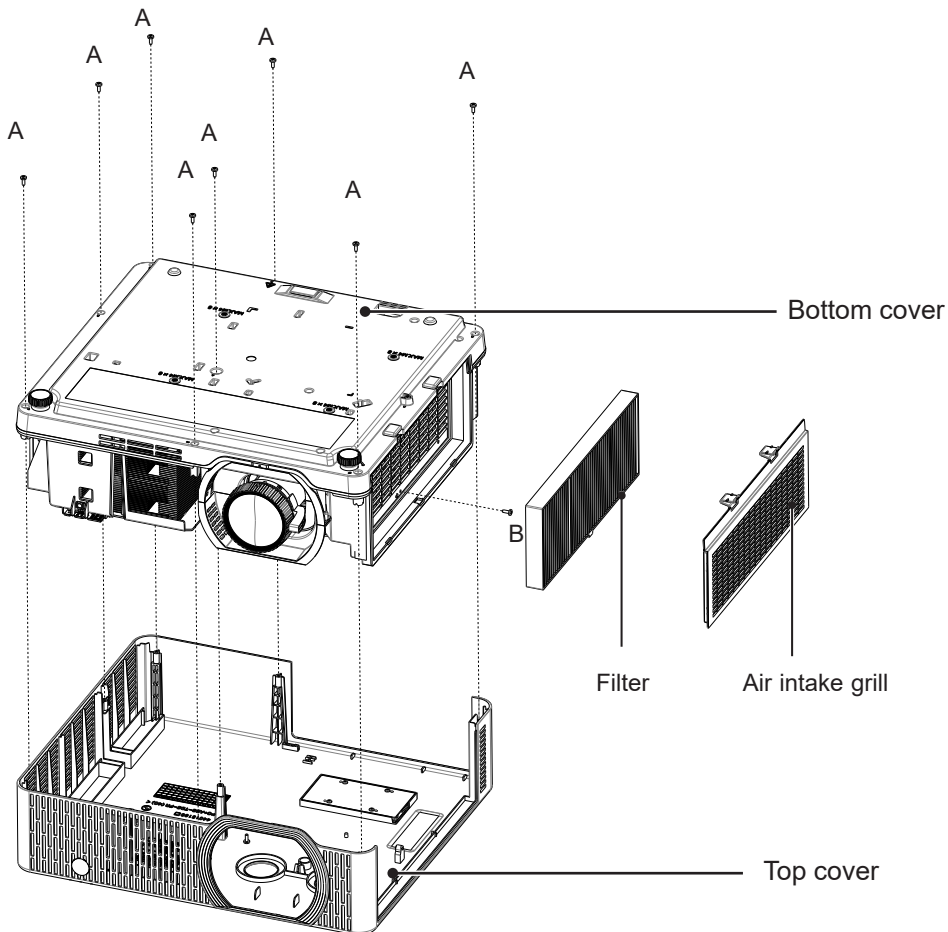
Please return parts and screws where it belongs, as it may influence the projector's performance and security.

Screw Description (Type D x L) mm	
Tapping screw-T	Mechanical screw-M
	



## 1. Top cover, key pad and filter disassembly

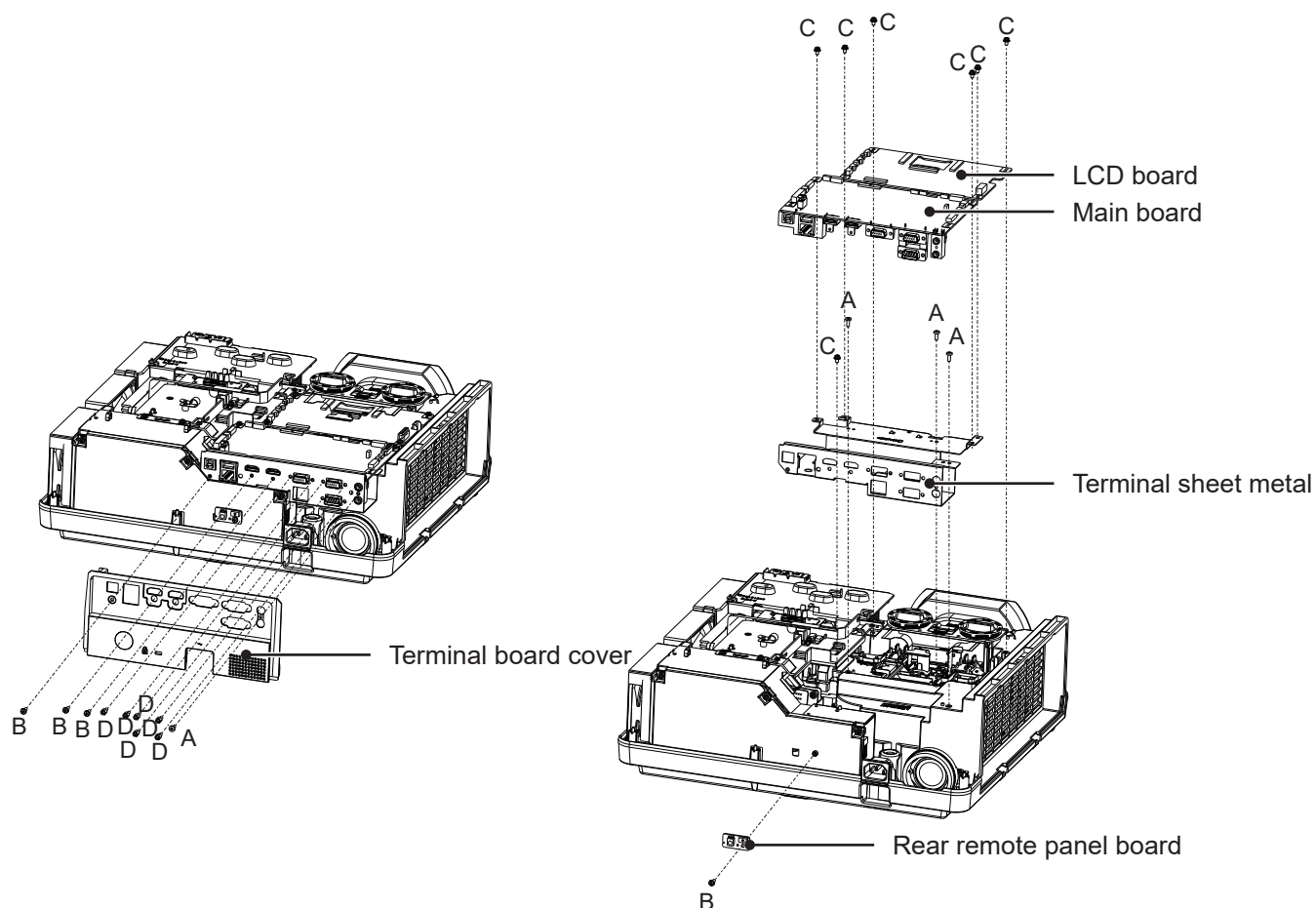
1. Remove 8 screws A (M3X8), then take out the top cover.
2. Remove 1 screws B (M3X8), and take out the filter and air intake.



## 2. Terminal, main board and LCD board disassembly

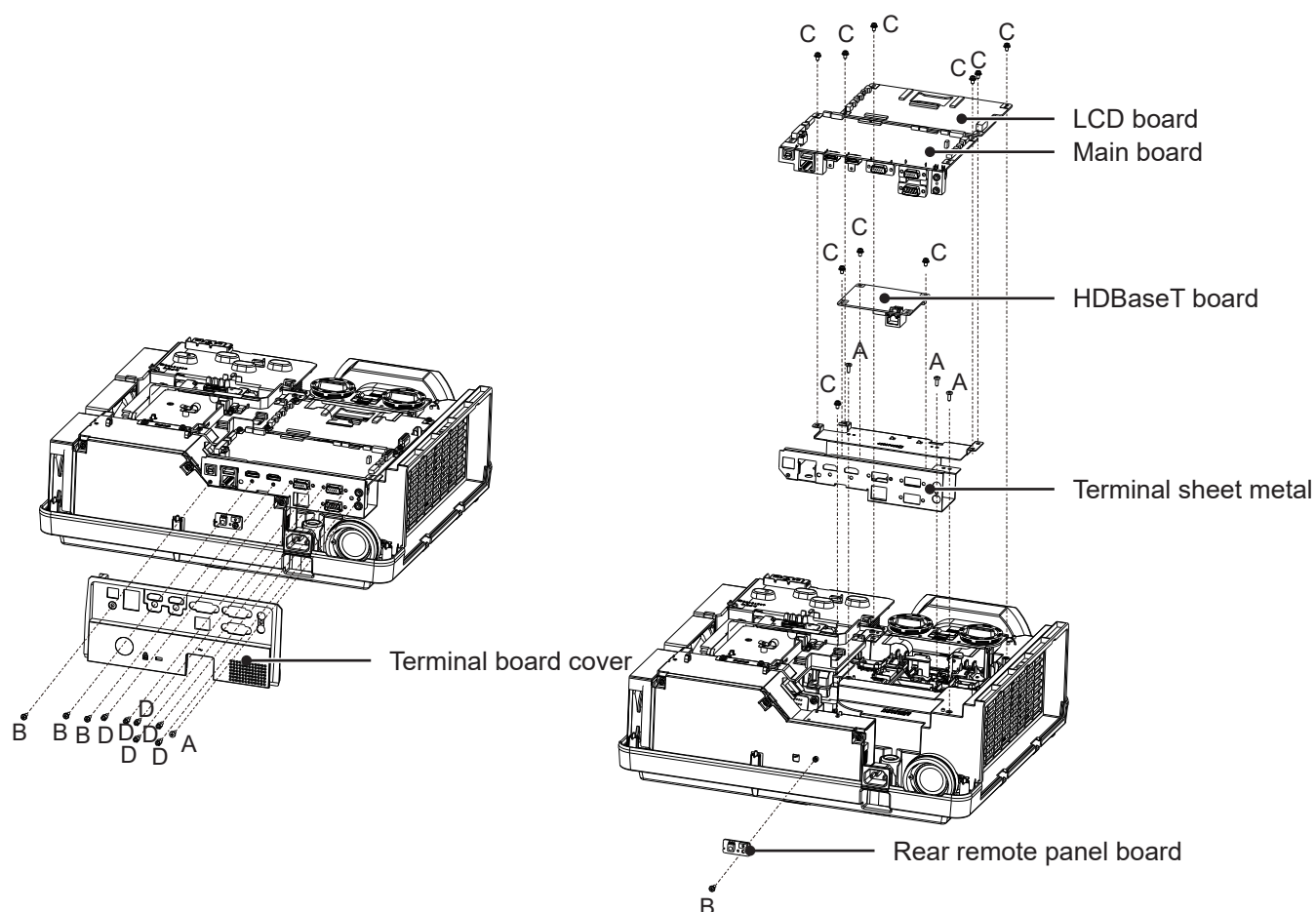
### Only for model w/o HDBaseT function

1. Remove 1 screw A (M3X8) and 3 screws B (M3X8), then take out the terminal board cover.
2. Remove 2 screws C (M3X6) and 6 screws D (M3X7), then take out the main board.
3. Remove 4 screw C (M3X6), then take out the LCD board.
4. Remove 3 screw A (M3X8), and 1 screw C (M3X6), then take out the terminal sheet metal.
5. Remove 1 screw B (M3X8), then take out the rear remote panel board.



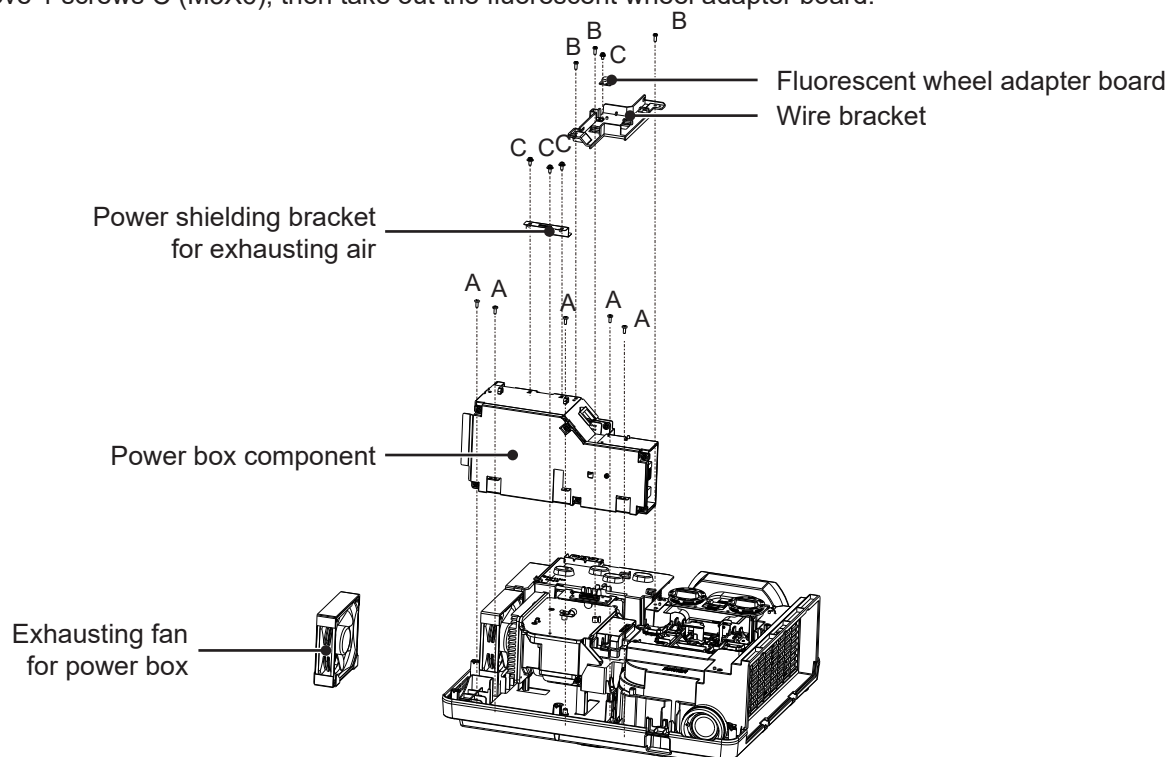
### Model for HDBaseT function

1. Remove 1 screw A (M3X8) and 3 screws B (M3X8), then take out the terminal board cover.
2. Remove 2 screws C (M3X6) and 6 screws D (M3X7), then take out the main board.
3. Remove 4 screw C (M3X6), then take out the LCD board.
4. Remove 3 screw C (M3X6), then take out the HDBaseT board.
5. Remove 3 screw A (M3X8), and 1 screw C (M3X6), then take out the terminal sheet metal.
6. Remove 1 screw B (M3X8), then take out the rear remote panel board.



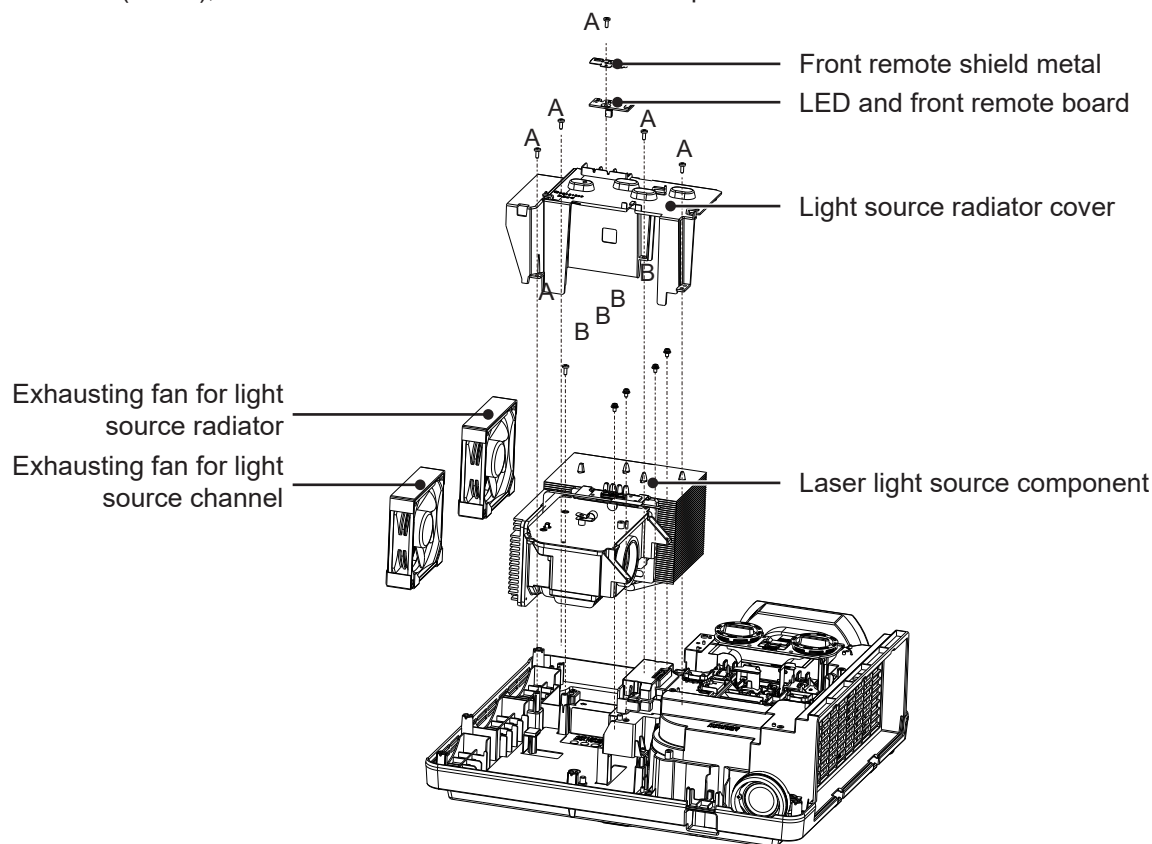
## 3. Power box disassembly

1. Remove 3 screws B (M3X8), then take out the Wire bracket.
2. Remove 3 screws C (M3X6), then take out the power shielding bracket for exhausting air and the fan.
3. Remove 5 screws A (M3X8), then take out the power box.
4. Remove 1 screws C (M3X6), then take out the fluorescent wheel adapter board.



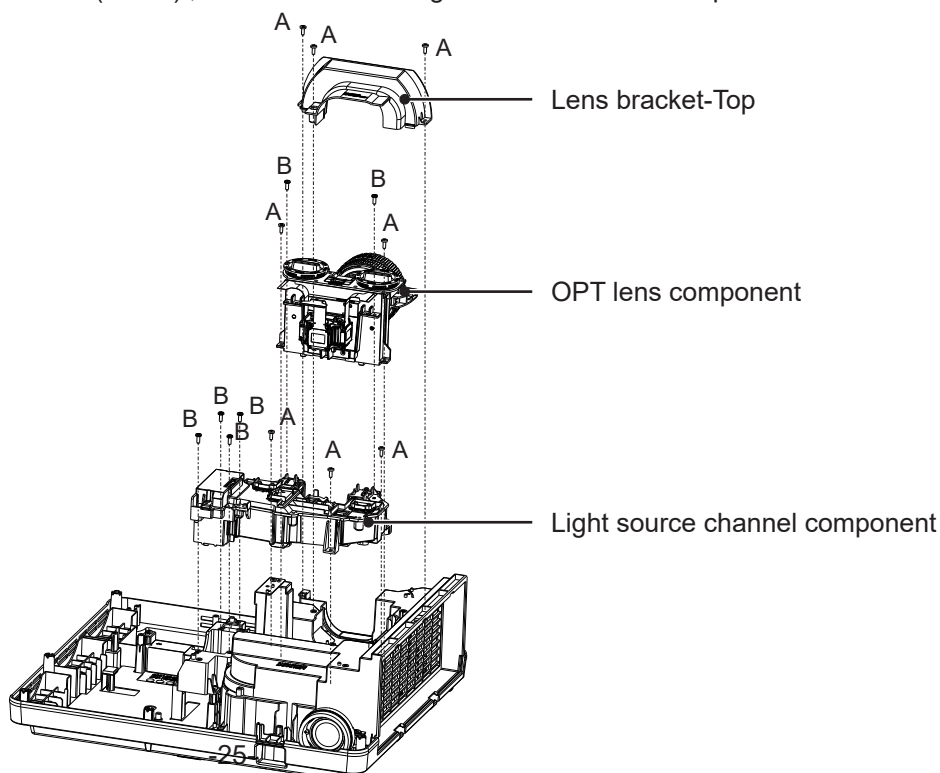
## 4. Laser light source disassembly

1. Remove 4 screws A (M3X8) , then take out the light source radiator plastic cover and the exhausting fan for the light source radiator.
2. Remove 1 screw A (M3X8), and 4 screws B (M3X6) , then take out the laser light source component.
3. Remove 1 screw A (M3X8), then take out the LED and front remote panel board.



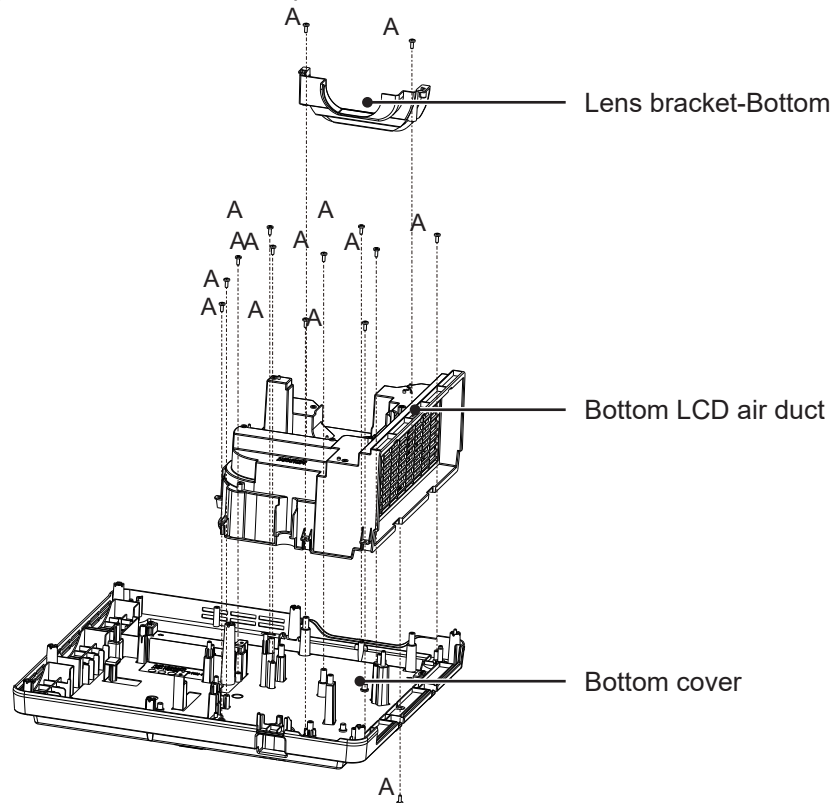
## 5. Optical engine component disassembly

1. Remove 3 screws A (M3X8) , then take out the lens bracket-Top.
2. Remove 2 screws A (M3X8), and 2 screws B (M3X8) , then take out OPT lens component.
3. Remove 3 screw A (M3X8), , and 4 screws B (M3X8) , then take out the light source channel component.



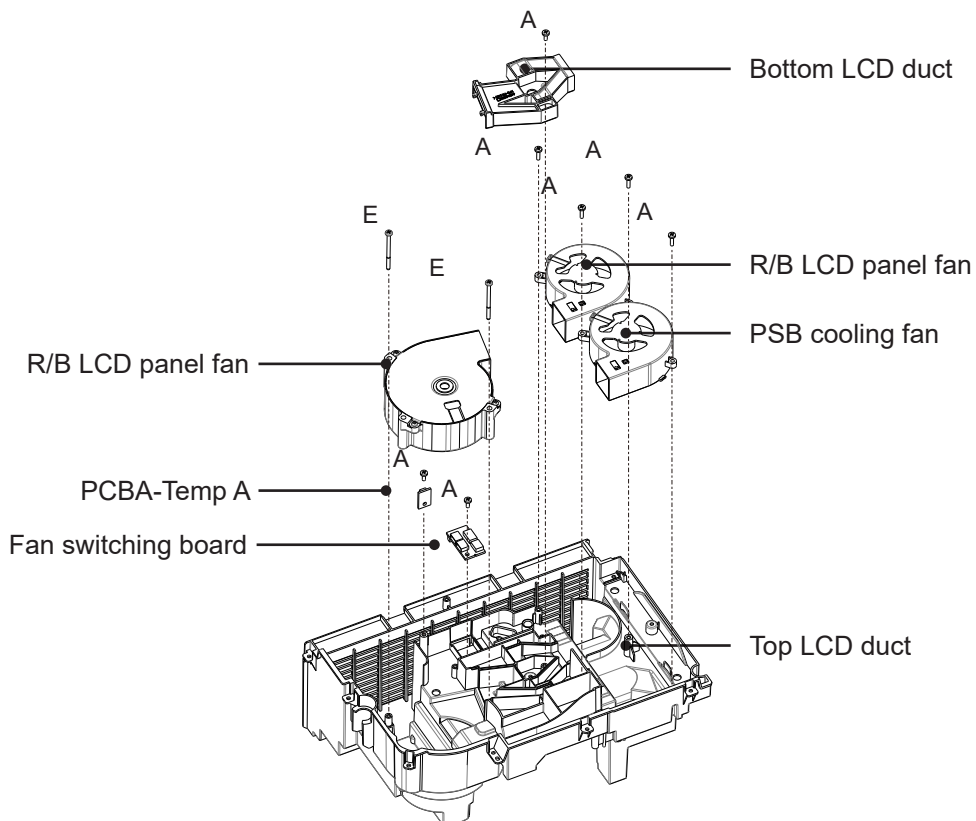
## 6. Air duct of LCD panel disassembly

1. Remove 2 screws A (M3X8), then take out the the lens bracket-Bottom.
2. Remove 12 screws A (M3X8), then take out the the top LCD air duct, bottom LCD air duct and the LCD fan.



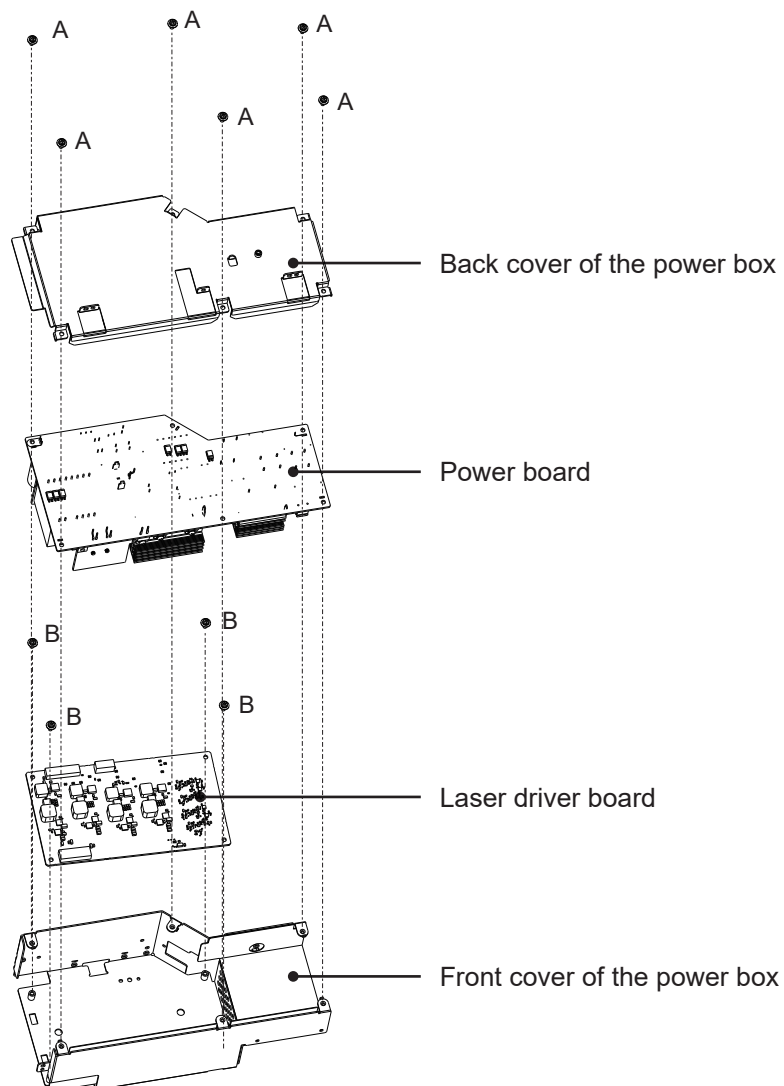
## 7. LCD panel fan disassembly

1. Remove 1 screws A (M3X8), then take out the the bottom lens bracket.
2. Remove 4 screws A (M3X8), then take out the R/B LCD panel fan and the PSB cooling fan.
3. Remove 2 screws E (M3X45), then take out the R/G LCD fan.
4. Remove 2 screws A (M3X8), then take out the fan switching board, PCBA-Temp A.



## 8. Laser driver board disassembly

1. Remove 6 screws A (M3X6) ,then take out the back cover of the power box and the power board.
2. Remove 4 screws B (M3X6) , then take out the laser driver board.

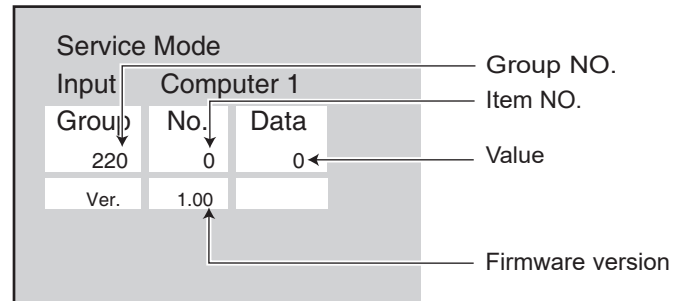


# Adjustment

## Service adjustment menu operation

### 1) Enter service mode

Press the Menu and ▼ button for more than 3 seconds. Then the service mode menu will display to enter to the service mode shown as follows.



### 2) Adjust the data on the service mode

Press the Menu button to adjust the items, Press ▲ or ▼ button to change the value.

#### ✓ Note:

You can refer to the Service adjustment data table for detailed description about the group, item and value.

### 3) Exit service mode

Press the ⏻ button to exit service mode.



## Adjustment after replacement parts

● : Adjustmen ○ : Check

		Remove / Replace parts							
		LCD/ Prism	Condenser lens(OUT)	Polarizing			POWER board	MAIN board	AV board
				R	G	B			
Optical adjustment	Optical center adjustment	○	●						
	Check and set the screen type	○						●	
	Anti-voltage adjustment							●	
	Keystone adjustment							●	
	EEPROM data transmission * 1	○						●	
	EDID data transmission	○						●	

✓ **Note:**

\* 1 When adjusting the EEPROM data transmission, the following data will be transferred from the original data to the new board:

- Service adjustment data (fan voltage regulator / flicker frequency adjustment)
- Uneven color correction data
- Gamma correction data

# Electric adjustment

✓ **Note:**

The circuit has been accurately adjusted at the factory. DO NOT attempt to adjust the following circuit as it may cause serious damage to property and product safety unless you have to adjust it during maintenance. Before adjustment, please turn on the projector to preheat at least 10 minutes.

## 1. ADC adjustment

### Input signal

Computer Signal..... 0.7Vp-p/75 Terminal (XGA16 Gray Scale Mode Diagram)

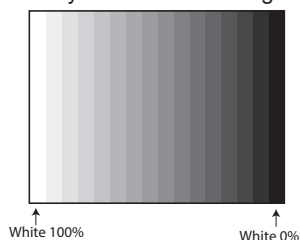
Component Video Signal....1.0Vp-p/75 Terminal (Component Video Signal) (480i 100% Color Bar)

### Input signal type

VGA Signal Source Input

1. When choosing VGA channel, input 16 gray scale pattern.
2. Enter the service mode, select group 260, item 0, change the setting value from "0" to "1";
3. When OK appears, the adjustment ends.

16 Gray Scale Pattern Diagram

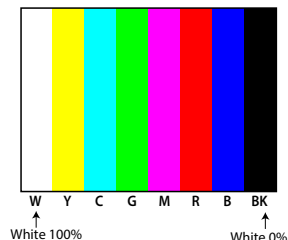


Component Video Signal Source Input

1. When choosing COMPONENT channel, enter 8-color 100% color bar map;
2. Enter the service mode, select group 260, item 0, change the setting value from "0" to "1";
3. When OK appears, the adjustment ends.

\* The above adjustments should be made when replacing the motherboard.

8-colour 100% color bars



✓Note:

\* Refer to "Service adjustment menu operation" for entering service mode and adjust the service data.

### 2. Screen type checking and setting

\* Before setting up, you need to check the type of LCD screen used by the projector according to the section "LCD Screen/Prism Component Disassembly" in "Optical Component Disassembly".

1. Enter the service mode.
2. LCD Screen Type Check

Select group 290, item 0, and check the values as follows.

Number "0": L-type LCD screen

Number "20": R LCD screen

If the type of LCD screen installed is different from the display mode set, do the following steps.

3. LCD screen type mode setting

Select group 290, item 1, and set the value from "10 to 0 or 20" according to the LCD screen type. When the value reaches 0 or 20, it will quickly return to 10.

\* The above adjustments should be made when replacing the optical components or motherboard.

### 3. Pole Voltage Adjustment

1. Enter the service mode.
2. Select Group 30 and change the data values according to the following instructions. Through adjustment Number to get the minimum number to make the screen flicker.

Group-item	adjustment
30 - 3	Red Scintillation
30 - 4	Green scintillation
30 - 5	Blue Scintillation

\* The above adjustments should be made when replacing the optical components or motherboard.

### 4. Keystone correction

Input signal                      no signal

1. Adjust the support to a minimum range, then place the projector horizontally and enter the service mode.
2. Select group 102, 3 items, and set values from "0 to 5".
3. Press the executive key and the Keystone correction will be turned on.
4. When finished, the "OK" information will appear on the screen.
5. Press any key on the projector or remote control and the OK information will disappear. Group 102, 3 items, the value will return the initial value of "0".

\* The above adjustments should be made when disassembling and assembling the motherboard.

### 5. Color correction adjustment

After replacing panel, it is necessary to use 50% or 30% gray scale images to confirm the problem of uneven color. If partial color bias occurs, please set the corresponding service mode to 0. The operation is as follows:

Input signal 50% gray field or 30% gray field

1. Enter the service mode.
2. Select group 32, item 1, and set the value from "1" to "0".

\* This operation is required when replacing the optical machine or motherboard components.

## 6. White Balance Adjustment

After replacing panel or motherboard, 16 gray scale is needed to confirm the color deviation of the picture. If the color deviation of the picture occurs, please adjust the white balance manually. The operation is as follows.

input signal          16 Gray Scale Pattern Diagram

1. Enter the service mode.
2. Select Group 35 and change the data values according to the following instructions.  
By adjusting the values, we can get the values that make the gray scale color normal.

Group-item	adjustment
------------	------------

35 - 0	red
35 - 1	Green
35 - 2	blue
35 - 3	red
35 - 4	Green
35 - 5	Blue

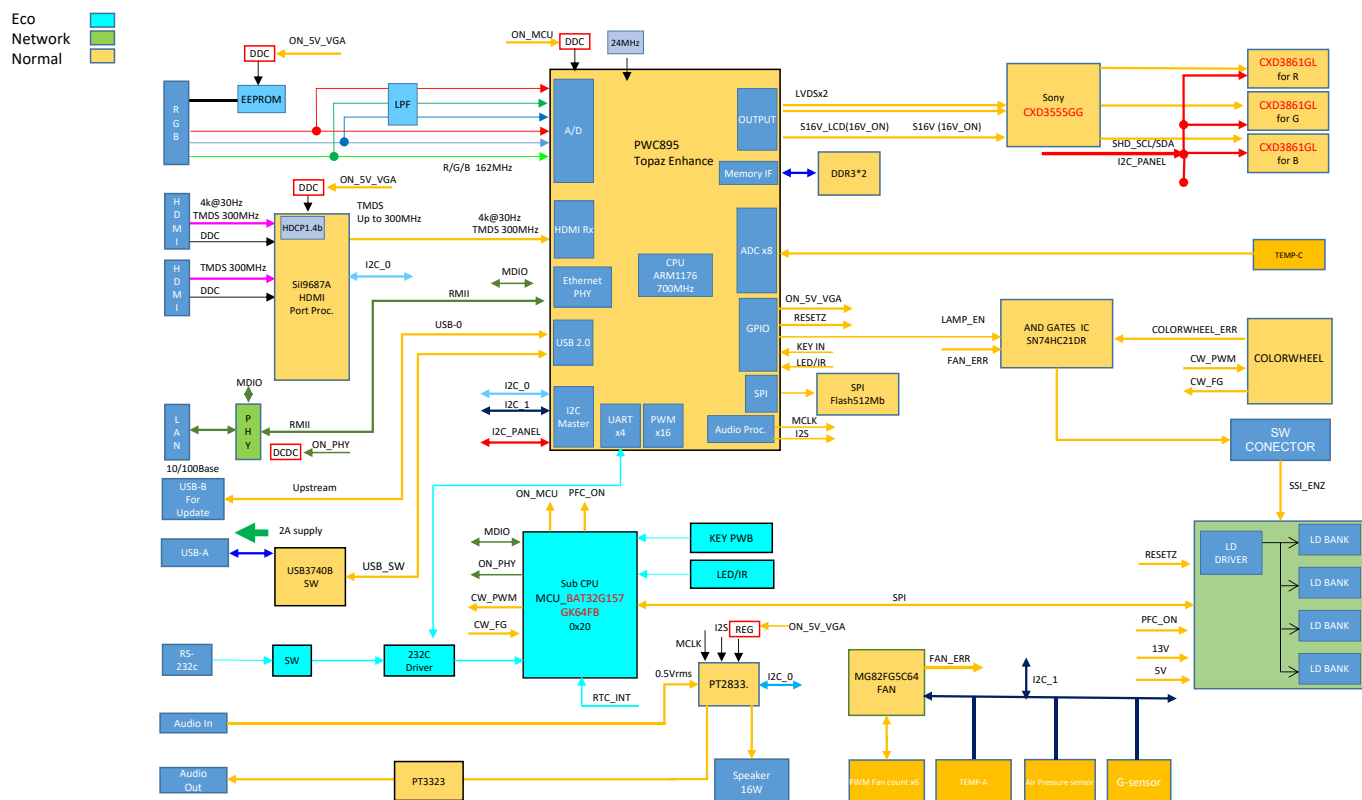
When adjusting, please first adjust the dark level of 16 gray scale, and then adjust the bright level.

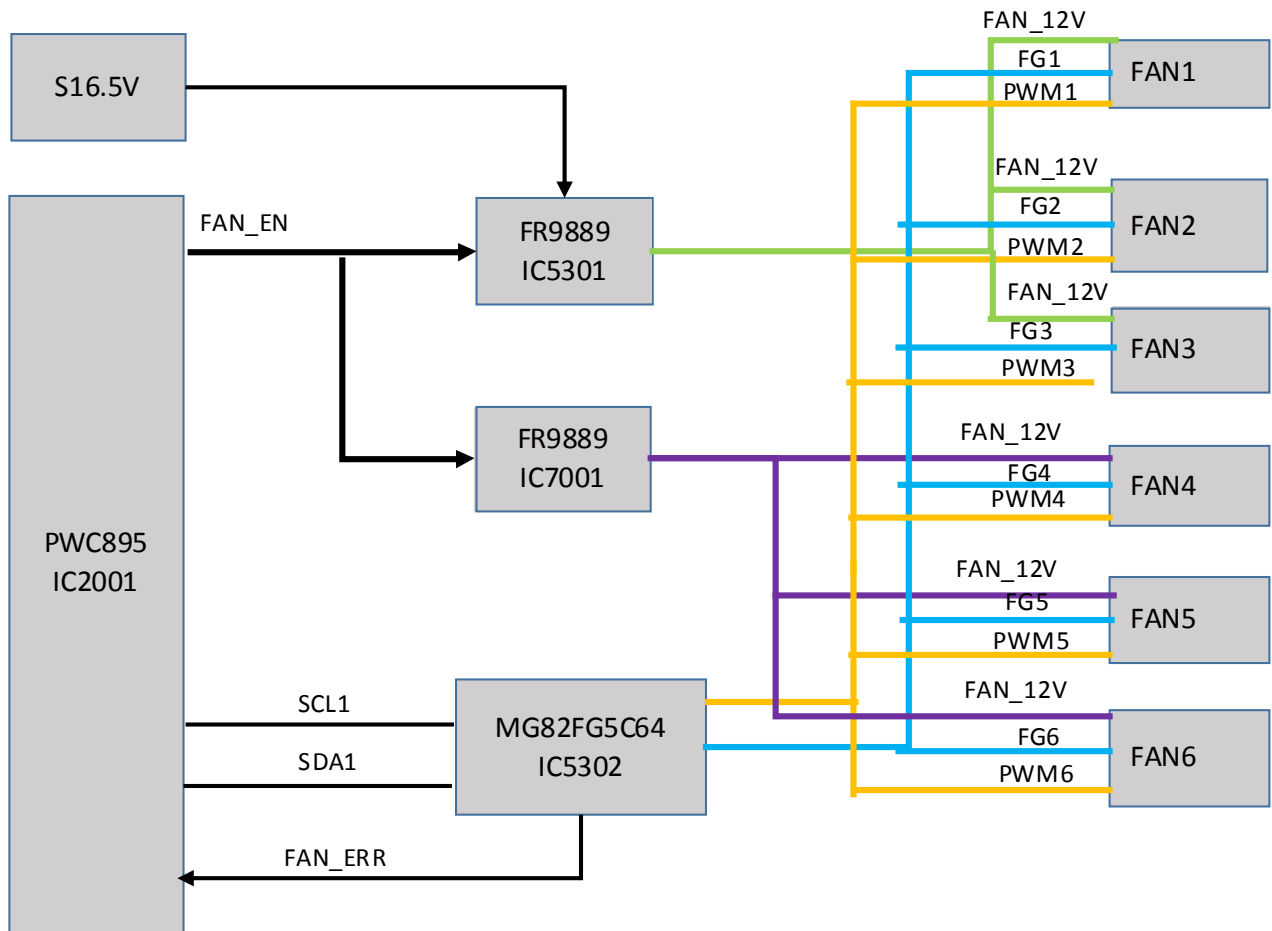
0-2 adjustments have obvious influence on dark order.

3-5 adjustments have obvious influence on the brighter order.

\* The above adjustments should be made when replacing the optical components or motherboard.

## Block diagram



**Fan control diagram**

## Trouble shooting

























### Light indicator and projector status

Light indicator indicates the projector status.

If you have met kinds of unexpected problems when you operate the projector, please do as the following table says to check the operation of the projector. Check light indicator to learn status of your projector to ensure your projector in the best state. Take proper maintenance measures according to the light indicator status.

#### ■ Indicator Message (Status)

Check light indicator to learn status of your projector.

POWER	STATUS	LIGHT	Projector status
 Off	 Off	 Off	Power is off.
 Orange (Blink* <sup>2</sup> )	 Off	 Off	In the state of Standby (Standby mode is Normal standby).
 Orange (Light)	 Off	 Off	Standby state (Standby mode is Network standby).
 Orange (Blink* <sup>1</sup> )	 Off	 Off	In the state of Standby (Standby mode is Sleep standby).
 Blue (Light)	 Off	 Green (Blink* <sup>3</sup> )	Powered state (ECO mode:On).
 Blue (Light)	 Off	 Green (Light)	Powered state (ECO mode:Off).
 Green (Blink* <sup>4</sup> )	 Off	 Off	In the state of Cooling.
 Green (Light)	 Off	 Off	In the state of Sleep.

\*1 Repetition to light on for 1.5 seconds / off for 1.5 seconds

\*2 Repetition to light on for 1.5 seconds / off for 7.5 seconds


























































\*3 Repetition to light on for 2.5 seconds / off for 0.5 seconds

\*4 Repetition to light on for 0.5 seconds / off for 0.5 seconds

#### ✓ Note:

- It is likely to something wrong inside the projector if the warning indicator still on or flashing after taking measures above. Please turn off the projector, otherwise it may result in electric shock or fire.
- DO NOT turn on the projector when you have checked something abnormal. Unplug the AC power cord quickly, insert again, then turn on the projector. If the projector is shutting down once again, that means that there is some serious problem with it. Do not continue to operate the projector, or it may result in electric shock or fire.

## Indicator Message (Error message)

POWER	STATUS	LIGHT	Projector status	Procedure
 Off	 Orange (Light)	 Off	A button has been pressed while the KEY LOCK is activated. ID numbers for the projector and the remote control do not match.	The projector's keys are locked. The setting must be canceled to operate the projector. Check the control IDs
 Red (Blink*4)	 Green (Light)	 Red	When LD-driver current value is too low	Please check the LD-driver board.
 Red (Blink*4)	 Green (Light*4)	 Red	When LD-driver SPI communication error	Please check the main board and power board.
 Red (Blink*4)	 Green (Light)	 Red (Light*4)	When LD-driver 55V error	Please check the LD-driver board and power board.
 Red (Blink*4)	 Green (Light*1)	 Red (Light)	When LD-driver 13V error	Please check the main board and LD-driver board.
 Red (Blink*4)	 Green (Light)	 Red (Light*1)	When LD-driver output current is abnormal	Please check the LD-driver board.
 Red (Blink*4)	 Green (Light)	 Red (Light)	When LD-driver is not ready	Please check the main board and power board.
 Red (Blink*4)	 Green (Light)	 Red (Light*3)	When LD-driver error	Please check the main board and LD-driver board.
 Red (Blink*4)	 Off	 Off	Temperature problem	Ambient temperature is out of the operation temperature. Check if any obstruction stays near the exhaust vent.
 Red	 Red (Blink*4)	 Off	Power problem	Please check the Fan-1 connection line and FAN 1.
 Red (Light)	 Orange (Light)	 Off	When Fan-1 status is error	Please check the Fan-2 connection line and FAN 2.
 Red (Light)	 Orange (Blink*4)	 Off	When Fan-2 status is error	Please check the Fan-3 connection line and FAN 3.
 Red (Light)	 Off	 Orange (Blink*4)	When Fan-3 status is error	Please check the Fan-4 connection line and FAN 4.
 Red (Light)	 Orange (Blink*1)	 Off	When Fan-4 status is error	Please check the Fan-5 connection line and FAN 5.
 Red (Light)	 Off	 Orange (Blink*1)	When Fan-5 status is error	Please check the Fan-6 connection line and FAN 6.
 Red (Light)	 Red (Blink*4)	 Off	When power status is error	Please check the main board and power board.
 Red (Blink*4)	 Red (Blink*4)	 Off	When phosphor wheel status is error	Check the main board and LCD -driver board.
 Red (Light)	 Red (Blink*3)	 Off	Filter over time Waring	Please clean up the filter and set filter counter reset. (→ Page 15)
 Red (Light)	 Red (Light)	 Off	High altitude error	Set the High Altitude option to On.



- \*1 Repetition to light on for 1.5 seconds / off for 1.5 seconds
- \*2 Repetition to light on for 1.5 seconds / off for 7.5 seconds
- \*3 Repetition to light on for 2.5 seconds / off for 0.5 seconds
- \*4 Repetition to light on for 0.5 seconds / off for 0.5 seconds

- When the thermal protector is activated:

When inside temperature of the projector becomes too high or low, the POWER indicator start to red blink in a short cycle. After this happened, the thermal protector will activate and the projector may be turned off.

In this case, please take the below measures:

- Pull out the power plug from the wall inlet.
- Place the projector in cool place if it has been placed in high ambient temperature.
- Clean the exhaust vent if dust has accumulated on.
- Leave the projector for about one hour until inside temperature gets lower.


## ■ Item 220 Error log information

Read only	Description	Details
1000	Abnormal power supply	Power supply is in an abnormal state
1004		FAN1 is abnormal
1005		FAN2 is abnormal
1006		FAN3 is abnormal
1007		FAN4 is abnormal
1008		FAN5 is abnormal
1009		FAN6 is abnormal
1010		Fluorescence wheel is abnormal
1011		USB current excessive abnormal
1012		The rotating speed of the Fluorescence wheel does not match and in an abnormal state
1100	Power Management	SHUTDOWN setting
2001	External temperature A error	Sensor A's value is abnormal (IIC)
2000		Sensor A temperature is out of the ordinary
2201	Internal temperature C error	Thermistor, Sensor C value is abnormal
2200		Sensor C's temperature is out of the normal
3002	Laser Driver error	SPI communication exception
3004		LD Voltage is abnormal (55V)
3005		LD Voltage is abnormal (13V)
3006		Abnormal LD output current is abnormal
3007		LD Not ready (LDDriver mode setting status failed)
41xx	Other anomalies about Laser Driver	41xx/42xx/43xx/44xx/45xx will appear at the same time xx is converted from decimal to binary. If the corresponding bit data is 0, it is normal and 1, it is abnormal. CH1(41xx)/CH2(42xx)/CH3(43xx)/CH4(44xx) error If xx is expressed as: 0x01(Bit0) overvoltage output error 0x02(Bit1) low voltage output error 0x04(Bit2) overcurrent output error 0x08(Bit3) low current output error 0x10(Bit4) high temperature error (decimal 16) 0x20(Bit5) low temperature error (32 in decimal) =>Two types of errors may occur at the same time, please convert to binary control <= =>For example, if the error log is 4310, the error code is 10(0xa=1010 in hexadecimal), and bit1 and bit3 are abnormal, corresponding to output overvoltage and low current errors  Vin error (45xx) If xx is expressed as: 0x01 overvoltage(55V) input error 0x02 low voltage (54V) input error
42xx		
43xx		
44xx		
45xx		
46xx	Abnormal setting of LD Driver mode status	LD Driver Mode status setting feedback exception (XX: register return value)
4701	LD Driver CH1 current error	CH1 current is low
4702	LD Driver CH2 current error	CH2 current is low
4703	LD Driver CH3 current error	CH3 current is low
4704	LD Driver CH4 current error	CH4 current is low
5000	High altitude error	High altitude is abnormal

Review error log: Please press the [OK] + [UP] keys simultaneously for 3 seconds

Clear error log: Service mode Group(220) -NO.(50) -Data (0->9)

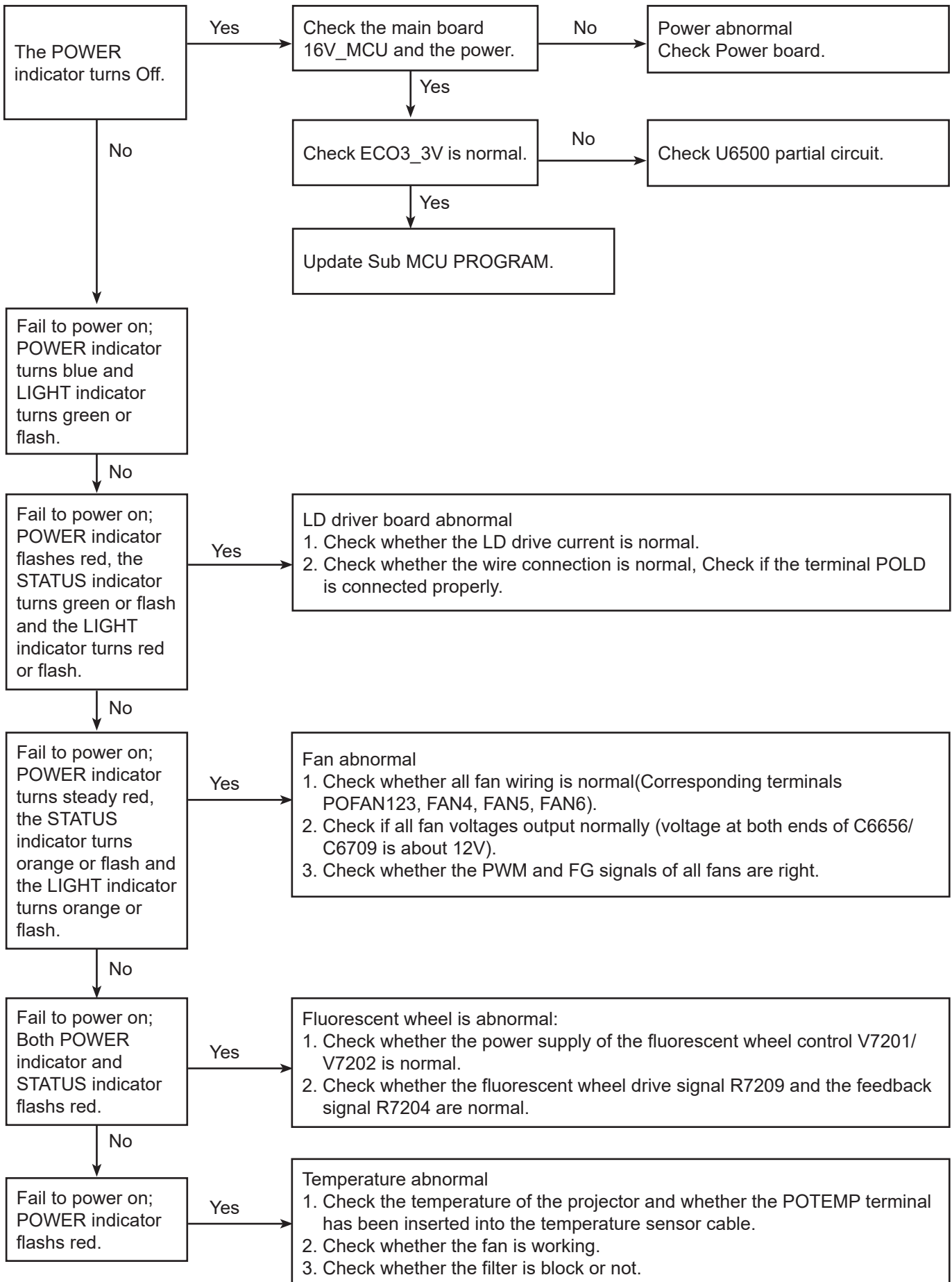
### No power

We can identify the abnormal area through light indicator status.  
Connect the AC power cord, press  button to check light indicator.

- All light indicators will be Off indicates the main board abnormal. Please check the main board circuit and component.
  - Check AC power cord, F101(Fuse), Filter board, POWER substrate and the thermal switch.
  - The thermal switch will be turned off when the ambient temperature of thermal switch is higher than 100°C.

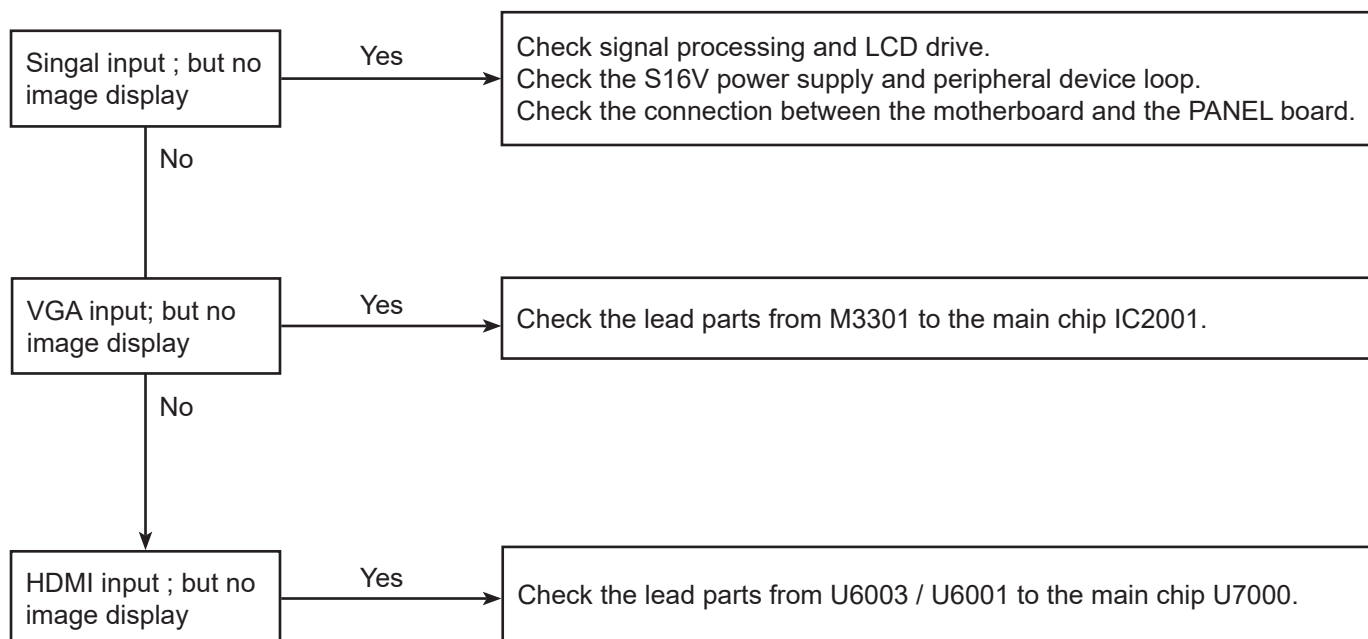
## Power on abnormal

Follow the steps below for check:



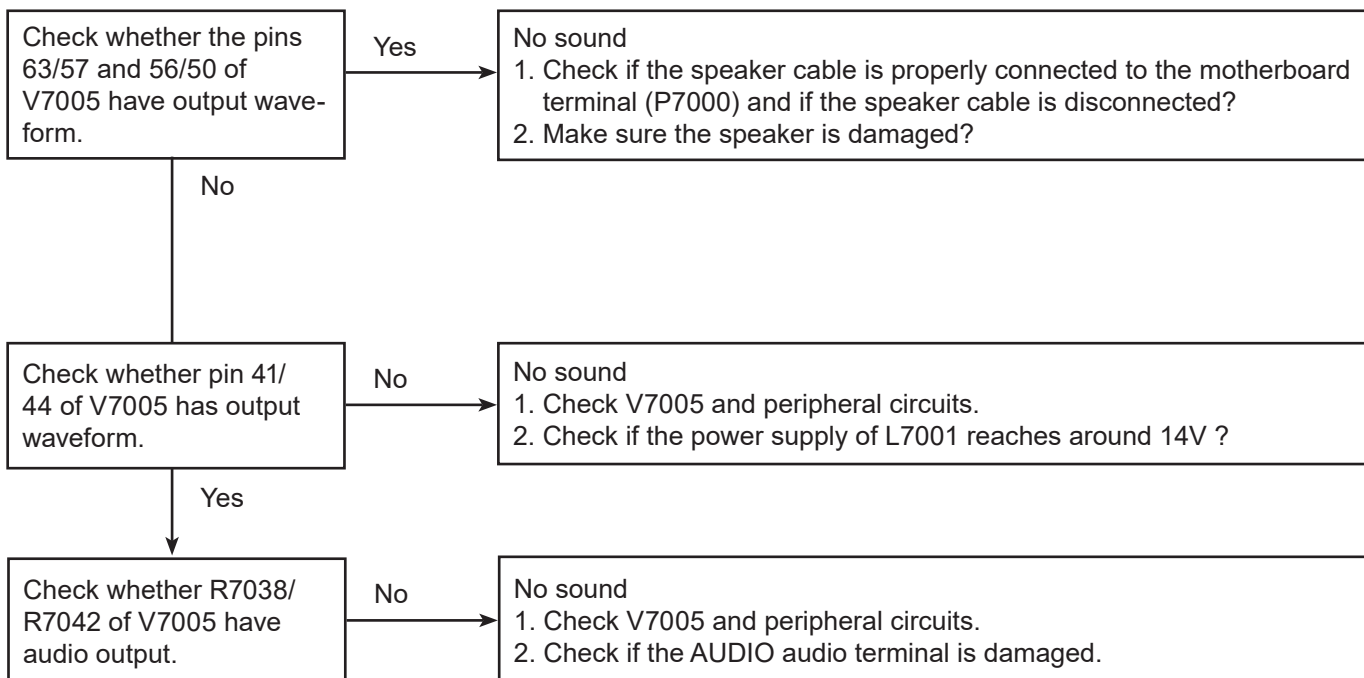
## Image display abnormal

Check the image as the following steps.



## No sound

Follow the steps below for check:



## Parts location diagram

---

### Parts location & Mechanical components list diagram

For detailed information about part location and mechanical components list diagram.

#### Important safety instruction

Components identified by international symbol  identifies hold the special security features.  
Please use the specified model for replacement .

Please make sure the parts list and the service code in structural parts list diagram before ordering repair parts.

Top cover & Light source component

INDEX	PART NAME	PART CODE	QTY
1	Bottom cover	63220219	1
2	Dust filter	63340119	1
3	Dust filter cover	63220226	1
4	Top cover	63220354	1
5	Keypad	63730271	1
6	LED board	63730272	1

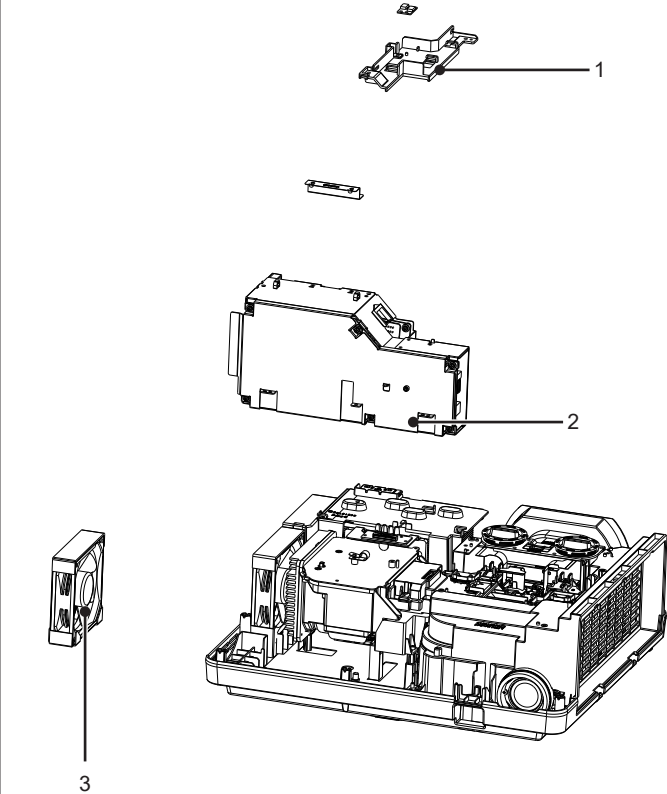
Terminal & main board component

INDEX	PART NAME	PART CODE	QTY
1	Panel board	63730270	1
2	Main board	63730370	1
3	HDBaseT board	63730275	1
4	Terminal board (HDBaseT)	63220221	1



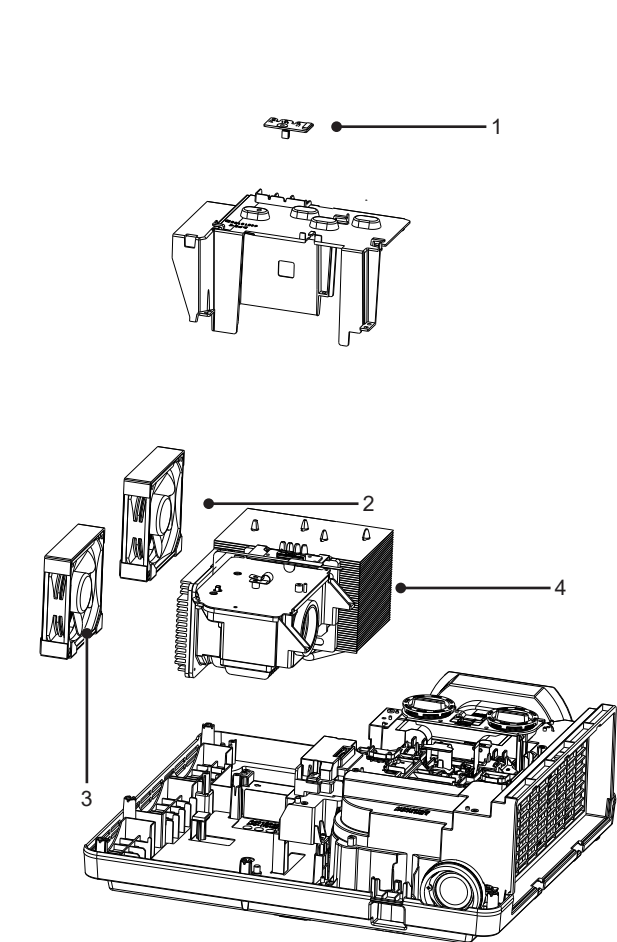
Parts location diagram

Power box component



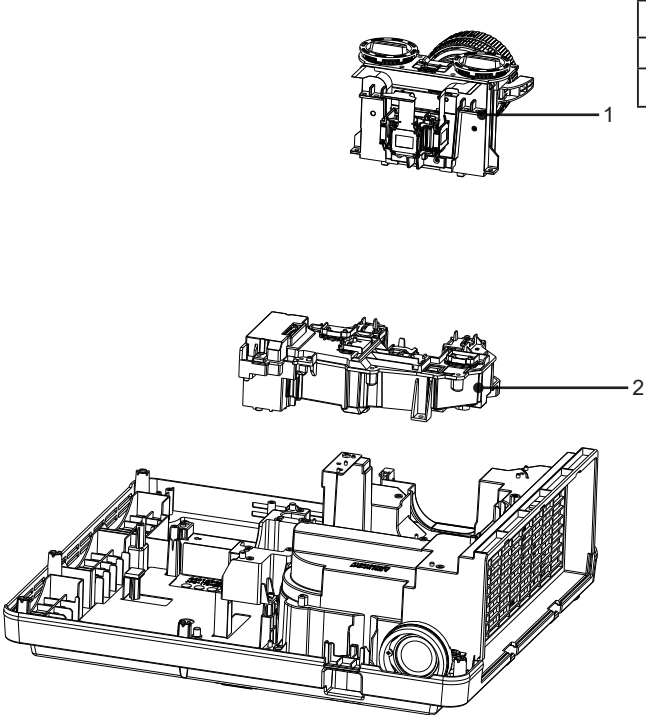
INDEX	PART NAME	PART CODE	QTY
1	Fluorescent wheel adapter board	63730274	1
2	Power board	63670070	1
3	Exhausting Fan of the power board	63260084	1

Laser light source component



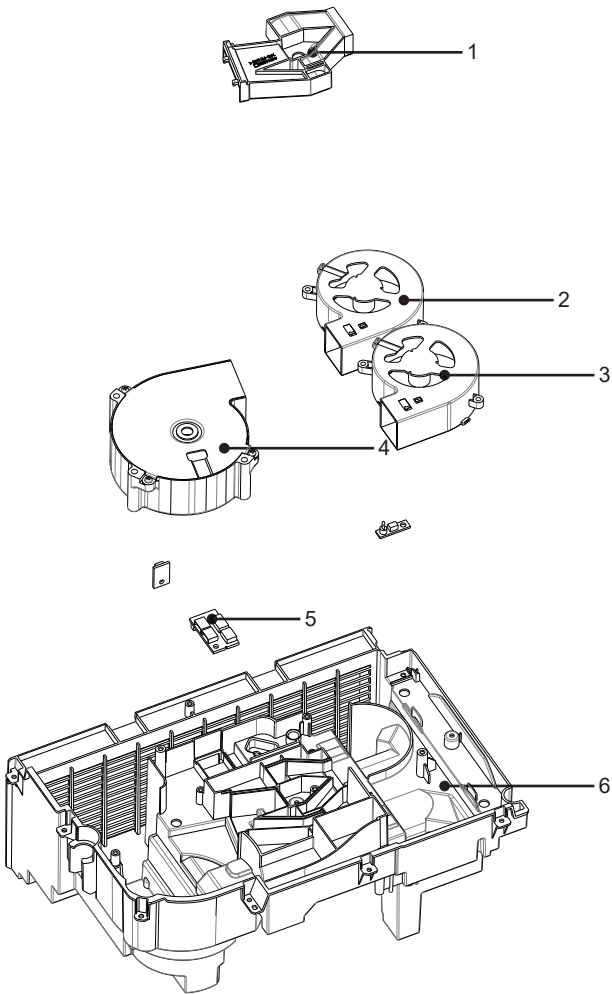
INDEX	PART NAME	PART CODE	QTY
1	LED board	63730272	1
2	Exhausting fan for lightsource radiator	63260085	1
3	Exhausting fan for light source channel	63260086	1
4	Light source component	63080056	1

OPT component




INDEX	PART NAME	PART CODE	QTY
1	Image System Assy(7K)	63050092	1
2	Light source channel	TBD	1

LCD panel fan



INDEX	PART NAME	PART CODE	QTY
1	LCD duct-Bottom	TBD	1
2	LCD fan	63260087	1
3		63260088	1
4		63260089	1
5	Fan switching board	63730273	1
6	LCD duct-top	TBD	1

### Important safety instruction

Components identified by International symbol  identifies hold the special security features.  
Please use the specified model for replacement .

#### ■ Low voltage and high voltage warning

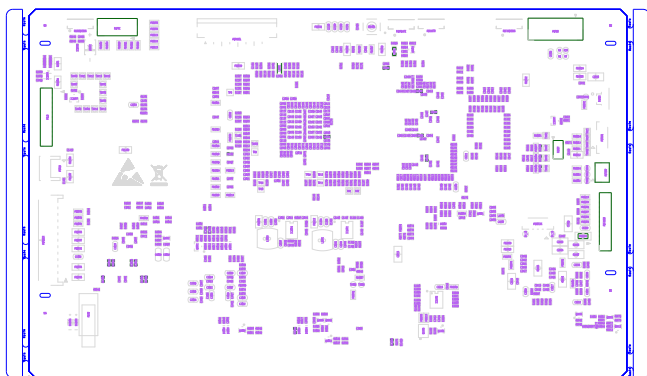
- The power supply circuit includes a circuit unit to separate the power supply from ground.
- Circuit has two kinds: high-voltage circuit and the low-voltage circuit. Please take the following precautions against it.
- This diagram is the final version before production. Changes may be made without notice.

#### ■ Preventive measure

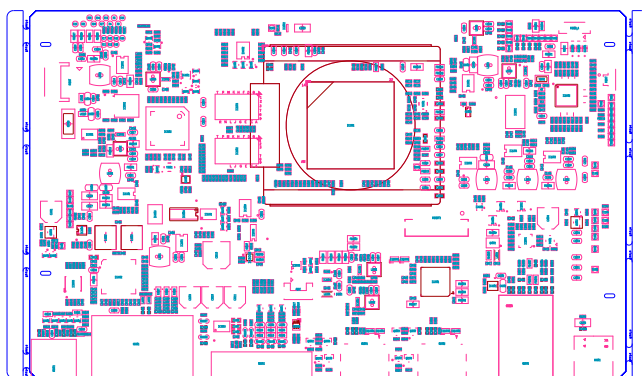
- DO NOT touch the parts of high voltage area or area between low voltage and high voltage , as it may cause risks of electric shock.
- DO NOT short circuit, high voltage and low voltage circuit, otherwise the fuse will be disconnected and damage the components.
- DO NOT connect the parts such as an oscilloscope in the high voltage area and the low voltage area to protect the fuse. Connecting the parts under measure from surface to the ground .
- When removing the movement, make sure to unplug the power cord from outlet.
- Please check service codes for this part in structural parts list diagram, when ordering components.

## PCB diagram

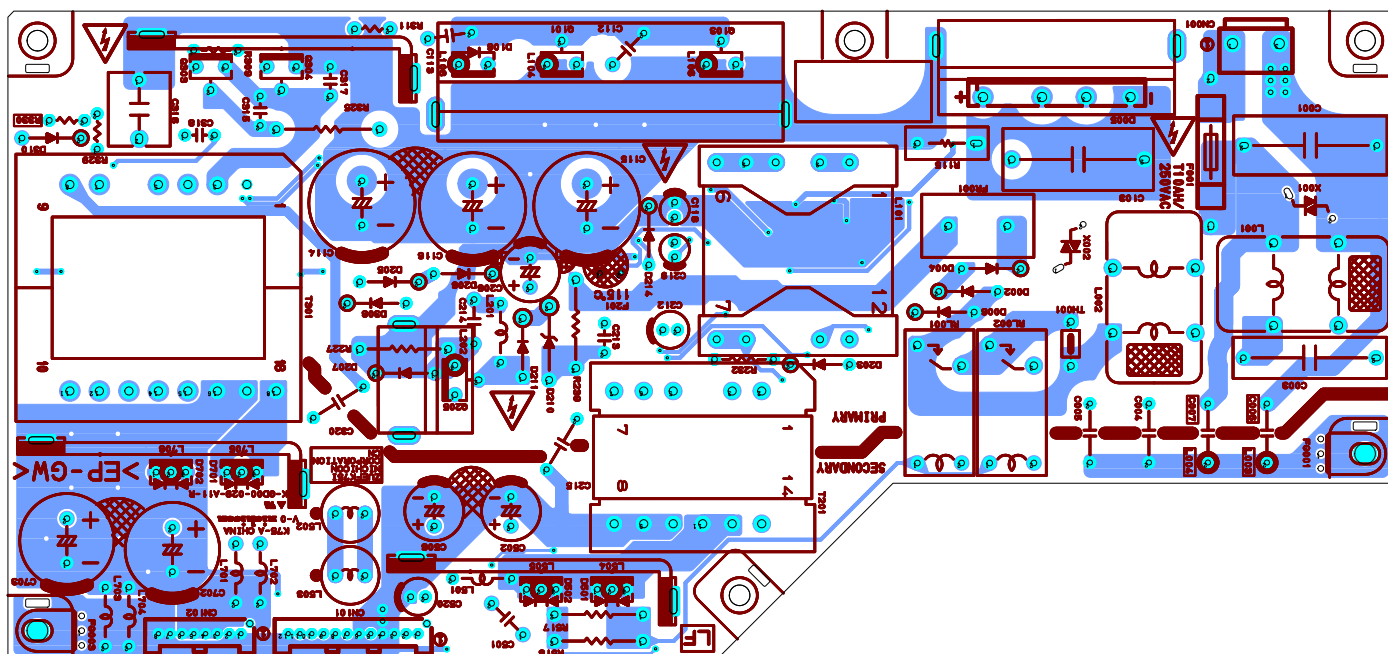
Main board PCB (Top)



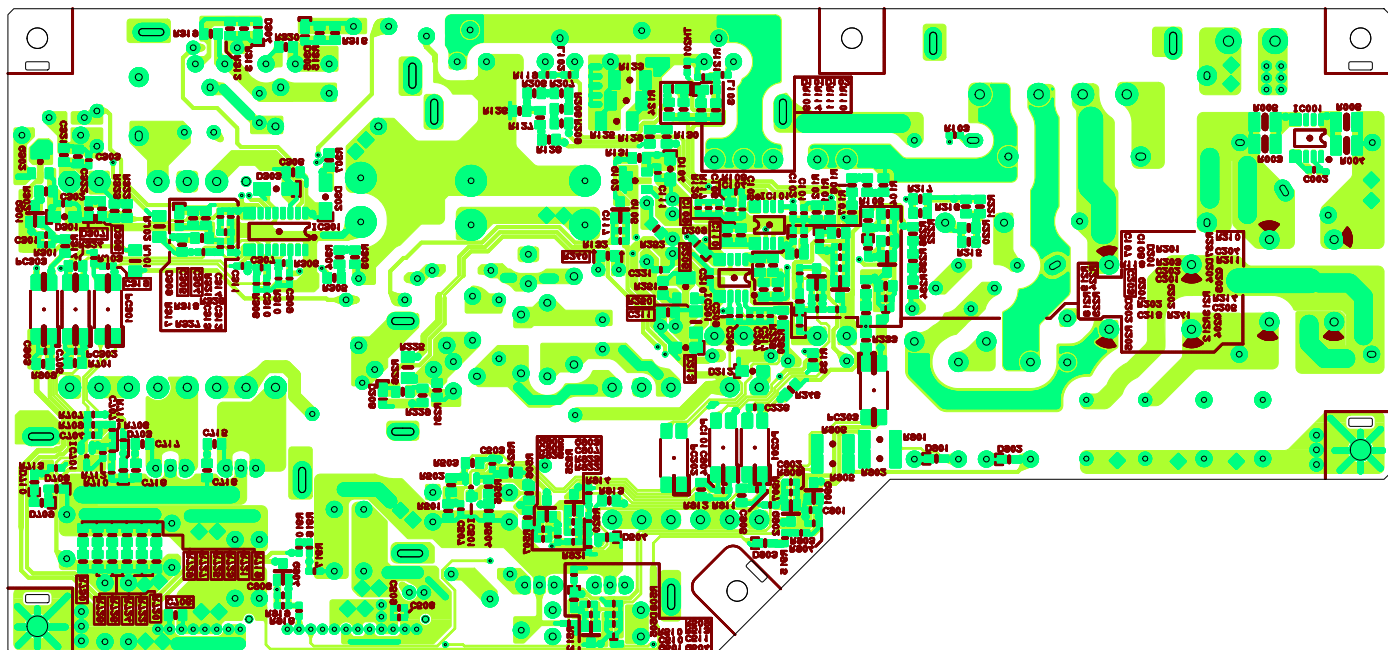
Main board PCB (Bottom)



Power board PCB (Top)

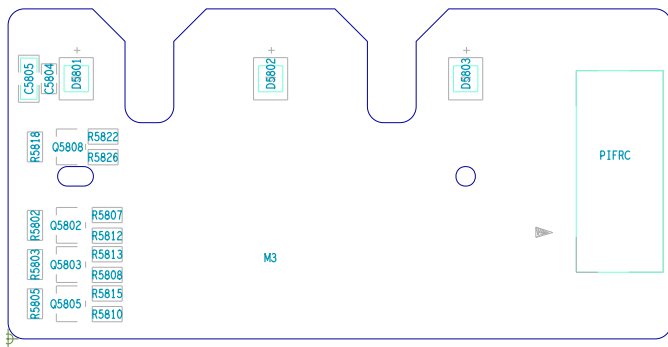


Power board PCB (Bottom)

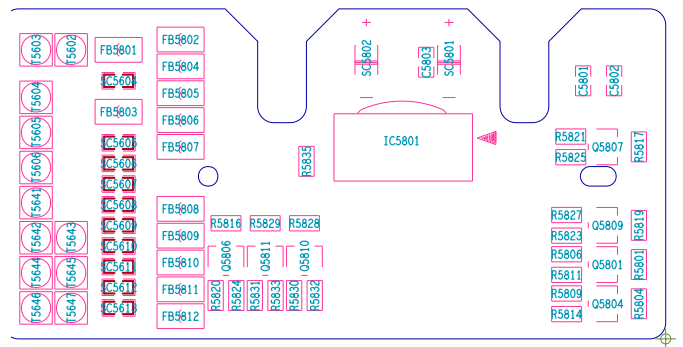


## PCB diagram

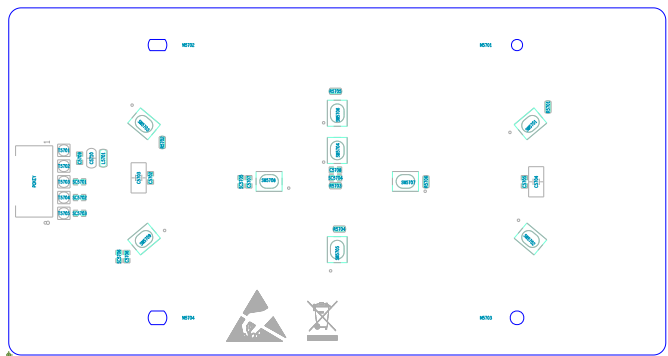
LED board(Top)



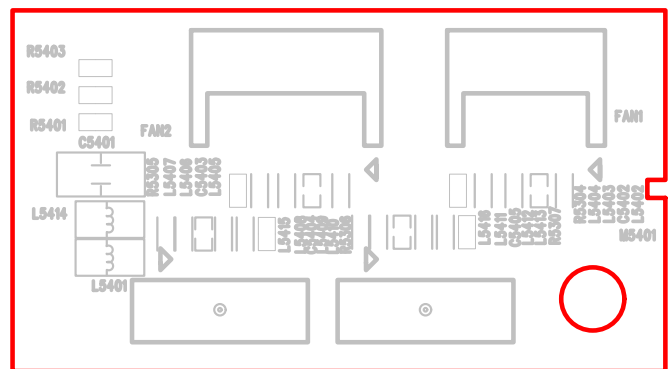
LED board(Bottom)



## Keypad



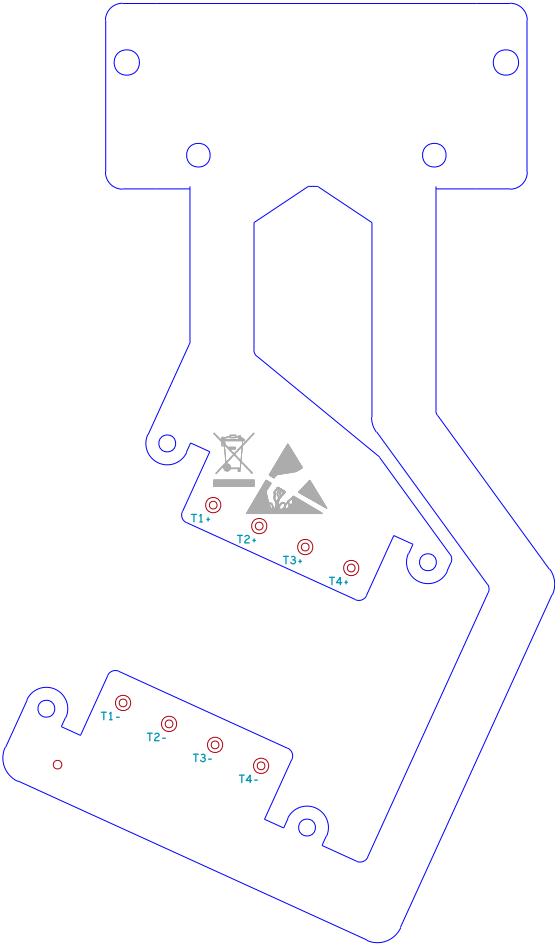
### Fan switch board (Top)



Fan switch board(Bottom)



Laser adapter board PCB (Top)



Laser adapter board (Bottom)

