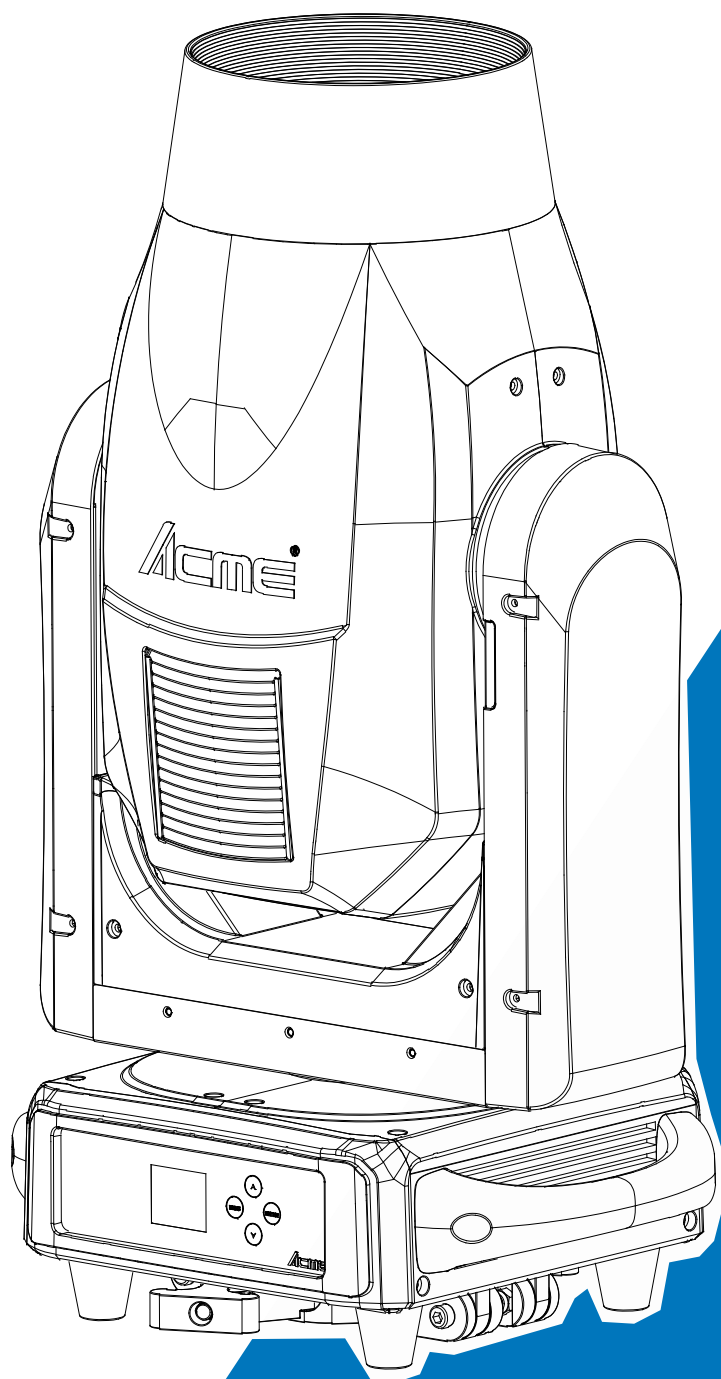


# Acme®

ANDROMEDA 



## User Manual

Please read the instruction carefully before use

## CONTENTS

1. Safety Instructions .....	2
2. Technical Specifications .....	4
3. Control Panel .....	6
4. Effect Wheels and Lamp.....	7
4.1 Effect Wheels .....	7
4.2 Replacing Rotating Gobos .....	8
4.3 Light Source .....	10
4.4 Change The Lamp.....	10
4.5 Lamp Replacement Warning .....	12
5. How To Set The Unit.....	12
5.1 Main Function.....	12
5.2 Home Position Adjustment .....	20
6. Control By Universal DMX Controller .....	24
6.1 DMX512 Connection .....	24
6.2 Address Setting .....	25
6.3 DMX512 Configuration.....	25
7. Error Information .....	31
8. Troubleshooting.....	37
9. Fixture Cleaning .....	38

## 1. Safety Instructions



Please read the instruction carefully which includes important information about the installation, usage and maintenance.

### WARNING

Please keep this User Guide for future consultation. If you sell the unit to another user, be sure that they also receive this instruction manual.

### Important:

**Damages caused by the disregard of this user manual are not subject to warranty. The dealer will not accept liability for any resulting defects or problems.**

- Unpack and check carefully to ensure that there is no transportation damage before using the unit.
- This product is for indoor use only. Use only in a dry location.
- DO install and operate by qualified operator.
- DO NOT allow children to operate the fixture.
- Use safety chain when fixing the unit. Handle the unit by carrying its base instead of head only.
- The unit must be installed in a location with adequate ventilation, at least 50cm from adjacent surfaces.
- Be sure that no ventilation slots is blocked, otherwise the unit will be overheated.
- Before operation, ensure that you are connecting this product to the proper voltage in accordance with the specifications in this manual or on the product's specification label.
- It's important to ground the yellow/green conductor to earth in order to avoid electric shock.
- Minimum ambient temperature TA: 0°C. Maximum ambient temperature TA: 40°C. Do not operate this product at a lower or higher temperature.
- DO NOT connect the device to any dimmer pack.
- During initial start-up some smoke or smell may arise. This is a normal process and does not necessarily mean that the device is defective, and it will decrease gradually within 15 minutes.
- Keep flammable materials away from the fixture while operating to avoid fire hazard.
- Make sure the power cord is not crimped or damaged; replace it immediately if damaged.
- Unit's surface temperature may reach up to 75°C. DO NOT touch the housing bare-handed during its operation.

- Avoid any flammable liquids, water or metal from entering the unit. Once it happens, cut off the mains power immediately.
- DO NOT operate in a dirty or dusty environment. DO clean the fixture regularly.
- DO NOT touch any wire during operation as there might be a hazard of electric shock.
- Avoid entanglement of the power cord with other wires.
- The minimum distance to objects/surface must be more than 12 meters.
- Disconnect mains power before fuse/lamp replacement or servicing.
- Replace fuse/lamp only with the same type.
- In the event of serious operating problem, stop using the unit immediately.
- Never turn on and off the unit time after time.
- The housing, the lenses, or the ultraviolet filter must be replaced if they are visibly damaged.
- DO NOT open the housing as there are no user serviceable parts inside.
- DO NOT attempt to operate this unit if it becomes damaged. DO NOT attempt any repairs yourself. Repairs carried out by unskilled people can lead to damage or malfunction. Please contact the nearest authorized technical assistance center if needed.
- Disconnect this product from its power source before servicing.
- DO use the original packaging if the device is to be transported.
- Hot lamp explosion hazard. DO NOT open the unit within 15 minutes after switching off.
- DO replace the bulb once it is damaged, deformed or life-expired.
- Avoid direct eye exposure to the light source while the product is on.
- Never touch bulb with bare fingers, as it is very hot after using.
- DO NOT operate this product if you see damage on the housing, shields, or cables. Have the damaged parts replaced by an authorized technician at once.

**Installation:**

The fixture should be fixed on the clamp. Always ensure that the unit is firmly fixed to avoid vibration and slipping off during operation. Ensure that the trussing or area of installation must be able to hold 10 times the weight without any deformation. Always install a safety cable that can hold at least 12 times the weight of the fixture when installing.

DO install and operate by qualified operator. It must be installed in a place where there is out of the reach of people.

## 2. Technical Specifications

### **Power Voltage:**

180-240V~ 50/60Hz

### **Power Consumption:**

640W

### **Light Source:**

PHILIPS MSD Platinum 400L Flex

### **Color Temperature:**

7800K

### **Zoom Range:**

Beam Mode: 2°~7°

Spot Mode: 5°~32°

Wash Mode: 8°~70°

### **Movement:**

Pan: 540°

Tilt: 270°

Pan/Tilt Resolution: 16 bit

Fixation: Tilt lock

### **Dimmer/Shutter:**

Smooth dimming from 0-100%; outstanding strobe effect with variable speed

### **Color Wheel:**

1 x color wheel with 14 fixed colors plus open, and rainbow effect

### **Gobo Wheel:**

1 x static gobo wheel with 16 gobos plus open (two optical apertures)

1 x rotating gobo wheel with 7 gobos plus open, convenient replacement

### **Control:**

DMX Channel: 26/19 channels

Control Mode: DMX512, RDM

Firmware upgrade via DMX link or USB disk

**Construction:**

Display: LCD display

Battery backup for user setup without mains connection

Data In/Out: 3-pin XLR (5-pin XLR is optional)

Power In/Out: Power Cord in

Protection Rating: IP20

**Features:**

Lamp life: 6000 hours

Motorized focus

Linear CMY color mixing + Variable CTO

1 x animation wheel with outstanding water and flame effect, the wheel can be replaced

2x prisms: 8-facets prism+6-facets linear prism, rotatable in both directions and overlayable

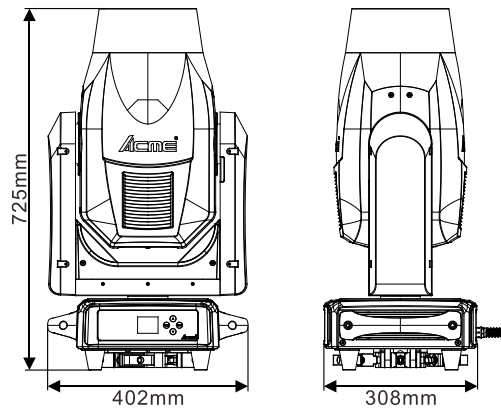
Independent frost effect

2x fixed clamps for 50mm truss

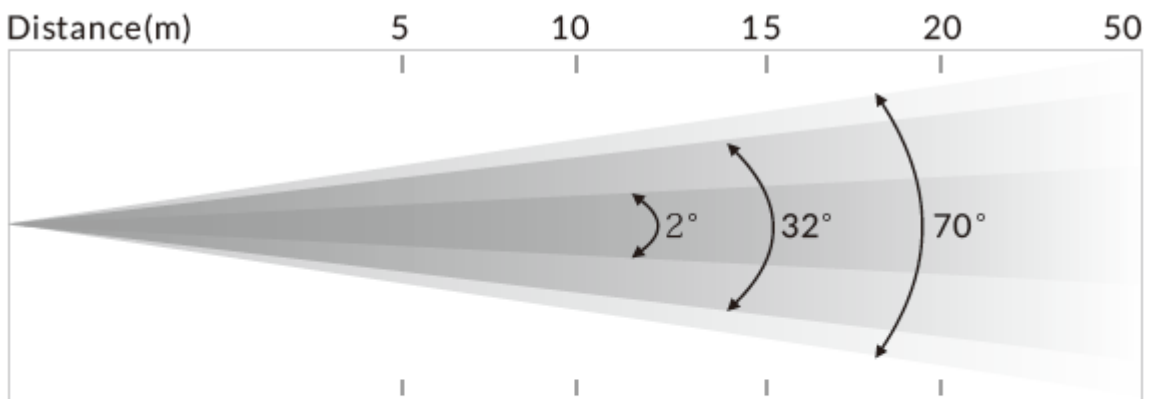
**Dimension/Weight:**

402x308x725mm, 30.5kgs

15.8"x12.1"x28.5" in, 67.2lbs

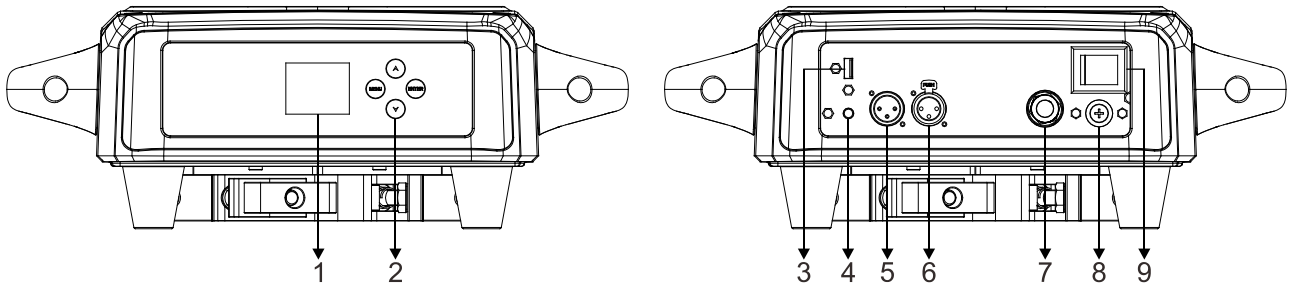


**Photometric Diagram:**



Distance(m)	5	10	15	20	50
2° Lux	2,120,000	530,000	235,000	132,000	21,200
Diameter(m)	0.2	0.3	0.5	0.7	2
32° Lux	14,640	3,660	1,626	915	146
Diameter(m)	3.0	6.0	8.9	11.9	30
70° Lux	4,240	1,060	470	265	42.4
Diameter(m)	6.4	12.7	19.1	25.5	64

### 3. Control Panel



**1. Display:** To show the various menus and the selected functions

**2. Button:**

<b>MENU</b>	To enter into move backward or leave the menu
<b>▲ UP</b>	To go backward to move up in the menu
<b>▼ DOWN</b>	To go forward to move down in the menu
<b>ENTER</b>	To perform the desired functions

**3. FIRMWARE UPGRADE:** Used to upgrade fixture's firmware

**4. BATTERY DISPLAY**

**5. DMX IN:**

For DMX512 link, use 3-pin XLR cable to link the unit and DMX controller (5-pin XLR is optional)

**6. DMX OUT:**

For DMX 512 link, use 3-pin XLR cable to link the next units (5-pin XLR is optional)

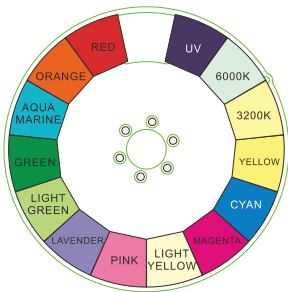
**7. POWER IN:** To connect to supply power

**8. FUSE(T 15A):** Protects the unit from damage of over-voltage or short circuit

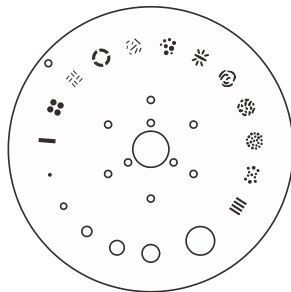
**9. POWER SWITCH:** Turns on/off the power

## 4. Effect Wheels and Lamp

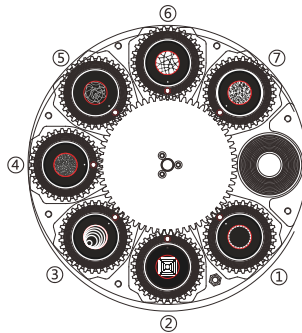
### 4.1 Effect Wheels



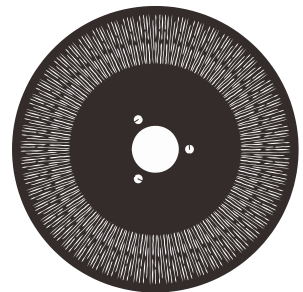
COLOR WHEEL



STATIC GOBO WHEEL



ROTATING GOBO WHEEL

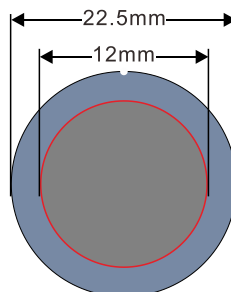


ANIMATION WHEEL

**DANGER!**  
 Install the rotating gobos with the device switched off only.  
 Unplug from mains before changing the rotating gobos!

**CAUTION:** Never unscrew the screws of the rotating gobo as the ball bearing will otherwise be opened!

R-Gobos	Part Number
① Gobo1	3011001305
② Gobo2	3011001167
③ Gobo3	3011001308
④ Gobo4	3011001307
⑤ Gobo5	3011001306
⑥ Gobo6	3011001168
⑦ Gobo7	3011001169

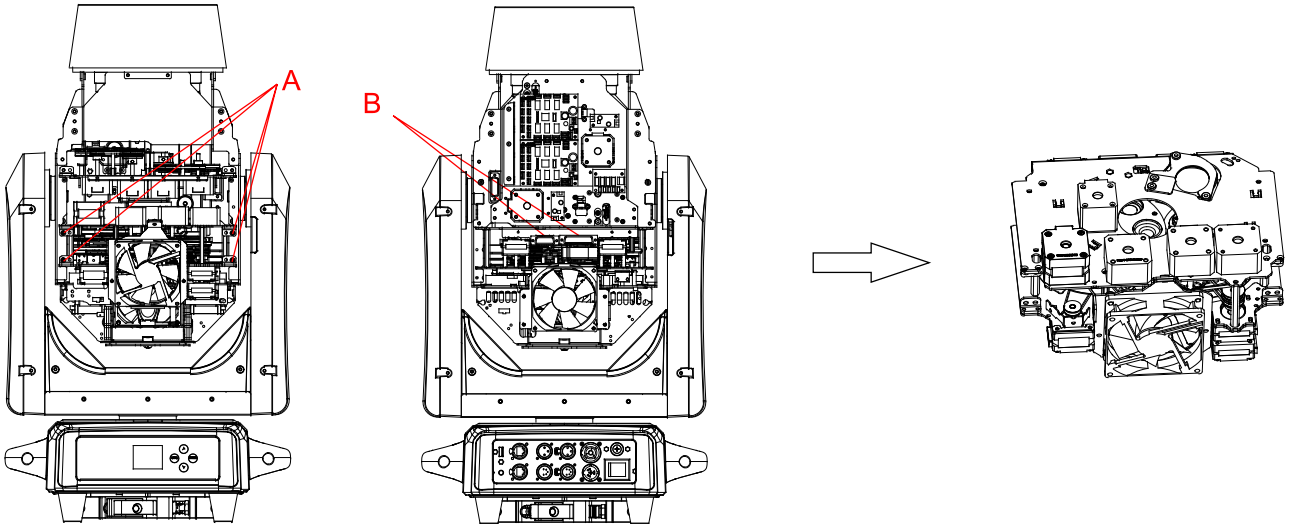


Rotating Gobos  
Dimensions

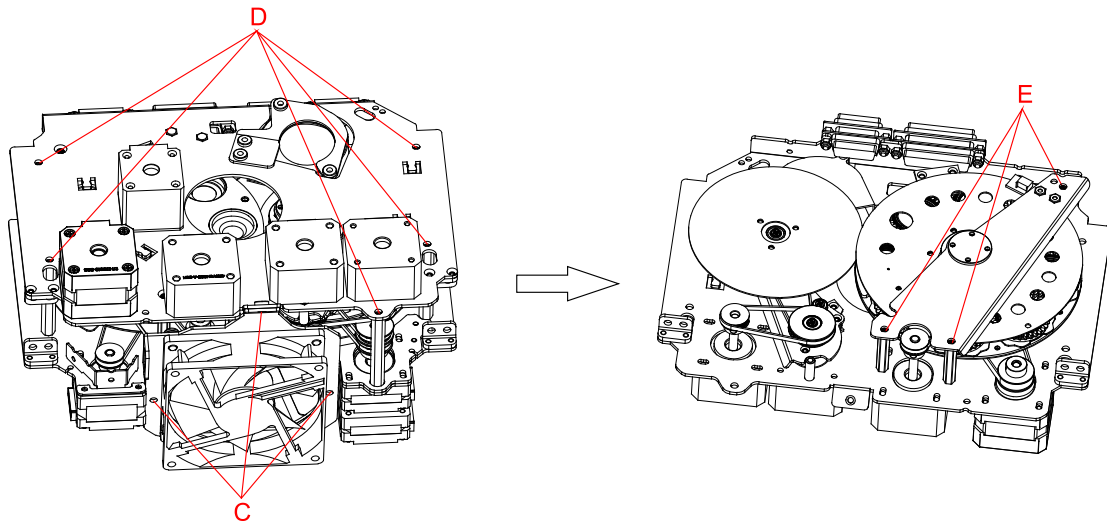


## 4.2 Replacing Rotating Gobos

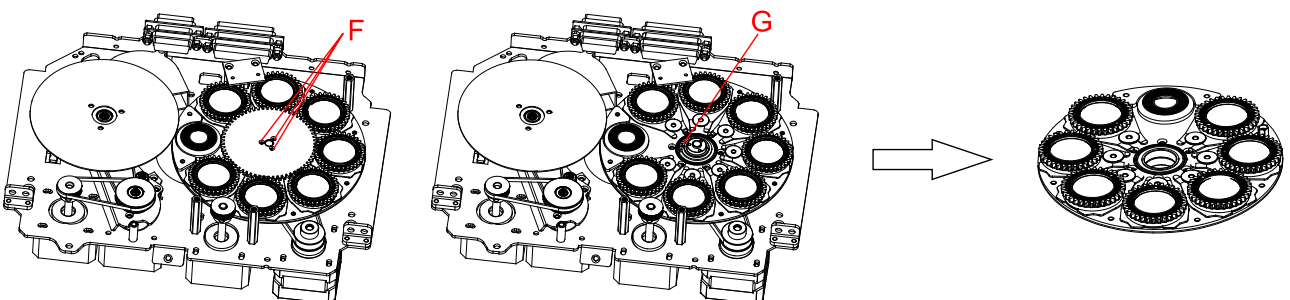
1. Unscrew the four screws at A and unplug the two sets of DB head cables at B to take out the component;



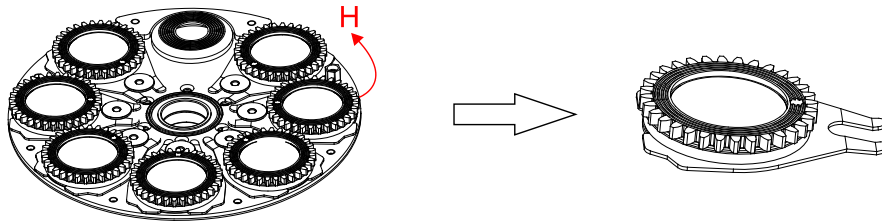
2. Unscrew the three screws at C and remove the fan; then unscrew the five screws at D to take out the component; unscrew the three screws at E;



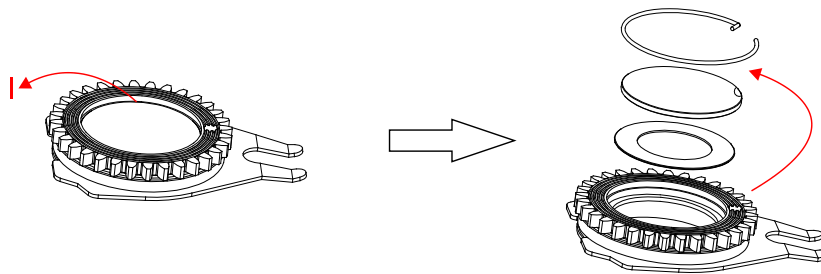
3. Unscrew the three screws at F and remove the plastic gear; Clamp out the circlip at G to take out the rotating gobo wheel component;



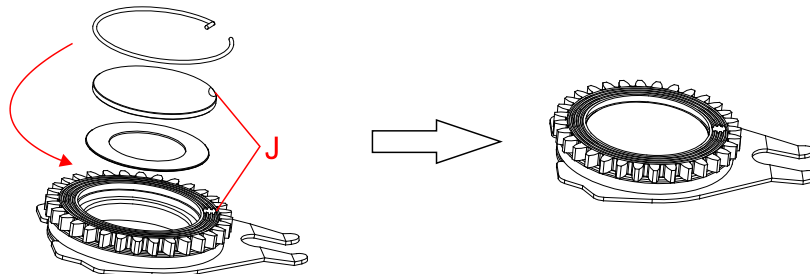
4. Gently lift the gobo holder from the edge of the rotating gobo wheel (reverse side) as H shows and slowly pull it out;



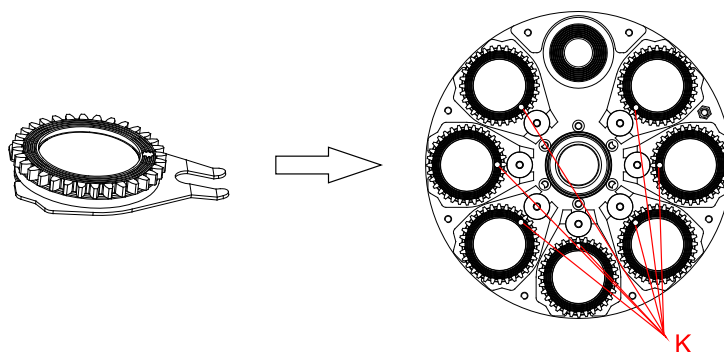
5. Remove the spring lock at I with an appropriate tool like tweezers (if the gobo is coated with glass glue, do remove it with some good glass cleaning fluid before removing the spring lock to avoid damage to the gobo).



6. Do not touch the surface of the gobo with bare fingers. The gobo has a small position point at its edge which has to aim at the position point on the gobo holder like J shows (glossy side towards the light source).



7. Insert the gobo holder back into the rotating gobo wheel component in this way that its position point has to exactly aim at the center of the rotating gobo wheel.



8. After installation, put the component back to the fixture.

## 4.3 Light Source

### PHILIPS MSD Platinum 400L Flex

- Because of its high internal pressure, there might be a risk that the Discharge lamp would explode during operation. The lamp emits intense UV radiation which is harmful to the eyes and skin. The high luminance of the arc can cause severe damage to the retina if you take a close look at the lamp.
- To protect the lamp, always turn off the lamp first (via control panel or DMX controller) and let the unit run at least five minutes to cool down before switching off the mains supply. Never handle the lamp or luminaire when it is hot.
- Do not touch the bulb with bare hands. If this happens, clean the lamp with denatured alcohol and wipe it with a lint free cloth before installation.
- The lamp generates UV radiation. Never operate the lamp without appropriate shielding.
- When lighting up, the lamp operates at high pressure and there is a slight risk of arc tube rupture. The risk increases with age, temperature and improper handling of the lamp. Do not use the lamp longer than its lifespan.
- Make sure the lamp is located in the center of the reflector for the best projection.

## 4.4 Change The Lamp

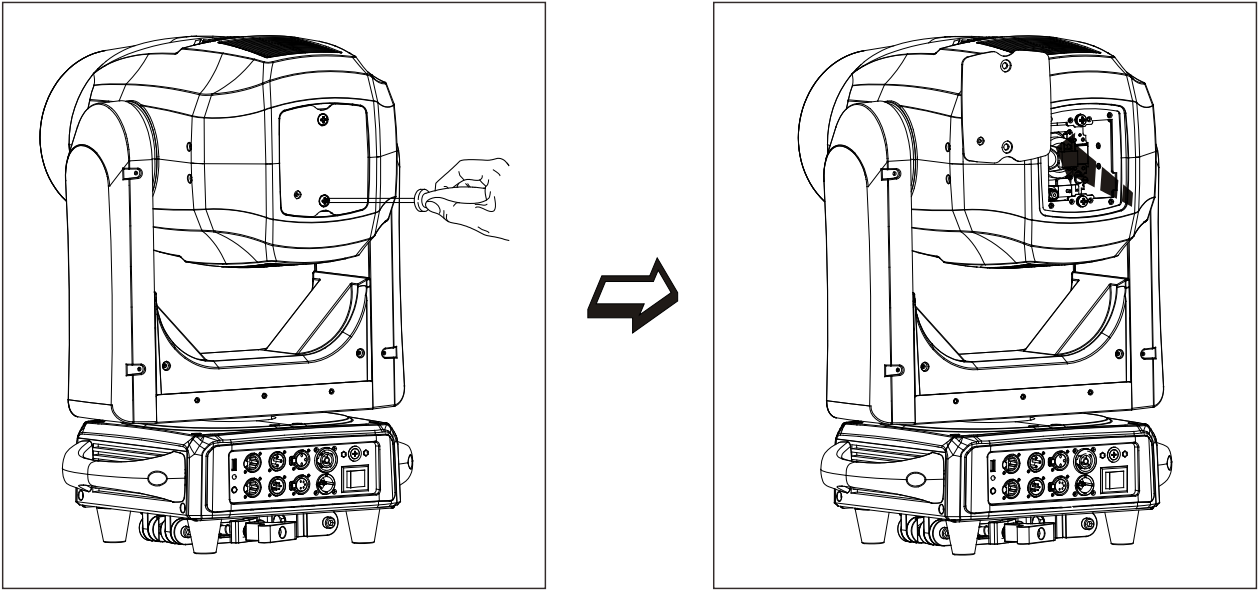
Attention: The entire light path and lens of the luminaire must be thoroughly cleaned before changing the bulb.

In the Work Mode, the lamp life is 1500 hours; when the Work Mode and the Sleep Mode are used alternately, the lamp life is between 1500 and 6000 hours according to the ratio of lamp use time; in the Sleep Mode, the lamp life is 6000 hours. Do not use the bulb beyond its lifetime, otherwise it may damage the luminaire. Check the Lamp Use Time regularly. When the lamp replacement warning appears, we strongly recommend that you replace the bulb. After replacing the bulb, the use hours of the bulb must be cleared and reset.

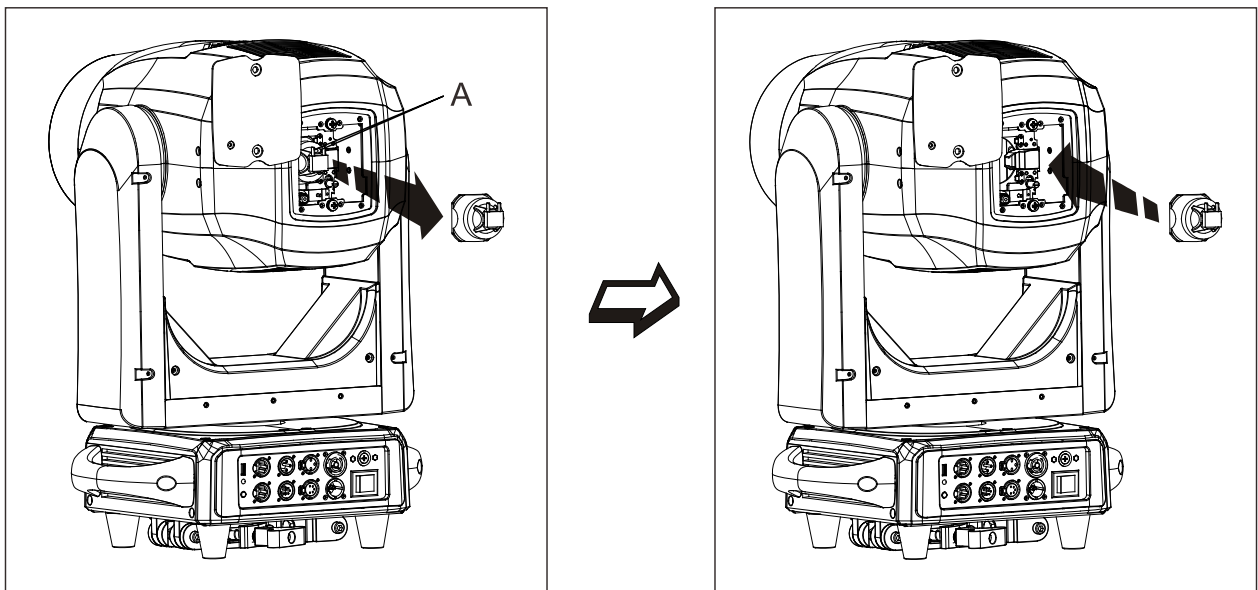
### To replace the lamp:

1. Ensure that the fixture is detached from power and has cooled down completely. It is a good idea to allow the fixture to run for 10 minutes after the lamp has been turned off, so that the cooling fans have time to work.

2. Loosen the screws on the head of the fixture and open the fixture head covers.



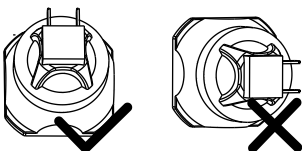
3. Unplug the leads of the lamp and lift the lamp out of its recess, disconnect the lamp and connect a new lamp that must be the same type with the old one. And then place the new lamp into the lamp recess.



Finally reinstall the head cover, fastening it securely before reapplying power.

**Warning:**

The installing direction of lamp:



## **4.5 Lamp Replacement Warning**

- When the lamp reaches 300 hours before its service time, the display will flash the message “Replace Lamp Soon” for up to 5 minutes. During this period, the fixture will still work normally.
- When the lamp reaches its service time, the display will flash the message “Replace Lamp Now” for up to 10 minutes. After 10 minutes, the fixture will return to normal operation.
- When the lamp is continuously used overtime, the display will flash the message “Lamp Timeout Use, Replace Lamp Now” for up to 10 minutes. After 10 minutes, the fixture will return to normal operation.

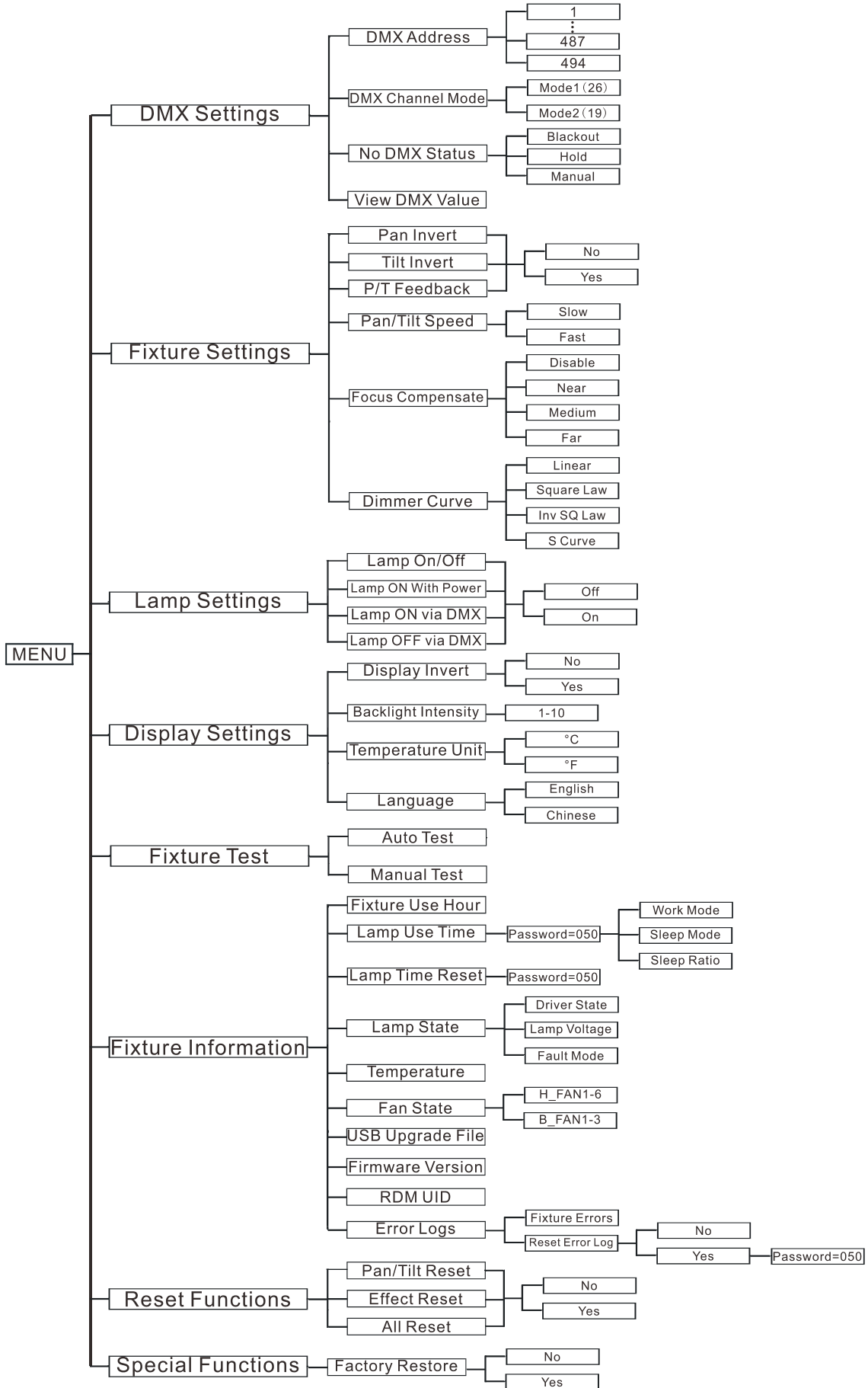
Attention: Damages caused by the failure to replace the bulb in time are not subject to warranty.

## **5. How To Set The Unit**

### **5.1 Main Function**

Turn on the unit, press the MENU button into menu mode, and press the UP/DOWN button until the required function is shown on the monitor. Select the function by pressing the ENTER button. Use the UP/DOWN button to choose the submenu, press the ENTER button to store and automatically return to the last menu. Press the MENU button or let the unit idle 30 seconds to exit menu mode.

The main functions are shown below:



## ***DMX Settings***

To select **DMX Settings**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **DMX Address, DMX Channel Mode, No DMX Status** or **View DMX Value**.

### **DMX Address**

To select **DMX Address**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to adjust the address from **001** to **487/494**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **DMX Channel Mode**

To select **DMX Channel Mode**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Mode1 (26)** or **Mode2 (19)**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **No DMX Status**

To select **No DMX Status**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Blackout**(fixture blacks out if DMX signal stops), **Hold**(fixture continues to obey the last command it received Via DMX if DMX signal stops) or **Manual**(the fixture will automatically read the DMX value in the “Manual Test” menu for operation after selecting this mode), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **View DMX Value**

To select **View DMX Value**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to view the DMX channel value. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

## ***Fixture Settings***

To select **Fixture Settings**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Pan Invert, Tilt Invert, P/T Feedback, Pan/Tilt Speed, Focus Compensate** or **Dimmer Curve**.

### **Pan Invert**

To select **Pan Invert**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **No** (normal) or **Yes** (pan invert), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### Tilt Invert

To select **Tilt Invert**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **No** (normal) or **Yes** (tilt invert), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### P/T Feedback

To select **P/T Feedback**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **No** (Pan or tilt's position will not feedback while out of step) or **Yes** (Feedback while pan/tilt out of step), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### Pan/Tilt Speed

To select **Pan/Tilt Speed**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Slow** or **Fast**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

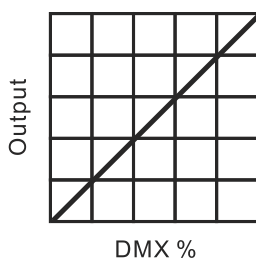
### Focus Compensate

To select **Focus Compensate**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Disable**, **Near**, **Medium** or **Far**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

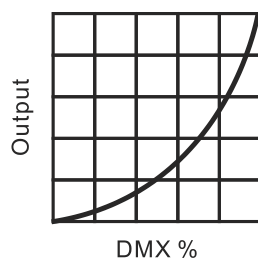
### Dimmer Curve

To select **Dimmer Curve**, press the **ENTER** button to confirm. Use the **DOWN/UP** button to select **Linear**, **Square Law**, **Inv SQ Law** or **S Curve**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

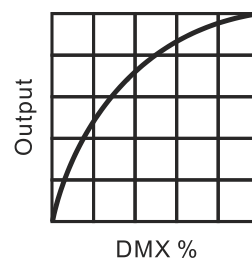
## Dimmer Modes



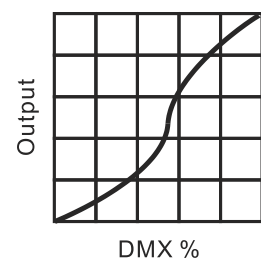
Optically Linear



Square Law



Inverse Square Law



S-curve

**Optically Linear:** The increase in light intensity appears to be linear as DMX value is increased.

**Square Law:** Light intensity control is finer at low levels and coarser at high levels.

**Inverse Square Law:** Light intensity control is coarser at low levels and finer at high levels.

**S-Curve:** Light intensity control is finer at low levels and high levels and coarser at medium levels.



## ***Lamp Settings***

To select **Lamp Settings**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Lamp On/Off, Lamp ON with Power, Lamp ON via DMX or Lamp OFF via DMX**.

### **Lamp On/Off**

To select **Lamp On/Off**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Off**(lamp off) or **On**(lamp on), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Lamp ON with Power**

To select **Lamp ON with Power**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Off**(Lamp off while power on) or **On**(Lamp on while power on), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Lamp ON via DMX**

To select **Lamp ON via DMX**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Off** or **On**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Lamp OFF via DMX**

To select **Lamp OFF via DMX**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Off** or **On**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

## ***Display Settings***

To select **Display Settings**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Display Invert, Backlight Intensity, Temperature Unit or Language**.

### **Display Invert**

Select **Display Invert**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **No** (normal display) or **Yes** (invert display), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Backlight Intensity**

Select **Backlight Intensity**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to adjust backlight intensity from **1** (dark) to **10** (bright), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Temperature Unit**

Select **Temperature Unit**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select °C or °F, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Language**

Select **Language**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **English** or **Chinese**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

## ***Fixture Test***

To select **Fixture Test**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Auto Test** or **Manual Test**

### **Auto Test**

Select **Auto Test**, press the **ENTER** button to confirm, the unit will run built-in programs to automatically test pan, tilt, color, gobo, gobo rotation, animation, prism, prism rotation, strobe, frost, focus, zoom, etc. Press the **MENU** button back to the last menu or exit menu mode after auto test.

### **Manual Test**

Select **Manual Test**, press the **ENTER** button to confirm, the present channel will show on the display, use the **UP/DOWN** button to select channel, press the **ENTER** button to confirm, then use the **UP/DOWN** button to adjust the value, press the **ENTER** button to store, the fixture will run as the channel value indicates. Press the **MENU** button back to the last menu or exit menu mode idling 30 seconds.

(The fixture will return to the previous DMX state after exiting Manual Test menu and the Manual Test parameters will be automatically saved after power off and restart.)

## ***Fixture Information***

To select **Fixture Information**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Fixture Use Hour**, **Lamp Use Time**, **Lamp Time Reset**, **Lamp State**, **Temperature**, **Fan State**, **USB Upgrade File**, **Firmware Version**, **RDM UID** or **Error Logs**.

### **Fixture Use Hour**

Select **Fixture Use Hour**, press the **ENTER** button to confirm, fixture use hour will show on the display, press the **MENU** button to exit.

### **Lamp Use Time**

To select **Lamp Use Time**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to set the password **050**, press the **ENTER** button to confirm and lamp use time in **Work Mode**, **Sleep Mode** or **Sleep Ratio** can be viewed, press the **ENTER** button to confirm. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Lamp Time Reset**

Select **Lamp Time Reset**, press the **ENTER** button to confirm, use the **UP/DOWN** button to set the password **050** to reset lamp use time, press the **MENU** button to exit.

### **Lamp State**

Select **Lamp State**, press the **ENTER** button to confirm, lamp state will show on the display, press the **MENU** button to exit.

### **Temperature**

Select **Temperature**, press the **ENTER** button to confirm, fixture temperature will show on the display, press the **MENU** button to exit.

### **Fan State**

Select **Fan State**, press the **ENTER** button to confirm, fan state will show on the display, press the **MENU** button to exit.

### **USB Upgrade File**

Select **USB Upgrade File**, press the **ENTER** button to confirm, USB upgrade file will show on the display, press the **MENU** button back to exit.

### **Firmware Version**

Select **Firmware Version**, press the **ENTER** button to confirm, firmware version will show on the display, press the **MENU** button back to exit.

## **RDM UID**

Select **RDM UID**, press the **ENTER** button to confirm, RDM UID will show on the display, press the **MENU** button back to exit.

## **Error Logs**

Select **Error Logs**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **Fixture Errors** or **Reset Error Log**, press the **ENTER** button to store. Select **Reset Error Log**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to select **No** or **Yes**, press the **ENTER** button to store. Select **Yes**, press the **ENTER** button to confirm. Use the **UP/DOWN** button to set the password **050**, press the **ENTER** button to reset error log. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

## ***Reset Functions***

To select **Reset Functions**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Pan/Tilt Reset**, **Effect Reset** or **All Reset**.

### **Pan/Tilt Reset**

Select **Pan/Tilt Reset**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **No**(normal) or **Yes** (the unit will run built-in program to reset pan and tilt to their home positions), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **Effect Reset**

Select **Effect Reset**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **No**(normal) or **Yes** (the unit will run built-in program to reset effect to their home positions), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 30 seconds to exit menu mode.

### **All Reset**

Select **All Reset**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **No**(normal) or **Yes** (the unit will run built-in program to reset all motors to their home positions), press **ENTER** button to store. Press the **MENU** button to exit.

## ***Special Functions***

### **Factory Restore**

Select **Factory Restore**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **No**(normal) or **Yes** (the fixture will reset to factory settings), press **ENTER** button to store. Press the **MENU** button to exit.

## ***RDM FUNCTIONS***

Select the MANUFACTURER menu to display the manufacturer of the fixture.

Select the SOFTWARE VERSION menu and the program version number of the fixture will be displayed.

Select the DMX START ADDRESS menu to change the DMX 512 address (001-512).

Select the DEVICE MODEL DESCRIPTION menu to display the model of the fixture.

Select the DEVICE LABEL menu to change the model of the fixture.

Select the DMX PERSONALITY menu to set the channel mode of the fixture (26/19 channel).

Select the DMX PERSONALITY DESCRIPTION menu to display the current channel mode of the fixture.

Select the DEVICE HOURS menu to display the running time of the fixture.

Select the LAMP HOURS menu to display the running time of the lamp.

Select the LAMP STATE menu to turn on/off the lamp.

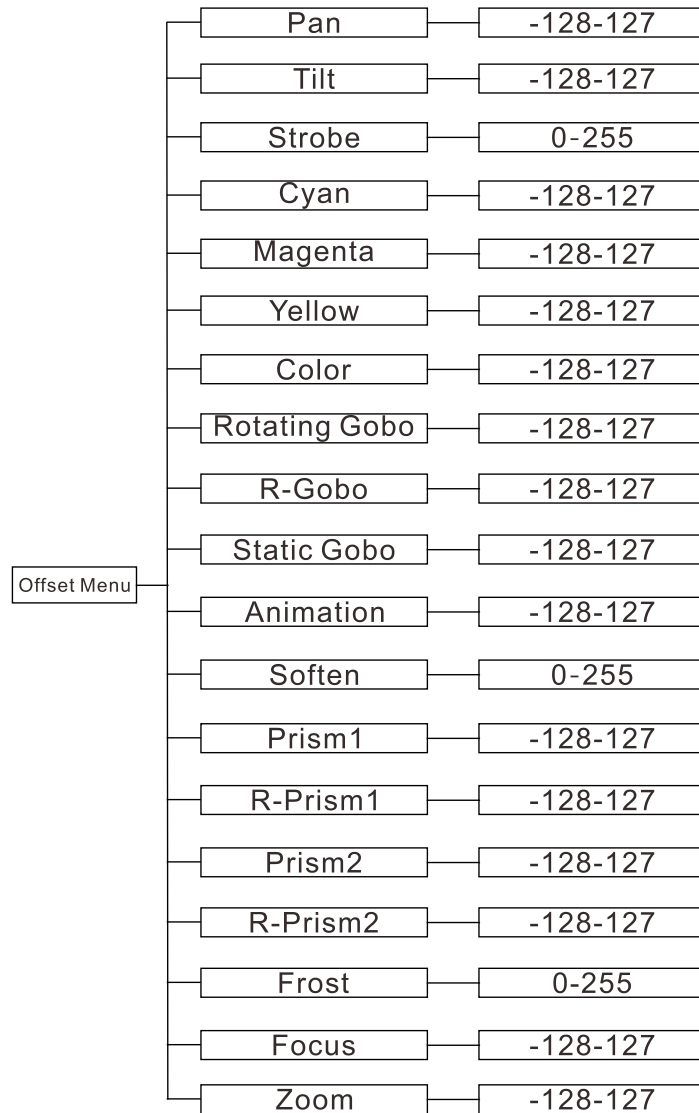
Select the PAN INVERT menu and the fixture will run the pan invert mode.

Select the TILT INVERT menu and the fixture will run the tilt invert mode.

Select the RESET DEVICE menu, the WARM RESET/COLD RESET option will be displayed. When WARM RESET is selected, the fixture will start a warm reset, and exit when COLD RESET is selected.

## **5.2 Home Position Adjustment**

Press the MENU button into menu mode, then press the ENTER button for about 3 seconds into offset mode to adjust the home position. Select the function by pressing the ENTER button. Use the UP/DOWN button to choose the submenu, press the ENTER button to store and automatically return to the last menu. Press MENU button to exit.



### Pan

Enter offset mode, Select **Pan**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

### Tilt

Enter offset mode, Select **Tilt**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

### Strobe

Enter offset mode, Select **Strobe**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from 0 to 255, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Cyan**

Enter offset mode, Select **Cyan**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Magenta**

Enter offset mode, Select **Magenta**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Yellow**

Enter offset mode, Select **Yellow**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Color**

Enter offset mode, Select **Color**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Rotating Gobo**

Enter offset mode, Select **Rotating Gobo**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **R-Gobo**

Enter offset mode, Select **R-Gobo**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Static Gobo**

Enter offset mode, Select **Static Gobo**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Animation**

Enter offset mode, Select **Animation**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Soften**

Enter offset mode, Select **Soften**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from 0 to 255, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Prism 1**

Enter offset mode, Select **Prism 1**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **R-Prism 1**

Enter offset mode, Select **R-Prism 1**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Prism 2**

Enter offset mode, Select **Prism 2**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **R-Prism 2**

Enter offset mode, Select **R-Prism 2**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Frost**

Enter offset mode, Select **Frost**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from 0 to 255, press the **ENTER** button to store. Press the **MENU** button to exit.

## **Focus**

Enter offset mode, Select **Focus**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.

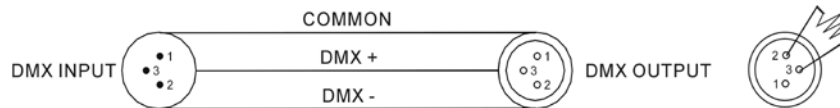
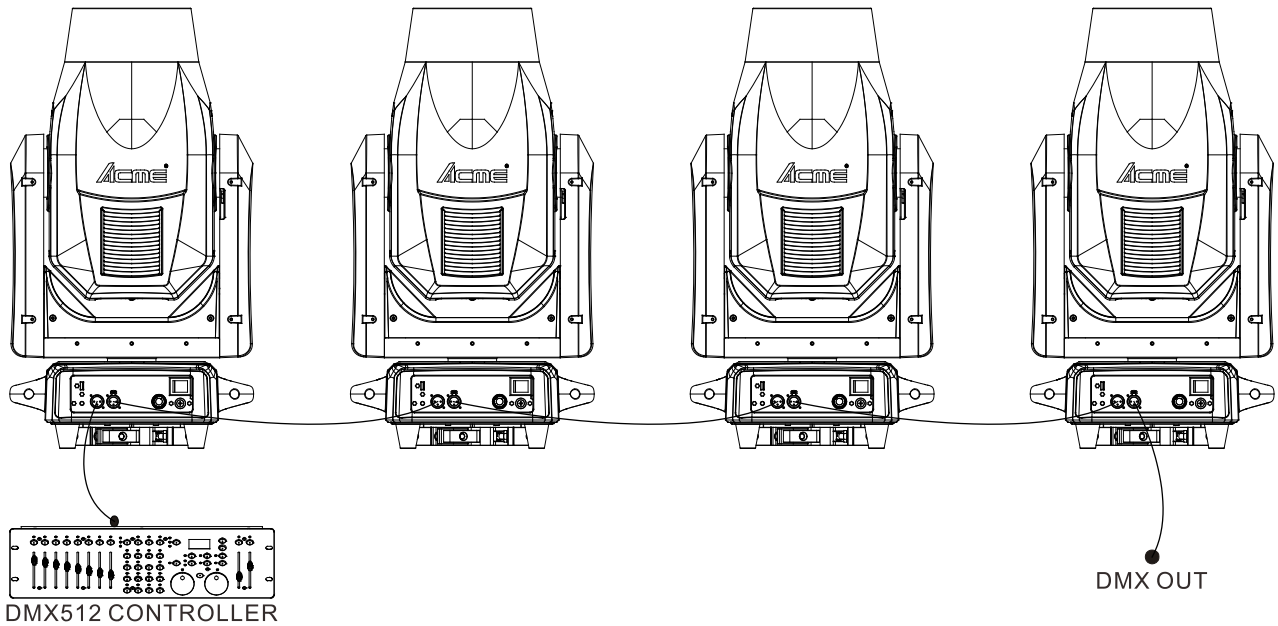
## **Zoom**

Enter offset mode, Select **Zoom**, press the **ENTER** button to confirm, the present position will blink on the display, use the **UP/DOWN** button to offset the value from -128 to 127, press the **ENTER** button to store. Press the **MENU** button to exit.



## 6. Control By Universal DMX Controller

### 6.1 DMX512 Connection



1. At last unit, the DMX cable has to be terminated with a terminator. Solder a 120-ohm 1/4W resistor between pin 2(DMX-) and pin 3(DMX+) into a 3-pin XLR-plug and plug it in the DMX-output of the last unit.
2. Connect the unit together in a “daisy chain” by XLR plug cable from the output of the unit to the input of the next unit. The cable can only be used in series and cannot be connected in parallel. DMX 512 is a very high-speed signal. Inadequate or damaged cables, soldered joints or corroded connectors can easily distort the signal and shut down the system.
3. The DMX output and input connectors are pass-through to maintain the DMX circuit, when one of the units’ power is disconnected.
4. Each lighting unit needs to have a DMX address to receive the data by the controller. The address number is between 1-512.
5. The end of the DMX 512 system should be terminated to reduce signal errors.
6. 3 pin XLR connectors are more popular than 5 pins XLR.  
3 pin XLR: Pin 1: GND, Pin 2: Negative signal (-), Pin 3: Positive signal (+)  
5 pin XLR: Pin 1: GND, Pin 2: Negative signal (-), Pin 3: Positive signal (+), Pin4, Pin5 not used.

## 6.2 Address Setting

If you use a universal DMX controller to control the units, you have to set DMX address from 1 to 512 so that the units can receive DMX signal.

Press the MENU button to enter menu mode, select DMX Settings, press the ENTER button to confirm, use the UP/DOWN button to select DMX Address, press the ENTER button to confirm, the present address will blink in the display, use the UP/DOWN button to adjust the address from 001 to 512, press the ENTER button to store. Press the MENU button back to the last menu or let the unit idle 30 seconds to exit menu mode.

Please refer to the following diagram to address your DMX512 channel for the first 4 units.

Channel mode	Unit 1 Address	Unit 2 Address	Unit 3 Address	Unit 4 Address
26 channels	1	27	53	79
19 channels	1	20	39	58

## 6.3 DMX512 Configuration

Please control the fixture by referring to the configurations below

### Attentions:

1. The unit will maintain the last condition until reset if you cut-off the DMX signal.
2. For the channel Function, keep the value for about 3 seconds, then the corresponding function will take into effect.

### 26 Channels (Mode 1):

CHANNEL	VALUE	FUNCTION
1	000-255	<b>CYAN</b> 0%→100%
2	000-255	<b>MAGENTA</b> 0%→100%
3	000-255	<b>YELLOW</b> 0%→100%
4	000-255	<b>CTO</b> 6000K→3200K
5	000-007 008-011 012-015	<b>COLOR</b> Open Color 1 Color 2

	016-019 020-023 024-027 028-031 032-035 036-039 040-043 044-047 048-051 052-055 056-059 060-063 064-127 128-189 190-193 194-255	Color 3 Color 4 Color 5 Color 6 Color 7 Color 8 Color 9 Color 10 Color 11 Color 12 Color 13 Color 14 Color Index Clockwise Rotation, Fast to Slow Stop Counter-Clockwise Rotation, Slow to Fast
6	000-003 004-103 104-107 108-207 208-212 213-251 252-255	<b>STROBE</b> Close Strobe from Slow to Fast Open Pulsation from Slow to Fast Open Random Strobe Open
7	000-255	<b>DIMMER</b> 0%→100%
8	000-255	<b>DIMMER FINE</b>
9	000-007 008-011 012-015 016-019 020-023 024-027 028-031 032-035 036-039 040-043 044-047 048-051 052-055 056-059 060-063 064-067 068-071 072-113	<b>STATIC GOBO</b> Open Gobo 1 Gobo 2 Gobo 3 Gobo 4 Gobo 5 Gobo 6 Gobo 7 Gobo 8 Gobo 9 Gobo 10 Gobo 11 Gobo 12 Gobo 13 Gobo 14 Gobo 15 Gobo 16 Clockwise Rotation, Fast to Slow

	114-117 118-159 160-165 166-171 172-177 178-183 184-189 190-195 196-201 202-207 208-213 214-219 220-225 226-231 232-237 238-243 244-249 250-255	Stop Counter-Clockwise Rotation, Slow to Fast Gobo1 Shaking, Slow to Fast Gobo2 Shaking, Slow to Fast Gobo3 Shaking, Slow to Fast Gobo4 Shaking, Slow to Fast Gobo5 Shaking, Slow to Fast Gobo6 Shaking, Slow to Fast Gobo7 Shaking, Slow to Fast Gobo8 Shaking, Slow to Fast Gobo9 Shaking, Slow to Fast Gobo10 Shaking, Slow to Fast Gobo11 Shaking, Slow to Fast Gobo12 Shaking, Slow to Fast Gobo13 Shaking, Slow to Fast Gobo14 Shaking, Slow to Fast Gobo15 Shaking, Slow to Fast Gobo16 Shaking, Slow to Fast
<b>10</b>	000-007 008-129 130-133 134-255	<b>ANIMATION</b> Null Counter-Clockwise Rotation, Fast to Slow Stop Clockwise Rotation, Slow to Fast
<b>11</b>	000-007 008-015 016-023 024-031 032-039 040-047 048-055 056-063 064-093 094-098 099-129 130-147 148-165 166-183 184-201 202-219 220-237 238-255	<b>ROATING GOBO</b> Open Gobo 1 Gobo 2 Gobo 3 Gobo 4 Gobo 5 Gobo 6 Gobo 7 Clockwise Rotation, Fast to Slow Stop Counter-Clockwise Rotation, Slow to Fast Gobo1 Shaking, Slow to Fast Gobo2 Shaking, Slow to Fast Gobo3 Shaking, Slow to Fast Gobo4 Shaking, Slow to Fast Gobo5 Shaking, Slow to Fast Gobo6 Shaking, Slow to Fast Gobo7 Shaking, Slow to Fast
<b>12</b>	000-127 128-189 190-193	<b>GOBO ROTATION</b> Gobo Index Counter-Clockwise Rotation, Fast to Slow Stop

	194-255	Clockwise Rotation, Slow to Fast
<b>13</b>	000-255	<b>FINE GOBO ROTATION</b>
<b>14</b>	000-010 011-132 133-223 224-255	<b>PRISM</b> Close Prism1(6-facets linear prism) Prism2(8-facets prism) Prism1 and Prism2 Mixing Effect
<b>15</b>	000-127 128-189 190-193 194-255	<b>PRISM ROTATION</b> Prism Index Counter-Clockwise Rotation, Fast to Slow Stop Clockwise Rotation, Slow to Fast
<b>16</b>	000-007 008-255	<b>FROST</b> Close Open
<b>17</b>	000-255	<b>ZOOM</b> 70°→2°
<b>18</b>	000-255	<b>FOCUS</b> 0%→100%
<b>19</b>	000-255	<b>FOCUS FINE</b>
<b>20</b>	000-255	<b>PAN</b> 0%→100%
<b>21</b>	000-255	<b>PAN FINE</b>
<b>22</b>	000-255	<b>TILT</b> 0%→100%
<b>23</b>	000-255	<b>TILT FINE</b>
<b>24</b>	000-255	<b>PAN/TILT SPEED</b> Fast to slow
<b>25</b>	000-007 008-255	<b>SOFT FILTER</b> Close Open
<b>26</b>	000-129 130-139 140-149 150-159 160-169 170-179 180-199 200-209 210-229 230-239 240-255	<b>SPECIAL FUNCTION</b> No Function Lamp On Reset XY Reset Effect No Function No Function No Function Reset All No Function Lamp Off No Function

19 Channels (Mode 2):

CHANNEL	VALUE	FUNCTION
1	000-255	<b>PAN</b> 0%→100%
2	000-255	<b>PAN FINE</b>
3	000-255	<b>TILT</b> 0%→100%
4	000-255	<b>TILT FINE</b>
5	000-255	<b>PAN/TILT SPEED</b> Fast to slow
6	000-255	<b>CYAN</b> 0%→100%
7	000-255	<b>MAGENTA</b> 0%→100%
8	000-255	<b>YELLOW</b> 0%→100%
9	000-255	<b>CTO</b> 6000K→3200K
10	000-007 008-011 012-015 016-019 020-023 024-027 028-031 032-035 036-039 040-043 044-047 048-051 052-055 056-059 060-063 064-127 128-189 190-193 194-255	<b>COLOR</b> Open Color 1 Color 2 Color 3 Color 4 Color 5 Color 6 Color 7 Color 8 Color 9 Color 10 Color 11 Color 12 Color 13 Color 14 Color Index Clockwise Rotation, Fast to Slow Stop Counter-Clockwise Rotation, Slow to Fast
11	000-003	<b>STROBE</b> Close

	004-103 104-107 108-207 208-212 213-251 252-255	Strobe from Slow to Fast Open Pulsation from Slow to Fast Open Random Strobe Open
<b>12</b>	000-255	<b>DIMMER</b> 0%→100%
<b>13</b>	000-255	<b>DIMMER FINE</b>
<b>14</b>	000-007 008-255	<b>FROST</b> Close Open
<b>15</b>	000-255	<b>ZOOM</b> 70°→2°
<b>16</b>	000-255	<b>FOCUS</b> 0%→100%
<b>17</b>	000-255	<b>FOCUS FINE</b>
<b>18</b>	000-007 008-255	<b>SOFT FILTER</b> Close Open
<b>19</b>	000-129 130-139 140-149 150-159 160-169 170-179 180-199 200-209 210-229 230-239 240-255	<b>SPECIAL FUNCTION</b> No Function Lamp On Reset XY Reset Effect No Function No Function No Function Reset All No Function Lamp Off No Function

## **7. Error Information**

**Error codes are shown continuously in the display when the fixture fails and they will not disappear until the fixture is repaired.**

### **1. CPU-B/C/D/E Error**

Check whether the 485 (DATA) leads on the PCB board are installed in place or disconnected.

Check whether the related 485 (DATA) signal circuit on the PCB board is damaged.

### **2. Pan Reset Error**

Check whether the position of the pan where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the pan operating range.

Check whether the Hall element on the pan is damaged.

Check whether the lead connecting the Hall element on the pan and the PCB board is in poor contact or disconnected.

Check whether the motor on the pan is damaged.

Check whether the related circuit of the motor drive board on the pan is damage.

### **3. Pan Encode Error**

Check whether the encoder on the pan is damaged.

Check whether the lead connecting the encoder on the pan and the PCB board is in poor contact or disconnected.

### **4. Tilt Reset Error**

Check whether the position of the tilt where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the tilt operating range.

Check whether the Hall element on the tilt is damaged.

Check whether the lead connecting the Hall element on the tilt and the PCB board is in poor contact or disconnected.

Check whether the motor on the tilt is damaged.

Check whether the related circuit of the motor drive board on the tilt is damage.

### **5. Tilt Encode Error**

Check whether the encoder on the tilt is damaged.

Check whether the lead connecting the encoder on the tilt and the PCB board is in poor contact or disconnected.



## **6. Cyan Reset Error**

Check whether the position of the cyan color wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the cyan color wheel operating range.

Check whether the Hall element on the cyan color wheel is damaged.

Check whether the lead connecting the Hall element on the cyan color wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the cyan color wheel is damaged.

Check whether the related circuit of the motor drive board on the cyan color wheel is damage.

## **7. Magenta Reset Error**

Check whether the position of the magenta color wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the magenta color wheel operating range.

Check whether the Hall element on the magenta color wheel is damaged.

Check whether the lead connecting the Hall element on the magenta color wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the magenta color wheel is damaged.

Check whether the related circuit of the motor drive board on the magenta color wheel is damage.

## **8. Yellow Reset Error**

Check whether the position of the yellow color wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the yellow color wheel operating range.

Check whether the Hall element on the yellow color wheel is damaged.

Check whether the lead connecting the Hall element on the yellow color wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the yellow color wheel is damaged.

Check whether the related circuit of the motor drive board on the yellow color wheel is damage.

## **9. Color Reset Error**

Check whether the position of the color wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the color wheel operating range.

Check whether the Hall element on the color wheel is damaged.

Check whether the lead connecting the Hall element on the color wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the color wheel is damaged.

Check whether the related circuit of the motor drive board on the color wheel is damage.

## **10. Rotating Gobo Error**

Check whether the position of the rotating gobo wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the rotating gobo wheel operating range.

Check whether the Hall element on the rotating gobo wheel is damaged.

Check whether the lead connecting the Hall element on the rotating gobo wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the rotating gobo wheel is damaged.

Check whether the related circuit of the motor drive board on the rotating gobo wheel is damage.

## **11. R-Gobo Reset Error**

Check whether the position of the rotating gobo wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the rotating gobo wheel operating range.

Check whether the Hall element on the rotating gobo wheel is damaged.

Check whether the lead connecting the Hall element on the rotating gobo wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the rotating gobo wheel is damaged.

Check whether the related circuit of the motor drive board on the rotating gobo wheel is damage.

## **12. Static Gobo Error**

Check whether the position of the static gobo wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the static gobo wheel operating range.

Check whether the Hall element on the static gobo wheel is damaged.

Check whether the lead connecting the Hall element on the static gobo wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the static gobo wheel is damaged.

Check whether the related circuit of the motor drive board on the static gobo wheel is damage.

## **13. Prism1/2 Reset Error**

Check whether the position of the prism1/2 where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the prism1/2 operating range.

Check whether the Hall element on the prism1/2 is damaged.

Check whether the lead connecting the Hall element on the prism1/2 and the PCB board is in poor contact or disconnected.

Check whether the motor on the prism1/2 is damaged.

Check whether the related circuit of the motor drive board on the prism1/2 is damage.

## **14. R-Prism1/2 Reset Error**

Check whether the position of the prism1/2 where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the prism1/2 operating range.

Check whether the Hall element on the prism1/2 is damaged.

Check whether the lead connecting the Hall element on the prism1/2 and the PCB board is in poor contact or disconnected.

Check whether the motor on the prism1/2 is damaged.

Check whether the related circuit of the motor drive board on the prism1/2 is damage.

## **15. Animation Reset Error**

Check whether the position of the animation wheel where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the animation wheel operating range.

Check whether the Hall element on the animation wheel is damaged.

Check whether the lead connecting the Hall element on the animation wheel and the PCB board is in poor contact or disconnected.

Check whether the motor on the animation wheel is damaged.

Check whether the related circuit of the motor drive board on the animation wheel is damage.

#### **16. Focus Reset Error**

Check whether the position of the focus where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the focus operating range.

Check whether the Hall element on the focus is damaged.

Check whether the lead connecting the Hall element on the focus and the PCB board is in poor contact or disconnected.

Check whether the motor on the focus is damaged.

Check whether the related circuit of the motor drive board on the focus is damage.

#### **17. Zoom Reset Error**

Check whether the position of the zoom where the magnet is installed falls off or is damaged.

Check whether there are obstacles in the zoom operating range.

Check whether the Hall element on the zoom is damaged.

Check whether the lead connecting the Hall element on the zoom and the PCB board is in poor contact or disconnected.

Check whether the motor on the zoom is damaged.

Check whether the related circuit of the motor drive board on the zoom is damage.

#### **18. BaseFan1/2/3 Start Error**

Check whether the fan is not running.

Check whether the fan leads are installed in place or disconnected.

Check whether the fan is damaged.

Check whether there are obstacles in the fan operating range.

#### **19. BaseFan1/2/3 Stop Error**

Check whether the fan circuit on the motherboard breaks down.

Check whether the component is damaged.

#### **20. BaseFan1/2/3 Too Slow**

Check whether the fan is out of order.

Check whether there are obstacles in the fan operating range.

#### **21. BaseFan1/2/3 Too Fast**

Check whether the fan is out of order.

Check whether the fan circuit on the motherboard breaks down.

**22. HeadFan1/2/3/4/5/6 Start Error**

Check whether the fan is not running.

Check whether the fan leads are installed in place or disconnected.

Check whether the fan is damaged.

Check whether there are obstacles in the fan operating range.

**23. HeadFan1/2/3/4/5/6 Stop Error**

Check whether the fan circuit on the motherboard breaks down.

Check whether the component is damaged.

**24. HeadFan1/2/3/4/5/6 Too Slow**

Check whether the fan is out of order.

Check whether there are obstacles in the fan operating range.

**25. HeadFan1/2/3/4/5/6 Too Fast**

Check whether the fan is out of order.

Check whether the fan circuit on the motherboard breaks down.

**26. G Sensor Error**

Check whether the gravity sensor on board E is damaged.

**27. Ballast Comm Err**

Check whether the output voltage of the ballast reaches 380V.

Check whether the ballast is damaged.

Check whether the telecommunication lines are installed in place or disconnected.

**28. Lamp Hot Power Off**

Check whether the temperature switch of the lamp is off.

Check whether the fans are still running properly.

**29. Lamp On Error**

Turn on the lamp four times. If it still fails, there could be a problem with the software.

**30. Lamp volt. too high**

Check if the lamp is damaged.

Check if the lamp has reached its lifetime.

Check if the ballast is damaged.

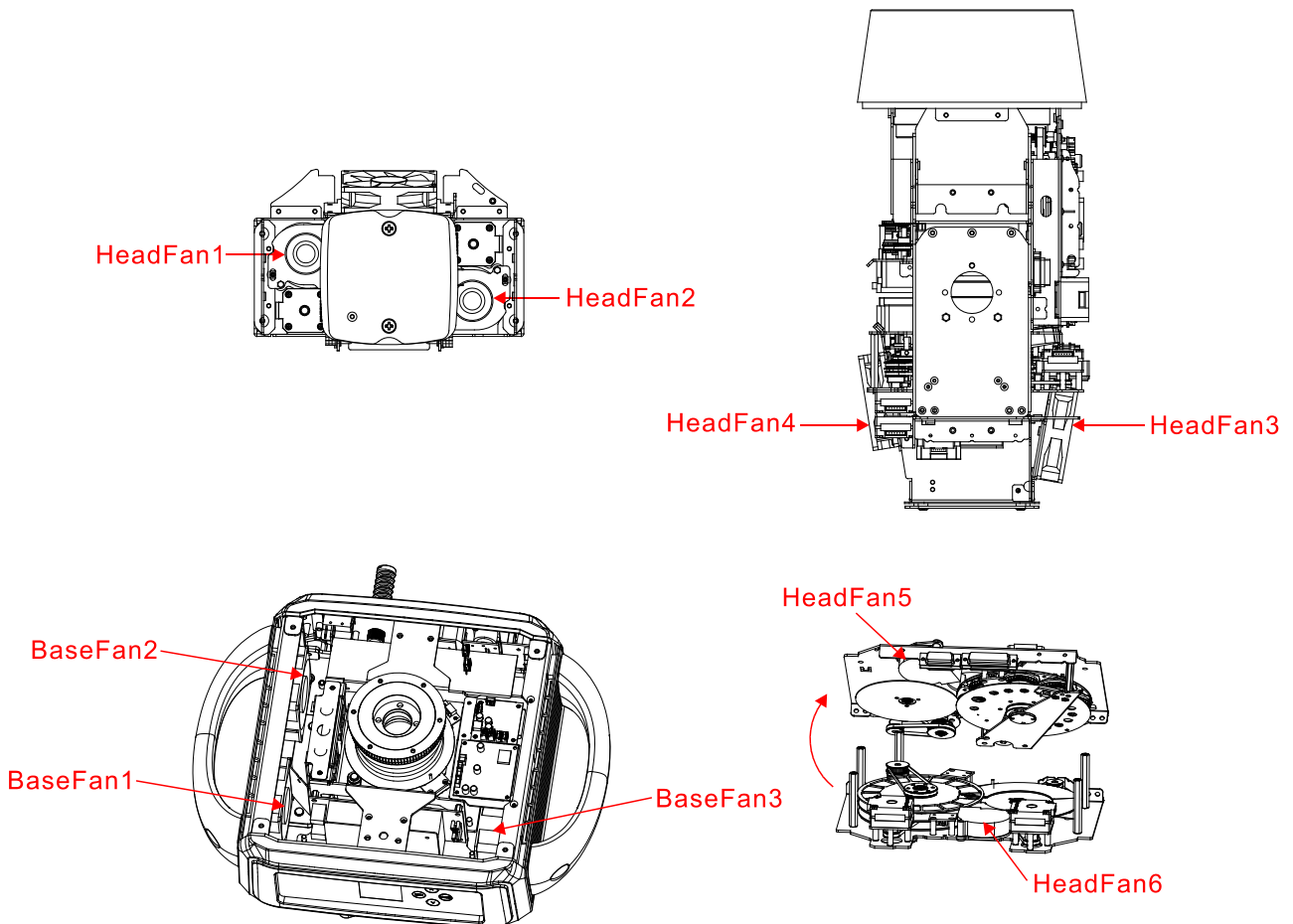
### 31. Ballast Temp. high

Check whether the ambient temperature exceeds 45°C.

Check if the ballast fan speed is too slow.

Check if the ballast is damaged.

The position of each fan of the fixture:



## 8. Troubleshooting

Following are a few common problems that may occur during operation. Here are some suggestions for troubleshooting:

### A. The unit does not work, no light and the fan does not work

1. Check the connected power and main fuse.
2. Measure the voltage.
3. Check the power indicator to see whether it can be lit up or not.

### **B. Not responding to the DMX controller**

1. Check whether the DMX connectors and the DMX cables are connected correctly.
2. Check whether the DMX address is correctly set.
3. If the intermittent DMX signal problem occurs, check whether the XLR socket and the signal cable are well connected.
4. Try it with another DMX controller.
5. Check whether the DMX cables run near or alongside to the high-voltage cables, which may damage or interfere with the signal circuit.

### **C. One of the channels is not working well**

1. The stepper motor might be damaged or the cable connected to the PCB might be broken.
2. The motor's drive IC on the PCB might be out of condition.

### **D. The lamp is cutting out intermittently**

1. The lamp is not working well. Check whether the voltage is too high or too low.
2. The internal temperature may be too high. Replace the cooling fan if necessary.

## **9. Fixture Cleaning**

It is absolutely essential that the fixture is kept clean to ensure the maximum light-output and allow the fixture to function reliably throughout its life. The fixture must be cleaned regularly to avoid dust, dirt and smoke-fluid residues building up on or within the fixture. The cleaning frequency depends on the application environment. Clean the fixture immediately if the dust enters it to avoid damage to the optical lens due to excessive dust.

- A soft lint-free cloth moistened with any good glass cleaning fluid is recommended, under no circumstances should solvents be used.
- Always dry the parts carefully.
- Clean the external optical lens at least every 20 days and the internal optical lens every 30 days.

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