

# **AUTO CHART PROJECTOR**



## **OPERATION HANDBOOK**



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## INTRODUCTION

Congratulations for purchasing of Auto Chart Projector.

In the area of subjective refraction, the Auto Chart Projector is best used for measuring visual acuity. It is fully recommended that you carefully read, understand and follow the steps in this manual in order to ensure safe operation, optimum performance and a longer service life from your new instrument. Please retain this manual for future reference.

## PACKAGE CONTENTS

Auto Chart Projector Auto Chart Projector and accessories were carefully checked and packed prior to the shipment. However, please check condition and contents upon delivery.

In addition to Auto Chart Projector, this shipment includes:

|  |       |
|--|-------|
| Polarized Metal Screen (400mm x 350mm) | 1 PC  |
| Power Cord                             | 1 PC  |
| Remote Control                         | 1 PC  |
| Spare fuses (2A,250V)                  | 2 PCS |
| AAA type batteries                     | 2 PCS |

## CLASSIFICATIONS

### [ Classification under the provision of 93/42/EEC(MDD) ] Class I

Auto Chart Projector is classified into Class I system.

### [ Protection method against electric shock ] Class I

Auto Chart Projector is classified into Class I instrument.

Class I instrument in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution with the provision of the instrument to the protective earth conductor in fixed wiring of the installation in such a way that any accessible conductive parts cannot become live in the event of a failure of the basic insulation.

### [ Degree of protection against ingress of liquids ] IPX0

Auto Chart Projector is the ordinary instrument (enclosed instrument without protection against ingress of liquids).

Be careful not to splash water on the instrument.

### [ Degree of protection against flammability ]







Auto Chart Projector is classified as an equipment not suitable to be used in a Potentially flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Do not use near flammable materials.

### [ Mode of operation ]

Continuous operation

## DESIGNATED SYMBOLS

|   |  |   |  |   |  |
|---|--|---|--|---|--|
|  | This symbol indicates that the degree of protection against Electric shock is for Type B Instrument. |  | This symbol on the main switch indicates that the power is ON. |  | This symbol on the main switch indicates that the power is OFF.  |
|  | This symbol indicates a fuse.  |  | This symbol indicates a protective earth.                      |  | <b>CAUTION</b><br>This symbol indicates that important operating and maintenance instructions are included in this User's Guide. |

# SAFETY INSTRUCTIONS

- **⚠ AT OPERATION**

Never disassemble or touch the inside of the instrument. This may result in an electric shock or instrument malfunction.

Never yank the power cord to disconnect from wall outlet but hold the plug while disconnecting. This can weaken the metal core of the cord and may result in a short circuit or an electric shock.

- **AT STORAGE**

Do not store the instrument in a place where it may get wet or where poisonous gas or liquid is stored.

Avoid storing the instrument in an area with excessive heat, humidity, or dust.

Recommended ranges:

|                                   |                |
|-----------------------------------|----------------|
| Temperature range within          | -10°C to 70°C  |
| Relative humidity range within    | 30% to 85%     |
| Atmospheric pressure range within | 500 to 1060hPa |

- **AT INSTALLATION**

Do not install the instrument near water. If water gets into the internal structure, there is the possibility of electrical Shock or instrument malfunction.

Install the instrument in a stable and level place where vibration or shock does not occur.

The instrument may not perform observation correctly or may malfunction.

Also, if the instrument is tripped over because of any accidental shock, it may result in possible injury.

- **⚠ AFTER USE**

If the instrument is not be used for a long time, disconnect the power cord from the wall outlet. Otherwise, it may cause a fire.

Remove batteries from the battery case of the remote controller when the remote controller will not be used for a long time.

- **AT DISPOSAL**

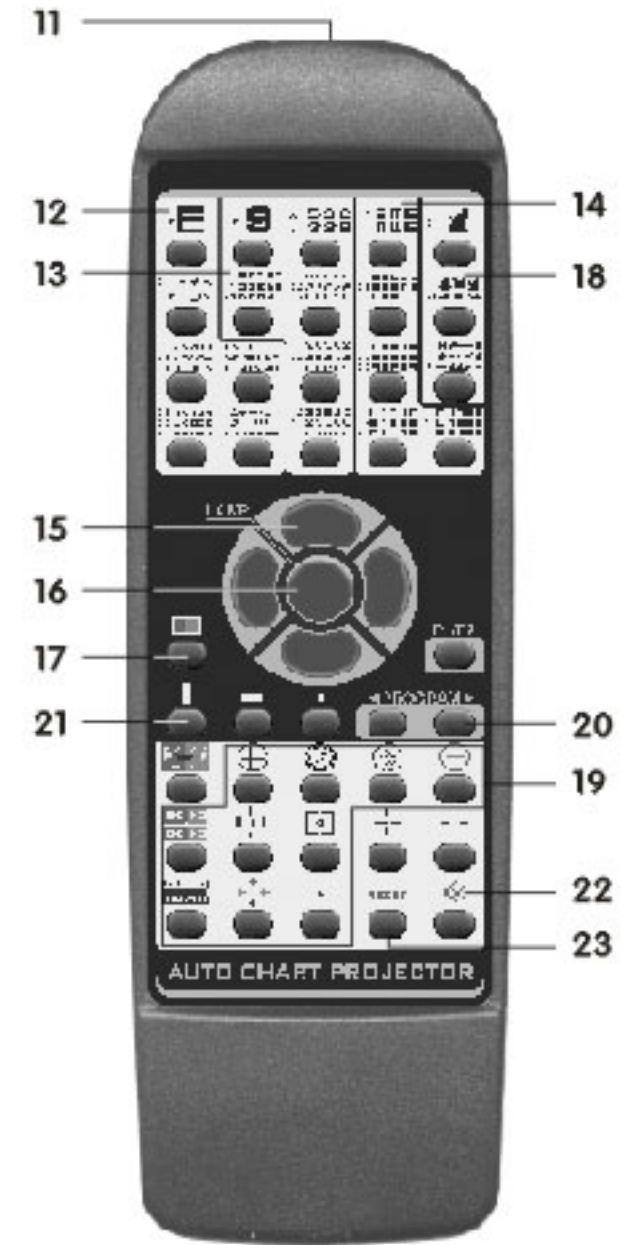
Follow local governing ordinances and recycling plans regarding disposal or recycling of device components.

Check the specified disposing method for the specific waste in advance, especially when disposing the batteries used in the remote controller.

When disposing packing materials, sort them by the materials and follow local governing ordinances and recycling plans.

# INSTRUMENT COMPONENTS

1. Upper Case
2. Projection Lens
3. Window for remote detection
4. Table stand
5. Focusing Wheel
6. Pilot Lamp
7. Power Switch
8. RS-232C Connector
9. Fuse Holders
10. Power Connector
11. Infrared ray transmitter
12. Alphabet chart buttons
13. Number chart buttons
14. Illiterate E chart buttons
15. Program buttons
16. Lamp ON/OFF button
17. Red / Green button
18. Children chart buttons
19. Vectograph chart buttons
20. Direction buttons
21. Vertical, horizontal, single letter Mask buttons
22. Buzzer
23. Reset

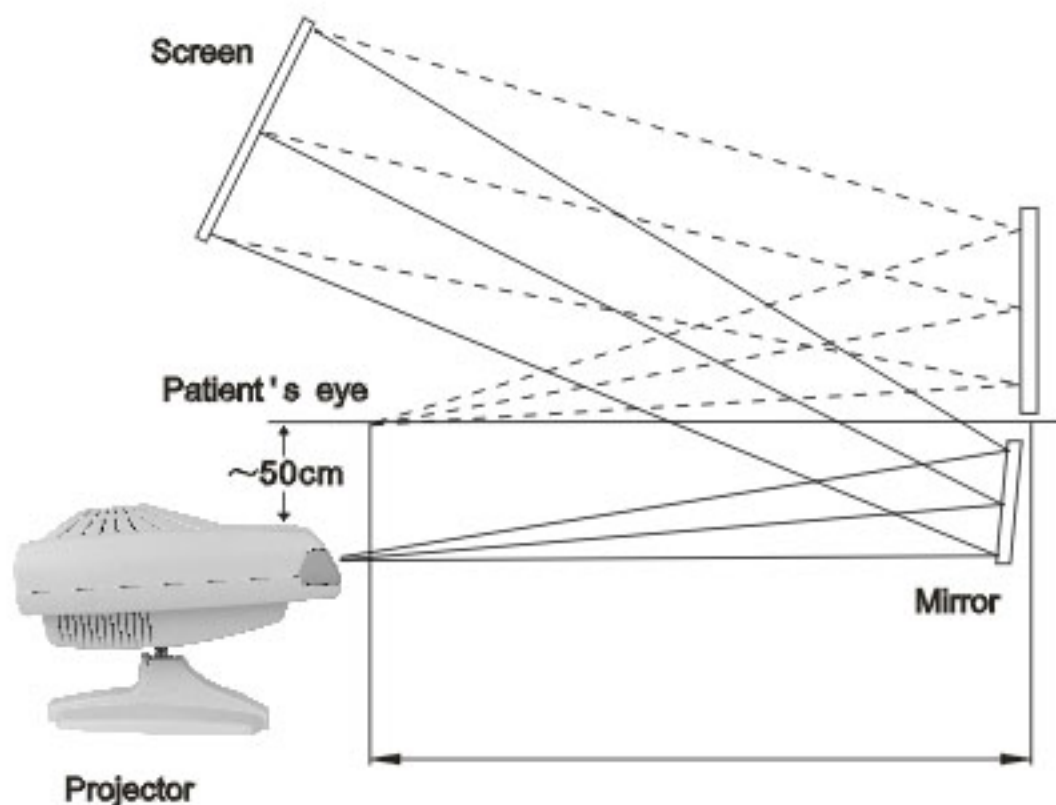


## INSTALLATION

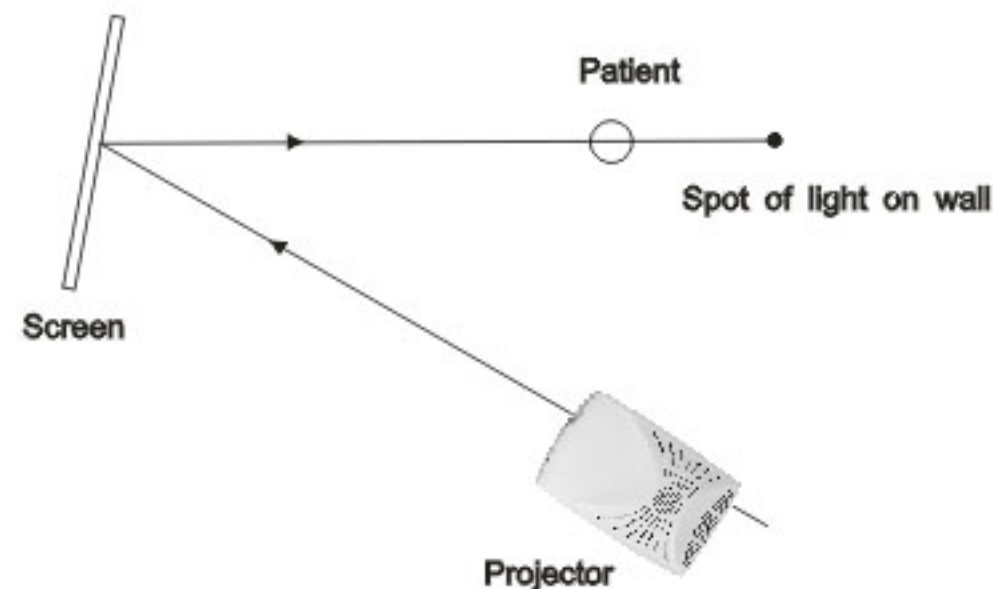
The Auto Chart Projector should be installed according to the following procedures:

- 1.If using a wall mount, it is best to locate a wall stud to support the weight of instrument.
- 2.Determine the refracting distance (from the patient's eye to the screen) and install the projection screen.
- 3.Position the instrument at the same distance from the screen to the patient within the range between 2m and 7m.

To obtain longer refracting distances in small rooms, a mirror or systems of mirrors can be used in this case, a high quality front surface mirror is required.



- 4.Check the three-dimensional alignment of the system. The instrument is optimized when the projection screen is angled to direct light to the patient's head. Place a mirror on the screen. The light should project where the patient's head would be.



## FOCUSING

To obtain the correct focus:

- 1.Measure the distance from the patient to the screen (refracting distance).
- 2.Turn the Auto Chart Projector on, and using the remote control, project the 0.05 "E" onto the screen.
- 3.If using a wall mount, it is best to locate a wall stud to support the weight of instrument.
- 4.Adjust the position of the instrument forward or backward for sizing.
- 5.Adjust for sharpness and clarity by turning the focusing wheel left or right as needed.



# OPERATING INSTRUCTIONS

















## 1. Turn the power switch of the instrument on.





The projection lamp light and the chart for 0.05 vision shall be viewed in 3 seconds.

## 2. Changing the chart


Press the appropriate chart button the remote controller on. The charts have 33 selections


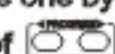


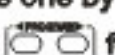

## 3. Isolating the visual acuity chart

- To use Vertical line masking : Press 
  - ▲To move the position right or left : Press  or 
  - ▲To move the position up or down : Press  or 
- To use Horizontal line masking : Press 
  - ▲To move the position right or left : Press  or 
  - ▲To move the position up or down : Press  or 
- To use Single letter masking : Press 
  - ▲To move the position right or left : Press  or 
  - ▲To move the position up or down : Press  or 
- To use Red/Green filter : Press 
- To release masking and filter : Press any chart button

|   |     |
|---|-----|
|    | 0.2 |
|   | 0.3 |
|   | 0.4 |
|    | 0.2 |
|   | 0.3 |
|   | 0.4 |
|   | 0.2 |
|   | 0.3 |
|   | 0.4 |
|  | 0.2 |
|   | 0.3 |
|   | 0.4 |

## 4. Programmed operation

There are two programs for selection, which are Program "P1" and "P2" . Be sure to press  to turn off the lamp before program selection.

- To install Program "P1"
  - 1) Keep pressing the left button of  for 2-3 seconds and release the button upon hearing a beep sound;
  - 2) Press the charts needed to store one by one, with a limit of at most 30 charts;
  - 3) Keep pressing the right button of  for 2-3 seconds to store selected charts and release the button upon hearing a beep sound;
  - 4) Press  to turn on the lamp and exit programming.
- To install Program "P2"
  - 1) Keep pressing the right button of  for 2-3 seconds and release the button upon hearing a beep sound;
  - 2) Press the charts needed to store one by one, with a limit of at most 30 charts;
  - 3) Keep pressing the left button of  for 2-3 seconds to store selected charts and release the button upon hearing a beep sound;
- Programmed Operation
  - 1) press 

The first chart in the program will be viewed and the programmed operation started. ( Press the button once again to switch over between P1 and P2)
  - 2) Press the left of right button to change charts.












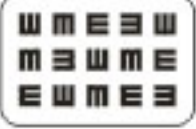
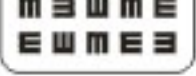
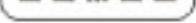



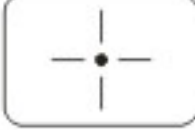


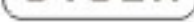
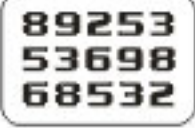
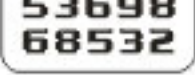
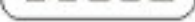
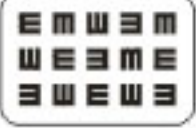

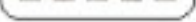
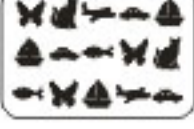
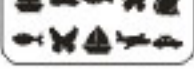






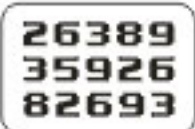
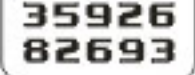





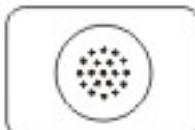
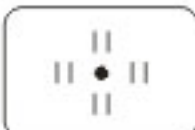



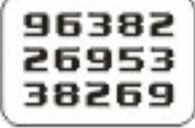
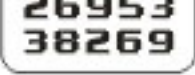

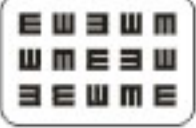

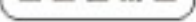




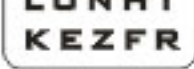

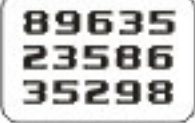
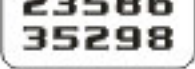

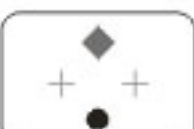
## 5.Reset

Press RESET button  to re-position charts to "0.05E".

## 6.Mute

Press the button  to switch over between mute and sound states.

## CHARTS DESCRIPTION

| Letters   | Number  | Illiterate  | Children   | Schober   | Phoria   |
|---|---|---|--|---|--|
|  0.05  |  0.05  |  0.1<br> 0.15   |  0.1  |                                    |                                   |
|  0.1<br> 0.15   |  0.1<br> 0.15   |  0.2<br> 0.3<br> 0.4       |  0.2<br> 0.4   | <b>Binocular Balance</b><br>       | <b>Phoria With Fixation</b><br>   |
|  0.2<br> 0.3<br> 0.4   |  0.2<br> 0.3<br> 0.4   |  0.5<br> 0.6<br> 0.7   |  0.6<br> 0.8<br> 1.0 | <b>Duochrome Balance</b><br>     | <b>Coincidence Vertical</b><br> |
|  0.5<br> 0.6<br> 0.7 |  0.5<br> 0.6<br> 0.7 |  0.8<br> 0.9<br> 1.0 | <b>Cross lines</b><br>  | <b>Cross Cylinder Dots</b><br>   | <b>Minute Stereo</b><br>        |
|  0.8<br> 0.9<br> 1.0 |  0.8<br> 0.9<br> 1.0 |  1.2<br> 1.5<br> 2.0 | <b>Red/Green</b><br>  | <b>Astigmatic Clock Dial</b><br> | <b>Fixation</b><br>             |
|  1.2<br> 1.5<br> 2.0 |  1.2<br> 1.5<br> 2.0 |   | <b>Worth For Dot</b><br>  |   |  |

# MAINTENANCE

⚠ Risk of electric shock. Always disconnect the power cord from the wall and the instrument Prior to performing any of the following procedures.

## ● Maintenance

There is no periodic or routine user maintenance required.

## ● Cleaning

There are no cleaning requirements other than regular office housekeeping, such as dusting.

### ▲Cleaning the main body

#### <Projection lens>

- 1) Blow dusts with a blower brush.
- 2) If it is not clean enough, wipe with lens cleaning paper.

#### <Cover and Screen>

- 1) Wipe with a dry and soft cloth.
- 2) If for some reason the instrument becomes soiled, wipe it with the damp lint-free cloth and mild detergent. Then, wipe off with a dry cloth to finish.

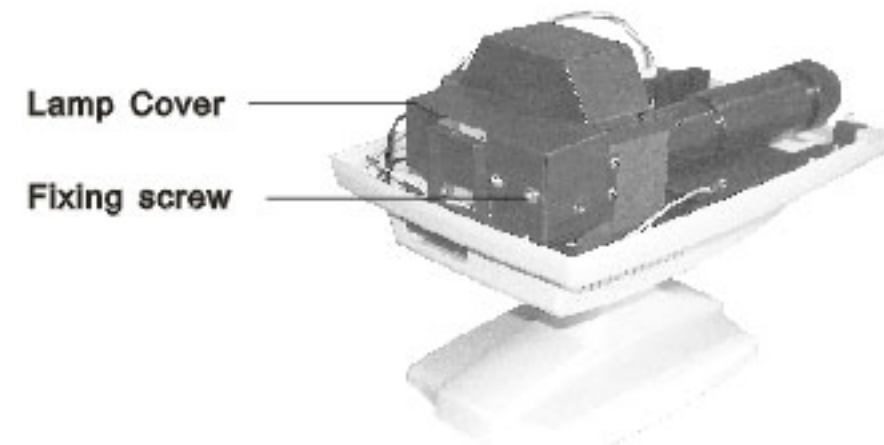
## ● Disassembling the upper case

- 1) Turn off the power and pull out the power cord.
- 2) Unfasten the screw in counterclockwise at the back side of case.
- 3) Disassemble the Upper Case by lifting it.
- 4) In case of reassembling, place the upper case on the main body and adjust the front position. Then, fasten the screw in clockwise.

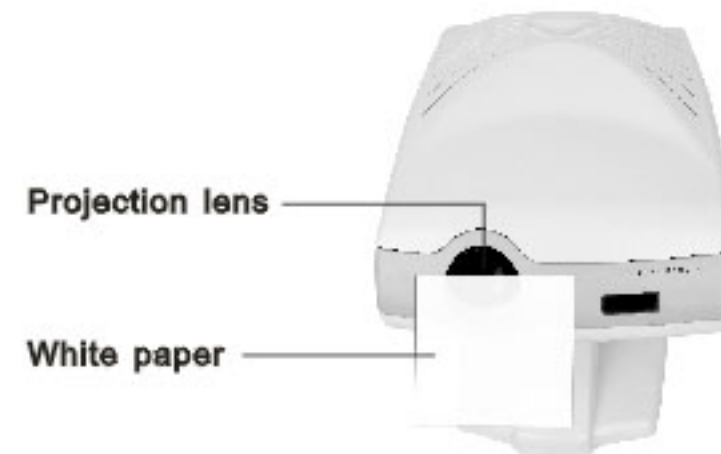
## ⚠ ● Replacement of lamp

The lamp may be HOT! Do not touch the Lamp directly and allow the sufficient amount of time to cool down the heat.

- 1) Unfasten the screw at the Lamp Cover.
- 2) Disassemble the Lamp Cover by lifting it and pull out the Lamp.

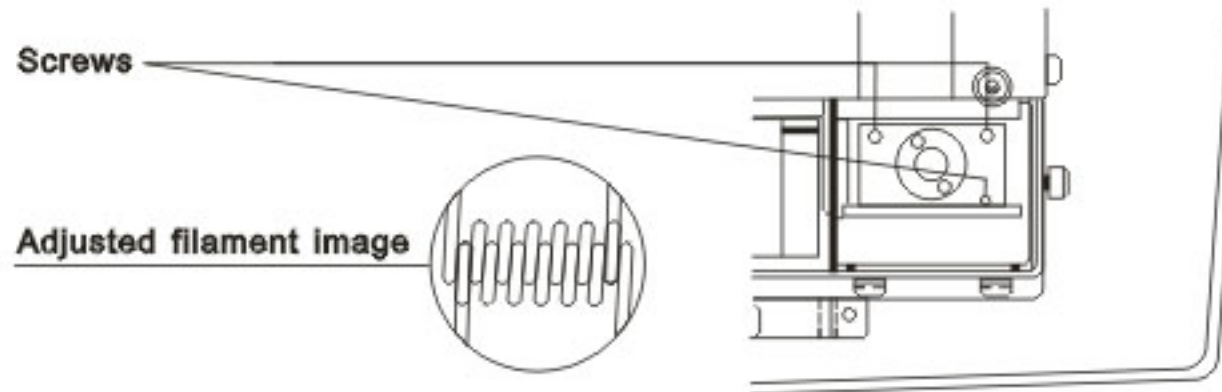


- 3) Place the new Lamp at the hole of Lamp Holder.
- 4) Turn on the power switch.
- 5) Place the white paper in front of the projection lens in order to project the filament image of lamp.



## MAINTENANCE

6) Adjust the filament image at the center of paper with the screw at the lamp plate. (Note: Do not look into the lamp directly)



7) Place the Lamp Cover and fasten the screw.

8) Turn the power switch off.

### ● Replacement of Fuses

- 1) Turn off the power switch and disconnect the power cord.
- 2) Push and turn the fuse holder a quarter counterclockwise with your finger and remove it.
- 3) Pull out the fuse from the fuse holder and check the condition.
- 4) Replace the fuse with the provided spare or equivalent as specified below.

| VOLTAGE   | FUSE          |
|-----------|---------------|
| 100V~120V | 2A 120V; T2AL |
| 200V~240V | 2A 250V; T2AL |

5) Simply return it with the fuse holder to the socket. Push and turn it a quarter clockwise to lock.

## BASIC TROUBLE SHOOTING

**Note:** Risk of electric shock. Always disconnect the power cord from the wall and the instrument prior to performing any of the following procedures.

- **If the instrument does not function at all:**

- 1) Check the facility power source.(Circuit Breakers)
- 2) Check the electrical connections.(Power Cord)
- 3) Check the main fuse located on the rear of the unit.

- **If the projector lamp dose not light:**

- 1) Check the main ON/OFF Switch.
- 2) Replace the lamp with the spare lamp.

⚠ The lamp may be HOT! Do not touch the Lamp directly and allow the sufficient amount of time to cool down the heat.

- **If the projector turns on but does not function:**

Check the batteries in the remote control.

## TRANSPORTATION

1. Make sure the instrument is disconnected from the power source.
2. If the instrument was installed on a custom mount, please remove the unit from the mount.
3. Pack the instrument in a sturdy carton with suitable packing materials.
4. After packing, do not hurl and impact cause of breakable goods.

Do not use this machine near by other machines or electric bulb (ex.Halogen lamp),It will improperly operate on the effect of electronic waves.

## TECHNICAL SPECIFICATIONS

|                                 |  |                    |                         |                     |                         |
|---------------------------------|--|--------------------|-------------------------|---------------------|-------------------------|
| <b>Chart</b>                    | 33 Selections  |                    |                         |                     |                         |
| <b>Chart selection speed</b>    | Average 0.3 sec.   |                    |                         |                     |                         |
| <b>Mask</b>                     | 1 open   | 5 horizontal lines | 5 vertical lines        | 21 single letters   |                         |
| <b>Filter</b>                   | Red / Green  |                    |                         |                     |                         |
| <b>Projection distance</b>      | 2.7m ~ 7.0m ( 5m is standard )   |                    |                         |                     |                         |
| <b>Projection magnification</b> | 30X ( at 5m )  |                    |                         |                     |                         |
| <b>Projection size</b>          | φ 252mm and 330mm(W) × 225mm(H) (at 5m )   |                    |                         |                     |                         |
| <b>Tilt angle</b>               | Ball joint ( ± 10 degree )   |                    |                         |                     |                         |
| <b>Lamp</b>                     | 8V 5W LED/6V 20W (Halogen), 2,000 hrs lifetime                                       |                    |                         |                     |                         |
| <b>Power source</b>             | AC 90-240V 50/60HZ   |                    |                         |                     |                         |
| <b>Power consumption</b>        | 50VA   |                    |                         |                     |                         |
| <b>Auto-OFF function</b>        | after 5 minutes  |                    |                         |                     |                         |
| <b>Dimensions</b>               | Main body: 265(H) × 230(W) × 360(D)mm<br>Remote controller: 20(H) × 64(W) × 195(D)mm |                    |                         |                     |                         |
| <b>Net weight</b>               | Main body: 6.0 Kg  |                    | Remote controller: 180g |                     |                         |
| <b>Accessories</b>              | Polarized Metal Screen ( 400mm × 350mm )   |                    | 1 PC                    |                     |                         |
|                                 | Spare fuses  |                    | 2 PCS                   |                     |                         |
|                                 | AA A size battery  |                    | 2 PCS                   |                     |                         |
| <b>Optional accessories</b>     | Table stand  | wall bracket       | floor stand             | variable focus lens | screen angle fixing set |
| <b>Interface</b>                | RS232  |                    |                         |                     |                         |

