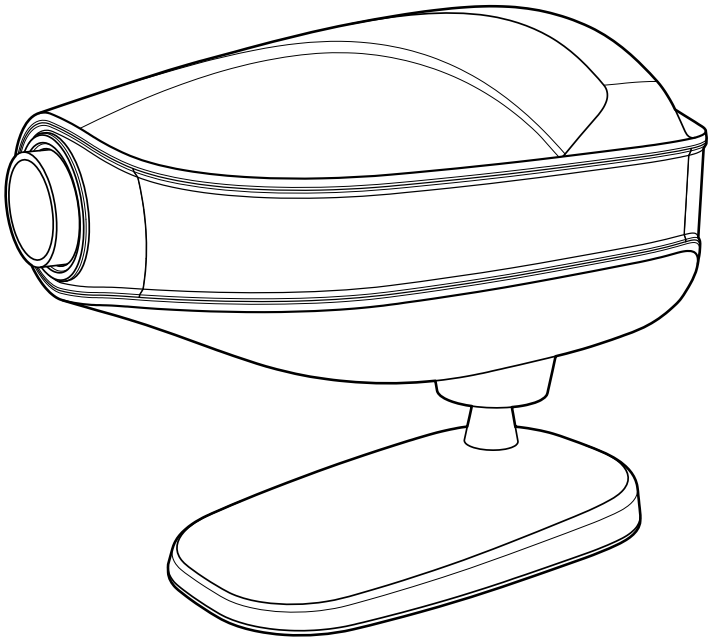
# Operator's Manual

## Chart Projector



Huvitz
Pacing Progress toward People

# IMPORTANT NOTICE

This product may malfunction due to electromagnetic waves caused by portable personal telephones, transceivers, radio-controlled toys, etc. Be sure to avoid having objects such as, which affect this product, brought near the product.

The information in this publication has been carefully checked and is believed to be entirely accurate at the time of publication. HUVITZ assumes no responsibility, however, for possible errors or omissions, or for any consequences resulting from the use of the information contained herein.

HUVITZ reserves the right to make changes in its products or product specifications at any time and without prior notice, and is not required to update this documentation to reflect such changes.

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# 1. Introduction

## 1.1. Outline of product

HUVITZ HCP-7000 is an automatic chart projector which provides 41 different charts including red/green and polarized filters for the eye optometry. Users can select the desired charts instantaneously by cordless remote controller. Charts move quickly and quietly. The customized two programs will help you to perform more convenient and effective examination. You can also execute the binocular balance tests, stereo tests, fixation disparity tests, fusion tests and aniseikonia tests with HCP-7000. This automatic chart project is compatible with HUVITZ digital refractor, HDR-7000.

## 1.2. Classifications

- Type of protection against electric shock**:** Class I Equipment
- Degree of protection against electric shock: No applied parts
- Degree of protection against the ingress of water: Ordinary
- Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

## 1.3. Certification

## 1.4. EMS

**Manufacturer's declaration Manufacturer's declaration -electromagnetic emission**

| The Model HCP-7000 is intended for use in the electromagnetic environment specified below. The customer or the user of HCP-7000 should assure that it is used in such an environment | | |
|---|---|---|
| Emission test | Compliance | Electromagnetic environment - guidance |
| RF emissions CISPR 11 | Group 1 | The Model HCP-7000 uses RF energy only for its internal function. Therefore. Its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment |
| | Class A | The Model Digital Refractor HCP-7000 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. |
| Harmonics emission IEC 61000-3-2 | A | |
| Voltage fluctuation IEC 61000-3-3 | Complies | |

## Manufacturer's declaration - electromagnetic immunity

| The Model HCP-7000 is intended for use in the electromagnetic environment specified below. The customer or the user of the Model HCP-7000 should assure that it is used in such an environment | | | |
|---|---|---|---|
| **Immunity test** | **IEC 60601 Test level** | **Compliance level** | **ElectromagneticEnvironment - guidance** |
| Electrostatic discharge (ESD) IEC 61000-4-2 | 6 kV Contact 8 kV Air | 6 kV Contact 8 kV Air | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30% |
| Electrical fast Transient / burst IEC 61000-4-4 | 2kV for power supply lines | 2kV for power supply lines | Mains power quality should be that of a typical commercial or hospital environment. |
| Surge IEC 61000-4-5 | 1 kV differential mode 2 kV common mode | 1 kV differential mode 2 kV common mode | Mains power quality should be that of a typical commercial or hospital environment. |
| Power frequency (50/60Hz) Magnetic field IEC 61000-4-8 | 3.0 A/m | 3.0 A/m | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment. |
| Voltage dips, short Interruptions and Voltage variations on power supply input lines IEC 61000-4-11 | <5% $U_T$ (>95% dip in $U_T$) for 0.5cycle<br>40% $U_T$ (60% dip in $U_T$ ) for 5 cycle<br>70% $U_T$ (30% dip in $U_T$) for 25 cycle<br><5% $U_T$ (<95% dip in $U_T$ ) for 5 s | <5% $U_T$ (>95% dip in $U_T$) for 0.5cycle<br>40% $U_T$ (60% dip in $U_T$ ) for 5 cycle<br>70% $U_T$ (30% dip in $U_T$) for 25 cycle<br><5% $U_T$ (<95% dip in $U_T$ ) for 5 s | Mains power quality should be that of a typical commercial or hospital environment. If the user of the Model HCP-7000 requires continued operation during power mains interruptions, it is recommended that the Model HCP-7000 be powered from an uninterruptible power supply or a battery |
| NOTE: $U_T$ is the a.c. mains voltage prior to application of the test level. | | | |

| The Model HCP-7000 is intended for use in the electromagnetic environment specified below. The customer or the user of the Model HCP-7000 should assure that it is used in such an environment | | | |
|---|---|---|---|
| **Immunity test** | **IEC 60601 Test level** | **Compliance level** | **Electromagnetic environment - guidance** |
| Conducted RF IEC 61000-4-6 | 3 Vrms 150 kHz to 80 MHz | 3 Vrms 150 kHz to 80 MHz | Portable and mobile RF communications equipment should be used no closer to any part of the Model HCP-7000, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** |
| Radiated RF IEC 61000-4-3 | 3 V/m 80.0 MHz to 1.0 GHz | 3 V/m 80.0 MHz to 1.0 GHz | **Recommended separation distance** 80 MHz to 800 MHz 800 MHz to 1.0 GHz Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as deter-mined by an electromagnetic site survey, (a) Should be less than the compliance level in each frequency range (b). Interference may occur in the vicinity of equipment marked with the following symbol: |
| NOTE 1) *U*t is the A.C. mains voltage prior to application of the test level. NOTE 2) At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 3) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. | | | |

**a** Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EUT is used exceeds the applicable RF compliance level above, the EUT should be observed to verifynormal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the EUT. **b** Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1] V / m.

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the HCP-7000 System.

The Model HCP-7000 system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The user of the HCP-7000 system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the HCP-7000 system as recommended below, according to the maximum output power of the communications equipment.

| Rated maximum output power (W) of transmitter | Separation distance (m) according to frequency of transmitter | | |
|---|---|---|---|
| | 150 kHz to 80 MHz | 80 MHz to 800 MHz | 800 MHz to 1.0 GHz |
| 0.01 | 0.12 | 0.12 | 0.23 |
| 0.1 | 0.37 | 0.37 | 0.74 |
| 1 | 1.17 | 1.17 | 2.33 |
| 10 | 3.70 | 3.70 | 7.37 |
| 100 | 11.70 | 11.70 | 23.30 |

For transmitters rated at a maximum output power not listed above, the recommended separation distance (d) in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

| Immunity and Compliance Level | | | |
|---|---|---|---|
| Immunity test | IEC 60601 Test Level | Actual Immunity Level | Compliance Level |
| Conducted RF IEC 61000-4-6 | 3 Vrms 150 kHz to 80 MHz | 3 Vrms | 3 Vrms |
| Radiated RF IEC 61000-4-3 | 3 V/m 80 MHz to 1.0 GHz | 3 V/m | 3 V/m |

## Guidance and manufacturer's declaration - electromagnetic immunity

| The Model HCP-7000 is intended for use in the electromagnetic environment specified below. The customer or the user of the HCP-7000 should assure that it is used in such an environment | | | |
|---|---|---|---|
| **Immunity test** | **IEC 60601 Test level** | **Compliance level** | **Electromagnetic environment -guidance** |
| Conducted RF IEC 61000-4-6 | 3 Vrms 150 kHz to 80MHz | 3 Vrms 150 kHz to 80 MHz | The HCP-7000 must be used only in a shielded location with a minimum RF shielding effectiveness and, for each cable that enters the shielded location with a minimum RF shielding effectiveness and, for each cable that enters the shielded location |
| Radiated RF IEC 61000-4-3 | 3 V/m 80.0 MHz to 2.5 GHz | 3 V/m 80.0 MHz to 2.5 GHz | Field strengths outside the shielded location from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than 3V/m.a Interference may occur in the vicinity of equipment marked with the following symbol: |
| NOTE 1) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. NOTE 2) It is essential that the actual shielding effectiveness and filter attenuation of the shielded location be verified to assure that they meet the minimum specification. | | | |
| **a** Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength outside the shielded location in which the EUT is used exceeds 3V/m, the EUT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as relocating the EUT or using a shielded location with a higher RF shielding effectiveness and filter attenuation. | | | |

# 2. Safety Information

## 2.1 Introduction

Safety is everyone's responsibility. The safe use of this equipment is largely dependent upon the installer, user, operator, and maintainer. It is imperative that personnel study and become familiar with this entire manual before attempting to install, use, clean, service or adjust this equipment and any associated accessories. It is paramount that the instructions contained in this manual are fully understood and followed to enhance safety to the patient and the user/operator. It is for this reason that the following safety notices have been placed appropriately within the text of this manual to highlight safety related information or information requiring special emphasis. All users, operators, and maintainers must be familiar with and pay particular attention to all Warnings and Cautions incorporated herein.

**⚠ WARNING**

"Warning " indicates the presence of a hazard that could result in severe personal injury, death or substantial property damage if ignored.

**NOTE**

"Note" describes information for the installation, operation, or maintenance of which is important but hazard related if ignored.

**⚠ CAUTION**

"Caution" indicates the presence of a hazard that could result in minor injury, or property damaged if ignored.

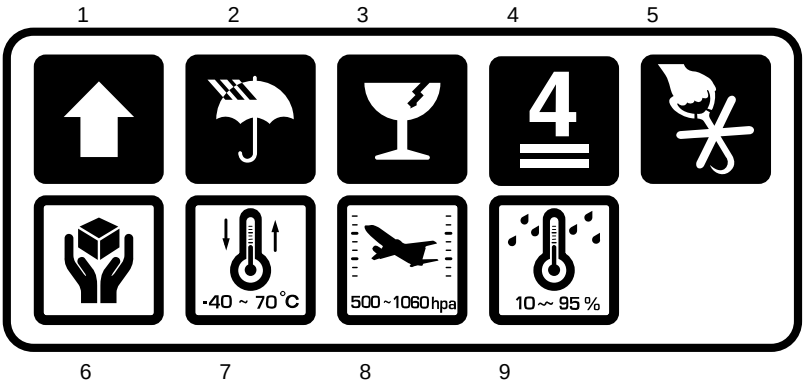
## 2.2 Safety Symbols

The International Electrotechnical Commission (IEC) has established a set of symbols for medical electronic equipment, which classify a connection or warn of any potential hazards. The classifications and symbols are shown below.

### 2.2.1. Save these instructions

| | |
|---|---|
| | I and O on the power switch represent ON and OFF respectively. |
| | Signal Input/Output Connection. |
| | This symbol identifies a safety note. Ensure you understand the function of this control before using it. Control function is described in the appropriate User's or Service Manual. |
| | Manufactured by xxxx (year). |
| | Identifies the point where the system safety ground is fastened to the chassis. Protective earth connected to conductive parts of Class I equipment for safety purposes. |

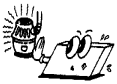
### 2.2.2. Shipping Mark




1. THIS SIDE UP
2. KEEP DRY
3. FRAGILE
4. DO NOT LOAD 4th
5. USE NO HOOK
6. DO NOT THROW
7. THE AMBIENT TEMPERATURE -40℃ TO 70℃
8. THE ATMOSPHERE PRESSURE 500 TO 1060hPa
9. THE HUMIDITY 10 TO 95%

## 2.3 Environmental factors

Avoid the following environments for operation or storage:

| | |
|---|---|
| | Where the equipment is exposed to water vapor.<br>Don't operate an equipment with a wet hand. |
| | Where the equipment is exposed to direct sunlight. |
| | Where the temperature changes extremely.<br>Normal operating temperature range is from 10℃ to 40℃, Humidity is from 30% to 75%. |
|  | Where it is near the heat equipment. |
| | Where the humidity is extremely high or there is a ventilation problem. |
| | Where the equipment is subject to excessive shocks or vibrations. |
| | Where equipment is exposed to chemical material or explosive gas. |
| | Be careful not to be inserted dust, especially, metal |

Avoid places where the ambient temperature falls below 10℃ or exceeds 40℃ for normal operation, or below -10℃ or exceeds 40℃ (14°F-104°F) for transportation and storage. Humidity should be maintained between 30 and 75% for normal operation, transportation and storage. Atmospheric pressure should be maintained between 500 to 1060hPa for normal operation, transportation and storage. Avoid environments where the equipment is exposed to excessive shocks or vibrations.

## 2.4 Safety Precautions

This equipment has been developed and tested according to national as well as international safety standards. This guarantees a very high degree of safety for this device. The correct handling of this equipment is imperative for its safe operation. Therefore, please read carefully all instructions before switching on this device. For more detailed information, please contact our Customer Service Department or one of our authorized representatives.

1. This equipment must not be used (a) in an area that is in danger of explosions and (b) in the presence of flammable, explosive, or volatile solvents such as alcohol, benzene or similar chemicals.

2. Do not put or use this device in humid rooms. Humidity should be maintained between 30 and 75% for normal operation. Do not expose the device to water splashes, dripping water, or sprayed water. Do not place containers containing fluids, liquids, or gases on top of any electrical equipment or devices.

3. The equipment must be operated only by, or under direct supervision of a properly trained and qualified person.

4. Customer maintenance of this equipment may only be performed as stated in the User's Manual. Any additional maintenance may only be

performed by HUVITZ service technicians or other authorized persons.

5. The manufacturer is only responsible for effects on safety, reliability, and performance of this equipment when the following requirements are fulfilled: (1) The electrical installation in the respective room corresponds to the specifications stated in this manual and (2) This equipment is used, operated, and maintained according to this manual.

6. The manufacturer is not liable for damage caused by unauthorized tampering with the device(s). Such tampering will forfeit any rights to claim under warranty.

7. Only persons who have undergone proper training and instructions are authorized to install, use, operate, and maintain this equipment.

8. Keep the User's Manual in a place easily accessible at all times for persons operating and maintaining the equipment.

9. Please do not pull on any cable. Always hold on to the plug when disconnecting cables.

10. Before every operation, visually check the equipment for exterior mechanical damage(s) and for proper function.

11. Do not cover any ventilation grids or slits.

# 3. Features

Bright (LED), high quality images
Quiet, instantaneous chart selection
41 different charts including: red/green and polarizing filters, binocular
balance tests, stereo tests, fixation disparity tests, fusion tests and Aniseikonia tests.
34 Masks (vertical line, horizontal line, and single character)
2.5 ~ 8 m (8 ~ 26 feet) projection range
Cordless Remote Control
User Programmable (2 programs up to 30 charts each)
Easily networked with HUVITZ's Digital Refractor

# 4. Notes for Using the Instrument

Do not hit or drop the instrument. The instrument may be damaged if it receives a strong impact. The impact can damage the function of this instrument. Handle it with care.

Exposure to direct sunlight or very bright indoor lights can influence the results of measurements.

If you want to connect this with other equipment, consult the dealer.

Sudden heating of the room in cold areas will cause condensation of vapor on the protective glass in the measurement window and on optical parts inside the instrument. In this case, wait until the condensation disappears before performing measurements.

Keep the objective glass of the examinee side clean. If it is stained with other substances or a fingerprint, it may cause an error or inaccurate measurements.

Disconnect the power supply and consult the dealer when there is smoke, strange odors, or noise while working.

Don't use organic solution such as alcohol, thinner, benzene, etc. to clean the surface of this instrument. It may damage the instrument.

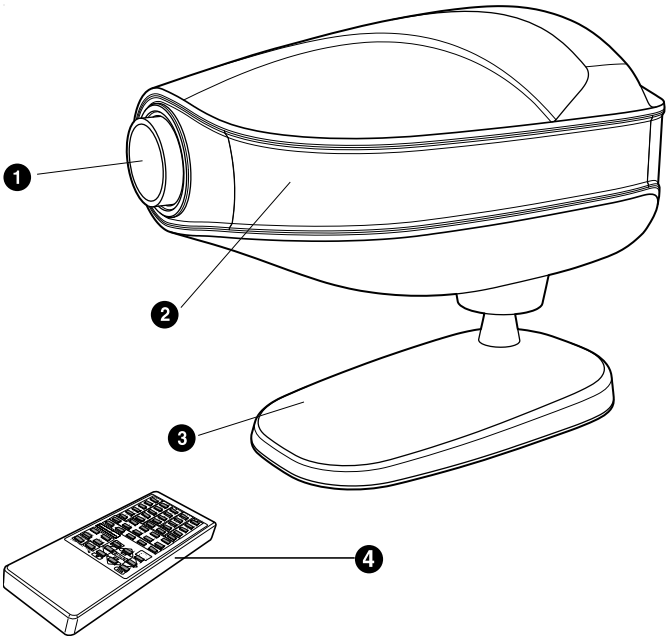
When moving the HCP-7000, always make sure the power supply is off, and then lift the bottom of the unit with both hands.

If you leave the HCP-7000 without using it for long periods, disconnect the power supply and protect the unit with dust cover.

# 5. Configurations

## 5.1 Main Body

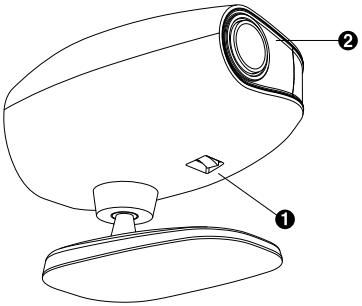
The HCP-7000 Chart Projector is mainly composed of the body, stand, screen and remote control.



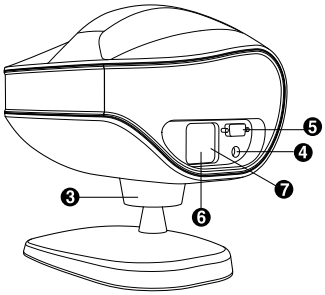

**[Fig. 1 Front View with Remote Control]**

| | |
|---|---|
| **1. Projection lens** | **2. IR receiving window** |
| **3. Stand (table mount)** | **4. Wireless remote control** |

## 5.2 Main Body cont.




[Fig. 2 Bottom View]




**[Fig. 3 Rear View]**

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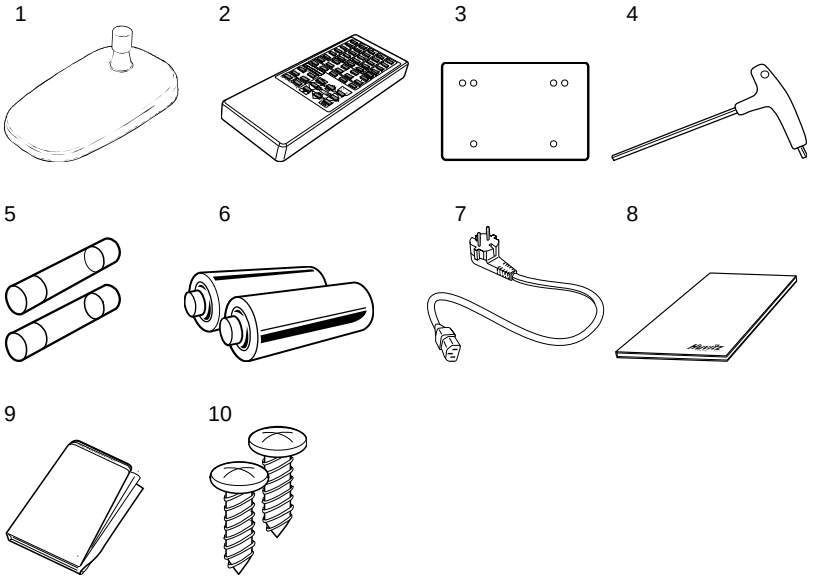
**1. Power On/Off Switch** **2. Power ON/OFF LED** **3. Tilting Adjustment**
**4. CAN (Controller Area Network)** **5. RS-232 Comm.Port**
**6. AC Power Inlet** **7. Fuse Holder**

## 5.3 Accessories



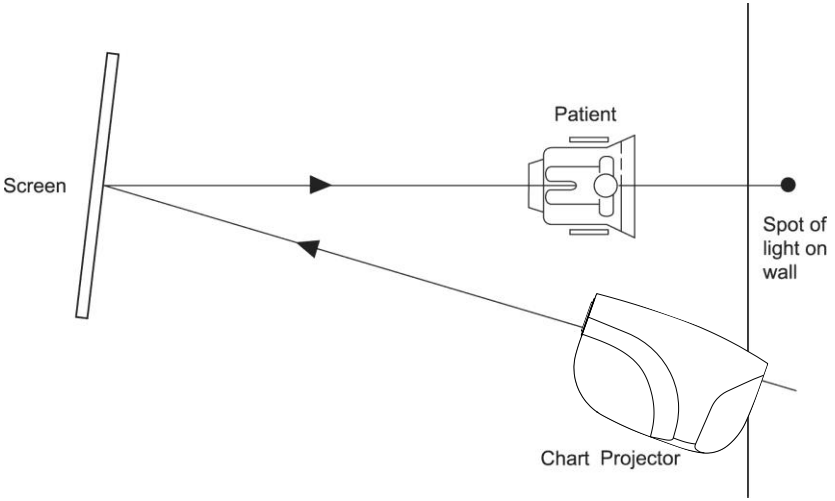

**[Fig.4 Accessories]**

| | | |
|---|---|---|
| **1. Table stand** | **2. Remote contol** | **3. Screen** |
| **4.Wrench (4mm)** | **5. Fuse(250v 3.15A)** | **6. Batteries(2 size AA)** |
| **7. Power cable** | **8. Operator manual** | **9. Dust Cover** **10. Screw(3*10)** |

# 6. Installation

## 6.1 Position of Chart Projector

The single tube projector must be installed at the same distance from the screen as the patient.



## 6.2 How to obtain correct Letter Size and focus (Zooming Type only)

1. Install chart projector at desired position of 2.5~8m (8~26 feet)
2. Measure the distance from patient to screen
3. Refer to the test scale shown in the Appendix A
4. Have someone hold the test scale at the screen
5. Project the 20/400(6/120, 0.05) alphabet "C"
6. Adjust the position of the projector forward or backward and turn the focusing wheel until "C" is brought in sharp focus within the respective distance scale

# 7. Input and Use of Program

## 7.1 How to input user's program

Step 1. Press the "LIGHT" button **once**.
Results: The light goes out.

Step 2. Press the "PGM 1" button **three** times.
Results: The light will come on and the chart projector will display the first chart of the default program.

Step 3. Select the first chart for your new program.
Press the "Program ►" button **once**.

Step 4. Select the second chart for your new program.
Press the "Program ►" button **once**.

Step 5. Repeat steps 3 & 4 as desired for a total of thirty charts per program.
Note: If you want to check or modify the previously programmed chart, press the "Program ◄" button.

Step 6. Press the "PGM 1" button **one** time to save your new program.
Caution : If you do not press the PGM1 button, your program will not be saved.

Program No. 2

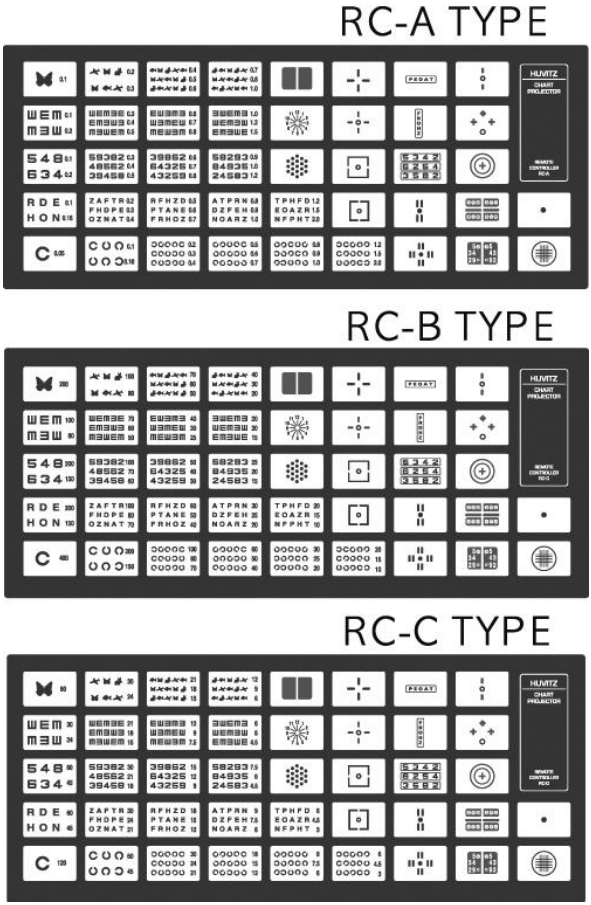
Repeat Steps 1 through 6 substituting "PGM 2" for "PGM 1".

## 7.2 How to use your stored programs.

Step 1. Press " PGM 1 " or "PGM 2" to select the program of your choice.

Step 2. Use the "Program ►" or "Program ◄" to scroll through your stored program.

## 8. **Types of Chart (Type C is Standard)**




**[Fig. 7 Types of Chart]**

# 9. Maintenance and Repair

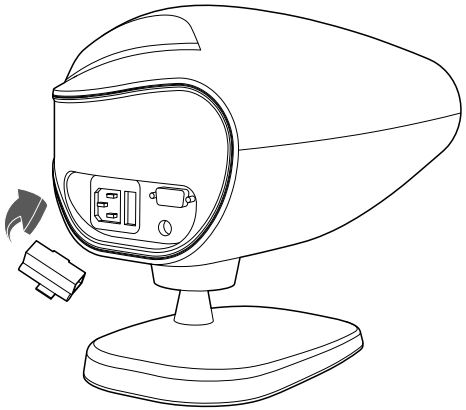
## 9.1 Fuse Replacement

1. Turn off power, and disconnect the power cord.

2. Pull out the plastic cover at the lower part of power socket, to replace the fuse.

**⚠ WARNING**

Do not touch the projector with wet hands. (Risk of electric shock)

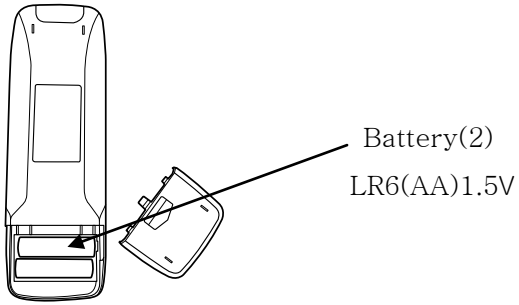


**[Fig. 9 Fuse assembly]**

## 9.2 Remote Control batteries Replacement

1. On the remote control battery cover to remove.

2. Battery replacement and remote control cover is mounting..




## 9.3 Cleansing

1. Product appearance and screen is dry and clean with a soft cloth.
2. The lens is messy if dry and clean with a soft cloth.

## 9.4 Disposal Information

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws (Within this system, the backlight lamps in the monitor display contain mercury). This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems.

Those systems will reuse or recycle most of the materials of your end-of-life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator. You can also contact our nearest representative office for more information on the environmental performances or disposal of our products

## 10. **Specifications**

| | |
|---|---|
| Charts | 41charts -34 mask, Red/green& Polarization Filters |
| Distance of projection | 2.5~8m(Optional: 8m screen) |
| Chart Rotation Speed | Average 0.15 sec |
| Chart magnification | 30X (When 5m distance) |
| Power saving | Automatic Lamp Off (10 min) |
| Program | 2 programs with a maximum of 30 charts each |
| Tilt angle | 15 degrees |
| Power Supply | 100-120V@50Hz : 1.0A<br>200-240V@60 Hz : 0.5A |
| Lamp | LED 4W |
| Fuse | 250V, T3.15AL |
| Dimension | 270X182X230mm |
| Weight | 3.44kg (Body: 3.06kg + Stand: 0.38kg) |

# 11. Components List

## 11.1 Standard accessories

1. Table stand
2. Remote contol
3. Screen
4. Wrench (4mm)
5. Fuse(250v 3.15A)
6. Batteries(2 size AA)
7. Power cable
8. Operator manual
9. Dust Cover
10. Screw(3*10)

## 12. **Service Information**

How to contact service: If there are any problems with the equipment, please follow the steps below:

- First of all, refer to the 9. Maintenance and Repair sections according to the problem that you are encountered. And then follow the suggested sequences.
- If the problem persists, please contact the local distributor in your province or country at first.
- Before calling to the local distributor, you'd better check these information such as Model and Serial Numbers. To do so, fill up the following table as soon as you purchase our product. You can look up these information at any time. The serial number is found on the back of this unit. The serial number is unique to this unit. You should retain this manual as a permanent record of your purchase. Please retain your purchase receipt as your proof of purchase.

| | |
|---|---|
| **Date of Purchase:** | |
| **Dealer's Name:** | |
| **Dealer Address:** | |
| **Dealer Phone No.:** | |
| **Model No.:** | |
| **Serial No.:** | |

If you can't contact with your local distributor, you can directly get in touch with the service

department of the HUVITZ using the phone number and the address written in the below table.

**How to Contact HUVITZ Co., Ltd**

**Write us at:**

HUVITZ Co., Ltd.

Huvitz B/D, 689-3 Geumjeong-dong

Gunpo-si Gyeonggi-do, South Korea

435-862

**Tel**: +82-31-442-8868

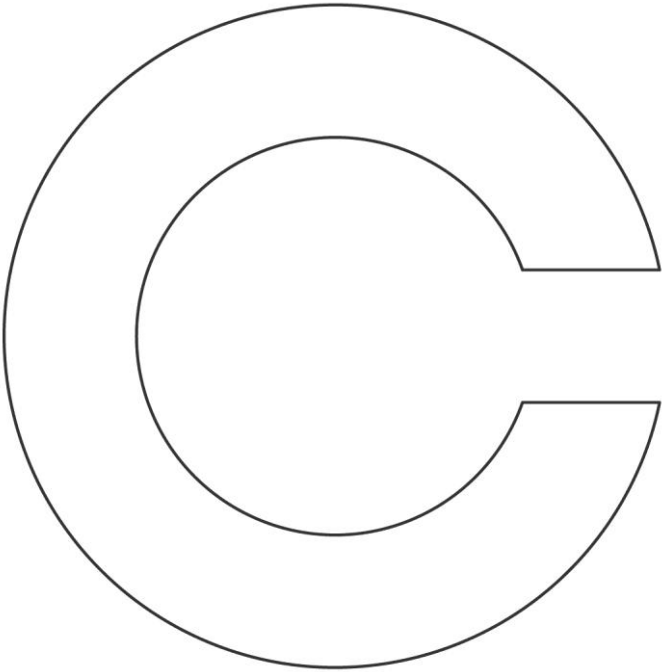
**Fax**: +82-31-442-8619

**URL**:**http://www.huvitz.com**

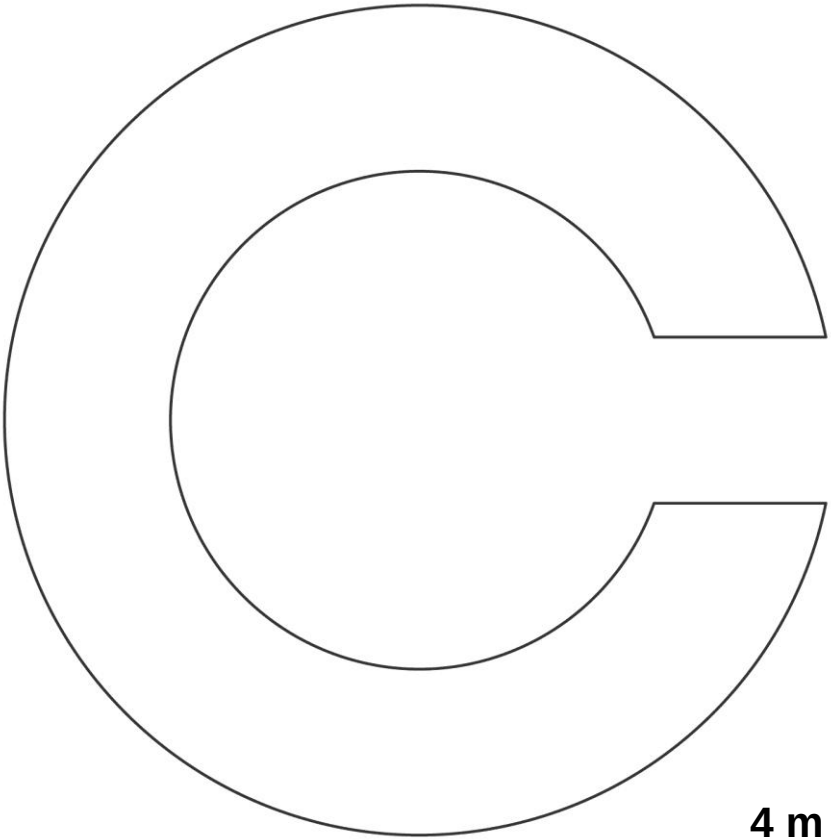
**e-mail: ccp-support@huvitz.com**

## ■ Appendix A

Test Scale Hold this test scale at the Screen, and according to the refracting distance from the patient's eye to the screen such as 3m, 4m, 5m or 6m position the projector backward and forward to fit the projector Alphabet 400 chart "C" with this Scale frame in sharp focus



**3 m**



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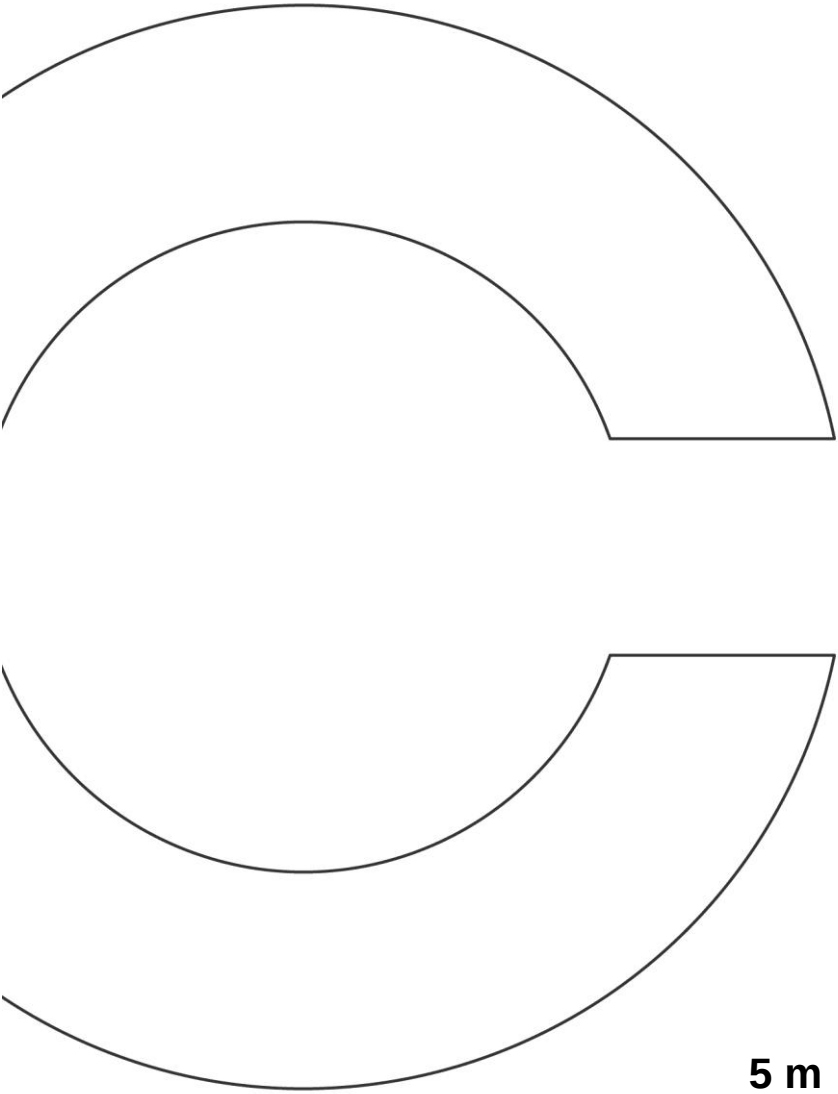
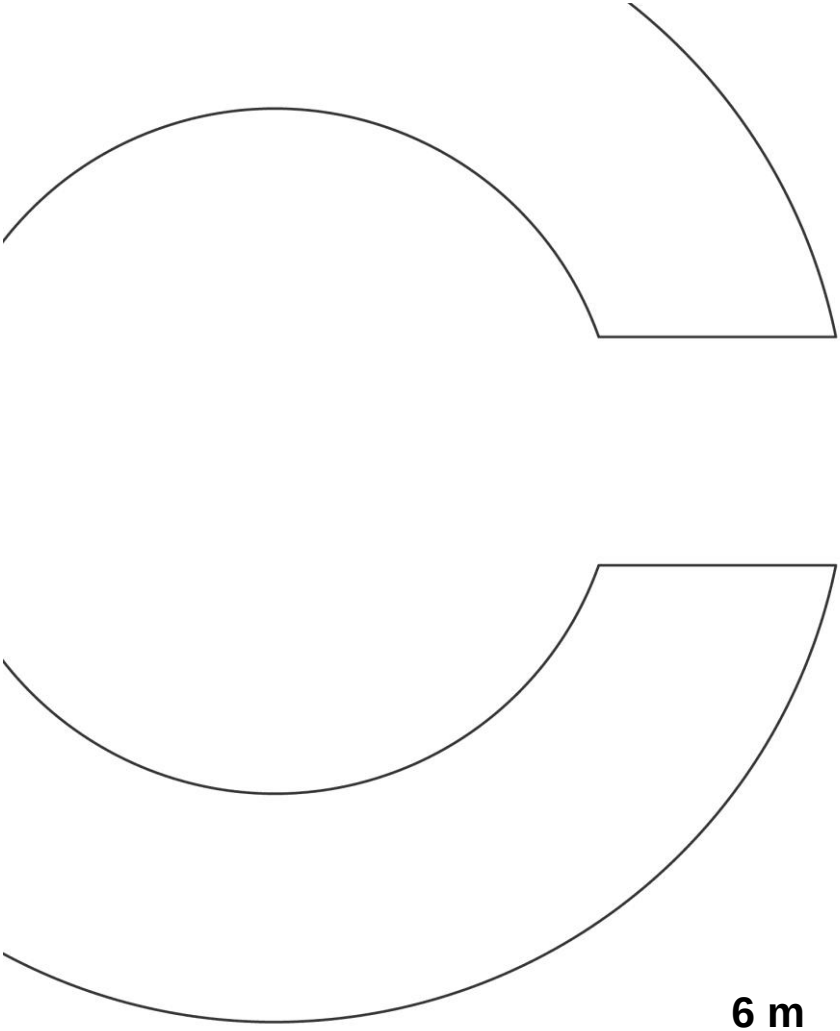

5 m


6 m