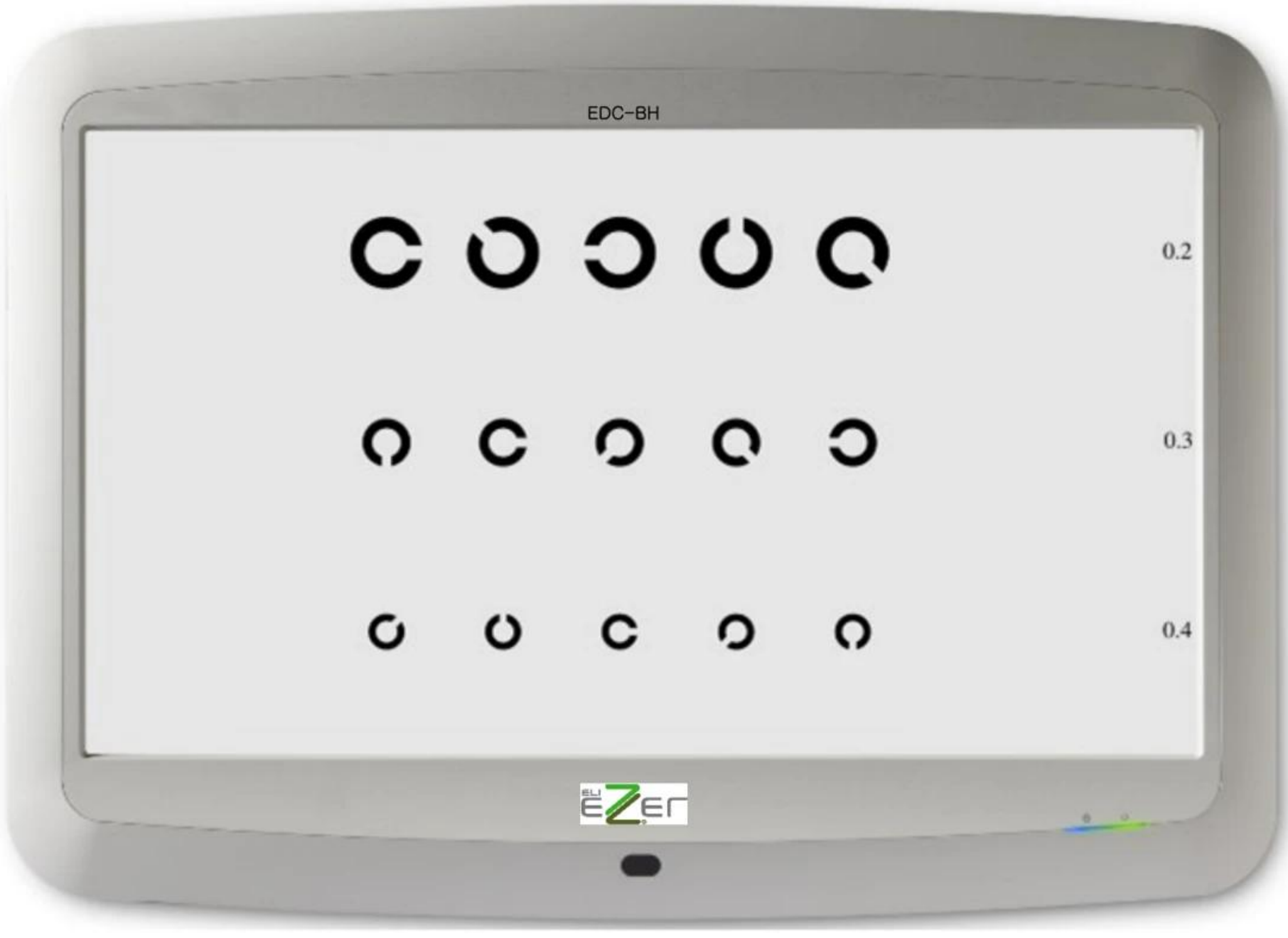
Operation Manual

LCD Chart EDC-BH (EDC-HP)



https://usophthalmic.com

Before use, read this manual carefully

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. EZER assumes no responsibility, however, for possible errors or omissions, or for any consequences resulting from the use of the information contained herein.

EZER 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.

For EU Countries

The following mark, the name & address of the Authorized Representative shows compliance of the instrument with MEDICAL DEVICE REGULATION (EU) 2017/745.

EC REP

Authorized Representative:
Medical Device Safety Service GmbH
Schiffgraben 41, 30175 Hanover, Germany

CE

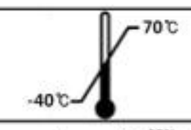
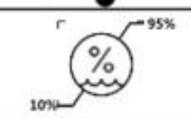
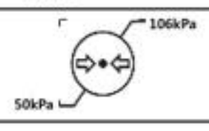
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Revision 1.00 (2021.10)

SAFETY INFORMATION

Symbols marked on the Instrument

Symbol	Description
~	Alternating current
	Protective earth (ground)
	Refer to operating instructions
	Caution
	**I** and **O** on the power switch represent ON and OFF respectively
	Manufacturer
EC REP	Authorized Representative in the European Community
SN	Serial number
MD	Medical Device
	Date of manufacture
	Refer to instruction manual/ booklet (ISO 7010-M002)
	Disposal of your old appliance ● When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC. ● All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. ● The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. ● For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product
	Keep dry
	This way up
	Fragile
	Do not build up more than 4 boxes
	Do not use hand-hooks

	Temperature between - 40℃~ 70℃
	Humidity between 10%RH ~ 95%RH
	Air pressure between 50kPa ~ 106kPa

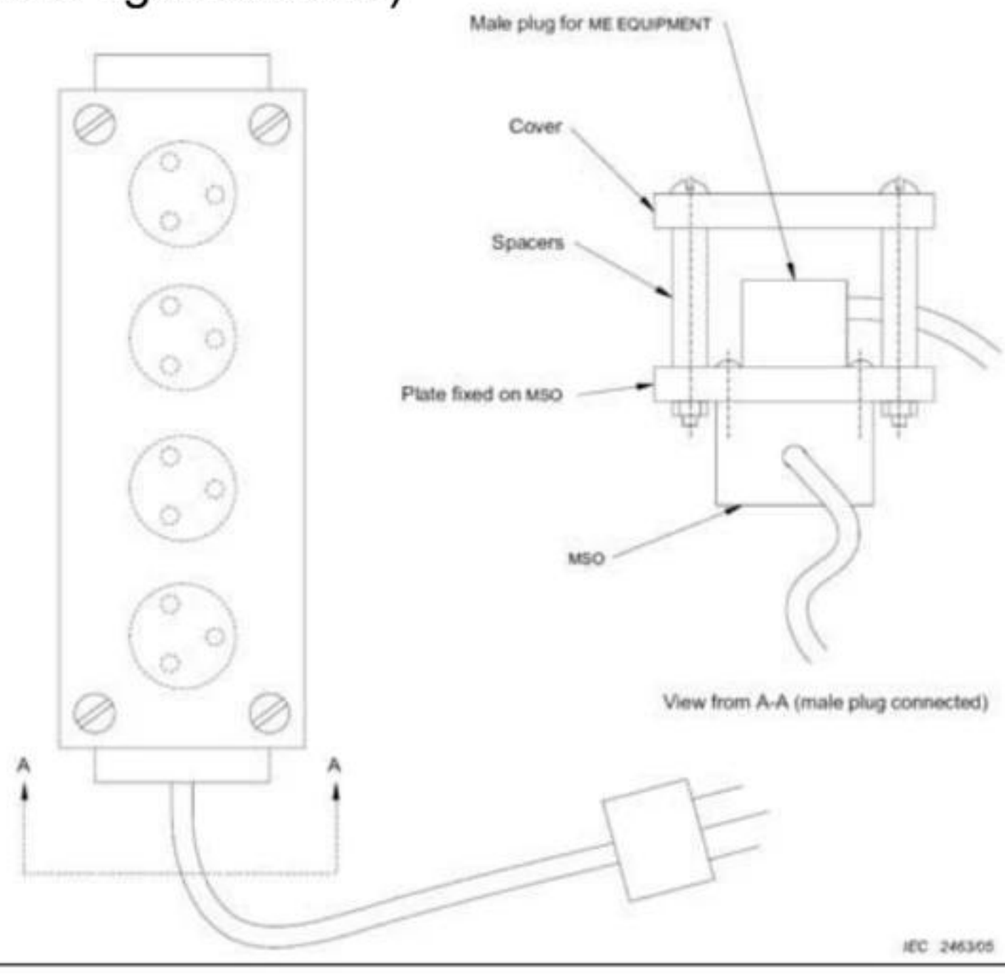
General Safety Information

Follow the safety instructions in this manual and all warnings and cautions printed on the warning labels. Ignoring such cautions or warnings while handling the product may result in injury or accident. Be sure to read and fully understand the manual before using this product. Keep this manual for future reference.

Caution Sign	Description
⚠WARNING	This indicates a potentially hazardous situation which, if not heeded, could result in death or serious injury to you or others.
⚠CAUTION	This indicates hazardous situations which, if not heeded, may result in minor or moderate injury to you or others, or may result in machine damage.
NOTE	This is used to emphasize essential information. Be sure to read this information to avoid incorrect operation.

⚠WARNING	If any serious device-related incident occurs, report it to EZER and the competent authority in the country where user or patient, or both reside.
⚠WARNING	To avoid risk of electric shock, this equipment must only be connected to a mains supply with protective earth.
⚠WARNING	Be sure to turn OFF the power switch before connecting or disconnecting the cables. Also, do not handle them with wet hands. Otherwise, you may get an electric shock that may result in death or serious injury.
⚠WARNING	Do not modify this equipment without authorization of the manufacture.
⚠WARNING	Only operate the instrument with the power supply indicated on the rating plate. Otherwise, it may result in fire or electric shock.
⚠WARNING	Never disassemble or modify this instrument because it may result in fire or electric shock. Also, since this instrument incorporates high-voltage parts and other hazardous parts, touching them may cause death or serious injury.
⚠WARNING	Should any of the following occur, immediately turn OFF the power switch, unplug the power cable from the AC outlet, and contact the dealer or the agent who/where you purchase this instrument. ● When there is smoke, strange odor or abnormal sound. ● When liquid has been spilled into the instrument or a metal object has entered through an opening. ● When the product has been dropped or its housing damaged.

⚠CAUTION	This instrument is shipped with a grounding type power cable. To reduce the risk of electric shock, always plug the cable into a grounded power outlet.
⚠CAUTION	Wipe the forehead rest with ethanol or glutaraldehyde solution to disinfect it each time a different examinee uses it, in order to prevent infection.
⚠CAUTION	Do not use the device near, on, or under other electronic equipment to avoid electromagnetic interference with the operation of the device.
⚠CAUTION	Do not use the device in the same room with other equipment such as life-support equipment, other equipment that has major affects on the life of patient an results of treatment, or other measurement or treatment equipment that involve small electric current.
⚠CAUTION	Do not use the device simultaneously with portable and mobile radio frequency communication systems because it may have an adverse effect on operation of the device.
⚠CAUTION	Do not use cables and accessories that are not specified for the device because that may increase the emission of electromagnetic waves from the device or the system and decrease the immunity of the device to electromagnetic disturbance.
⚠CAUTION	Do not position the equipment to make it difficult to operate the disconnection device. (Appliance coupler or separable plug)
⚠CAUTION	Do not placed the multiple socket-outlet for EDC-BH(EDC-HP) system on the floor in order to prevent liquid penetration and damage to the product.
⚠CAUTION	EDC-BH(EDC-HP) system shall not be connected with additional multiple socket-outlets or extension cords in addition to a designated single multiple socket-outlet.
⚠CAUTION	Maximum permissible load of each socket-outlet used for the EDC-BH(EDC-HP) system, shall not be less than 100VA.
⚠CAUTION	If non-medical electrical equipments (e.g. Video monitor, IT equipment, etc.) that are connected with the EDC-BH(EDC-HP) are, directly connected to the wall socket-outlets, high touch current may flow since the earth continuity is not ensured.
⚠CAUTION	Multiple socket-outlet should be a grounding-type and complied with IEC 60884-1.

⚠CAUTION	Connection of the plug shall be possible only by using the tool. (Refer to the figure below.) 

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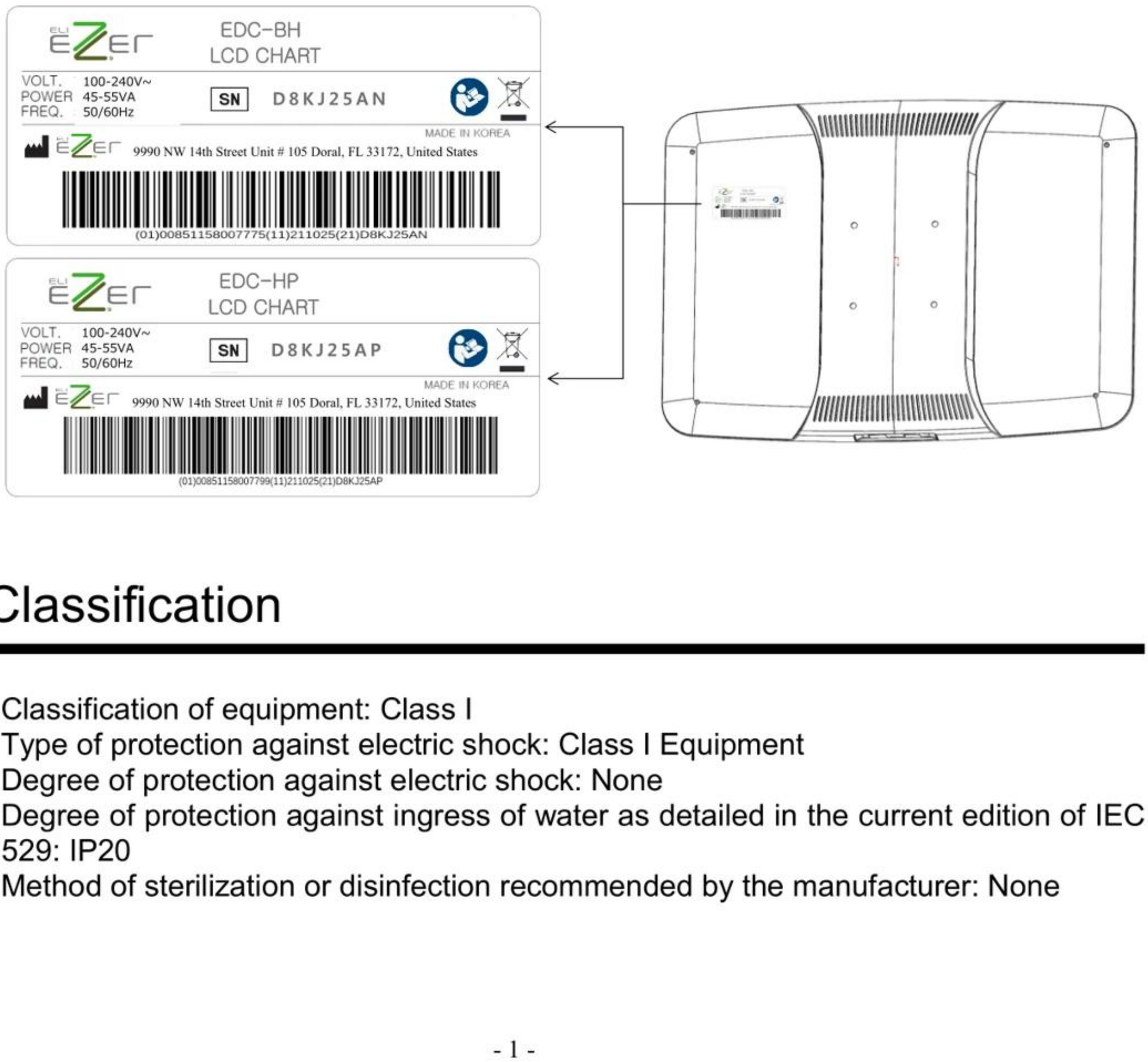
1. Features

- Can measure, Astigmatism, Binocular balance tests, Fixation disparity tests, Fusion tests, stereo test with only one equipment
- Can make efficient eyesight measurement without changing position of handler.
- LCD monitor features associated with the use of the computer graphics processing of Specific chart (Chart) Table of 1m ~ 8m in front of video a patient displayed on the LCD screen is installed.
- It is efficiently operated in an eyesight test even though the tester doesn't move.
- It is possible to connect with external devices by RS-232 terminal connection
- EDC-BH(EDC-HP) is LCD module to apply, a special chart to display the red and green.

CAUTION	Do not use RS-232S, USB communication for any other purpose for cybersecurity.

- Intended Use
  This device (EDC-BH, EDC-HP)) measures the refractive power of the human eye, i.e. measuring visual acuity.

- Label



2. Classification

- Classification of equipment: Class I
- Type of protection against electric shock: Class I Equipment
- Degree of protection against electric shock: None
- Degree of protection against ingress of water as detailed in the current edition of IEC 529: IP20
- Method of sterilization or disinfection recommended by the manufacturer: None

- Degree of safety or application in the presence of a flammable anesthetics mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anesthetics mixture with air or with oxygen or nitrous oxide
- Mode of operation: Continuous operation

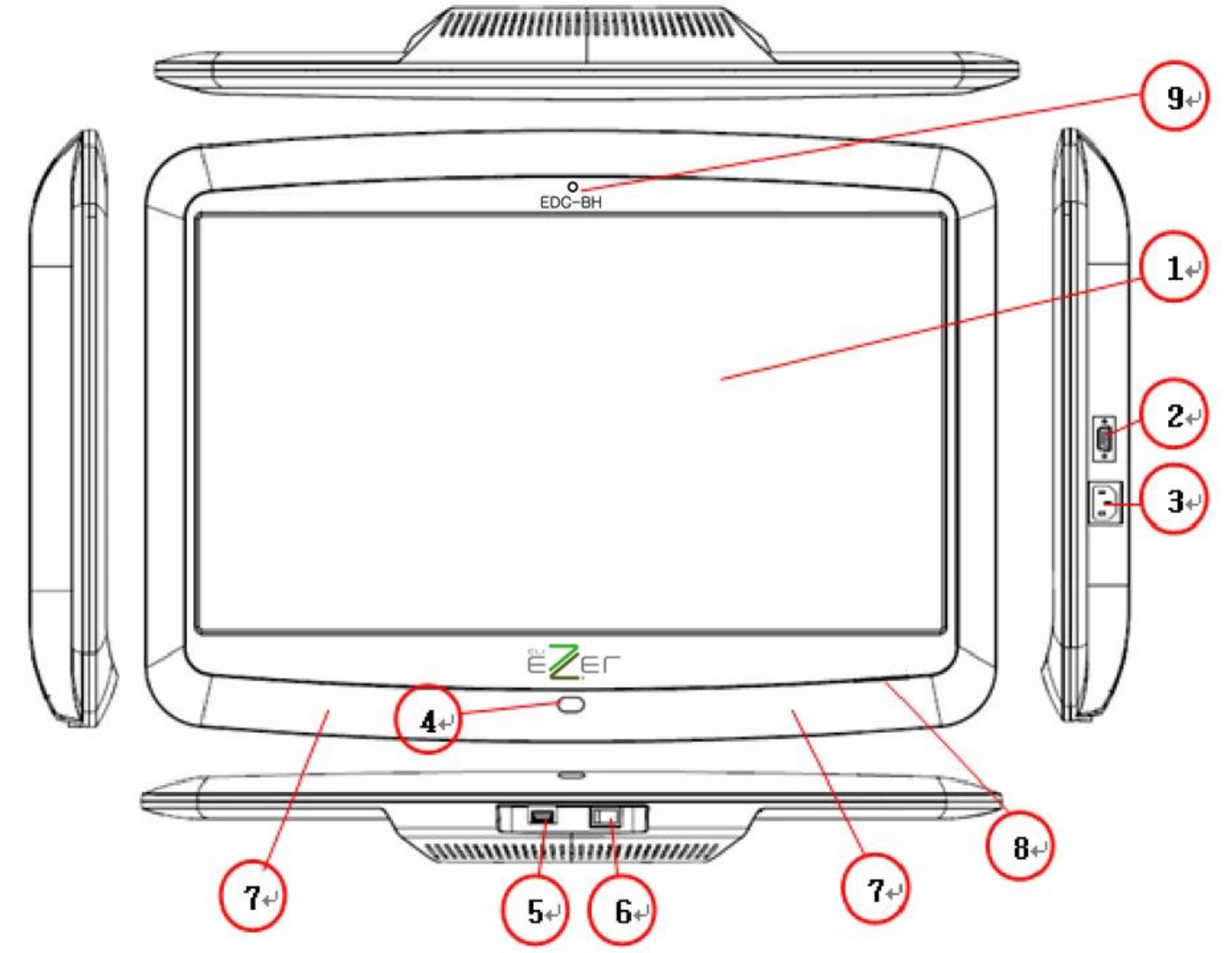
3. Notes for Using the Instrument

- 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.
- 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.
- Disconnect the power supply and consult the dealer when there is smoke, strange smell, or noise while working.
- If you want to connect this with other equipment, consult the dealer.
- Don’t use organic solution such as alcohol, thinner, benzene, etc. to clean the surface of this instrument. It may damage the instrument.
- If you leave the EDC-BH(EDC-HP) without using it for long periods, disconnect the power supply and protect the unit with dust cover.

CAUTION	Do not Use this device for any purposes other than those intended. EZER is not responsible for accidents or malfunctions caused by misuse.

4. Configurations

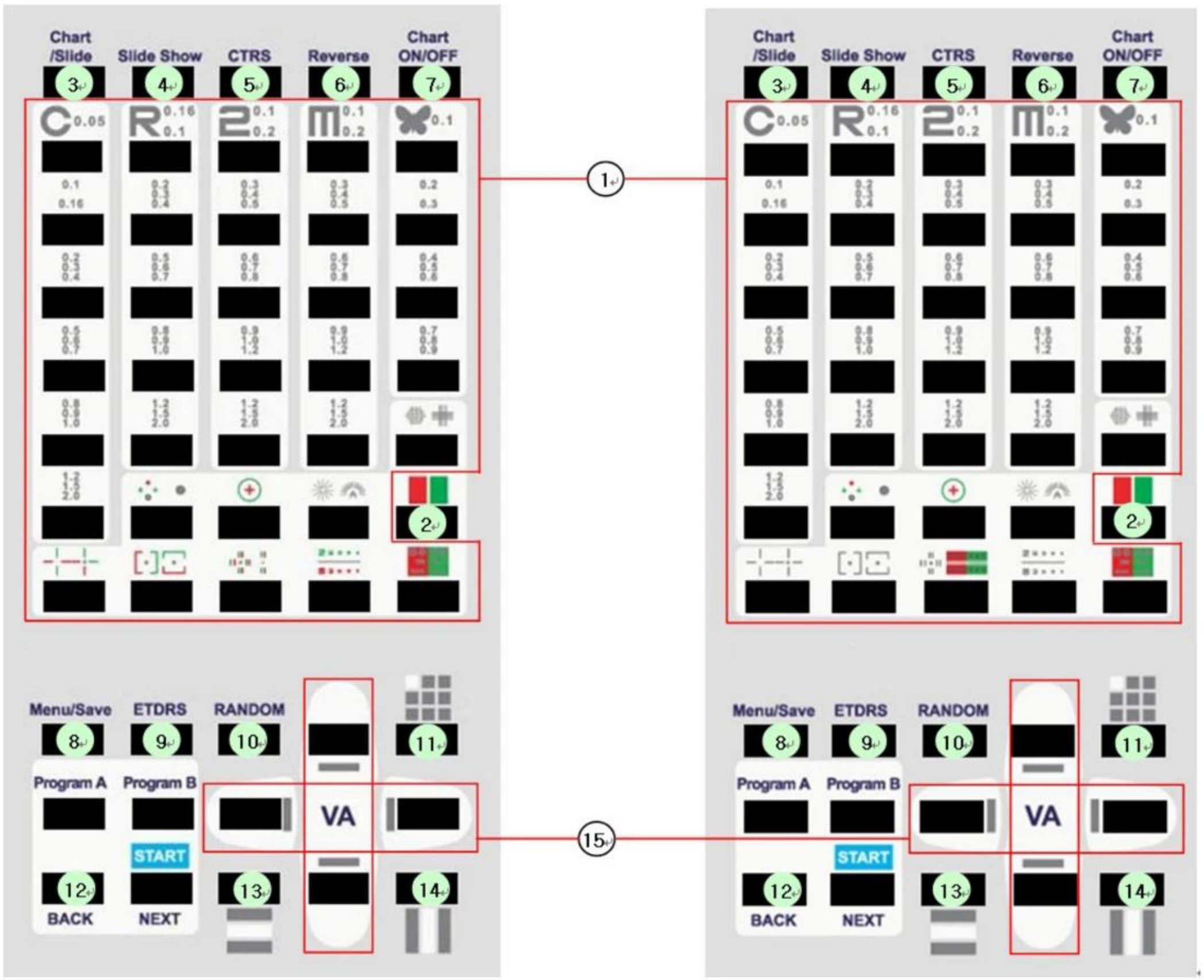
4.1 Main Unit



NAME	FUNCTION
① LCD Display Monitor	Displayed the chart for test by using the graphic-processing function on computer
② RS-232	Serial port for communicating with external devices
③ AC Power Inlet	A part of the power supply cables and connections
④ IR Receive window	Display chart to receive the infrared windows from remote controller
⑤ USB	Port for the USB flash drive.
⑥ Power On/Off Switch	Power on/off Switch
⑦ Speaker	Release the sound in need for the application program
⑧ LED	Power LED
⑨ Fixation Target Lamp	Maddox Test LED

⚠WARNING	SAFETY INFORMATION - Accessory equipment connected to the analog and digital interfaces must be certificated according to the respective IEC standards (e.g. IEC 60950-1 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore all configurations shall comply with the system standard EN 60601-1:2006, Clause 16. Everybody who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of the system standard IEC 60601-1:2005, Clause 16. If in doubt, consult the technical service department or your local representative.

4.2 Remote controller



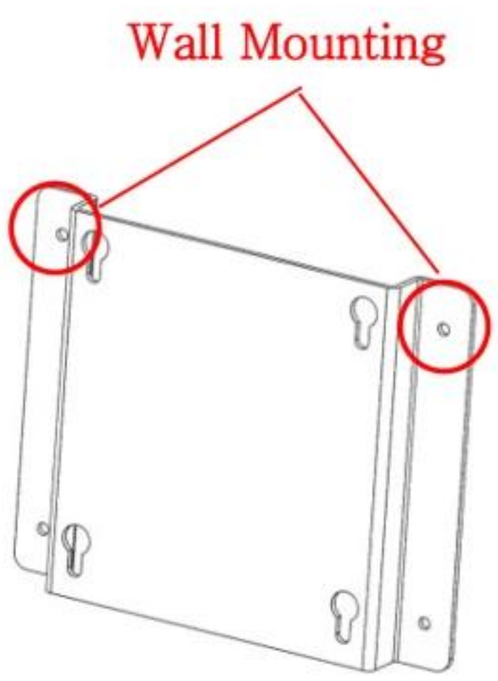
EDC-BH　　EDC-HP

① Chart select button: Changes the chart. When the switch has two chart, it can indicate them alternately
② Red/Green button: Applies the Red/Green filter to the chart
③ Chart/Slide button: Chart-Slide-Movie condition of the chart

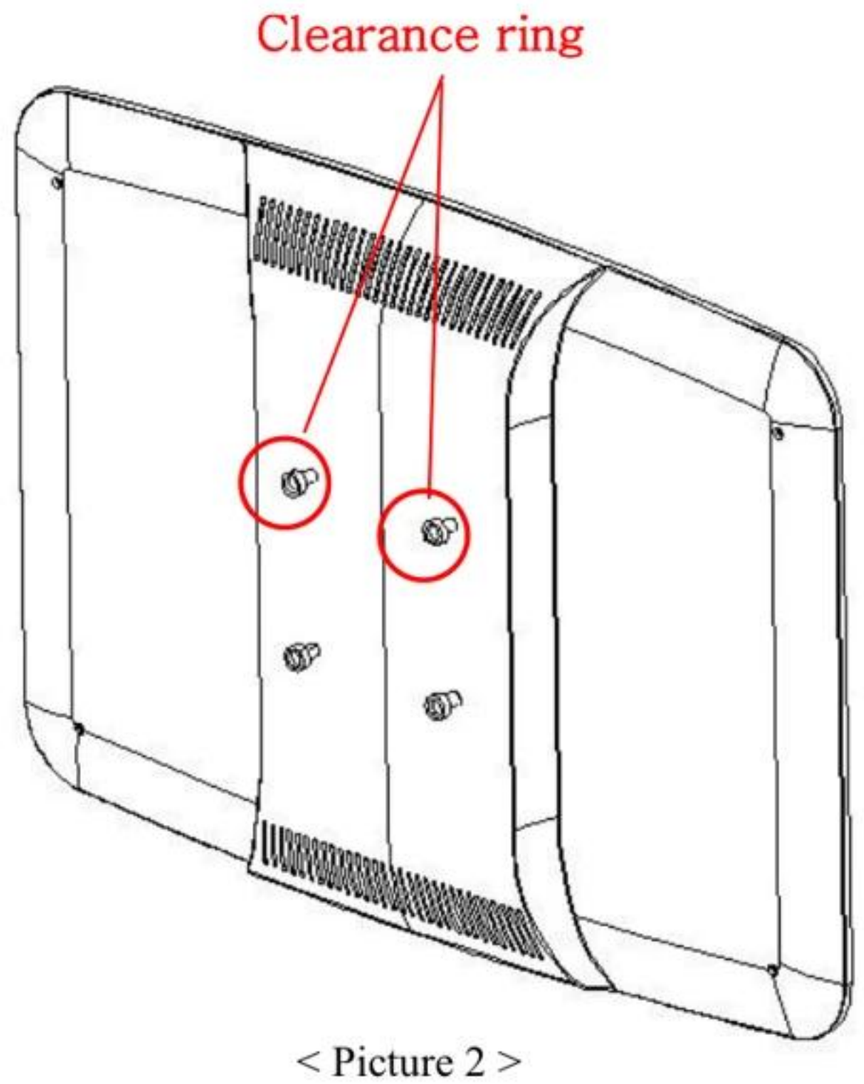
④ Slide Show button: Displays the slide show of the image
⑤ CTRS button: Selects the contrast of charts.
⑥ Reverse button: Reverses the black-and-white condition of the chart.
⑦ Chart On/Off button: Turns the monitor on or off
⑧ Chart Menu/Save button: Chart type, Distance, Beep sound, Mirror, Power Save Time, Slide Show, Brightness, Auxiliary Chart Type, Background Gray Color Screen, Video Progressive Bar Display, Filter Red/Green, BackGround Gray, Image update, Reset of setting button
⑨ ETDRS button: Display ETDRS A, ETDRS B ETDRS C
⑩ RANDOM button: Used to arrange the targets at random and present them.
⑪ Single Mask button: Pressing the button toggles between entire chart and single line display
⑫ BACK button: It used to cancel in Menu function.
⑬ Horizontal Mask button: Pressing the button toggles between entire chart and horizontal line display
⑭ Vertical Mask button: Pressing the button toggles between entire chart and vertical line display
⑮ Mask button: Moves the display to a higher or lower VA value when a single mask, vertical line, or horizontal line is isolated on the VA chart.

5. Installation

- Use the provided “Tapping Screw” when you fix the product with “Wall Mount Bracket”.
- Fix the Wall Mount Bracket to the wall after choosing the location of the chart.
  (Reference, Wall Mount Bracket’s signed location of picture 1)



< Picture 1 >



< Picture 2 >

6. Input and Use of Program

6.1 How to input user's program

How to input user's program A

- If you hold the button “Program A” for more than 3seconds, the whole LED of the front part flickers twice and display the chart “C”
- Select the chart that you want and press the button “NEXT”, then the whole LED of front flickers once.
- You can repeat above process as many as you want to. (40 programs can be input in total)
  - Program button -> chart button -> NEXT button -> chart button -> NEXT button -> chart bu
  Tton -> NEXT button ……
- In case you want to check the previous program while you’re inputting a new one, you can check the previous one when you press “NEXT”.
- If you press the button “Program A” once, the whole LED of the front part flickers twice and the new program is saved.

NOTE	If you do not press the "Program A" button, the program will not be saved (If you turn off and turn on, a program will be deleted.).
NOTE	On the time of delivery, the chart is input on user program A in accordance with the chart of remote control.

How to input user's program B

- “How to input user’s program A” in the “Program A” button instead of “Program B” button is used.

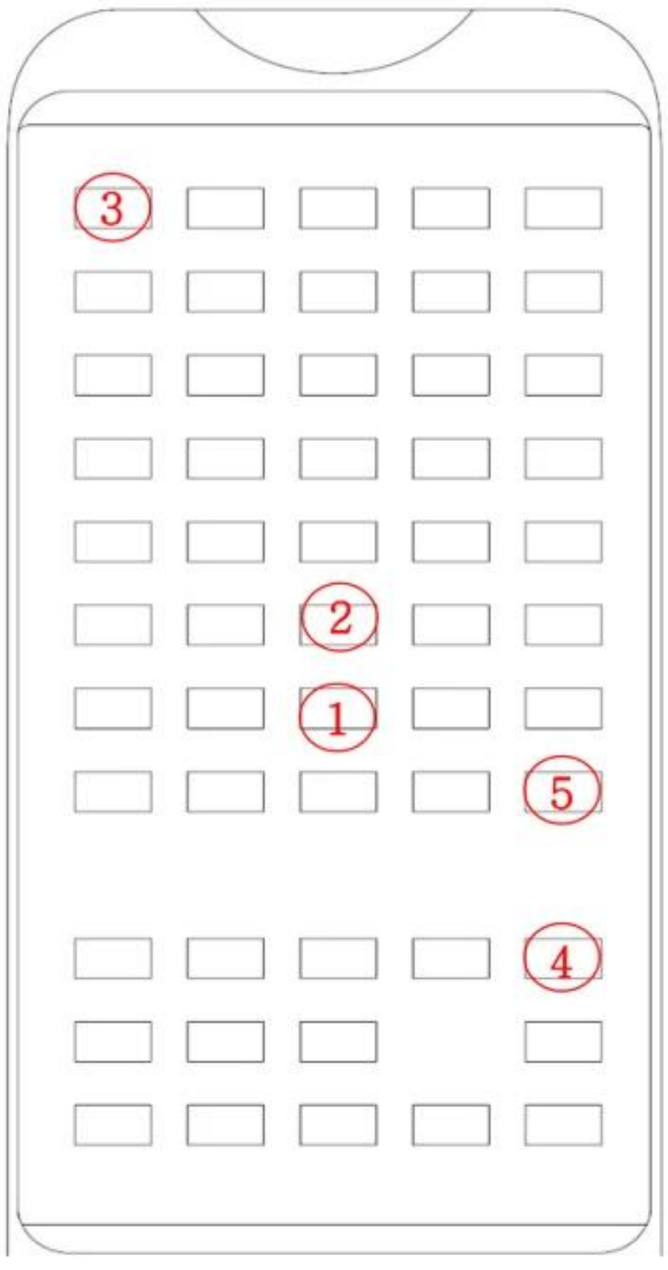
NOTE	On the time of delivery, there is no program on “User program B”

6.2 How to use your stored programs

- When you press “Program A” or “Program B”, the first chart of chosen program appears.
- When you press “Next” button, you may move to a next chart.
- When you press “Back”, you may move to a previous chart.
- When you chose your preference, “User program call” is finished.

NOTE	If “PC Communication” in user menu Setting, cannot “Program A” or “Program B”. Used only PC Communication button.

7. Change the channel of remote controller



7.1 Basic Setup

- There is “A~E” channels on the remote control and on the time of delivery, the entire channel is set on channel “A”

7.2 The method to check a channel between the remote control and a machine

- (Regardless of a channel which is set on remote control or a machine) if a machine recognizes a signal of “①” which a user presses 3 times continually, a machine let a user know the channel of remote control showing blinking LED on the each side. (A=1, B=2, C=3, D=4, E=5)
- (Regardless of a channel which is set on remote control or a machine) if a machine recognizes a signal of “②” which a user presses 3 times continually, a machine let a user know the channel of a machine

7.3 The method to change a channel of remote control and channel of a machine at the same time

- For your reference, in case a channel of a remote control and a machine is connected, you can follow this step.
- You need to turn off all of the chart projector except a machine which you want to change a channel.
- Push the “③” button while pushing the “④” button. Then release ③, ④ button. again, press “④” button, a remote control transmits data of a new channel a machine let a user know the channel of a machine showing blinking LED on the each side. (A=1, B=2, C=3, D=4, E=5)
- A user needs to repeat above process till a new channel appears.
- When a user presses “⑤” button, a machine let a user know showing blinking LED two times on the each side.

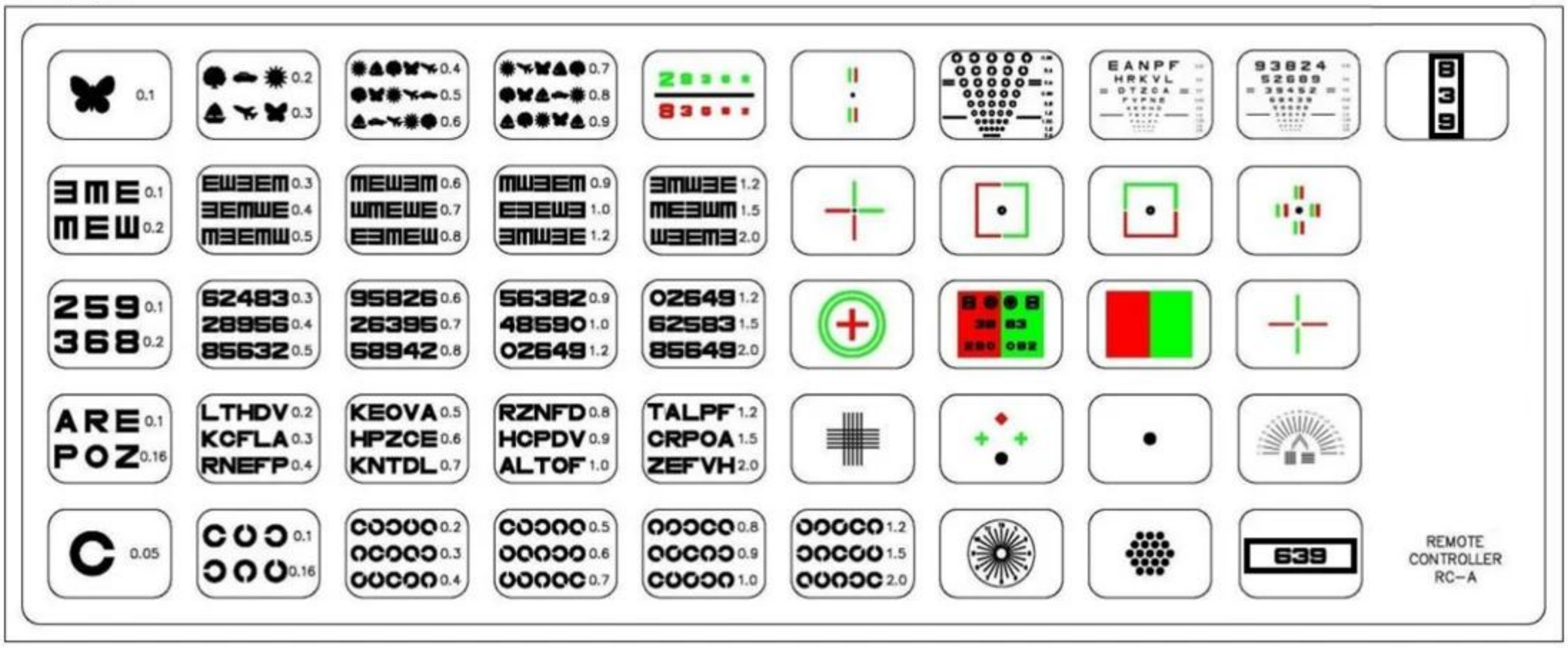
7.4 The method of adjusting a channel of a machine to the one of remote control unconditionally

- (In case of a channel of the machine and remote control is different) When a user presses “③” button, a remote control transmits data of a setting channel a machine let a user know the channel of a machine showing blinking LED on the each side. (A=1, B=2, C=3, D=4, E=5)
- When a user presses “⑤” button, a machine let a user know showing blinking LED

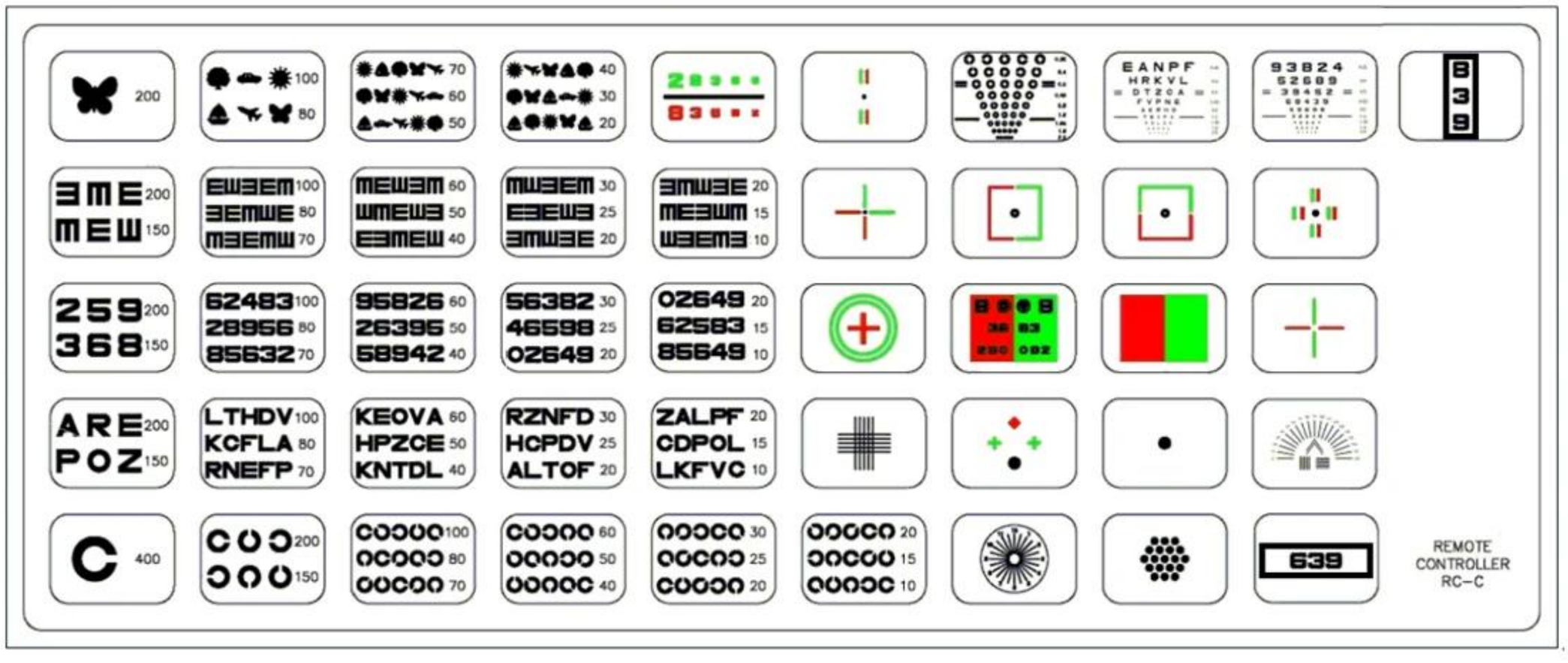
8. Types of Chart

8.1 EDC-BH

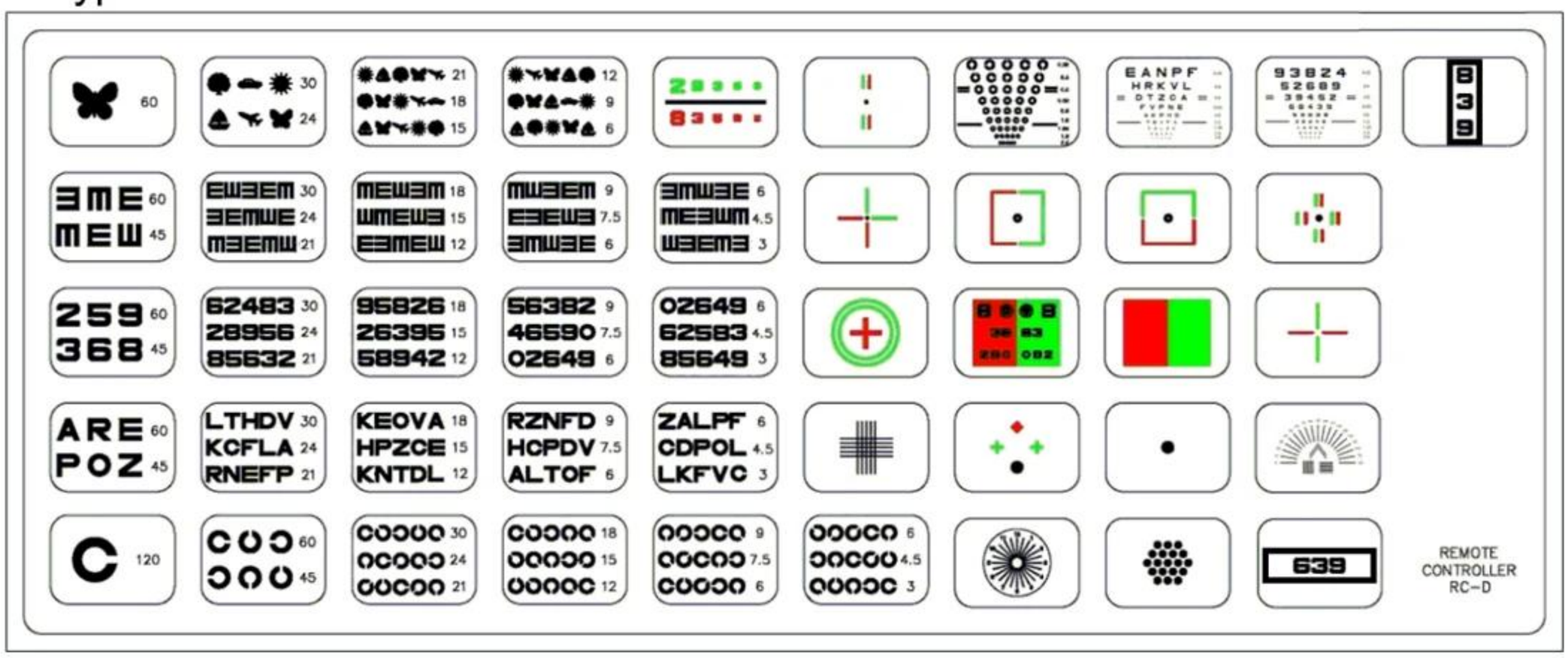
A Type



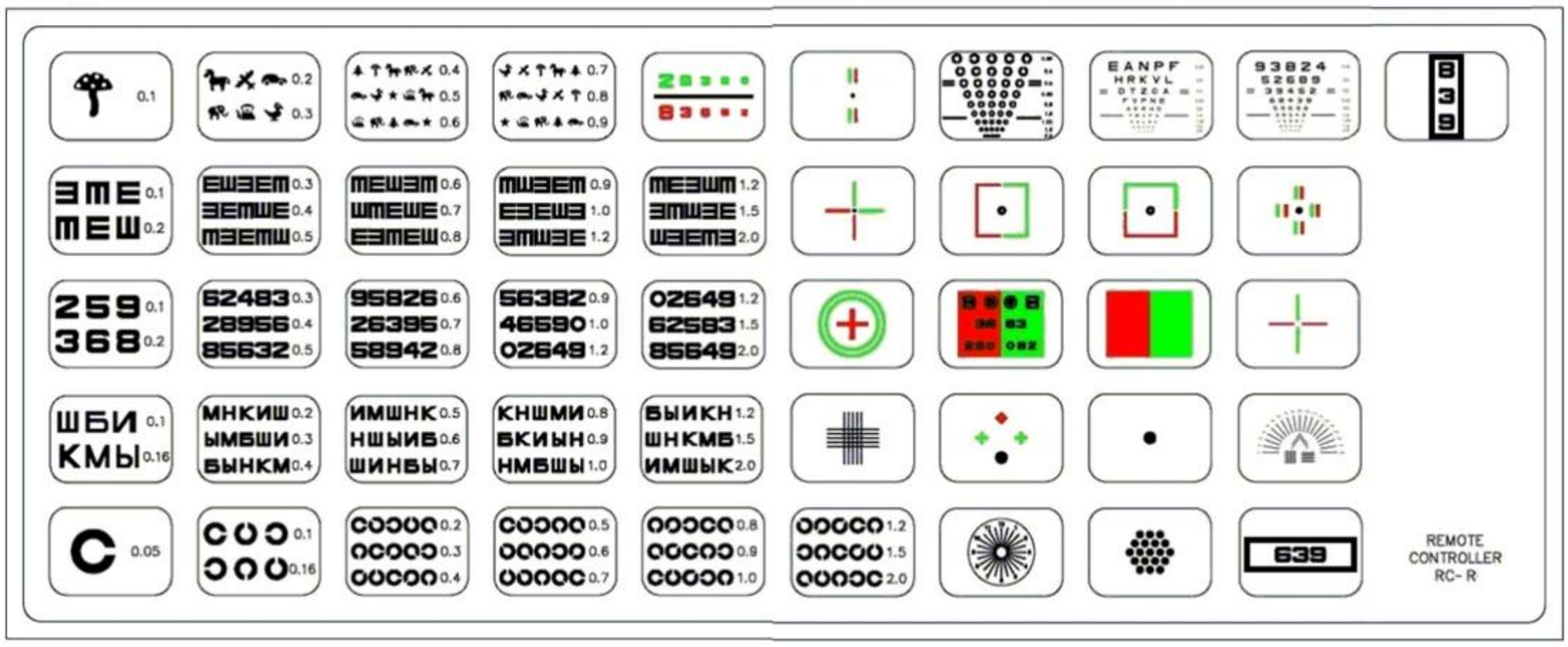
C Type



D Type

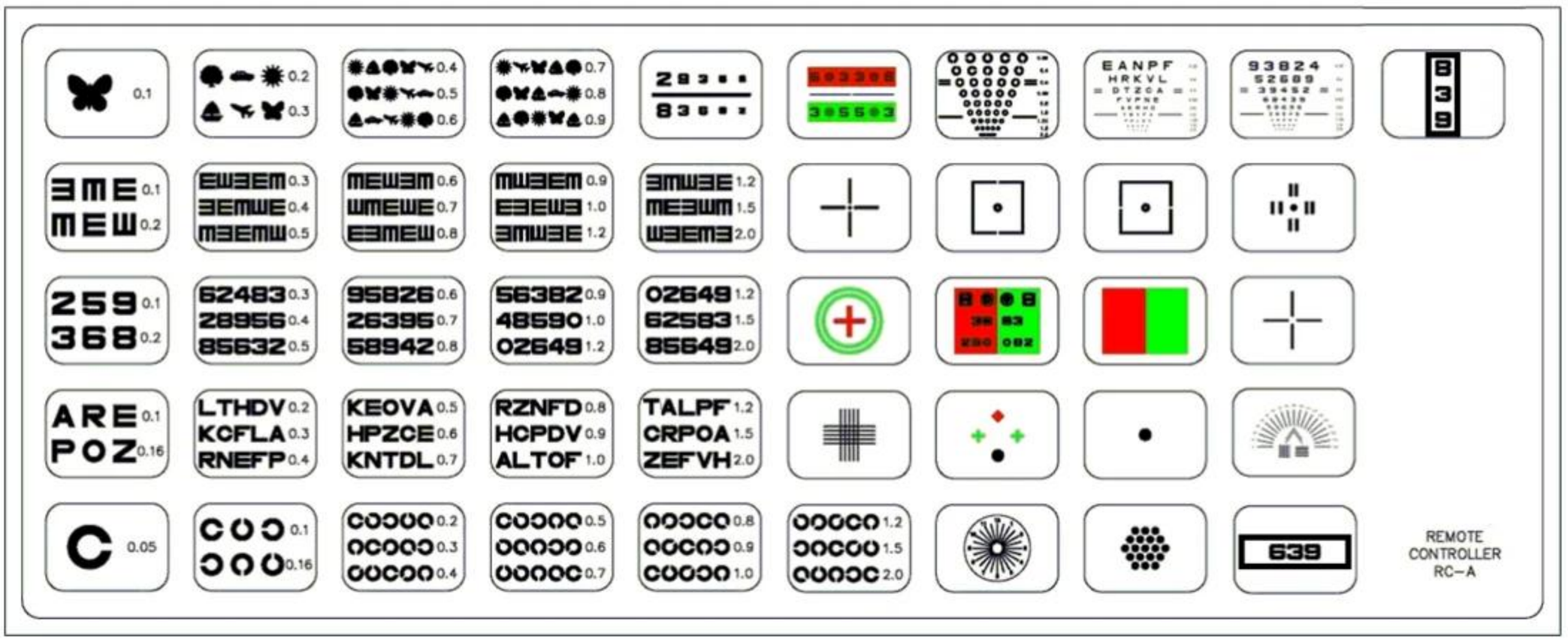

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EANPF
HRKVL
93824
52689
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REMOTE
CONTROLLER
RC-D

R Type

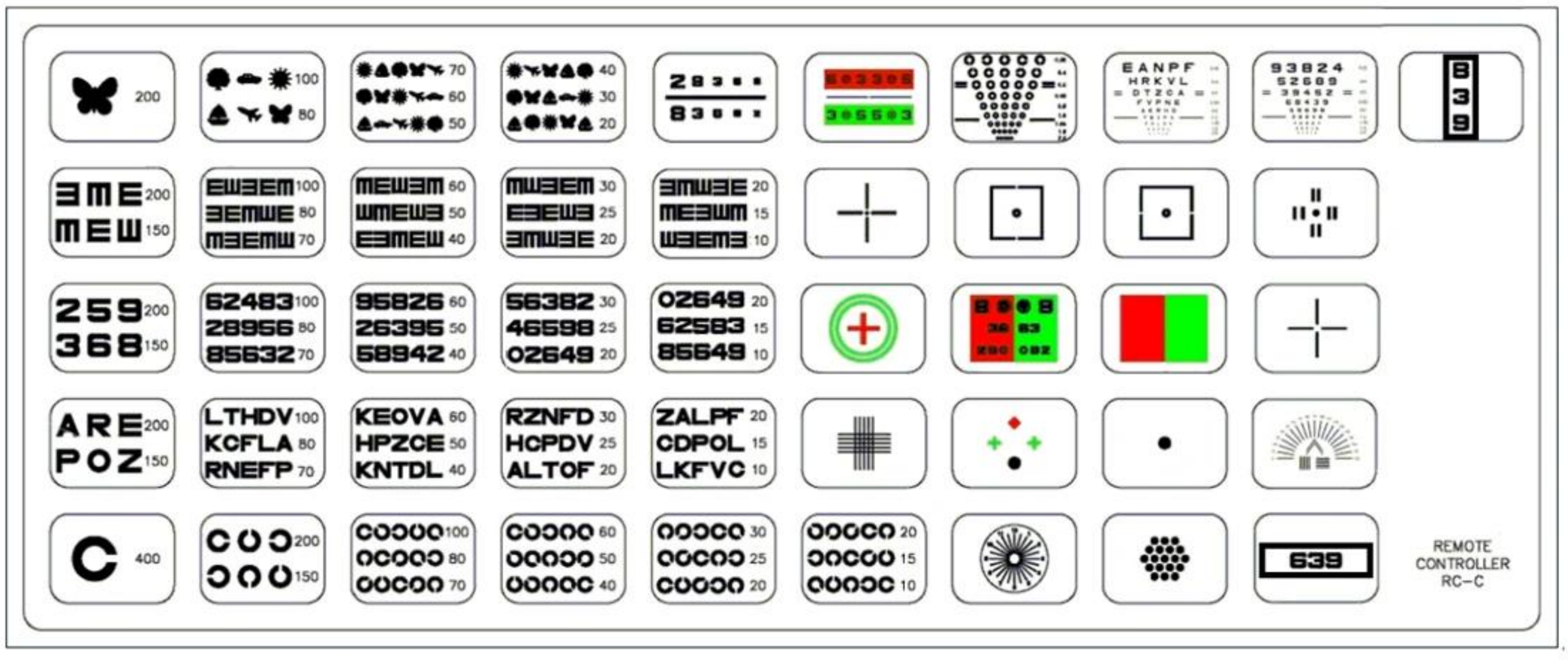

0.1
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0.4
0.5
0.6
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EANPF
HRKVL
93824
52689
639
REMOTE
CONTROLLER
RC- R

8.2 EDC-HP

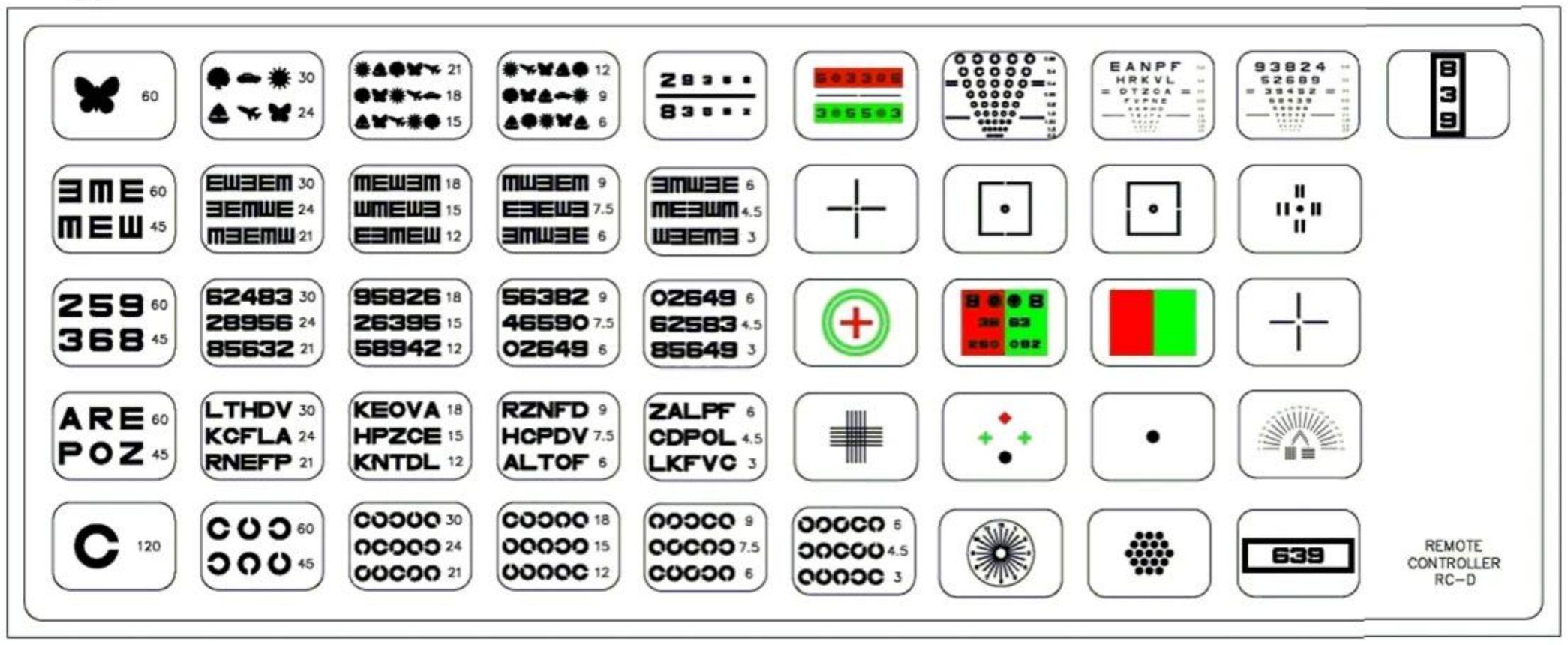
A Type



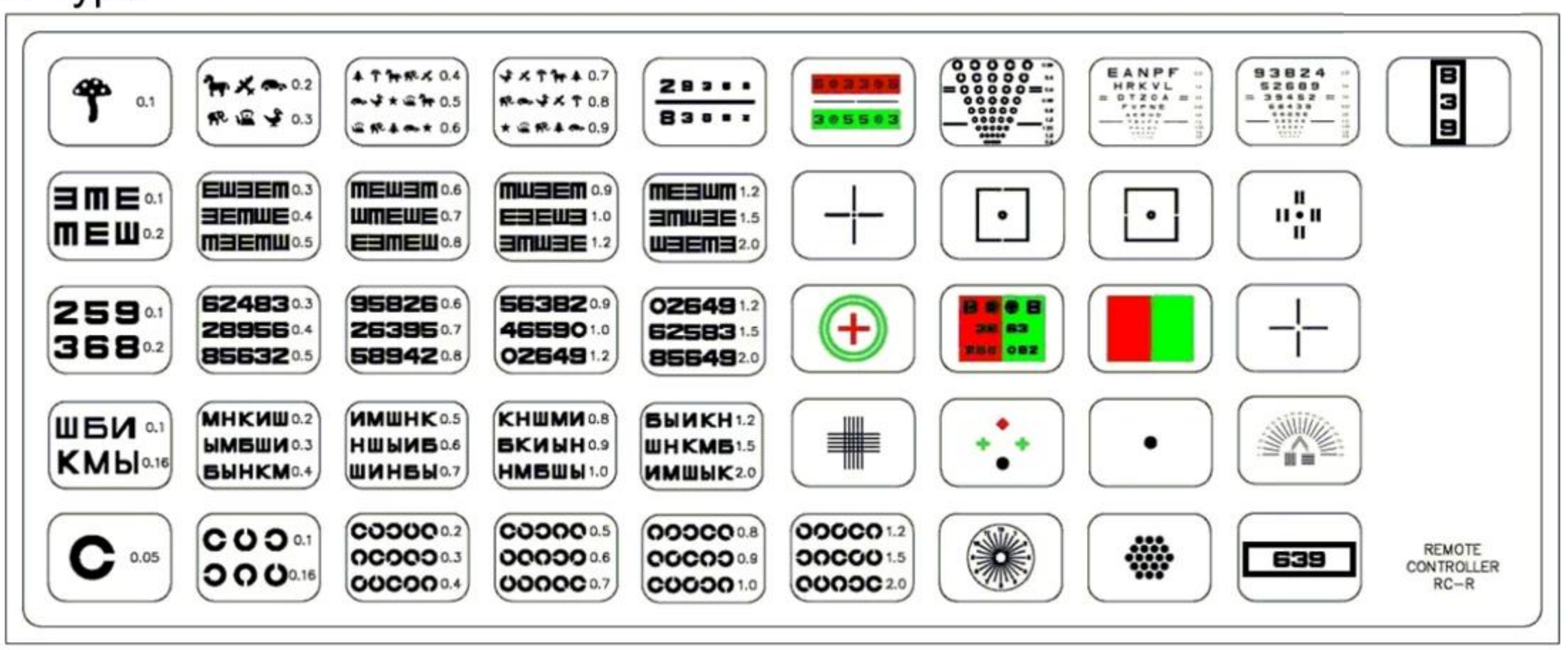
C Type



D Type


60
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OTZCA
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12
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7.5
6
4.5
3
120
REMOTE
CONTROLLER
RC-D

R Type


0.1
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0.4
0.5
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0.8
0.9
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HRKVL
OTZCA
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52689
639
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.2
1.5
2.0
0.05
0.16
REMOTE
CONTROLLER
RC-R

9. Setting of the instrument

Settings

Chart Type	:	A
Distance	:	5.0m
Beep Sound	:	High
Mirror	:	Off
Power Save Time	:	Off
Slide Show, Sequence	:	Forward
Slide Show, Delay	:	1
LCD Display Brightness	:	8
Fixation Target Lamp Brightness	:	Off
Clock Dial Type	:	A type
PR(Promotion) video play at Auto Light Off	:	None
PC Communication	:	None
Video Progress Bar Display	:	None
Bluetooth Communication Setting	:	Press Mask_Right Key
Auxiliary Chart Type	:	Red Green
Background Gray Color	:	Only RG Chart
Background Gray	:	200
Filter Red	:	225
Filter Green	:	240



Image Update : check USB and Files
Reset
Exit without Saving

Save and Execute : press [Menu/Save] button on the Remote-controller
Cancel and Exit : press [BACK] button at Remote-controller

9.1 Parameters Setting Item

- Chart type: A, C, D, R
- Distance: 1.0m~8.0m(unit 0.1m)
- Beep Sound: Off, Low, Mid, High
- Mirror: Off, On
- Power Save Time: None, 5Min, 10Min, 30Min
- Slide Show, Sequence: Forward, Reverse, Random
- Slide Show, Delay: 1, 2, 3, 4, 5
- LCD Display Brightness: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- Fixation Target Lamp Brightness: Off, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- Clock Dial Type: A, B, C, D, E, F, G Type
- PR(Promotion) video play at Auto Light Off: None, Yes
- PC Communication: None, Yes
- Video Progressive Bar Display: None, Yes
- Bluetooth Communication Setting: Press Mask_Right Key
- Auxiliary Chart Type: Red Green, Pola
  (Only “Red Green” at EDC-BH)

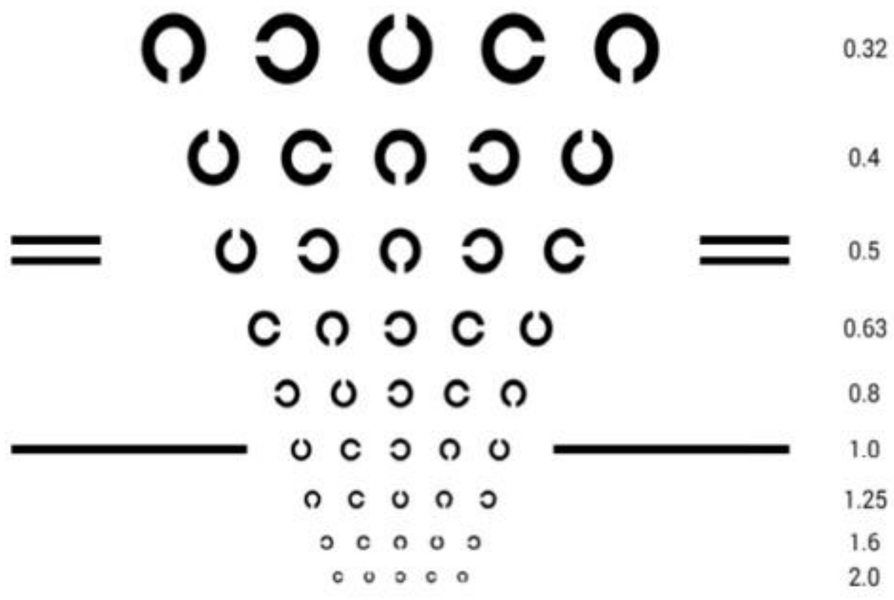
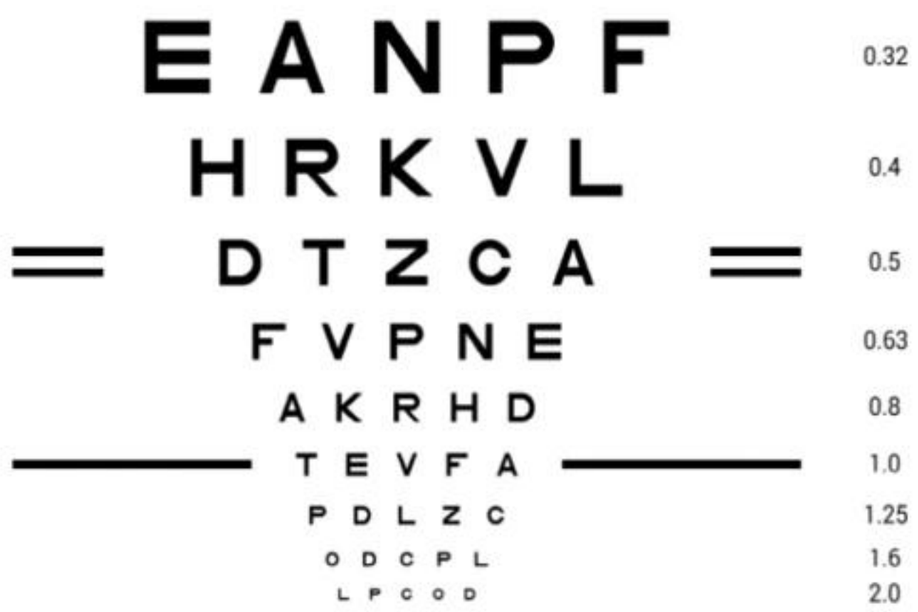
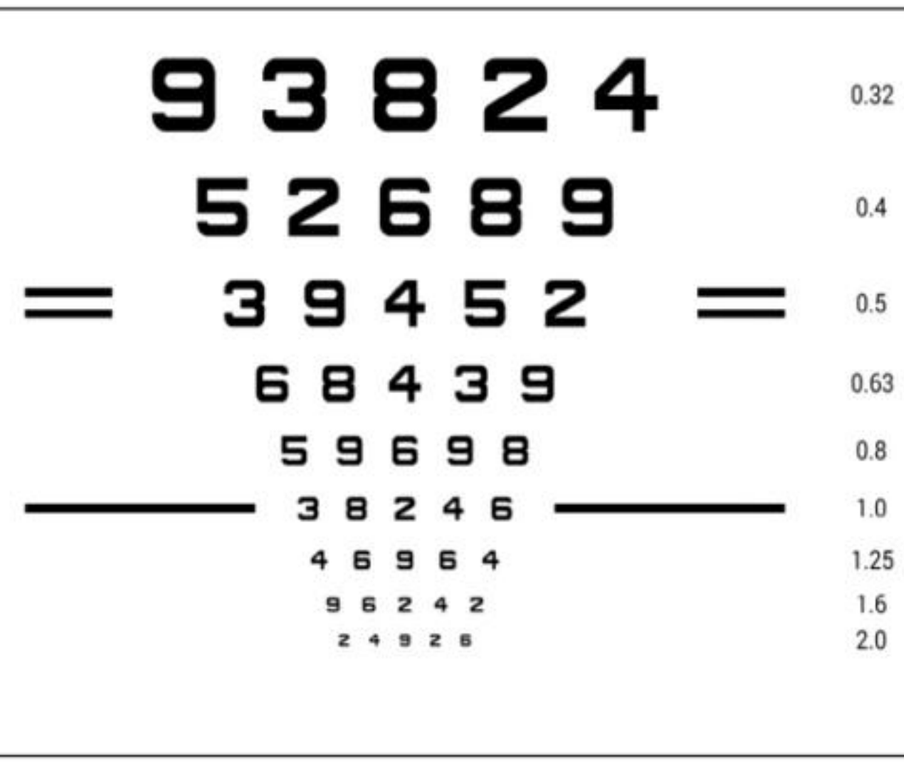
- Background Gray Color: None, Only RG Chart, ALL Chart
- Background Gray: 180 ~ 255
- Filter Red : 160 ~ 255
- Filter Green : 160 ~ 255
- Image Update
- Reset
- Exit Without Saving

9.2 Parameters Setting Method

- Menu/Save button on the Remote controller : Parameters setting context menu display and Parameters setting information save
- Mask_Up or Mask_Down button on the Remote controller : Select parameter move up and down
- Mask_Left or Mask_Right button on the Remote controller : Select parameter change
  (Bluetooth Communication Setting = only Mask Right button)
- BACK button on the Remote controller : Cancel and exit

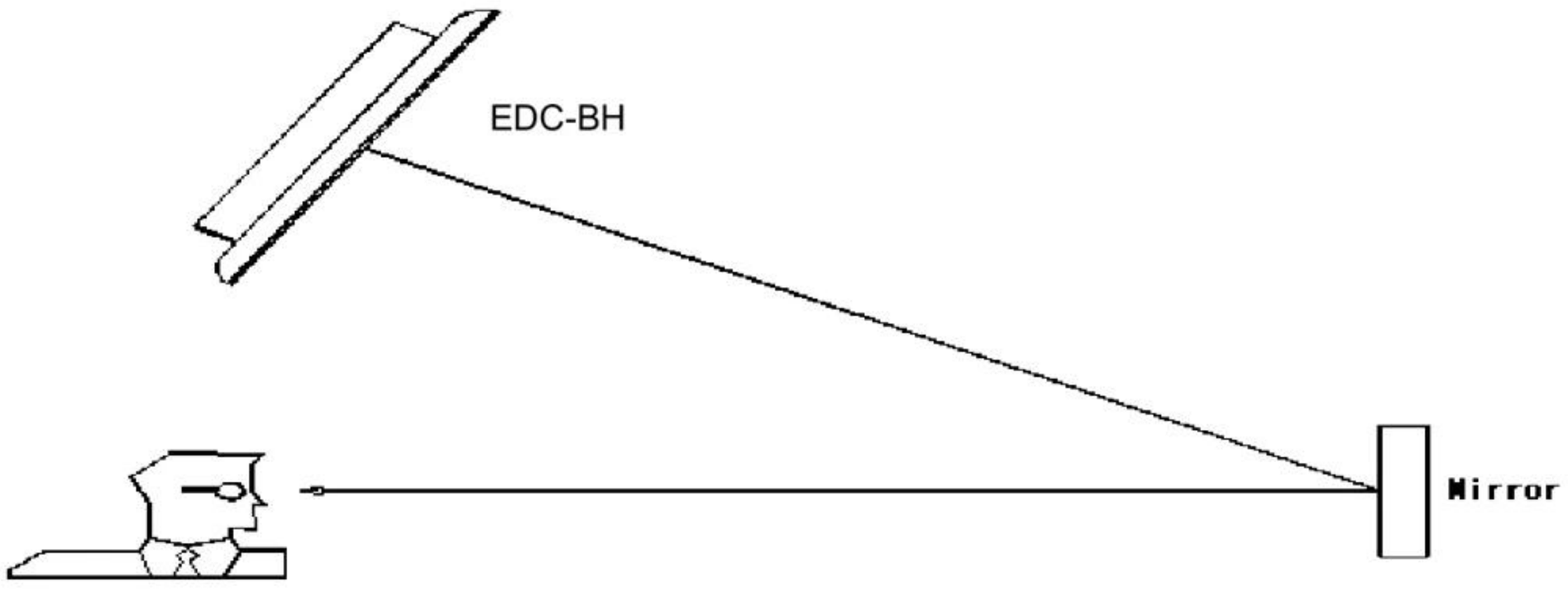
10. ETDRS Chart Function

- The instrument indicates the ETDRS chart where the visual acuity is changed in turn from the upper column. While the ETDRS chart is indicated, press the ETDRS button of the remote controller. Different ETDRS charts are indicated alternately.

ETDRS A	ETDRS B
	
ETDRS C	
	

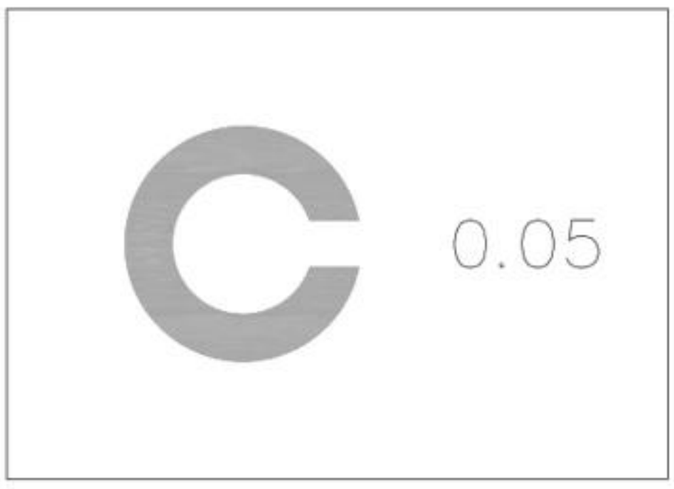
11. Mirror Function

- You can select whether the right-and-left mirror reverse of chart should be done. Use this item when the chart is set by folding with a mirror. Picture and animation are not reversed.

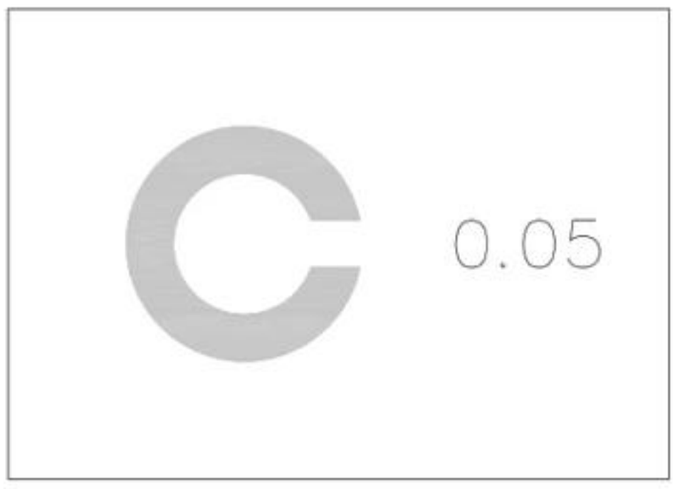


12. CTRS Chart Function

- It is possible to indicate the whole chart in the single contrast ratio. When this function is in use, the brightness and background of the liquid crystal display are fixed at the shipment setting even if it is changed.
- Press the CTRS button once. The chart is indicated with the contrast reduced to 25%
- Press the CTRS button twice. The chart is indicated with the contrast reduced to 12.5%
- Press the CTRS button three times. The chart is indicated with the contrast reduced to 6%



Picture 3



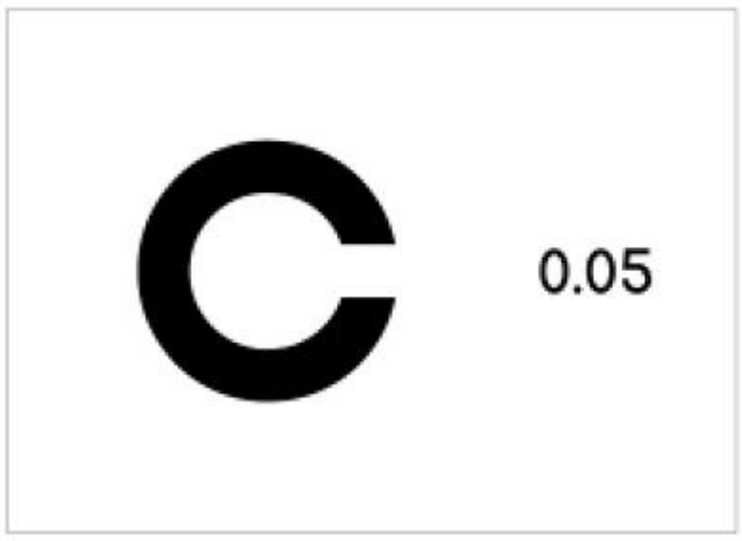
Picture 4



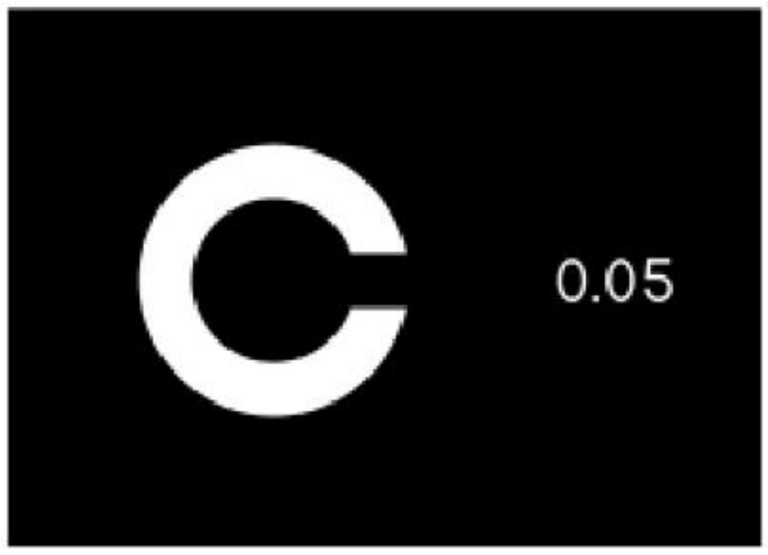
Picture 5

13. Black/White Reverse Chart Function

- While the visual acuity chart is indicated, press the Reverse button. The Black-and-White condition of the chart being indicated is reversed.



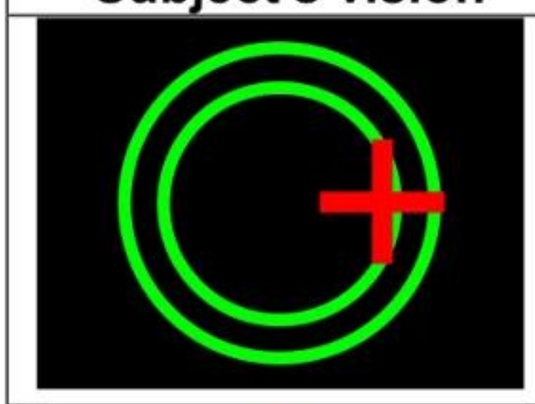
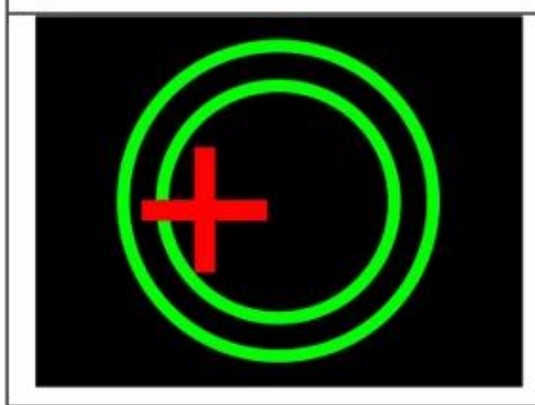
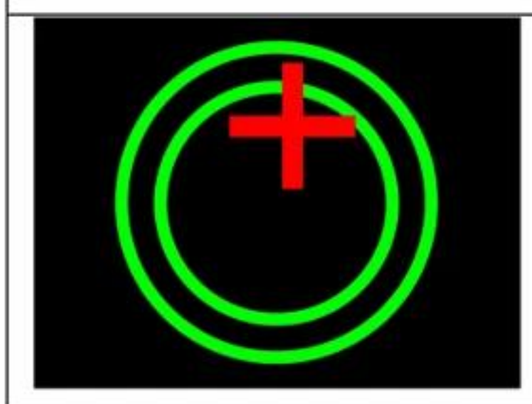
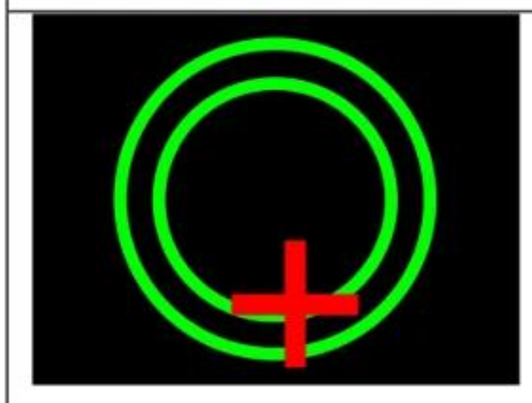
Picture 6



picture 7

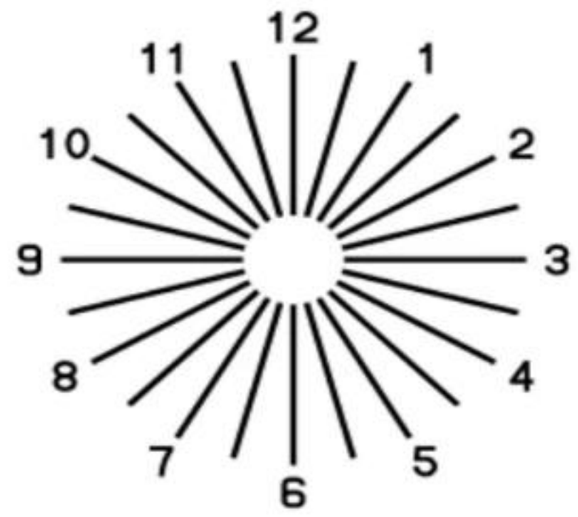
14. Schober Chart Function

- Auxiliary lens: Red filter on the right eye, green filter on the left eye

Subject's vision	Button	Correction
	Mask_ Right	Add the BO prism powers until the cross comes to the center of the circle
	Mask_Left	Add the BI prism powers until the cross comes to the center of the circle
	Mask_Up	Add the BU prism power to the right eye and BD prism power to the left eye until the cross comes to the center of the circle
	Mask_Down	Add the BD prism power to the right eye and BU prism power to the left eye until the cross comes to the center of the circle

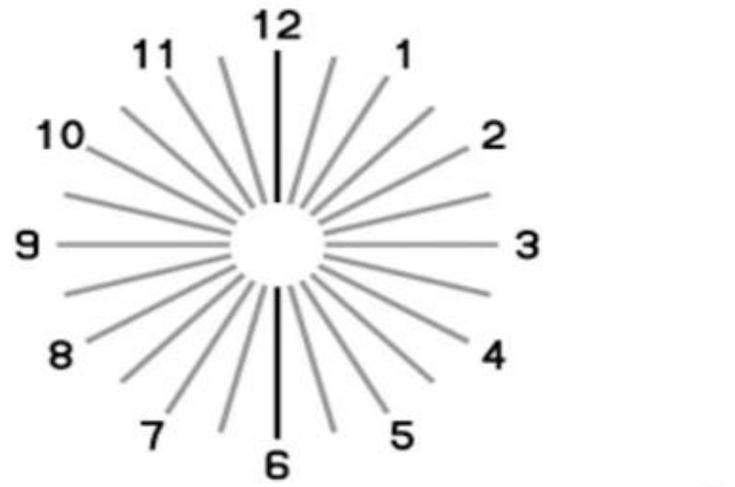
15. Astigmatism Chart Function

- For the astigmatism chart of this instrument, more types of radiation can be selected by setting. Moreover, there is the function to indicate the astigmatic axis more accurately. When the active chart is operating, the background of the liquid crystal display is fixed at the shipment setting even if it is changed.
- Select the astigmatism chart from the remote controller and indicate it on the liquid crystal display. You can execute the normal astigmatism test in this condition.



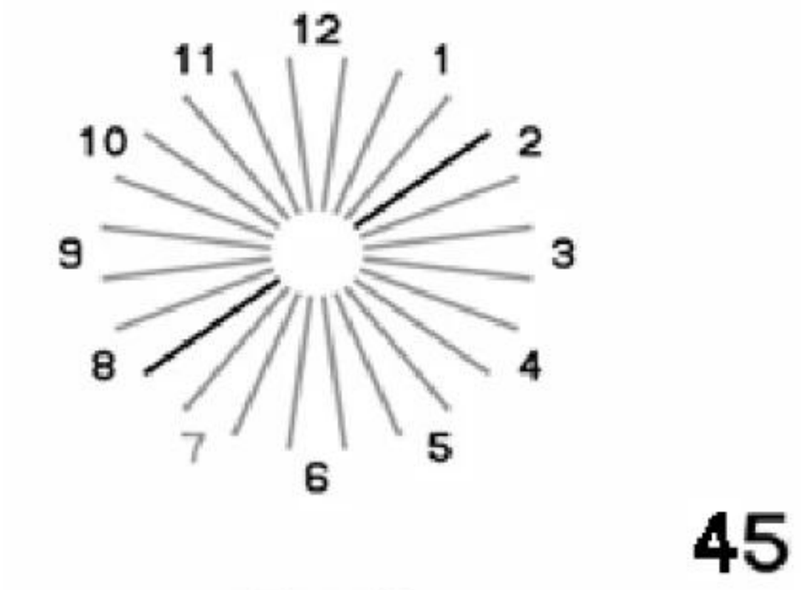
Picture 8

- Select the Mask Up and Mask Down button of the remote controller again. The color of the radiation except “12-6 o’clock” fades.



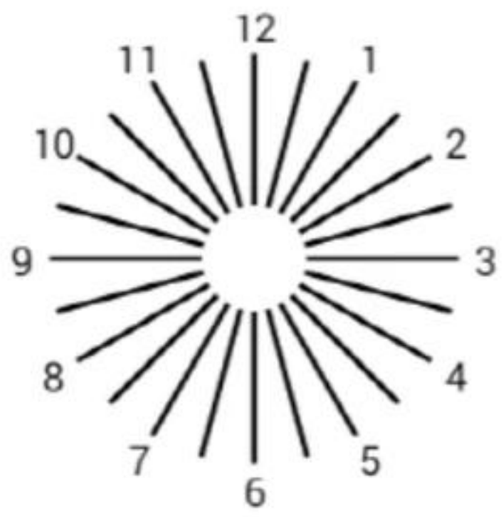
Picture 9

- Press the Mask Up and Mask Down button of the remote controller, and the deep color line can be rotated by 15°. Rotate the deep color line with the Mask Up and Mask Down button until it is seen most clearly.
  Press the Mask Up button, and the astigmatic axis is changed in the positive direction.
  Press the Mask Down button, and the astigmatic axis is changed in the negative direction.

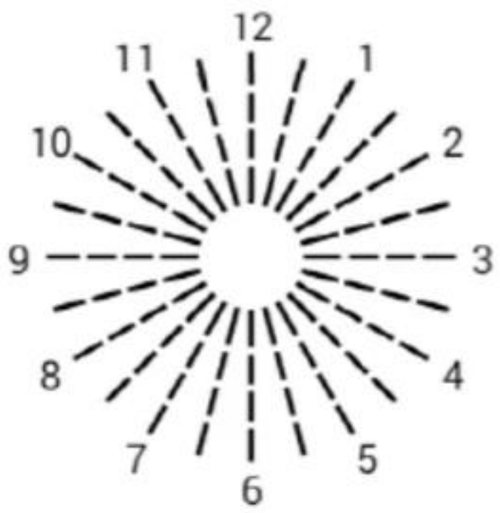


Picture 10.

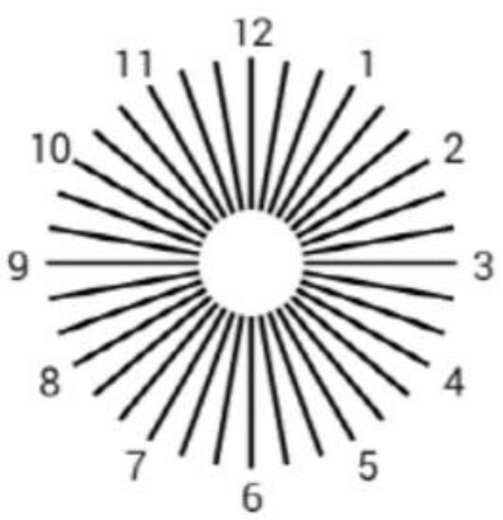
- EDC-BH(EDC-HP), Kind of Astigmatism type is A~G Type. It want Chart to test can select in menu



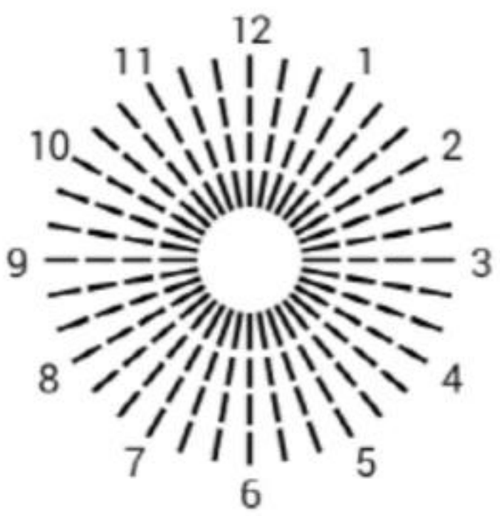
A Type



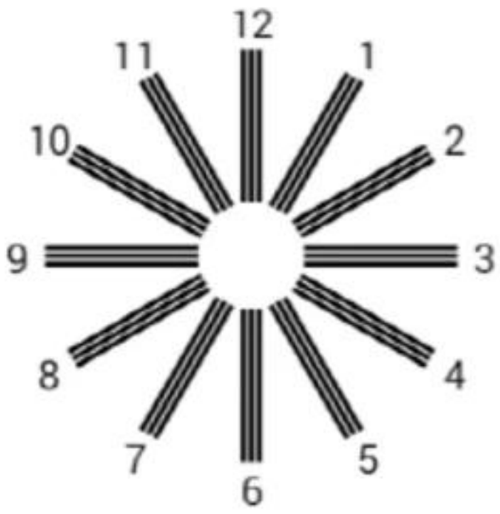
B Type



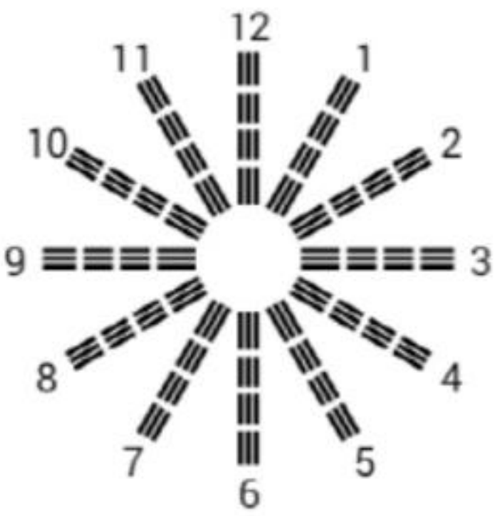
C Type



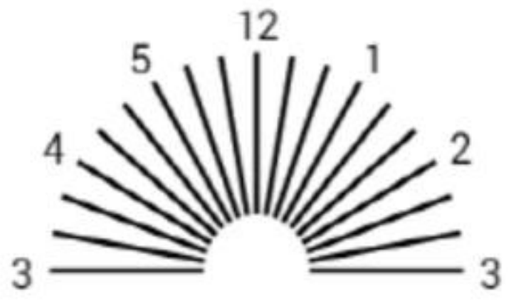
D Type



E Type



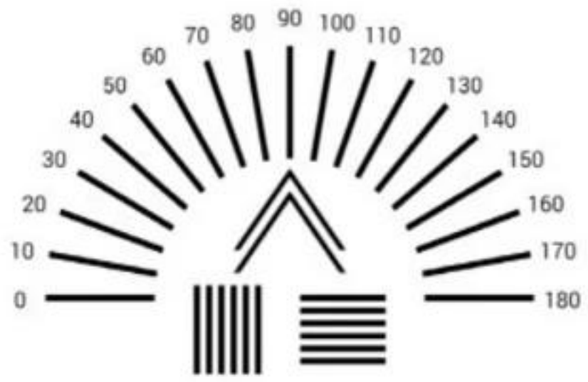
F Type



G Type

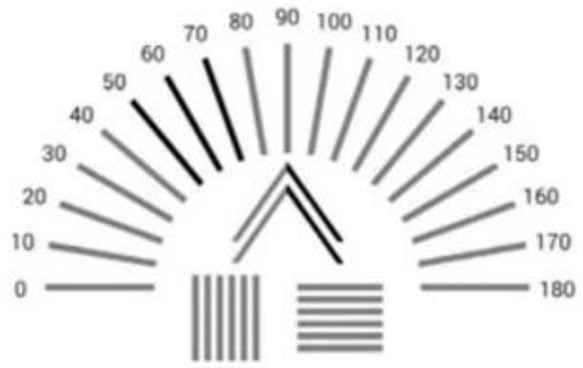
16. Fan & Block Chart Function

- It will be shown in figure 11 when you press astigmatism chart button in twice.
- Figure. 11 is a normal astigmatism test chart and apart from that it can be used as an additional test chart.
- Press Mask_up button to display the chart from 0 to 180 degree clockwise by the interval of 10 degree and for anti-clockwise display press Mask-down button. (figure no. 11)
- If the patient has astigmatism, the chart will be shown as figure no.12.
- Arrow mark will be adjusted until it appears clear. (See Figure no. 13)
- Adjust astigmatism axis as the arrow indicates using phoropter or EDR-H so that the patient could see Figure 14.



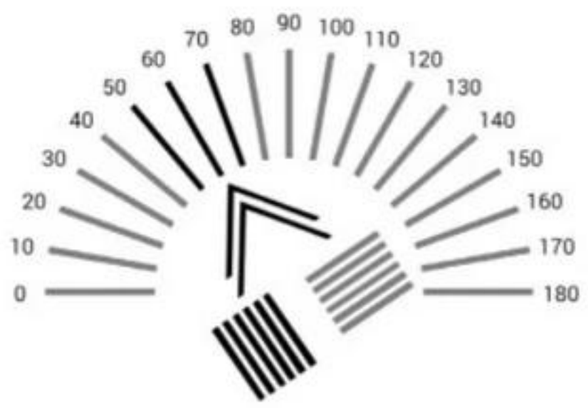
90

Figure 11



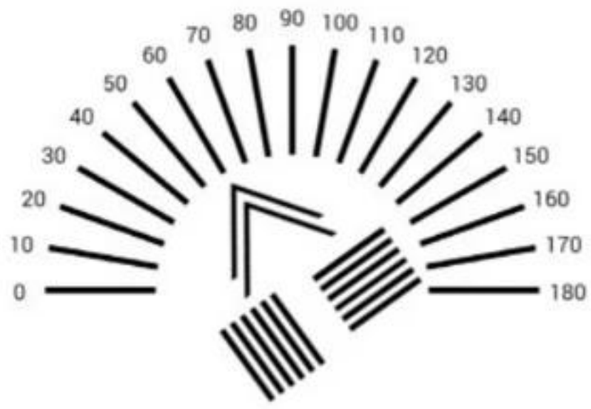
90

Figure 12



60

Figure 13

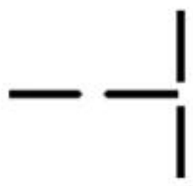
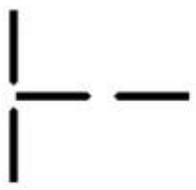
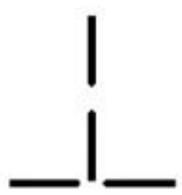


60

Figure 14

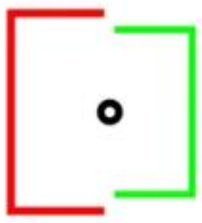
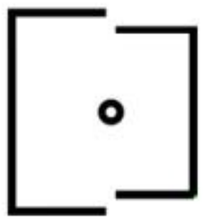
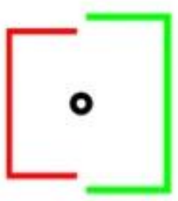
17. Reticle Chart Function

- Auxiliary lens: Red/Green Glasses(EDC-BH), Polarizing Glasses(EDC-HP)
- Right eye see the vertical bar and left eye see the horizontal bar.
- Basically, the two bars are moved symmetrically from the center coordinates of the LCD.
- Displayed by moving 0.5cm increments based on Distance 5m.
- When you pressed Single Mask button once: Unit and number are not displayed on the lower right.
- When you pressed Single Mask button twice: Unit and number are displayed on the lower right.

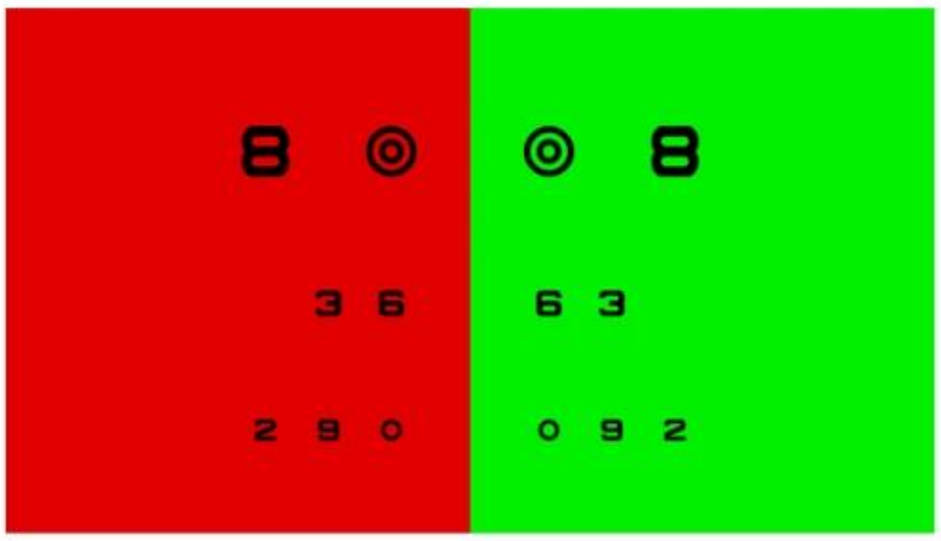
Subject's vision		**Button**	**Correction**
EDC-BH	EDC-HP		
		Mask_Right	Add the BO prism powers until a cross is formed.
		Mask_Left	Add the BI prism powers until a cross is formed.
		Mask_Up	Add the BD prism power to the right eye and BU prism power to the left eye until a cross is formed.
		Mask_Down	Add the BU prism power to the right eye and BD prism power to the left eye until a cross is formed.

18. Aniseikonia(Vertical) Chart Function

- Auxiliary lens: Red : Red/Green Glasses(EDC-BH), Polarizing Glasses(EDC-HP)
- Right eye see the right frame and left eye see the left frame.

Subject's vision		**Button**	**Correction**
EDC-BH	EDC-HP		
		Mask_Up	Enlarge only the left part of the chart displayed on the LCD.
		Mask_Down	Reduce only the left part of the CHART displayed on the LCD.

19. Red-green Chart Function



- Ideal appearance : The sharpness of letters on the red and green sides appears equ al

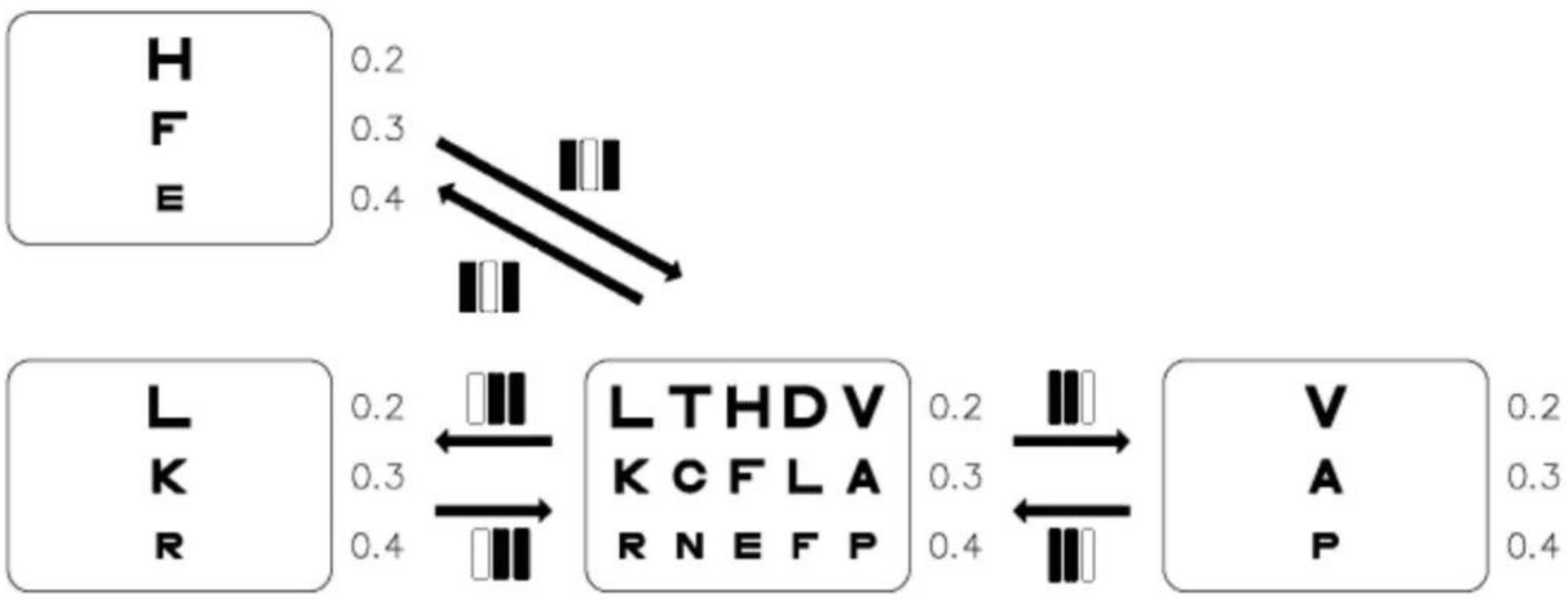
The letters on the red side are sharper.	Add the negative power.
The letters on the green are sharper.	Add the positive power.

20. Mask Function

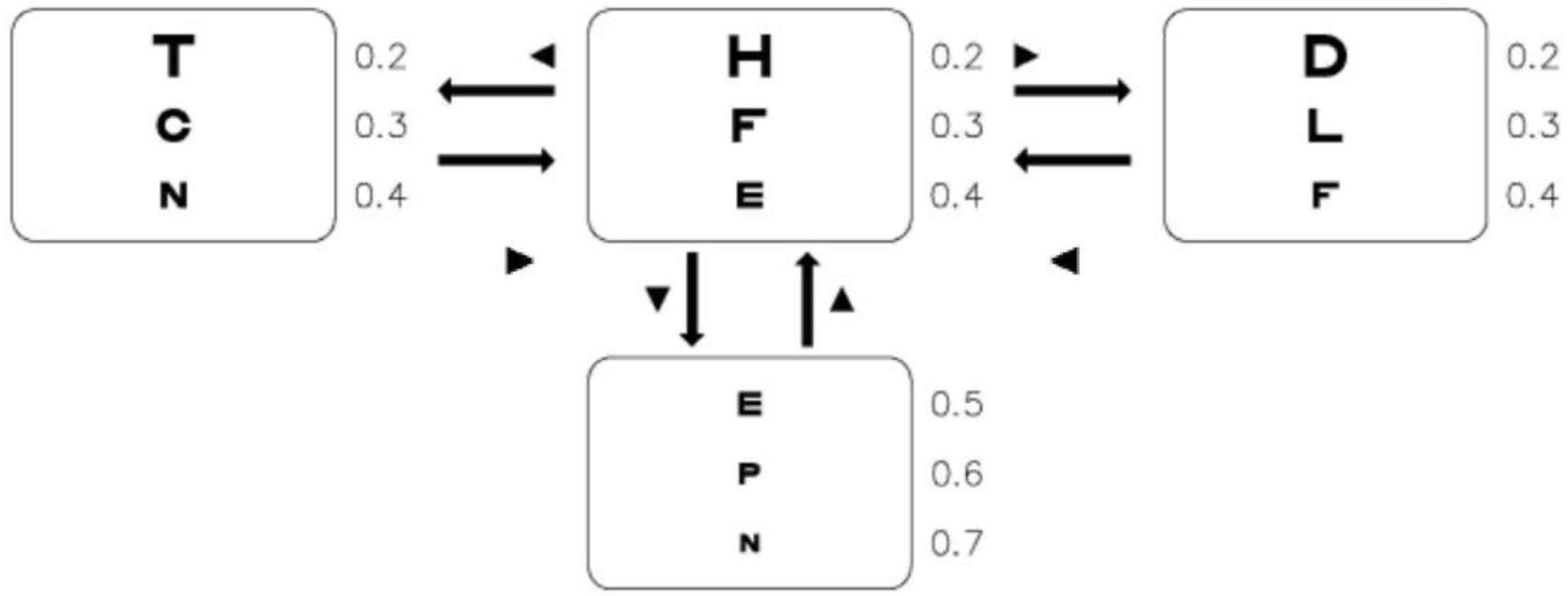
20.1 Vertical Mask

- Mask_Right button: To move to the right column
- Mask_Left button: To move to the left column
- Mask_Up button: To move to the up column
- Mask_Down button: To move to the down column
- Vertical Mask button: Return to the original chart

Ex1)



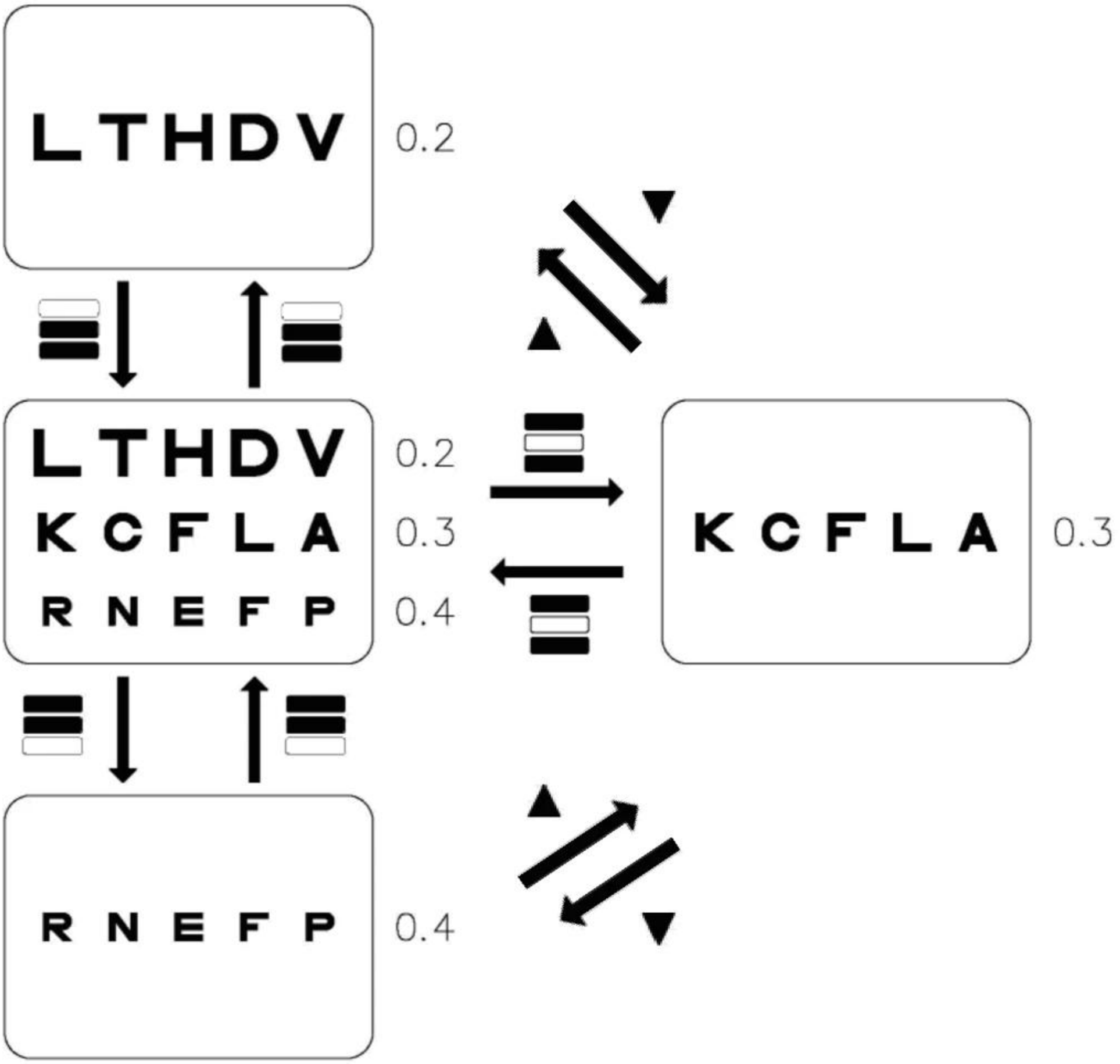
Ex2)



20.2 Horizontal Mask

- Mask_Right button: To move to the right row
- Mask_Left button: To move to the left row
- Mask_Up button: To move to the up row
- Mask_Down button: To move to the down row
- Horizontal Mask button: Return to the original chart

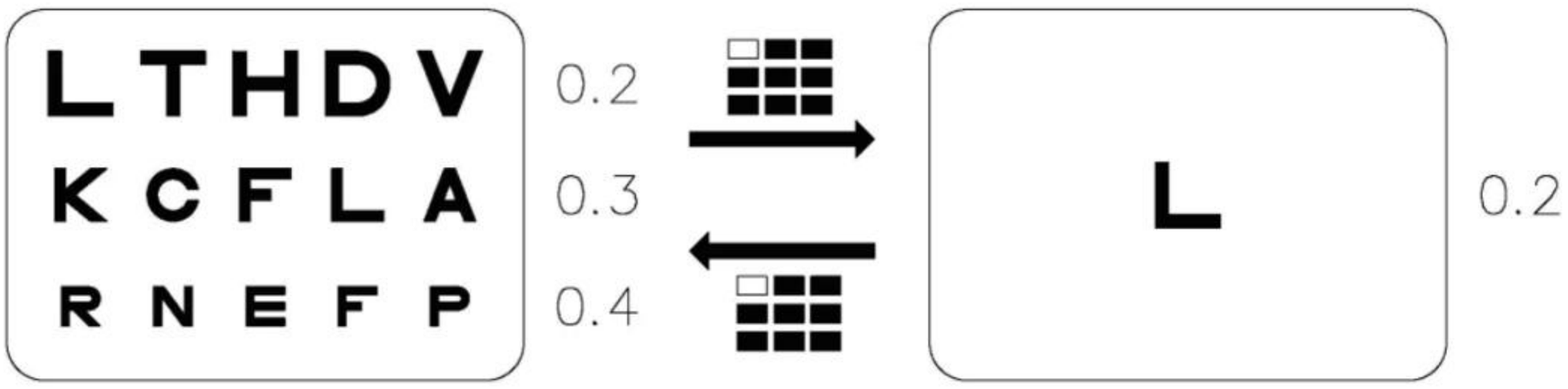
Ex1)



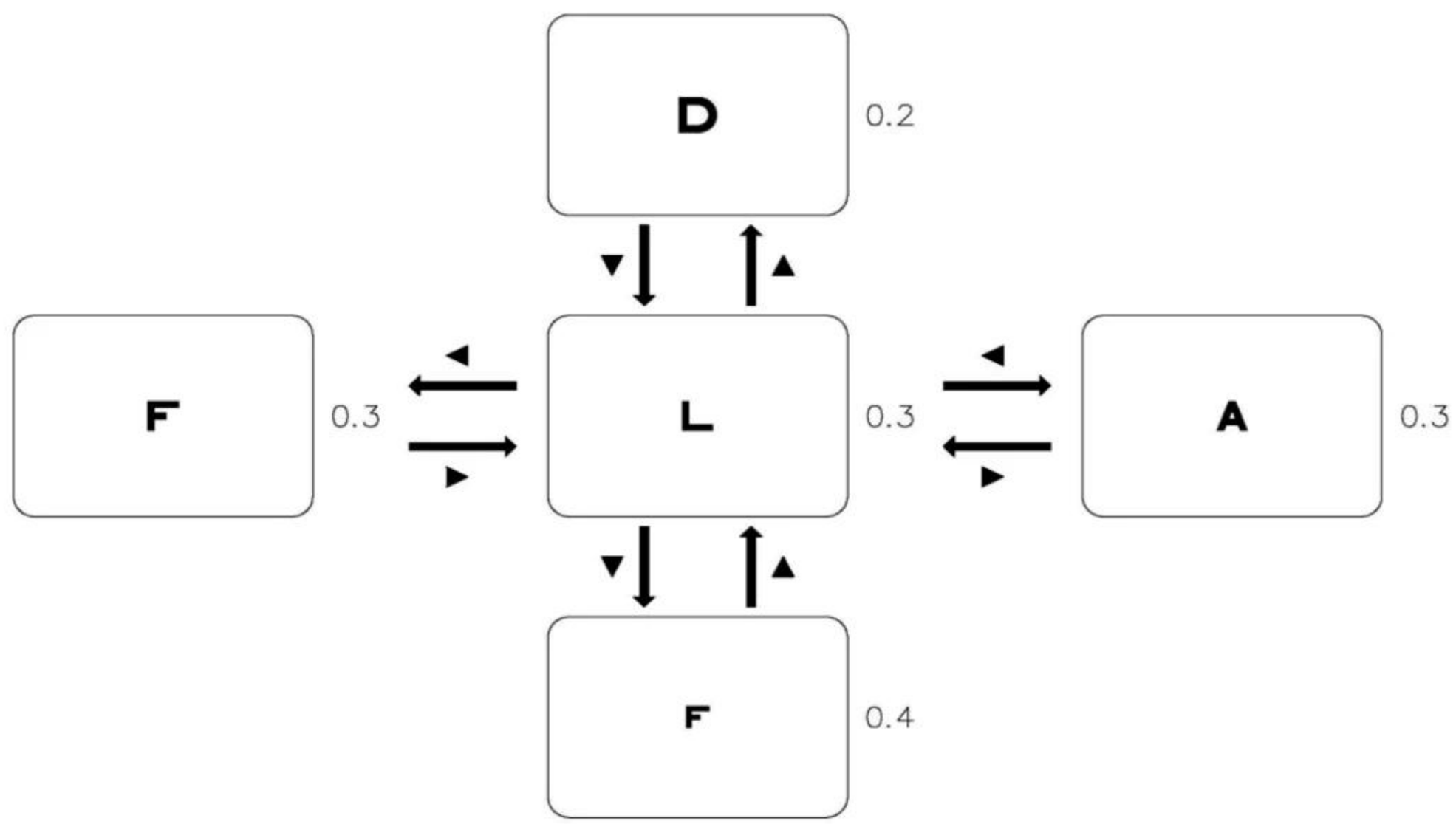
20.3 Single Mask

- Mask_Right button: To move to the right column
- Mask_Left button: To move to the left column
- Mask_Up button: To move to the up column
- Mask_Down button: To move to the down column
- Single Mask button: Return to the original chart

Ex1)

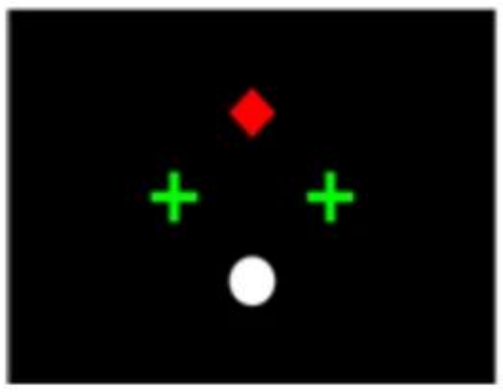
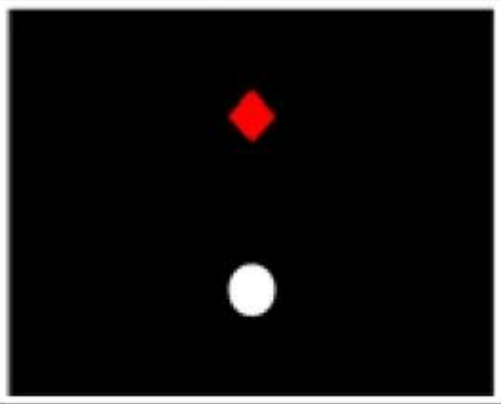
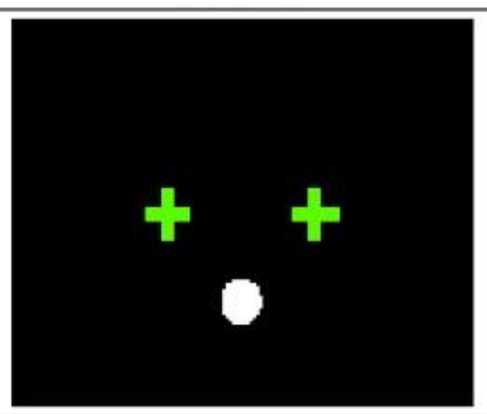
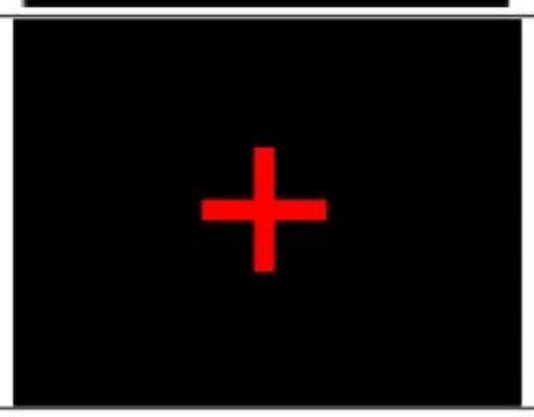
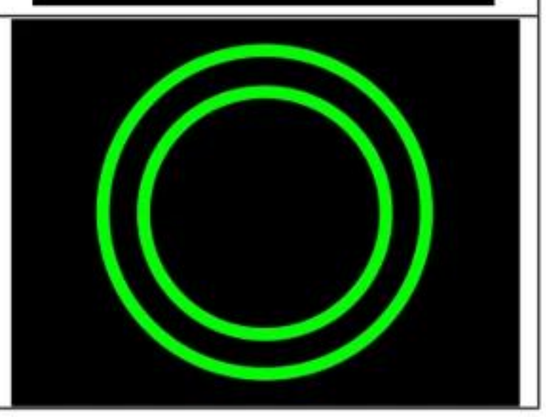


Ex2)

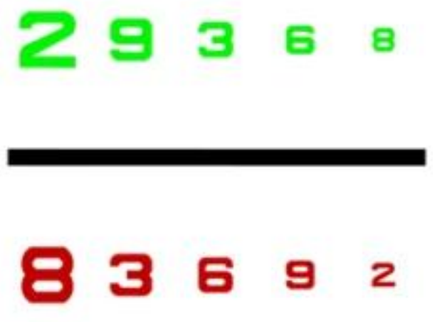


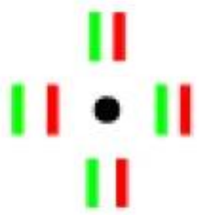
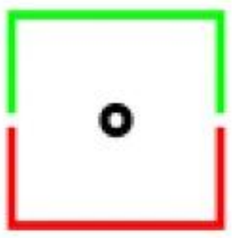
21. Red/Green Chart Function

Common charts

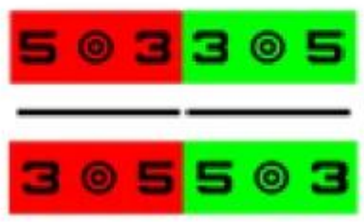
Chart		Red	Green
Worth			
Schober			

EDC-BH Only charts

Chart		Red	Green
Stereoscopic vision			
Binocular balance			
Phoria			
Phoria with fixation			

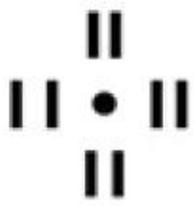
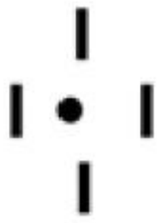
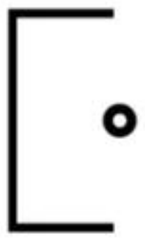
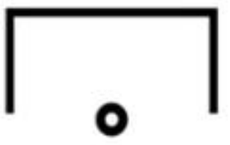
Stereo				
Vertical coincidence				
Horizontal coincidence				

EDC-HP Only chart

Chart		Red	Green
Duochrome balance			

22. Polarizing Chart Function

EDC-HP Only

Chart		45°	135°
Phoria			
Phoria with fixation			
Stereo			
Vertical coincidence			
Horizontal coincidence			
Duochrome balance			
Binocular balance			

23. Maddox Test Function

- EDC-BH(EDC-HP) allows you to test by either light from LED or white spot illuminant in the center of LCD chart. According to LED light or white spot of EDC-BH's screen, you can process the testing.
- If you select "off" for Fixation Target Lamp from the menu, the spot will be shown in the center of LCD chart and LED light brightness of LCD chart can be controlled from one to ten power.
- The screen will be shown as only black screen if you select 1~10 of fixation target lamp in the menu.

24. Von Graefe Chart Function

- When you press Red/Green Chart(figure 3) button twice on the remote control, the LCD will display as shown in figure 1.
- Figure 1 is a chart showing the characters in a horizontal arrangement.
- And then if you press Red/Green Chart(figure 3) button on the remote control once more, the LCD will display as shown in figure 2.
- Figure 2 is a chart showing the characters in a vertical arrangement.
- If you press Red/Green Chart(figure 3) button on the remote control once more, the LCD displays as shown in figure 3 and returns to the initial screen.

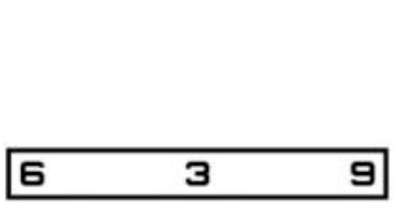


figure 1



figure 2

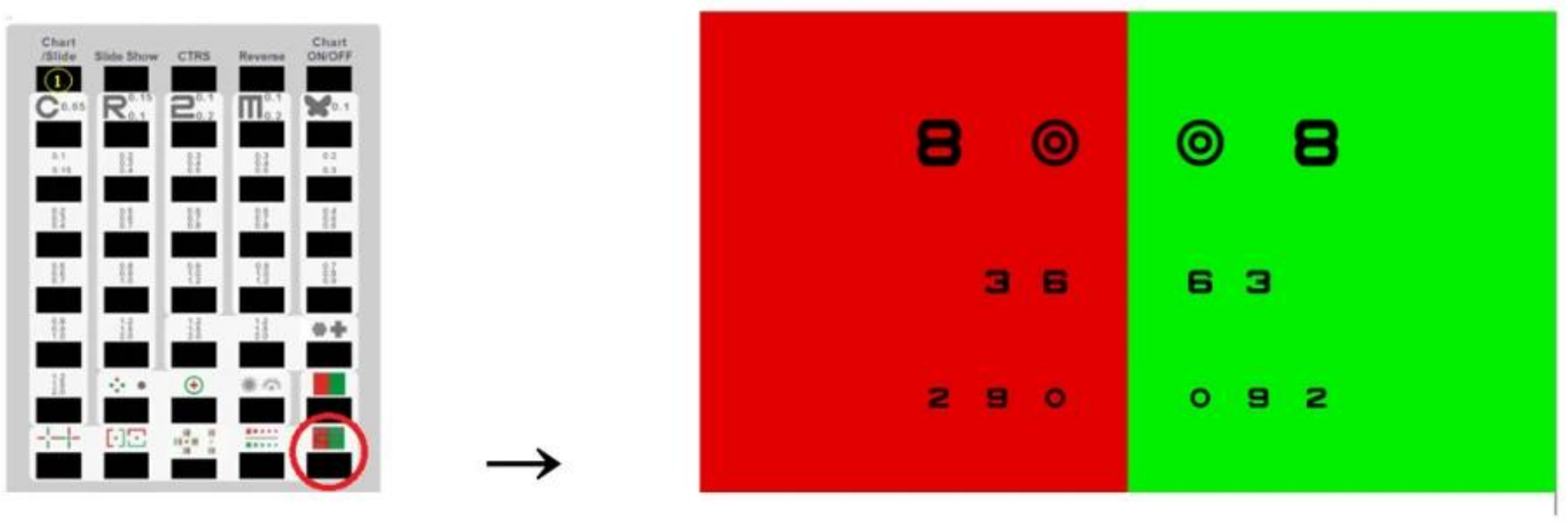


figure 3

● Horizontal line

- Use : To detect vertical phoria(Von Graefe test)
- Auxiliary lens : 10△BI to the right eye
- Ideal appearance :

Right eye	Left eye	Binocular ideal
6 3 9	6 3 9	6 3 9 6 3 9

● When the two rows are not in line, see the table below to reduce the amount of shift

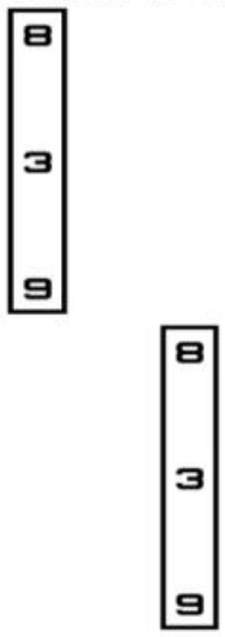
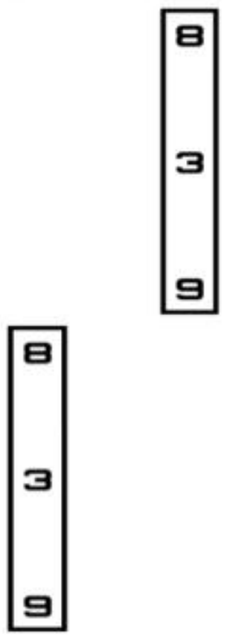
Subject`s vision	Phoria	Correction
<1> The left row is higher 6 3 9 6 3 9	Right eye hyperphoria	Add the BD prism power to the right eye until the rows line up.
<2> The right row is higher. 6 3 9 6 3 9	Left eye hyperphoria	Add the BU prism power to the right eye until the rows line up.

● Vertical line

- Use : To detect horizontal phoria(Von Graefe test)
- Auxiliary lens : 6△BU to the right eye
- Ideal appearance :

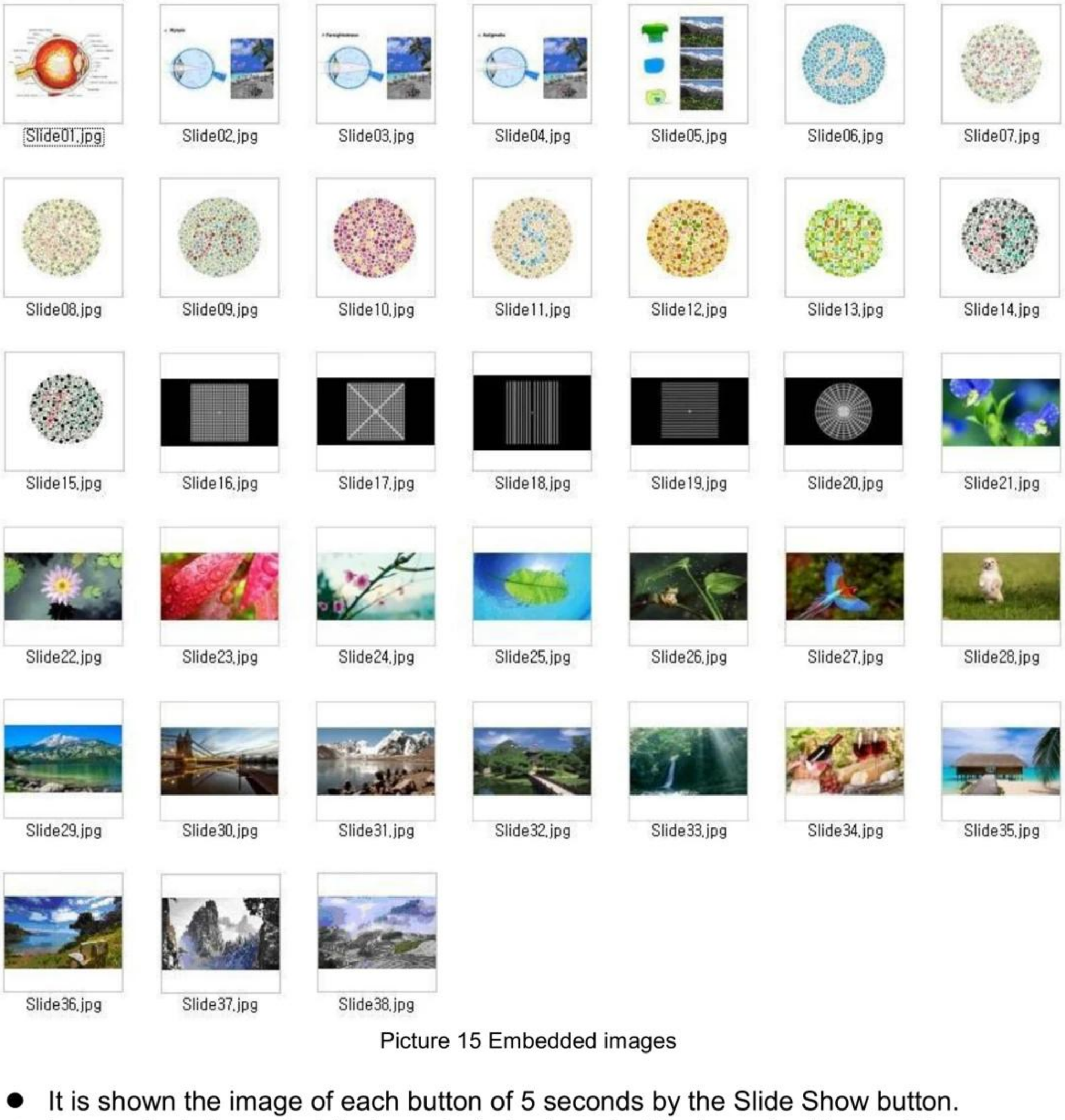
Right eye	Left eye	Binocular ideal
8 3 9	8 3 9	8 3 9 8 3 9

● When the two column are not is line, see the table below to reduce the amount of shift.

Subject`s vision	Phoria	Correction
<1> The upper column is on the left.  	Esophoria	Add the BO prism power to the left eye until the two columns line up.
<2> The upper column is on the right.  	Exophoria	Add the BI prism power to the left eye until the columns line up.

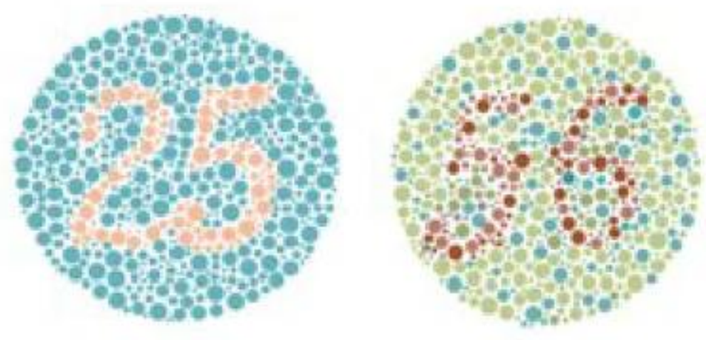
25. Slide Function

- EDC-BH(EDC-HP) has a image of each button. Show the image on Slide condition when press the button.



Picture 15 Embedded images

- It is shown the image of each button of 5 seconds by the Slide Show button.
- Images includes color blindness test charts, color blindness test is possible.



Picture 16 Picture 17

How to change the images of EDC-BH(EDC-HP) built on

- Users can change the images of EDC-BH(EDC-HP) built on (USB flash drive is required)
- Create a “image” folder in USB flash drive.
- Insert to change images in “image” folder.
  - ✓ Images must be the name of “Slide+NUMBER(1~38).jpg”
    Ex) Slide01.jpg, Slide13.jpg
  - ✓ Logo image must be the name of “EDC-BH Logo.jpg” (Case of Pola Type, must be the name of “EDC-BH(EDC-HP Logo.jpg”)
- Put USB flash drive in EDC-BH(EDC-HP) after Boot up that. Select "Images Update" on Menu setting, change the image.
- It seems Full-HD Image when Image resolution is 1920x1080 Image.

26. Video Play Function

- EDC-BH(EDC-HP) can play video for announce of Ophthalmology or optician's shop and concentration of child

26.1 Video Play Specifications

- USB Class: Class 2 or more
- File Format: AVI, MPEG, MP4, MKV

26.2 Using the Video Play function

- Make the “VIDEO” folder in USB flash
- Insert to files in “VIDEO” folder of USB flash
- Insert USB into the USB port at EDC-BH(EDC-HP) like as figs. 1 and 2.

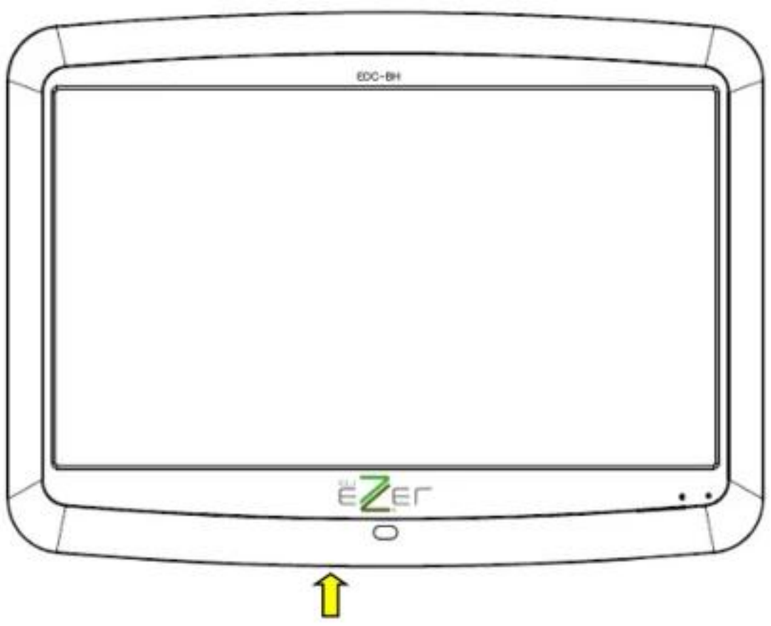


figure 1

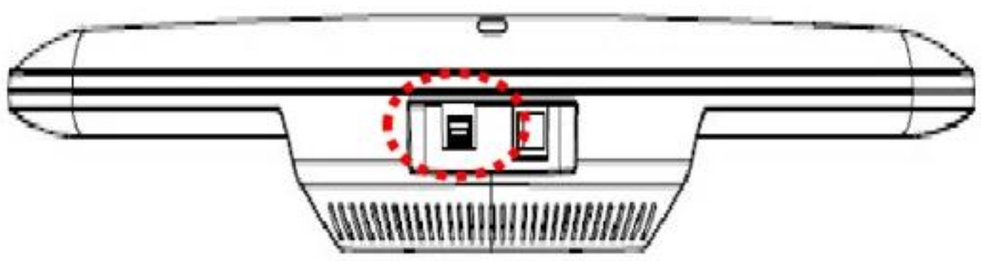


figure 2

- After connected to USB port, waiting about 2~4 seconds to be recognized the USB flash at EDC-BH(EDC-HP). If movie size is bigger than 1.3GByte or a number of movie is many, the USB flash loading time will take 1~2minite.
- Press the Chart/Side button two times of remote control. And then you can see the Video Select Screen (Figure 3).

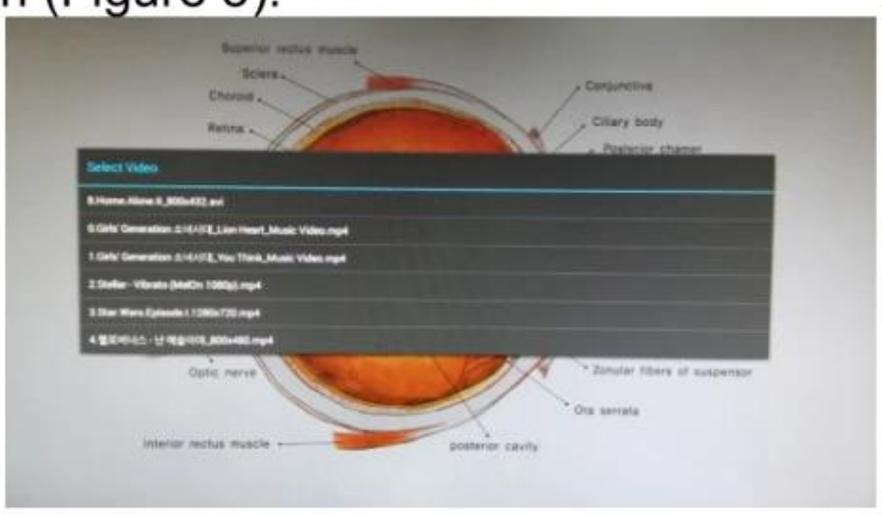
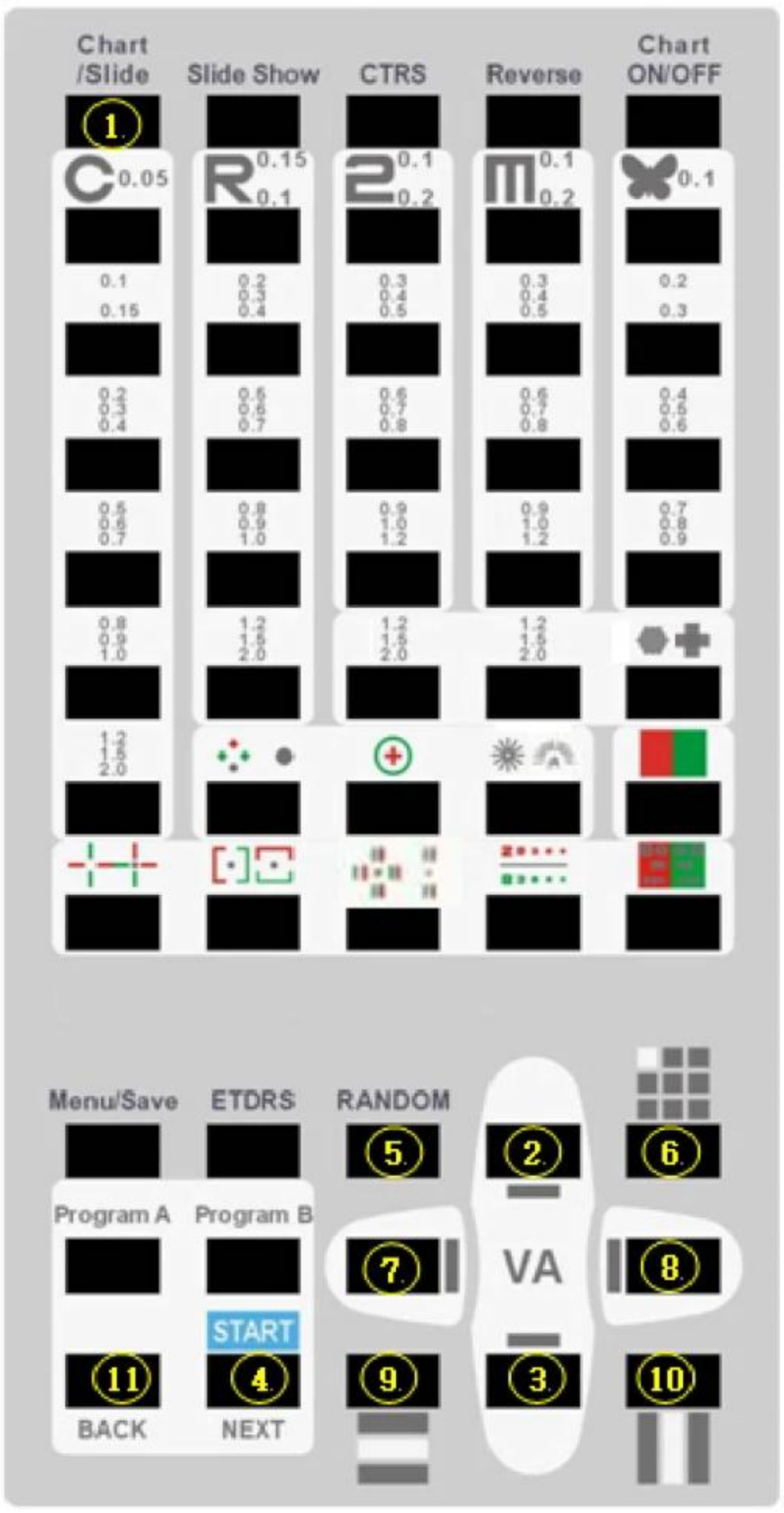


figure 3

- You can select movie for up/down button of remote control, and then press START button for play.
- If you want back to the Chart screen, press Chart/Slide or BACK button.

26.3 Remote control function to Video Play



① USB recognize popup / comeback chart screen

② Select upper movie / Increase volume

③ Select downer movie / Decrease volume

④ Start video play

⑤ Stop video

⑥ Pause video play

⑦ Backward 10 seconds

⑧ Forward 10 seconds

⑨ Select previous file to play

⑩ Select next file to play

⑪ Comeback to chart screen

26.4 PR(Promotion) Video Play function

- If sleep mode is not turn on after 5 min, 10min and 30 minutes later sleep mode will be active automatically. In that mode you can play your video advertisement.
- Please follow the steps to play video advertisement.
  - ✓ Make a folder named ‘PR’ in USB.
  - ✓ Store your video file inside the ‘PR’ folder.
  - ✓ From menu, set the time for ‘Power Save Time’.
  - ✓ Set ‘Yes’ for PR(Promotion) video play at Auto Light Off.
  - ✓ Insert the USB drive to EDC-BH. (figure 1.2)
- At the time of playing video file, remote control function will followed by clause 25.3.
- Sub-tittle is not compatible in EDC-BH

26.5 Note of video play function

- Depending on the video, "⑦ Backward 10 seconds" function can not be synchronized temporarily.
- Subtitles are not supported.

27. Bluetooth Function (optional)

EDC-BH(EDC-HP) and EDR-H, can be connected by wireless communication with Bluetooth Dongle. The wireless communication among other products except EDC-BH(EDC-HP) and EDR-H is not possible yet. (Communication may fail in heavy signal traffic)

27.1 Recommended specification for Bluetooth

- Version: Bluetooth 4.0 or more
- Class: class 2 or more
- Data Rates: Up to 3Mbps
- Distance of Use: Up to 20M

27.2 Check the EDR-H version

Before connecting to Bluetooth, you need to check the version of EDR-H. If there is a power button( ) on the EDR-H chart selection screen, it is version 3. If there is no power button, it is version 4.



EDR-H Version 3



EDR-H Version 4

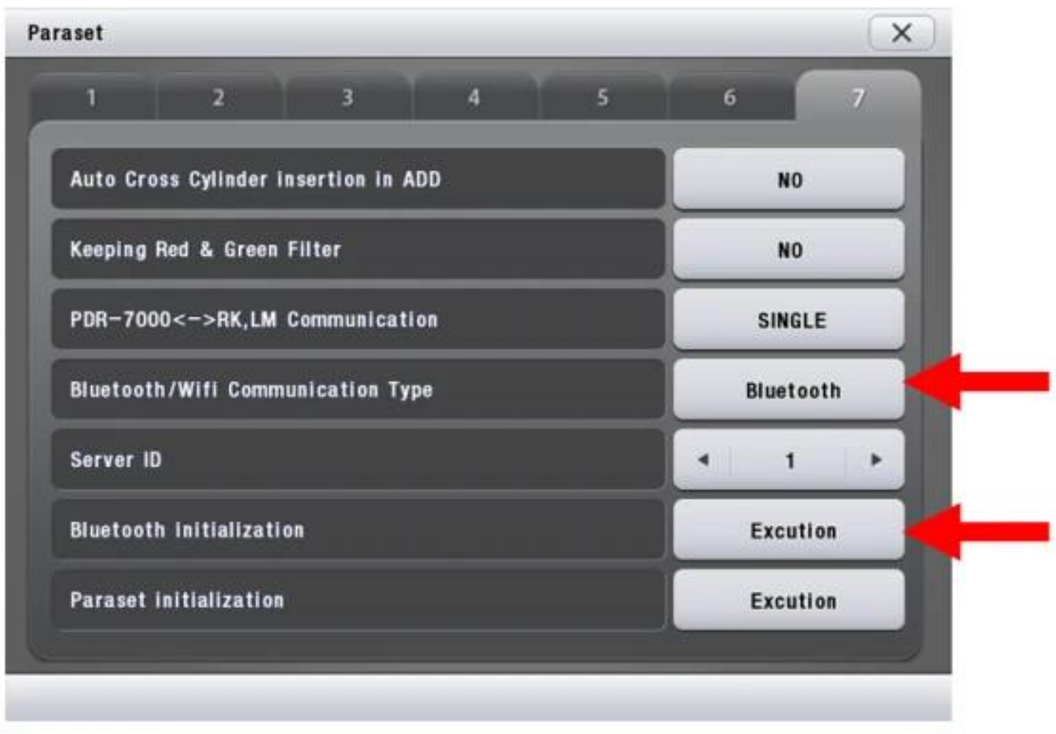
27.3 EDR-H Version 4 Bluetooth connection

NOTE	If there are several Bluetooth devices (smart phone, etc.) during Bluetooth connection operation of EDR-H and EDC-BH chart, communication may be interrupted. In the Bluetooth Pairing step, it is safe to turn on only the Bluetooth device of the set 1 device to be connected.

- Initializing EDR-H Bluetooth Settings

(1) On the EDR-H's Paraset page 7, set the 'Bluetooth / Wifi Communication Type' item to "Bluetooth".

(2) Bluetooth Initialization ➔ Execution.
(Bluetooth initialization is required before proceeding with Bluetooth pairing.)



(3) The Select EDC-BH(EDC-HP) from the 'Select Chart' menu.

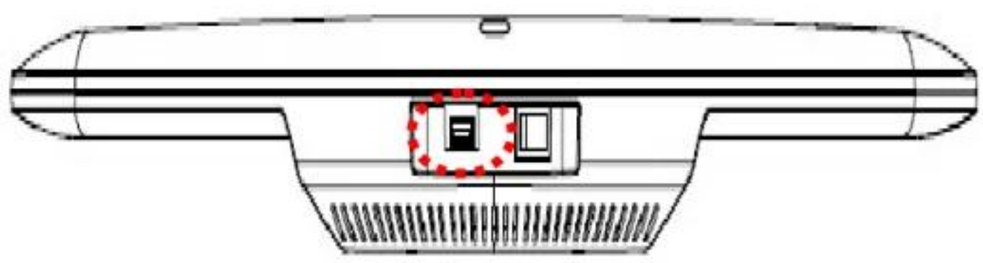
※ When using EDC-BH R type, check the version of EDC-BH. Version of the EDC-BH can be checked from the top left of the screen after pressing the EDC-BH Remote Control Menu. Select "R" type when the EDC-BH version is lower than 1.2.10 (1.2.00 to 1.2.09), or "NR" type when it is higher than 1.2.10.

(4) Reboot EDR-H.



- EDC-BH (EDC-HP) Bluetooth communication connection

(1) Insert Bluetooth dongle into USB hub at the bottom of EDC-BH to pair with wireless Mouse and turn on power.



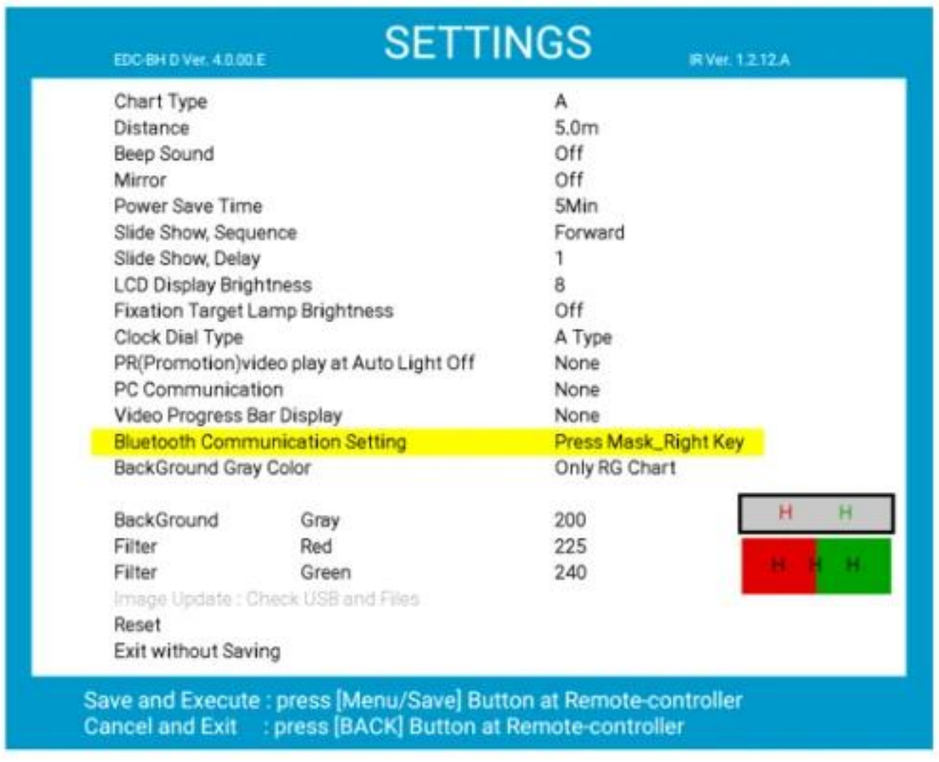
(2) Press “on/off button” of remote controller on start-up screen.



(3) Turn on the EDC-BH (EDC-HP).

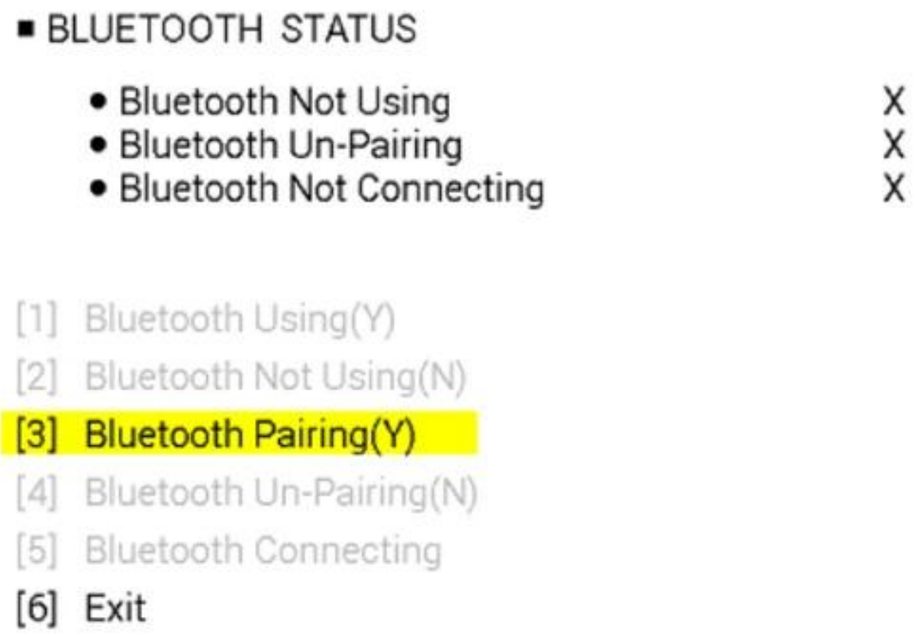
(4) When the EDC-BH (EDC-HP) logo screen, press the SETUP button on the remote control to go to the SETUP menu.

(5) Use the up and down buttons to move to the Bluetooth item, select(right button).



(6) Select '[3] Bluetooth Pairing (Y).' (Right button)

(7) When pairing is completed, 'Pairing Success' message will be output..



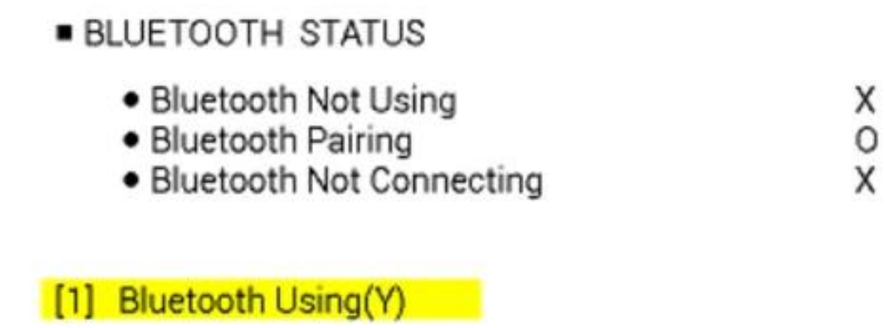
(8) After completing pairing, select [1] Bluetooth Using (right button). Wait a few seconds and the message 'Bluetooth Connection Success' will be displayed.

(9) In 'Bluetooth using (Y)' step, the Bluetooth communication status is unstable and connection may fail.
In this case

■ EDR-H: Go to Paraset page 7. Bluetooth Initialization ➔ Execution.

■ EDC-BH (EDC-HP): Select '[4] Bluetooth Un-Pairing (N)' ➔ '[2] Bluetooth Not Using(N)'
After resetting the settings in order, need to reboot the device and start again from Step 1.

(10) Select chart with EDR-H to check communication.
Bluetooth connection completed.





If the Bluetooth is connected normally, the color of the Bluetooth icon in the upper left corner changes as shown in the picture above to enable wireless. Bluetooth Not connected Bluetooth, select [4] Bluetooth Un-Pairing, [2] Bluetooth Not Using, remove the dongle while turning off the power of the EDC-BH(EDC-HP) device, then connect again to turn on the device to connect to Bluetooth. Try the process again.

28. Maintenance and Repair

28.1 Replacement the Battery of Remote Controller

- Remove the battery cover of the remote controller
- Replace the batteries and the battery cover to the remote controller

⚠WARNING	Be sure to observe the polarity marks (plus + & minus -) inside the battery compartment. Remove these batteries if equipment is not likely to be used for some time. Follow local governing ordinances and recycling plans regarding disposal or recycling of device components.

28.2 Cleaning

- Wipe the cover and the screen with a dry soft cloth when they get dirty.

28.3 Service Information

- You cannot solve the problem device sales representative to request a consultation. Show product labels and distributors to use the information below, please let us know.

  Model Name: EDC-BH or EDC-HP
  Product Number: Display products on the label says the 8-digit character
  Symptoms: A detailed technical

- If you can't contact with your local distributor, you can directly get in touch with the service department of the EZER using the phone number and the address written in the below table.

  Manufacturer: EZER
  Address: 9990 NW 14th Street Suite 105 Doral, FL 33172 USA
  Tel: +1(888) 881-1122
  Fax: +1(786) 621 0521

- Disposal of equipment

⚠WARNING	This equipment has battery that can cause environment pollution when be left. Ahead of going into the discard, ask way to do it or consult with selling agency
⚠WARNING	Upon request, circuit diagrams, component part lists, descriptions, calibration instructions, or other information will be provided to assist service personnel to repair parts of the equipment that are designated by EZER as repairable by service personnel.

29. Specifications

Distance of projection	1.0~8.0m (0.1 step adjustment)	
Charts	Landolt, English, Russian, Numeral, Snellen, Children, Mask(Horizontal. Vertical, Single Optotype), Special charts(Separate Red/Green at EDC-BH, Red/Green and Polarization at EDC-HP), Color Blindness	
Program	2 programs with a maximum of 40 charts each	
External input/output port	USB(USB 2.0), RS-232	
Communication	RS-232 at Wired connection Bluetooth at Wireless connection	
LCD	23-inch Full-HD (1920 x 1080 pixels) at EDC-BH 24-inch Full-HD (1920 x 1080 pixels) at EDC-HP	
Memory Card	microSDHC Class10, 8GB or more size	
Power Supply	AC100-240V, 50/60Hz	
Power Consumption	EDC-BH:	45-55VA
	EDC-HP:	35-45VA
Dimension	Body:	583(W) × 55(D) × 423(H) mm
	Remote controller:	64(W) × 196(D) × 20(H) mm
Weight	Body:	about 6 kg
	Wall Mount Bracket:	370 g
	Remote controller:	160 g (Battery included)
Environment conditions		
(In use)	Temperature:	+10℃ ~ +40℃
	Humidity:	30%RH ~ 85%RH
	Pressure:	700hPA ~ 1060hPA
(In transport/storage)	Temperature:	-10℃ ~ +55℃
	Humidity:	10%RH ~ 90%RH
	Pressure:	600hPA ~ 1060hPA

30. Components.

Product Body : EDC-BH (EDC-HP)	1EA
Wall Mount Bracket	1EA
Remote Controller	1EA
Dust Cover	1EA
Power Cable (with Ferrite Core ZCAT3035-1330)	1EA
Battery	2EA

Optional accessories

Red/Green Glasses	1EA
Polarizing Glasses *< EDC-HP Only>*	1EA

31. EMC (ELECTROMAGNETIC COMPATIBILITY)

The EDC-BH(EDC-HP) complies whit these standards as tabled below. Follow the guidance on the ta bles for use of the device in the electromagnetic environment.
EDC-BH(EDC-HP) is suitable for the home healthcare environment.

Requirement Test	Reference standards	Application point	Test level
Conducted Disturbance at The Main Ports	EN55011:2009+A1:2010, CISPR11:2009+A1:2010	Mains	Group 1, Class A
Radiated Disturbance		10m distance	Group 1, Class A
Harmonic Current Emissions	EN 61000-3-2:2014 IEC 61000-3-2:2014	AC power source	Class A
Voltage Fluctuations and Flicker	EN 61000-3-3:2013 IEC 61000-3-3:2013	AC power	Pst : 1, Plt : 0.65 Dmax : 4%, Tmax : 0.5s, DCmax 3.3%
Electrostatic Discharge(ESD)	EN 61000-4-2:2009 IEC 61000-4-2:2008	Product Enclosure	Air-Direct ±2, ±4, ±8, ±15kV Contact-Direct ±8kV
Radiated RF Electromagnetic Fields	EN 61000-4-3:2006 +A2:2010 IEC 61000-4-3:2006 +A2:2010	Product Enclosure	3 V/m, 80 % Amplitude Modulation (1 kHz) 9 V/m, Pulse Modulation (217 Hz) 27 V/m, Pulse Modulation (18 Hz) 28 V/m, FM ± 5 kHz Deviation (1 kHz sine) Pulse Modulation (18 Hz) Pulse Modulation (217 Hz)
Electrical Fast Transient / Burst (EFT)	EN 61000-4-4:2012 IEC 61000-4-4:2012	AC main Signal: Clamp	AC Power Ports ±2kV Signal: ± 1 kV Peak Repetition Frequency 100kHz
Surges	EN 61000-4-5:2014 IEC 61000-4-5:2014	AC main: Direct	Differential mode: ± 0.5 kV, ± 1 kV Common mode: ± 0.5 kV, ± 1 kV, ± 2 kV
Immunity Conducted Disturbances	EN 61000-4-6:2014 IEC 61000-4-6:2013	AC main: CDN(M3) Signal: Clamp	Tested frequency0.15 MHz ~ 80 MHz 3 V (6 V in ISM bands), 80 % Amplitude Modulation (1 kHz)
Magnetic Field Immunity	EN 61000-4-8:2010 IEC 61000-4-8:2009	Enclosure x, y, z	Frequency 50/60 Hz 30 A/m
Dips and Interruptions	EN 61000-4-11:2004 IEC 61000-4-11:2004	Input AC power port 100 V, 50/60 Hz, 240 V, 50/60 Hz	- 100% voltage reduction; 0.5 Period; 0,45,90,135,180,225,270,315 degrees - 100% voltage reduction; 1 Period; 0 degrees - 30% voltage reduction; 25/30 Period ; 0 degrees - 100% voltage reduction; 250/300 Period; 0 degrees

* The equipment is tested under specified conditions of operation.