YPB-2100
LCD VISUAL CHART
User Manual

CE

Product Name:	LCD VISUAL CHART
Nome do produto:	TABELA VISUAL DE LCD
Nombre del producto:	TABLA VISUAL LCD
Ürün Adı:	LCD GÖRSEL ŞEMA
Nome prodotto:	TABELLA VISIVA LCD
Produktname:	LCD-VISUAL TABELLE
Nom du produit:	TABLEAU VISUEL LCD
Име на продукта:	LCD ВИЗУАЛНА КАРТА
Produkto pavadinimas:	LCD ženklų ekranas
Nazwa produktu:	WYKRES WIZUALNY LCD
Název produktu:	VIZUÁLNÍ TABULKA LCD
Toote nimi:	LCD VISUAALNE KAART
Produkta nosaukums:	LCD Vizuālā karte
Όνομα προϊόντος:	ΟΡΑΤΙΚΟ ΔΙΑΓΡΑΜΜΑ LCD
Numele produsului:	HABĂ VISUALĂ LCD
Productnaam:	LCD VISUELE KAART

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Preface

Thank you for purchasing and using our LCD visual chart.

⚠ Please read this User Manual carefully before using this device. We sincerely hope that this User Manual will provide you with sufficient information to use the device.

Our pursuit is to provide people with high-quality, complete-function and more personalized devices. Information in promotional materials and packing boxes is subject to changes due to performance improvement without additional notice. Chongqing Yeasn Science - Technology Co., Ltd. reserves the rights to update the devices and materials.

If you have any questions during using, please contact at our service hotline: (86-023) 62797666, we will be very happy to help you.

Your satisfaction, our impetus!

Information of manufacturer

Name: CHONGQING YEASN SCIENCE - TECHNOLOGY CO., LTD

Address: 5 DANLONG ROAD, NAN'AN DISTRICT, CHONGQING, CHINA.

Tel: 86-23 62797666

Content

1. Basic information

1.1 Uses

Used to detect visual sensitivity, refractive properties and binocular vision function of human eye.

Produce name: LCD visual chart.

Model: YPB-2100

Software version number: V3

Contraindications: none.

Target groups of patients: adults, children.

Intended users: optometrists in hospital ophthalmology and optical shops.

Specific qualifications of device users and/or other persons: have a qualification certificate for optometry and glasses.

If cleaning and maintenance needed, please power off the product and unplug from the socket. Detailed cleaning and maintenance method, please refer to 8 Cleaning and Protection 9 Maintenance.

1.2 Performance Parameters

1.2.1 LCD displayer: 23.8 inches (1920 ×1080 pixels)

1.2.2 Optometry distance: 1.5~7.3 m optional, step 0.1 m

　　　　　　　　5-24 ft optional, step 0.5 ft

1.2.3 Optotypes

Visual Chart: Used for vision test, including 6 types Charts such as "E", "C", Letter, Number, Kids and ETDR.

1.2.4 Visual Charts display modes: all, single, row and column.

1.2.5 Automatic screensaver: 5 mins, 15 mins and 45 mins are optional.

E/C/Letter/Number/Kids							
5-Grade	LOG	decimal1	decimal2	Imperial	Metric	decimal3	decimal4
3.6	1.4	0.04	0.05	20/500	20/500	0.04	0.04
3.7	1.3	0.05	0.06	20/400	20/400	0.05	0.05
3.8	1.2	0.06	0.07	20/300	20/300	0.06	0.066
3.9	1.1	0.08	0.08	20/250	20/250	0.08	0.08
4	1	0.1	0.09	20/200	20/200	0.1	0.1
4.1	0.9	0.12	0.1	20/150	20/150	0.125	0.133
4.2	0.8	0.15	0.2	20/100	20/100	0.16	0.2
4.3	0.7	0.2	0.3	20/90	20/90	0.2	0.222
4.4	0.6	0.25	0.4	20/80	20/80	0.25	0.25
4.5	0.5	0.3	0.5	20/70	20/70	0.32	0.285
4.6	0.4	0.4	0.6	20/60	20/60	0.4	0.33
4.7	0.3	0.5	0.7	20/50	20/50	0.5	0.4
4.8	0.2	0.6	0.8	20/40	20/40	0.63	0.5
4.9	0.1	0.8	0.9	20/30	20/30	0.8	0.66
5	0	1	1	20/25	20/25	1	0.8
5.1	-0.1	1.2	1.2	20/20	20/20	1.25	1
5.2	-0.2	1.5	1.5	20/15	20/15	1.6	1.33
5.3	-0.3	2	2	20/10	20/10	2	2

Remarks: When distance less than 2.5m, Chart "E", "C", Letter ，Number, Kids will be influenced by pixel size, the last three lines optotypes of above chart will be shielded.

ETDRS							
5-Grade	LOG	decimal1	decimal2	Imperial	Metric	decimal3	decimal4
4.5	0.5	0.3	0.3	20/63	6/20	0.32	0.32
4.6	0.4	0.4	0.4	20/50	6/15	0.4	0.4
4.7	0.3	0.5	0.5	20/40	6/12	0.5	0.5
4.8	0.2	0.6	0.6	20/32	6/9.5	0.63	0.63
4.9	0.1	0.8	0.8	20/25	6/7.5	0.8	0.8
5	0	1	1	20/20	6/6	1	1
5.1	-0.1	1.2	1.2	20/16	6/5	1.25	1.25
5.2	-0.2	1.5	1.5	20/13	6/4	1.6	1.6
5.3	-0.3	2	2	20/10	6/3	2	2

1.3 Power Supply Parameters

1) Input voltage   AC 100V~240V(±10%)

2) Input frequency   50/60 Hz

3) Input power   1.0-0.5A

1.4 Weight and Size

1) Wall-mounted

Weight   Host: about 4.65 kg

              Remote controller: about 80 g

Size   Host: 595.6 mm (L) ×388.7 mm (W) × 62 mm (H)

              Remote controller: 186 mm (L) × 55 mm (W) × 17 mm (H)

* The design and specifications are subject to changes due to technical updates without additional notice.

1.5 Name plate and indications

Name plate and indications are pasted on the instrument to arise end-users' notice.

In case the name plate is not pasted well or the characters become unclear to recognize, please contact authorized distributors.

YEOSN® LCD VISUAL CHART [MD]

REF YPB21/X   # YPB-2100   CE

SN XXXXXXX   UDI   (01)0697192213XXXX
(11)XXXXXX
(17)XXXXXX
(21)XXXXXX

XXXXXX

XXXXXX   Input:DC 15V 2.67A

CHONGQING YEASN SCIENCE - TECHNOLOGY CO.,LTD.
5 DANLONG ROAD,NAN'AN DISTRICT,CHONGQING,CHINA.

EC REP   Shanghai International Holding Corp. GmbH(Europe)
Eiffestrasse 80, 20537 Hamburg，Germany
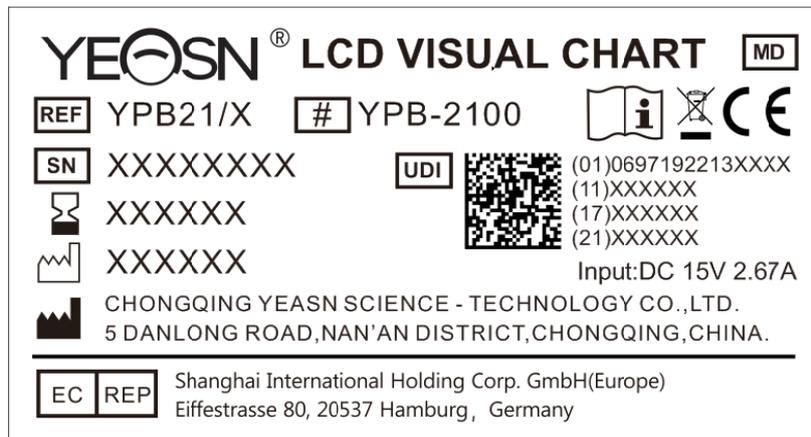
　　　Manufacturer

　　　Date of manufacture

SN　　　Serial number

　　　Country of manufacture

CE　　　CE marking

🗑	Correct Disposal of This Product (Waste Electrical & Electronic Equipment)
MD	Medical device
⧖	Use-by date
📖	Consult instructions for use
👁	Refer to instruction manual / booklet
EC REP	Authorized European representative
REF	Catalogue number
UDI	Unique Device Identifier
#	Model number
G.W.	Gross Weight
DIM.	Dimension
⚠	Attention! Please refer to accompanying documents
⏻	Power switch identification
🔊	Audio interface
⇿	USB interface
I/O	Switch Mark
((•))	Nonionizing radiation
🍷	Fragile, handle with care
⇈	This way up
☂	Keep dry
	Do not roll
	Stacking limit by 5

	Temperature limit
	Humidity limitation
	Atmospheric pressure limitation

We will make available on request circuit diagrams, component part lists, descriptions, calibration instructions, or other information that will assist service personnel to repair those parts of ME equipment that are designated by the manufacturer as repairable by service personnel.

2. Safety Precautions

Please read the following precautions carefully to avoid personal injury, device damages or other possible hazards:

● Use the device indoors and keep it clean and dry; do not use it under inflammable, explosive, high temperature and dusty environment;

● Do not use the device near water; also be careful not to make any kinds of liquid drop onto the device. Do not place the device in damp or dusty places, nor place it where humidity and temperature change quickly;

● When mounting the device on the wall, make sure the wall is able to withstand the weight of 8 kg;

● When mounting the device on the wall, reserve a gap over 50mm all around the device;

● The device is hung on the rack. Be careful when touching the device on the wall: Upward displacement may cause the device unhooked and fall, resulting in personal injury or device failure;

● Dedicated power adaptor configured for the device should be used:

Model: GSM40A15-P1J (Component of the device), Input 100-240V～1.0-0.5A　50-60Hz, Output15V 2.67A;

● Make sure the input voltage is consistent with rated input voltage and the electric wire is correctly connected and well grounded;

● Do not use multiperture socket or extend the power cord to insert the plug of the device into power socket;

● Unplug power cord and cut off power supply line especially under emergency circumstances; hold the power plug to pull out it from the socket rather than pulling the power cord;

● Do not touch the power cord with wet hands. Check the power cord and do not allow the power

cord to be stamped, pressed by heavy objects or knotted;

● Power cord damage may cause fire or electric shock. Please check it regularly;

● Cut off power before cleaning or disinfecting the device;

● Do not dismantle or touch the interior parts of the device, otherwise it may cause electric shock or device failure;

● The device has passed electromagnetic compatibility test. Follow below instructions related to EMC (electromagnetic compatibility) when mounting and using the device:

- Do not use the device with other electric devices to avoid electromagnetic disturbance to the device;

- Do not use the device nearby other electric devices to avoid electromagnetic disturbance to the device;

- Do not use a power adaptor that is not configured with the device, otherwise it may increase the electromagnetic emission amount, which may reduce the capacity of resisting disturbance.

● This product contains a wireless module, and the wireless parameter specifications are as follows (transmit and receive):

-Network conditions: CS structure, local area network mode.

-Modulation type: 802.11b CCK; 802.11g OFDM; 802.11n OFDM.

-Channel bandwidth: 20MHz.

-Recommended operating parameters: Operating frequency: 40MHz.

-Working mode: 802.11b/g/n mixed operation mode.

● Communication equipment requirements

-Network equipment requirements: automatic optometry head produced by Chongqing Yeasn Science - Technology Co., Ltd.

-Storage media U disk configuration requirements: meet its own industry standards; support USB2.0 interface; file storage space is not less than 16GB; file format: NTFS file format, FAT32 file format.

● User access control mechanism:

-User identification method: After selecting the user type, verify it by entering a password.

-User type and permissions:

Ordinary users: no USB port connection function and no WIFI connection function permission.

YPA users: have USB port connection function and have WIFI connection function authority.

Administrator user: Has YPA user rights and has software upgrade rights.

-Password: The factory default is the administrator user, the initial password of the administrator user is yeasn8888, and the initial password of the YPA user is ypa2100.

● Because the software of this product is embedded software, there is no description of the software operating environment and security software updates.

● Notification: Any serious event related to the device to the user and/or patient shall be reported to the manufacturer and competent authority of the Member State where the user and/or patient is located.

⚠ Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

3. Main Structure

3.1 Host

Front diagram of the displayer (host)
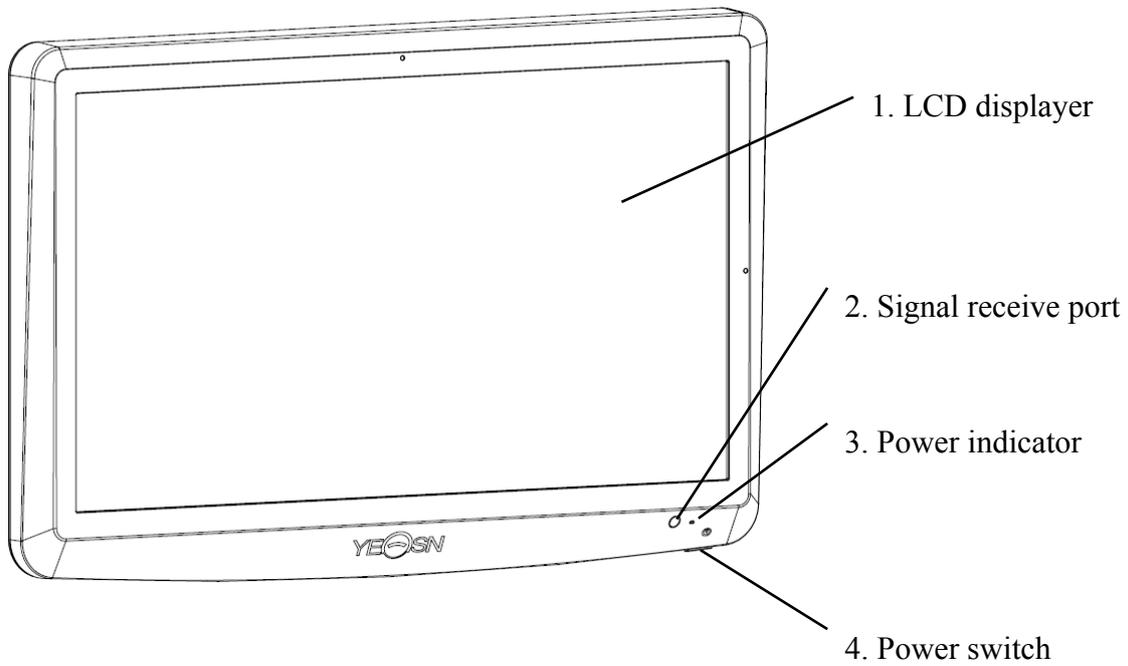
1. LCD displayer

2. Signal receive port

3. Power indicator

4. Power switch

Back diagram of the displayer (host)

5. Label

6. 2 × USB 2.0 Ports Area

7. Audio Output Jack Area

8. DC-DC socket

9. Rack mounting hole
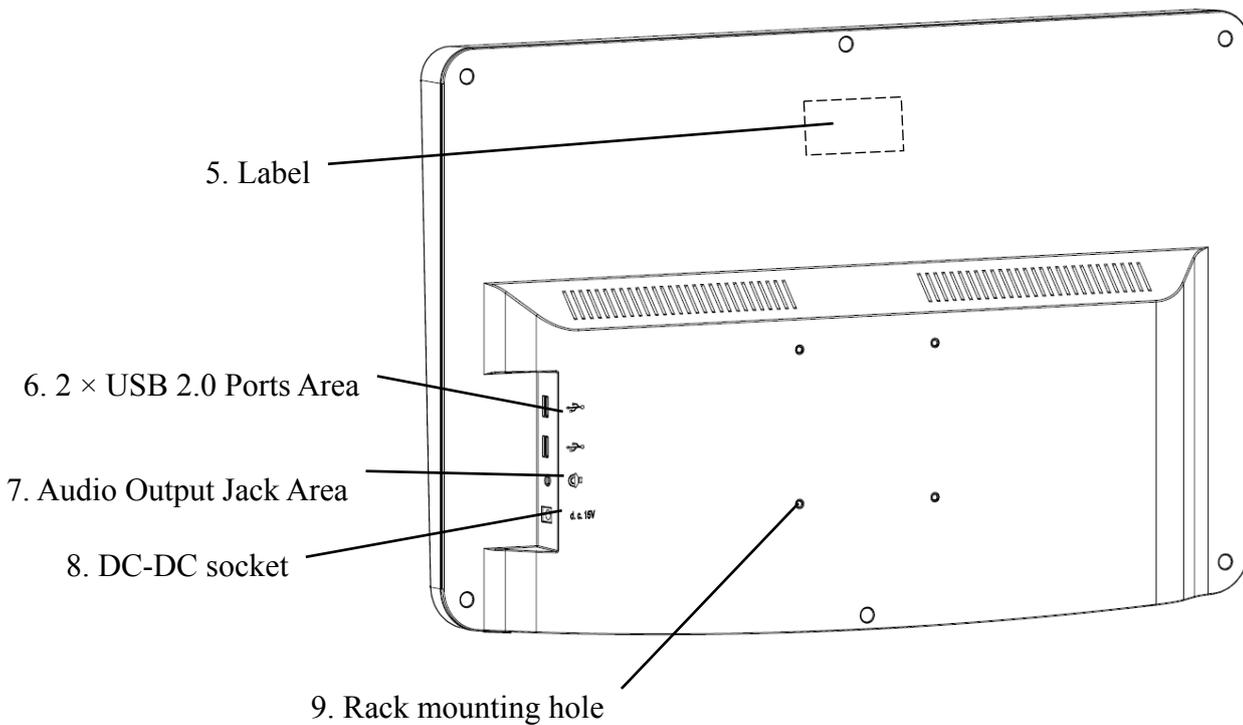
1. LCD displayer

Displays Charts and vision record.

2. Signal receive port

Receives signals from the remote controller.

3. Power indicator

Power indicator is lit on when the device is connected to power and enters standby mode.

4. Power switch

Power switch of the LCD visual chart.

5. Label

Product label.

6. 2×USB 2.0 Ports（out put 5V0.5A）

Can carry out program upgrading, video and image play through USB flash disk.

7. Audio Output Jack Area

Connect to speaker.

8. DC-DC socket

Power adaptor socket.

9. Rack mounting hole

It is used for installation of hanger frame. 4 holes in total.

Note:

USB 2.0 Ports and Audio Output Jack Area section to desk 60601-1，60950-1 type Equipped.

USB 2.0 Ports can also be U disk.

3.2 Remote Controller

**Back diagram of the remote controller**

1. Label

2. Switch

⊕ AAA-DC1.5V ⊖

⊖ AAA-DC1.5V ⊕

3. Battery case
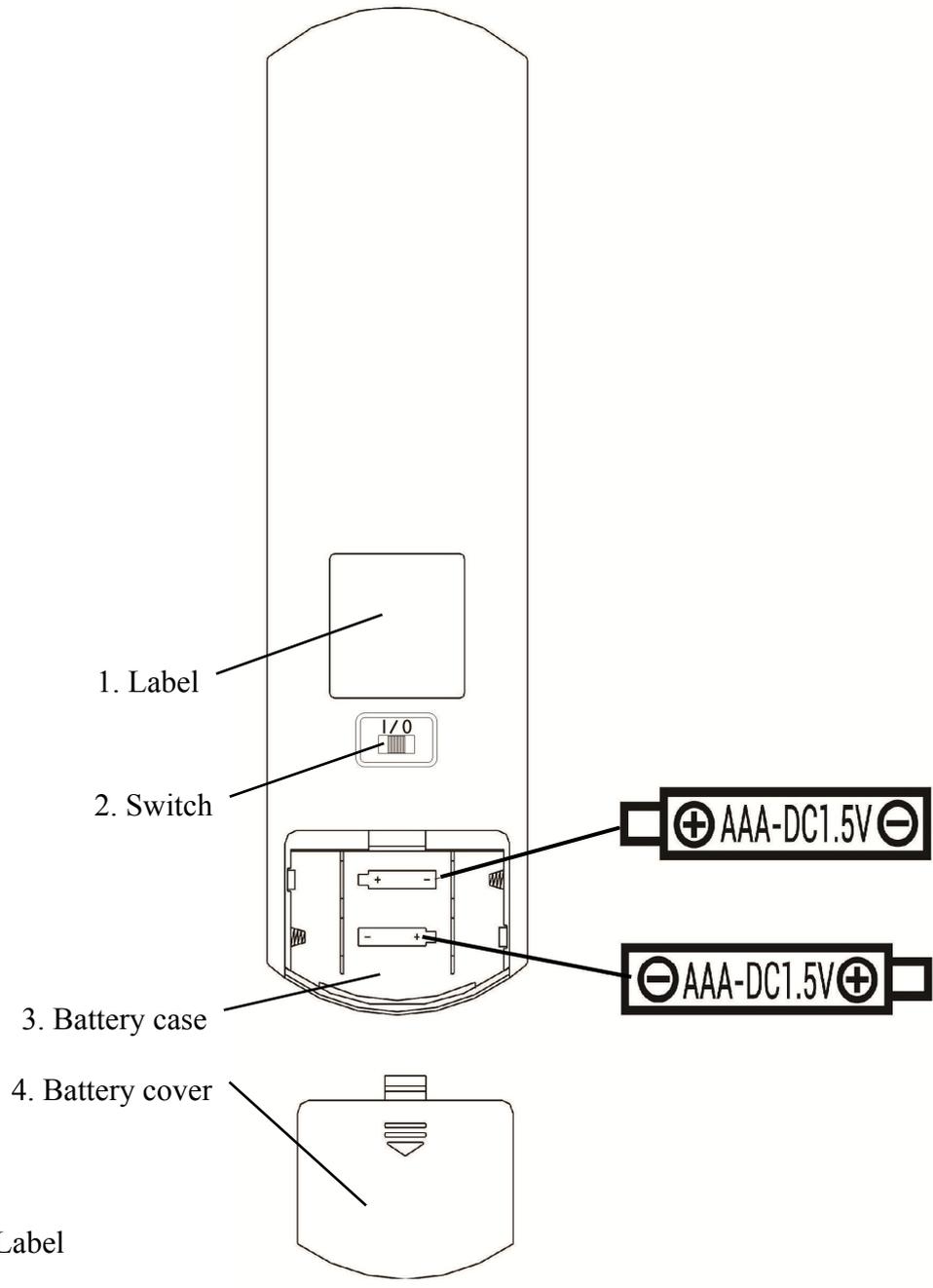
4. Battery cover

1. Label

Remote controller label.

2. Switch

Remote controller switch.

3. Battery case

Install two AAA grade alkaline batteries

4. Battery cover

3.3 Power Adapter

3. DC Output plug

5. Power adapter indicator

1. AC port

2. Power cord plug
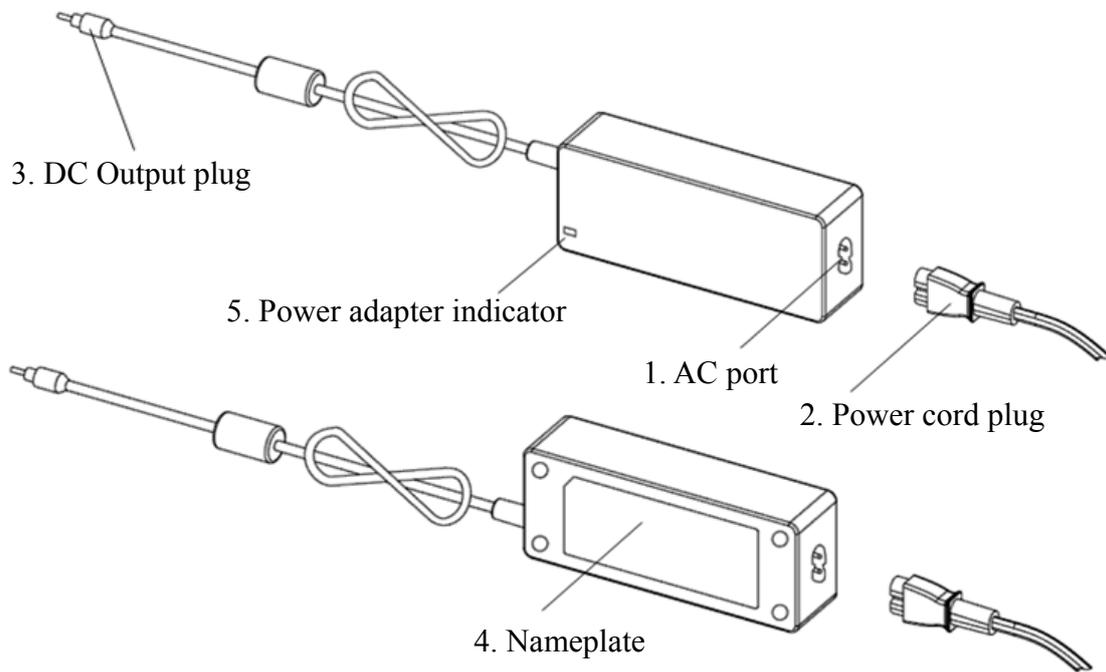
4. Nameplate

1. AC port

Used to connect the power cord plug.

2. Power cord plug

Used to connect to the AC interface.

3.DC output plug

Used to connect the monitor DC-DC socket.

4. Nameplate

The nameplate of the power adapter.

5. Power adapter indicator

When the adapter is connected, the work indicator lights up.

4 Installation

4.1 Part List

1) Displayer (host)	1 Set
2) Rack	1 Pc
3) Pan head screws with cross recessed M4×12	5 Pcs
4) Plain washer grade A φ4	4 Pcs
5) Spring lock washers, square ends φ4	4 Pcs
6) Wall bearing	1 Pc
7) Remote controller	1 Pc
8) Red-and-green glasses	1 Pc
9) Hex wrench	1 Pc
10) Power adaptor	1 Pc
11) Adaptor Rack	1 Pc
12) Plain washer grade A φ6	2 Pcs
13) Plastic expansion tube M8×38	4 Pcs
14) Cross recessed pan head tapping screws ST4.8×40	4 Pcs
15) Aircraft butterfly type plastic expansion tube M10×50	4 Pcs
16) Cross recessed countersunk head tapping screws ST3.5×50	4 Pcs

4.2 Installation Instructions

⚠️ When using the rack to mount the device, the device must be hung on a wall that can withstand a weight of 8 kg. If necessary, reinforce the wall.

⚠️ Do not install the device on a wall that is damp, mildew, or cracked.

4.2.1 Install the wall bearing

4.2.1.1 The wall bearing is installed on the load-bearing wall

⚠️ The wall is a solid bearing wall.

Using an electric drill to drill 4 suitable mounting holes on the wall perpendicular to the wall. The hole diameter is 8mm and the depth is 40mm. The relative positions of the mounting holes are consistent with the 4 small holes with a diameter of 6mm on the wall mount.

Put 4 M8×38 plastic expansion pipes into the mounting holes respectively, so that the plastic expansion pipes enter the wall completely, and use a manual screwdriver to put the 4 cross recessed pan-head tapping screws ST4.8×40 through the wall support. Screw the mounting hole of the seat into the plastic expansion tube to fasten the wall-mounted bearing seat on the wall.


Load-bearing wall

Wall bearing

Plastic expansion tube M8×38

Cross recessed pan head tapping screws ST4.8×40
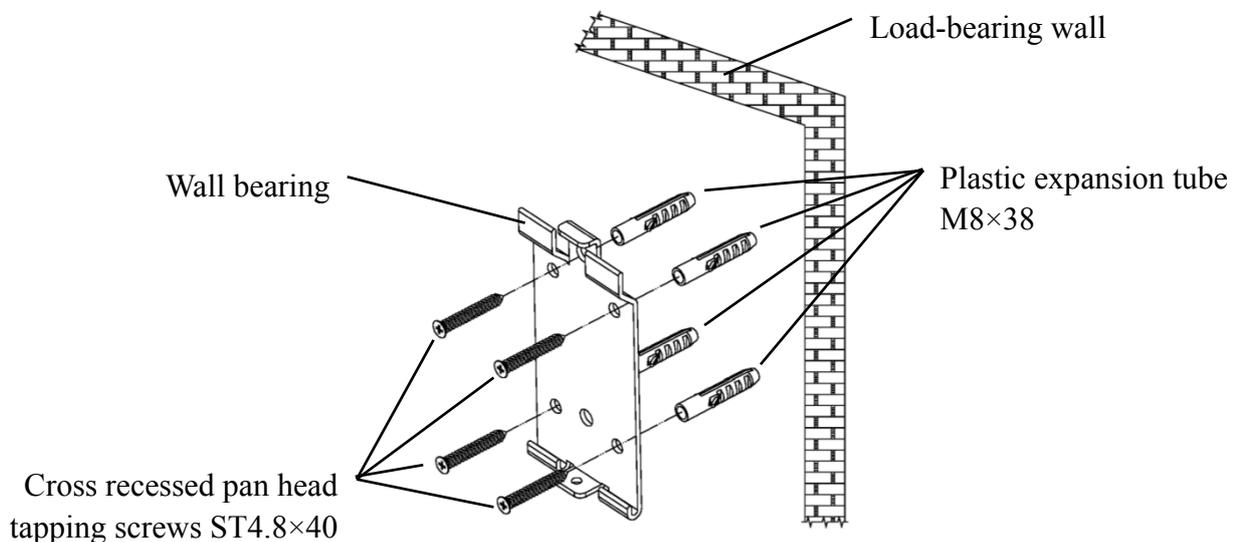
4.2.1.2 Wall mounts are installed on non-load-bearing walls

⚠️ The wall types are non-solid and non-load-bearing walls such as gypsum walls, hollow walls, and composite board walls. The thickness of the wall substrate is 10mm-20mm. It is recommended to use a 10mm twist drill bit or a triangle drill bit when installing and drilling, and a 10mm impact drill bit is not recommended.

Using an electric drill to drill 4 suitable mounting holes on the wall perpendicular to the wall. The hole diameter is 10mm, and the relative position of the mounting holes is consistent with the 4 small holes with a diameter of 6mm on the wall mount.

Flatten the expanded parts of the 4 M10×50 aircraft butterfly plastic expansion pipes and install them into the mounting holes, so that the expanded and deformed parts of the plastic expansion pipes completely enter the wall, and use a manual screwdriver to hold the 4 ST3.5×50 screws through the mounting holes of the wall-mounted socket into the plastic expansion pipe, and fasten the wall-mounted socket on the wall.

Non load-bearing wall

Wall bearing

Aircraft butterfly type plastic expansion tube M10×50

Cross recessed countersunk head tapping screws ST3.5×50
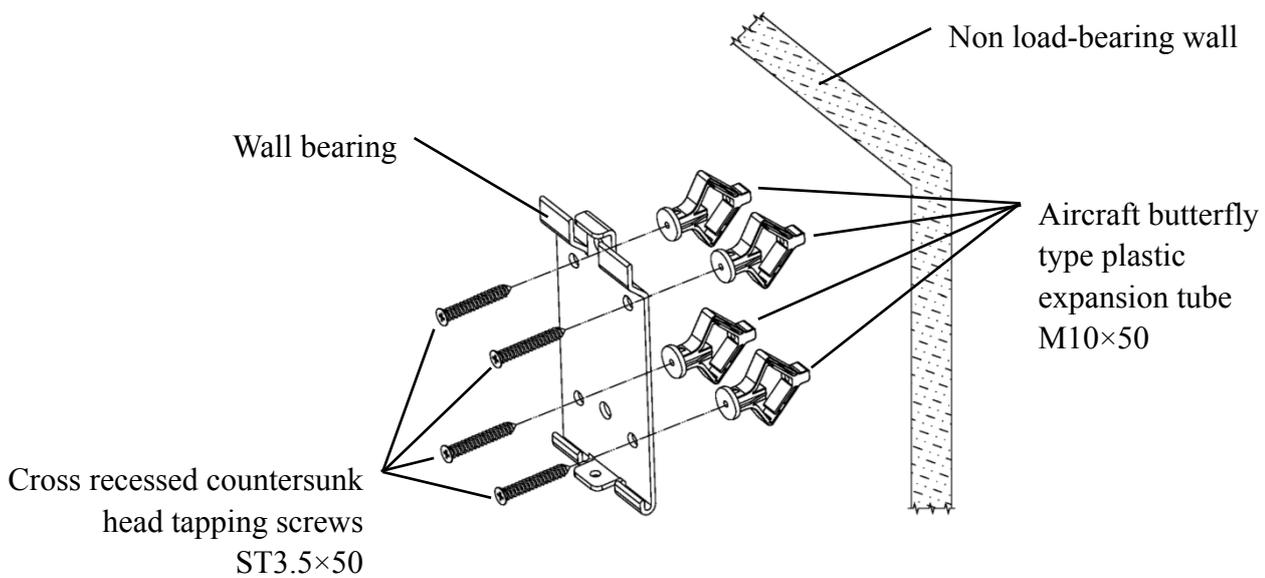
4.2.2 Installation of hanger frame

Place the rack against the back of the monitor so that the four outermost mounting holes on the rack are aligned with the mounting holes on the monitor. In turn, use 4 M4×12 cross-recessed pan-head screws to pass through 4 φ4 spring washers, then 4 φ4 flat washers, and then align with the 4 outermost mounting holes of the rack and pass through the mounting holes. Using the screwdriver to screw into the four mounting holes on the monitor. Before locking the screws through the two mounting holes on the upper end of the rack, first align and align the two mounting holes on the adapter rack with the two mounting holes on the upper end of the rack, and then lock the screws to complete the installation of the adapter rack.

After the adapter rack is installed, put the adapter vertically into the adapter rack.

Displayer

Power adapter

Power adapter rack

Spring washer φ4

Plain washer φ4

Rack

Rack mounting holes

Cross-recessed pan-head screws M4×12
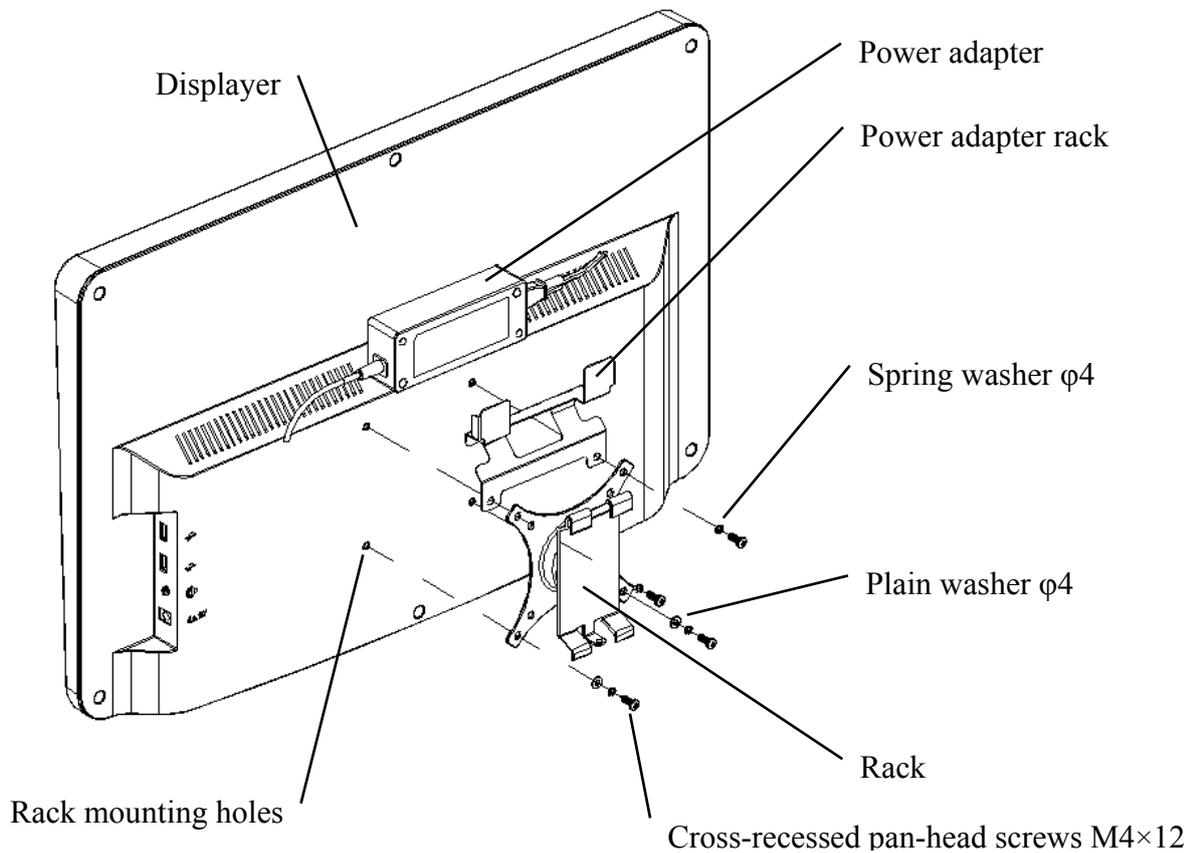
4.2.3 Install the device

Hold the monitor and the rack as a whole with both hands align the 4 bending buckles on the rack with the 4 bending buckles on the wall mount, and slowly buckle into them from top to bottom. Then use a M4×12 screw to lock it into the rack through the mounting hole at the bottom of the wall mount to complete the installation of the monitor, the rack and the wall mount.

The angle of the display can be adjusted according to the installation position and usage requirements. The hanger can adjust the pitch and left and right directions. When adjusting the angle, pay attention to use both hands to grasp the edge of the display for adjustment.

Displayer

Rack

Wall bearing

Wall

Cross-recessed pan-head screws
M4×12
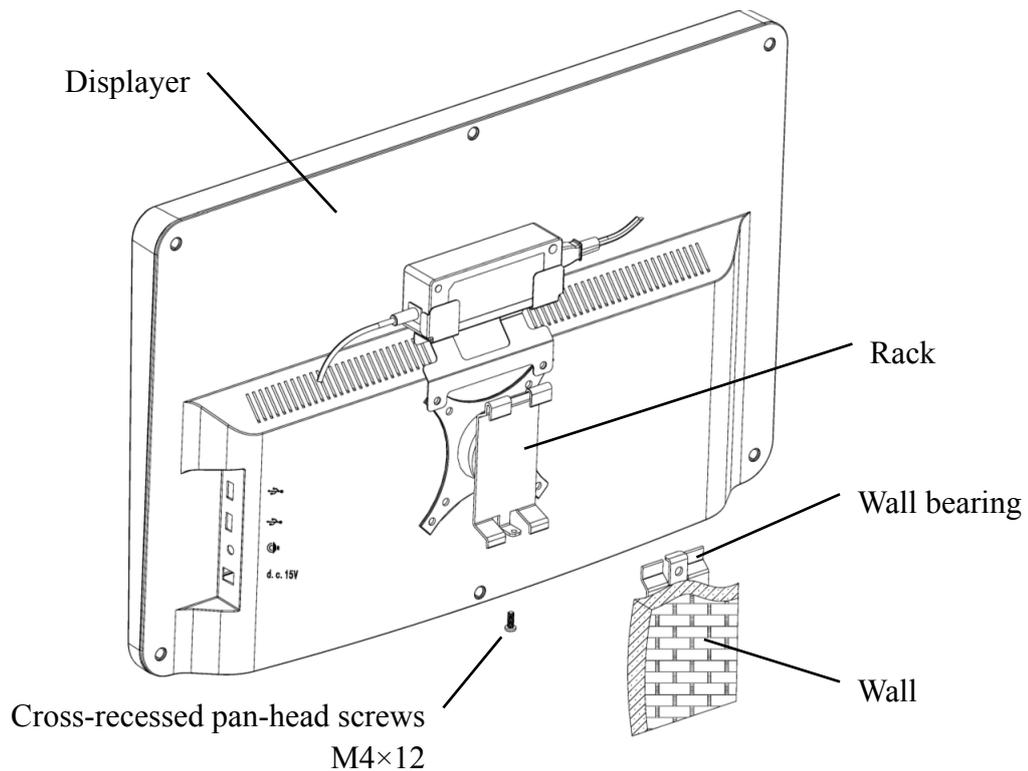
⚠ Keep a clearance of at least 50 mm around the device for ventilation.

The pre-tightening force of the rack has been adjusted when the equipment leaves the factory to meet the installation requirements of the equipment. If there is a situation where the display cannot be positioned within the adjustable angle range during use, the wrench in the accessory can be used to align the hexagon nut on the rack for locking.

Hex nut

Wrench
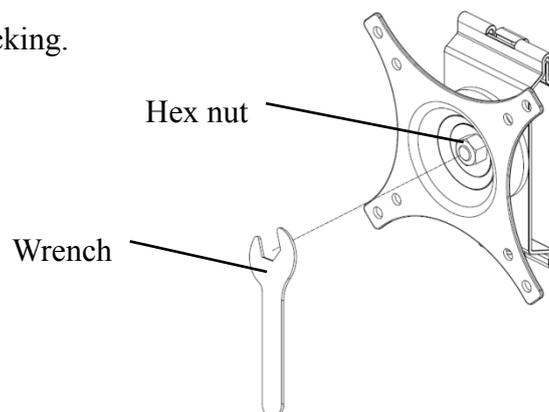
5. Preventive inspection

The equipment should be inspected preventively before use.

5.1 Power plug

The power adapter of this device is a two-core plug, please choose a matching power socket.

Note: Please use the dedicated power cord configured with this device.

5.2 Inspection

Power on and check the following:

-The LCD display should be clean.

-The LCD display should be evenly illuminated.

-The visual mark can be switched.

-The displayed visual mark is the same as the icon displayed on the remote control button.

5.3 Inspection cycle: before use every day.

6. Directions for Use

6.1 Device Startup and Shutdown

6.1.1 Device startup

6.1.1.1 Turn on the displayer.

Press the power switch to turn on the displayer.

6.1.1.2 Main module: When choosing module，press OK key to enter.

VISION TEST: Visual Test.

VIDEO PLAYER: Can carry out program upgrading, video and image play through USB flash disk.

Press ◀ key to fold USB flash disk folders, press ▶ key to unfold, press OK key to play.
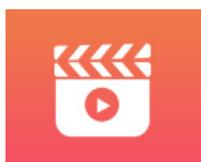
⚠ It is recommended to unplug the adapter firstly, then plug the USB flash disk, otherwise there is the risk of file damage.

After selecting the video file, press the OK button to start playing. Fast forward and backward through the left and right selection keys ◀ ▶ (each change time is 30 seconds);

Adjust the volume through the up and down selection keys ▲ ▼ ; press the OK button to pause during the video playing process. Press other keys to exit video playing.

**EYES & VISON：** Functional Test, including Contrast sensitivity Function, Structure of Eye and Vision

CSF Test:

① Select the contrast sensitivity functional (CSF) and press the OK button to enter the test interface.

② Start the measurement by pressing the OK button.

③ The direction of the measured image can be controlled by the direction key of the remote controller. The picture pointer will follow the change. If you can confirm the direction of the picture, press the OK button to select, and if you can't, press the OK button to skip the determination of the picture directly.
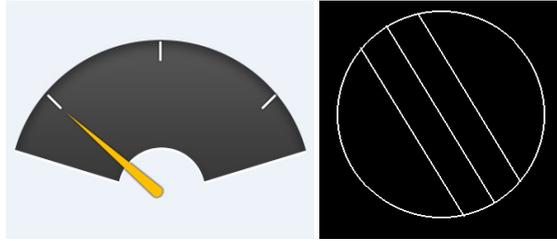
④ The test results will be displayed after all the pictures have been determined.

⚠ The results of CSF test are for reference only, and cannot be used as clinical evaluation data.

SETTINGS：Setting Parameters.

6.1.1.3 Chart display

Aim the signal emitter of the remote controller at the signal receive port of the displayer and then press the chart key on the controller to select the chart you need.

6.1.2 Recover from screensaver status

The displayer is automatically turned off and enters screensaver status when the device stops working for 5 minutes (you can also set it to 15 minutes, 45 minutes). Press any key (except device power on/off button) on the controller to light up the displayer and enter working state.

6.1.3 Device shutdown

Press button 🔴 on the remote or power on-off button on the device to turn off the displayer.

6.1.4 Brightness Adjustment

The brightness of the test zone of this device is (80~320) cd/m^2.

The procedure for adjusting the brightness is described as follows:

Press button ⚙ on the remote, choose "system" by pressing ▲ ▼ . Move to the screen brightness option by pressing ◀ ▶ . Select Low, intermediate, high and ultrahigh to adjust the screen brightness and then confirm the settings by press button (OK) for every parameter.

⚠ Except brightness, all other parameters have been well set up, please do not make any change. Otherwise, it may have an impact on the normal use of the LCD visual chart.

6.2 How to use the Remote Controller

6.2.1 Remote controller
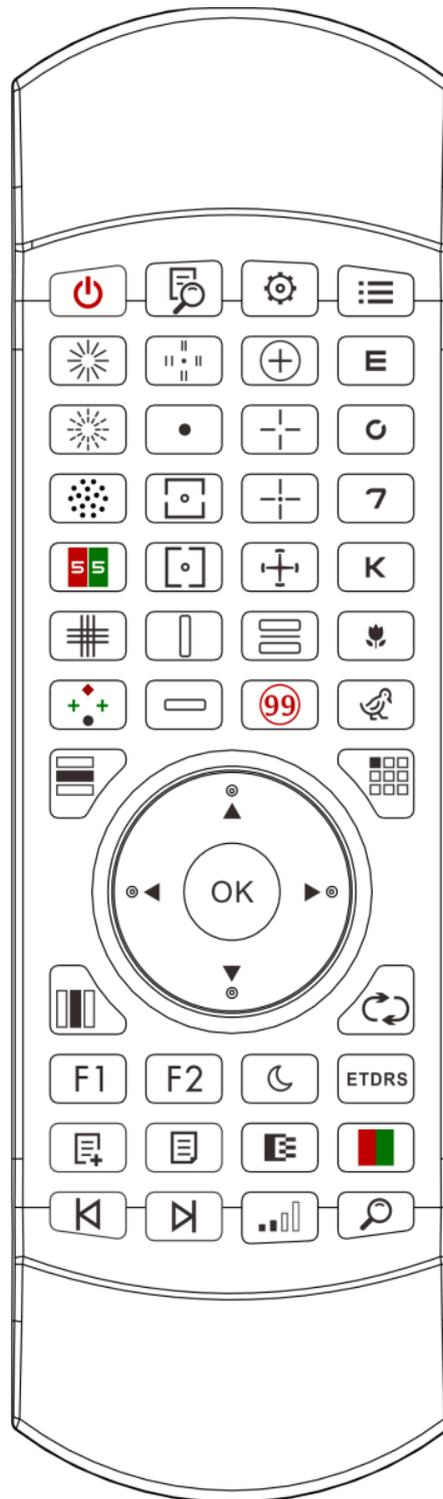
6.2.2 About the battery in the remote controller

Two AAA before use.

Take out these batteries if the device will not be used for a period of time.

 Attention:

● Do not use ordinary acid battery, only alkaline batteries can be used to avoid device damage due to battery leakage.

● Pay attention to the polarity of the battery when replacing it.

● Dispose of used battery properly to avoid environment pollution.

● Operator is not allowed to touch the batter and the patient at the same time.

6.2.3 Setup Methods of Multi-Channel

 Before entering multi-channel setup, to make sure only one LCD visual chart within operation region and be in working. Otherwise, will possibly cause operation mistake to other LCD visual chart

First, to press one time, and then press one time. Repeat 3 times and then automatically enter the setup mode of channel

Continuously press + 3 seconds and visual chart will be set as channel 1

Continuously press + 3 seconds and visual chart will be set as channel 2

Continuously press + 3 seconds and visual chart will be set as channel 3

Continuously press + 3 seconds and visual chart will be set as channel 4

6.2.4 Communication with YPA-2100

Press the key button on the remote control and enter the setting interface.

Select the WIFI network you need to connect to from the wireless networks list and then tap OK key twice to enter the WIFI password and tap ENTER. After the confirmation WIFI network connection is completed.

Connect YPA-2100 to the same WIFI network in accordance with the Instruction manual of YPA-2100 digital refractor. Then the communication between YPA-2100 and YPB-2100 is completed.

6.2.5 Introduction of function key button

Remote control key button icons	Function
⏻	Switch key: Turn on or off the LCD displayer.
🔍	Help function
⚙	Setting function key
☰	return key
◀ ▶	Left-right selection key: When single chart displays or charts display in column, press this key to shift the chart left or right on the same visual chart.
▲ ▼	Up-down selection key: When visual charts display, press this key to display last or next screen of visual charts. When single chart displays or charts display in column, press this key to shift the chart up or down on the same visual chart.
OK	Function confirmation key: 1) Operation confirmation; 2) Color blind test, display answer; 3) Astigmatic disc mark, display red dot mark
▤	Row display key: Press this key to shift between row charts and all charts: press once to display row chart, press again to display all charts.
▥	Column display key: Press this key to shift between column charts and all charts: press once to display column chart, press again to display all charts.
▦	Single display key: Press this key to shift between single chart and all charts: press once to display single chart, press again to display all charts.
↻	Press this button to rearrange optotypes randomly on the visual chart.
F1	Reserved function key
F2	Reserved function key
☾	Night vision test button: low brightness test, convenient for night vision test
ETDRS	Pressing it one time to display ETDRS format, pressing it again to go back to standard format.

[icon]	Add custom programming steps
[icon]	Custom program selection
[icon]	custom programming optotypes back to the previous step.
[icon]	Custom programming startup key, custom programming optotypes advance to the next step.
[icon]	Black and white shift key: Press this key to shift the Charts between black mark on white background and white mark on black background.
[icon]	Contrast key: Select Chart contrast.
[icon]	Red-Green Mask key: Press this key the Red-Green background will be loaded.
[icon]	Fast locate optotype
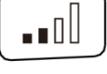
6.2.6 Optotype key introduction.

Remote control key icon	Chart types display of YPB-2100 visual chart	Function
[E]	visual chart display E chart	E chart, used for visual acuity test of adults and children
[C]	visual chart display C chart	C chart, used for visual acuity test of adults and children
[7]	visual chart display NUMBER chart	Number chart, used for visual acuity test of adults and children
[K]	visual chart display LETTER chart	Letter chart, used for visual acuity test of adults and children
[icon]	visual chart display KIDS chart	Kids chart, used for visual acuity test of children
[icon]	visual chart display KIDS chart	Kids chart, used for visual acuity test of children

6.2.7 Other tests function
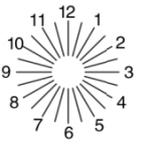
Remote control key icon	Chart types display of YPB-2100 visual chart	Function
		Solid line Astigmatic disc，used for test astigmatism axis and degree
		Dotted line Astigmatic disc，used for test astigmatism axis and degree
		Cross cylinder optotype , used for detecting the position and the degree of astigmatism of a crossed Cylindrical lens, and also used for binocular balance test.
		Red - green Optotype, used for test the spherical vision.
		Cross grid optotype, used for test the spherical vision.
		Worth 4-point optotype, used for detecting binocular simultaneous visual function、fusion, dominant eye
		Stereo optotype, used for stereo vision detection
		Fixation point optotype, Used for detection of heterophoria.
		Horizontal alignment optotype, used for detecting anisophoria, binocular aniseikonia.
		Vertical alignment optotype, used for detecting anisophoria, binocular aniseikonia.
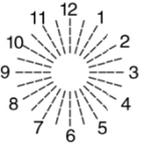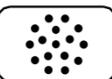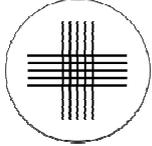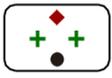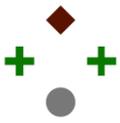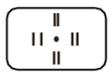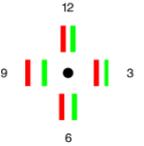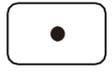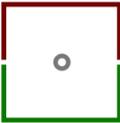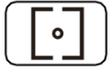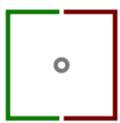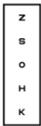
|		
▯	Z S O H K	Vertical line optotypes, used for detecting horizontal heterophoria
▭	R V D C N	Horizontal line optotypes, used for detecting vertical heterophoria
⊕	(cross ring optotype)	Cross ring optotype, used for detecting heterophoria
⊹	(cross view)	Cross view optotype ,used for the detection of heterophoria.
⊹	(cross fixed view)	cross fixed view optotype ,used for the detection of heterophoria.
⊹	(clock disc)	Clock disc optotype, used for the detection of rotating heterophoria
≡	5 4 6 2 / 2 8 3 5 / 3 5 2 4	Red and green binocular balanced optotype, used for the detection of binocular balance
99	Ishihara (indcluding traffic light)	Ishihara，used for the detection of parachromatoblepsia
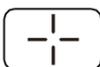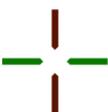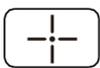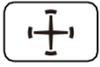
Remarks:

1. Ishihara Chart

Press 99 key, the color blindness will pop-up. Press ◀ ▶ ▲ ▼ key to shift among different color blindness visual charts. Press OK key, shows the test result.

2. Astigmatic disc chart (two options)

Press ☀ or ☀ and then Press OK key, display red indicating visual chart. Press ◀ ▶ to adjust the location of red indicating visual chart.
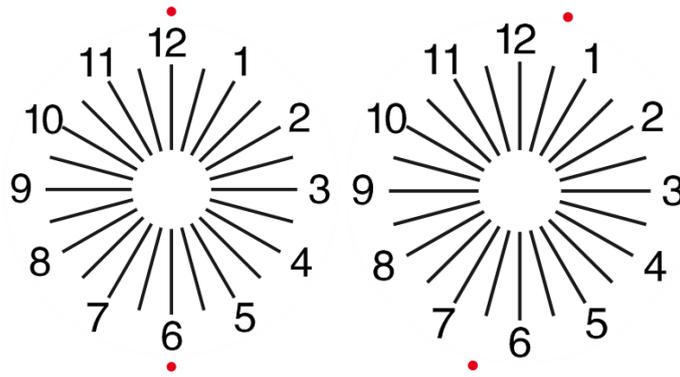
6.2.8 Parameter Setup

1. Press [≔] to enter parameter setup interface.

2. Press ◄ ► ▲ ▼ to select needed parameters to change parameter setup. When the item to be set up is selected, the item is highlighted.

3. When the setup is finished, press [≔] to return to test interface.

The detailed parameters are set up as follows:

1) Display

a) Mirror: On and Off

Factory default: Off

Set normal chart display and mirror chart display.

b) Spacing: Small, Medium, Large. Factory default: Medium.

c) Arrange: Regular, V Type. Factory default: Regular.

d) Unit background: White, Black. Factory default: White.

e) Scrolling: By page, By line. Factory default: By page.

f) Crowding Bar: On, Off. Factory default: Off.

g) Contrast level: 4 Level, 6 Level, 8 Level. Factory default: 6 Level.

h) Initial optotype: Default, E, C, Alphabet, number. Factory default: Default.

Set defaulted start-up sight mark mode.

2) Calibration

Operators conduct settings and calibration of screen parameters according to their demands and needs.

3) Test Distance: 1.5 m- 7.3 m, step: 0.1 m.

Factory default: 5 m

Distance (feet): 5 ft-24 ft, step: 0.5 ft.

Factory default: 20 ft.

Optometry distance can be set based on the situation of the optometry room.

4) Operators decide whether sight marks are effective according to their own needs and demands: Highlighted marks are effective and low-lighted are ineffective. When they are effective, the corresponding sight mark type key on the remote control has the reusable function, it means that by tapping the corresponding sight mark type key effective sight marks can be changed by pressing

◄ ►key.

5) Unit: Decimal1, Decimal2, Decimal3, Decimal4, 5-Grade, Metric1, Metric2, Metric3, Imperial 1, Imperial 2, Imperial 3, LogMAR1, LogMAR2, LogMAR3, VAR1, VAR2, VAR3

Set vision value display method.

Factory default: decimal1.

6) Scale

Red green mark: Isometry, Retain. Factory default: Retain.

Dot mark: Isometry, Retain. Factory default: Retain.

Astigmatism mark: Isometry, Retain. Factory default: Isometry.

Balance mark: Isometry, Retain. Factory default: Isometry.

Critical distance: at critical working distance operator can proportionally zoom in so as to perform examination of critical visual acuity.

Factory default: unadjustable by default.

7) System

a) Screen saver: On, Off, Video (product promotion material)

Factory default: On

b) Sleep: 5 mins, 15 mins and 45 mins

Factory default: 5 mins

c) Auto off: 1 hour, 3 hours, 5 hours, off

Factory default: 3 hours

d) Buzzer: Off, low, Medium, high

Factory default: Off

e) Luminance: Low, Medium, High, EX-High

Factory default: High

f) Language: English

Factory default: English

g) Restore

Press the reset key to reset the factory default settings.

h) User: Normal, YPA, Admin

Factory default: Admin

8) About

Displaying the system information

6.3 Other operating instructions

6.3.1 About Stereoscopic Optotype

Icons seen by normal eyes during detection: the numbers 12, 3, 6, 9 and the middle dot are on the same plane, and the four short lines bulge outward; the distance between the short lines on the side of the numbers 12, 3, 6, 9 and the eyes It seems to be narrowed in order, and the short line on the side of the number 9 seems to be the closest.
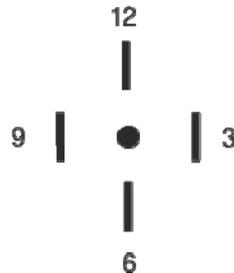

The stereo disparity of each line is as follows:

The stereo disparity between the short line on the side of the number 12 and the center dot is 10';

The stereo disparity between the short line on the side of the number 12 and the number 3 is 1';

The stereo disparity between the short lines on the side of the number 3 and the number 6 is 2';

The stereo disparity between the short line on the side of the number 6 and the number 9 is 4'.
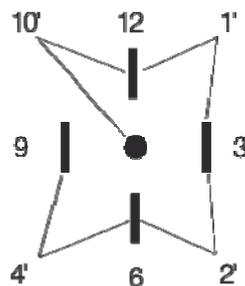
6.3.2 Instructions for use of red and green glasses

Green filter
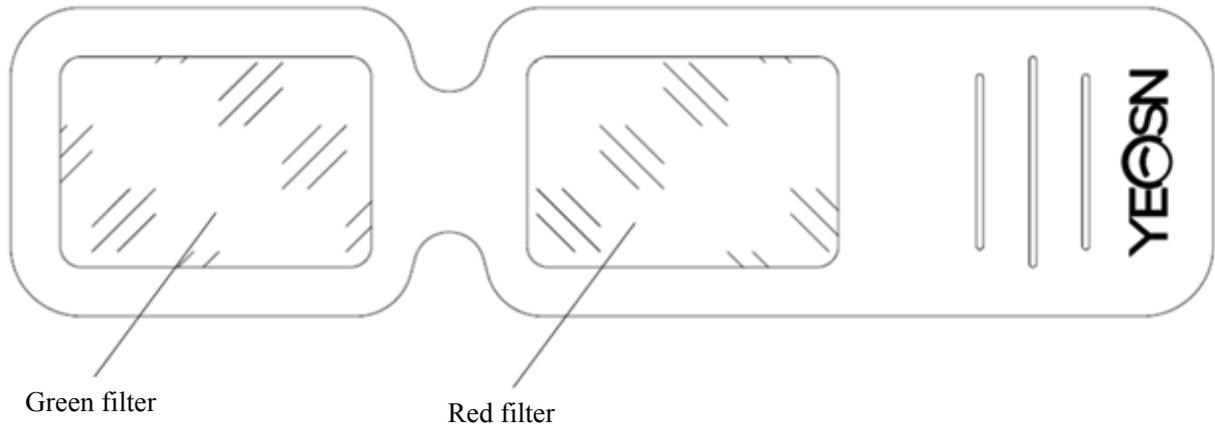
Red filter

When using red and green glasses to see the red and green targets, the red filter should be placed on the right eye and the green filter should be placed on the left eye.

7. Troubleshooting

In the event of device trouble, please check the device as per below chart to obtain guidance. If the trouble is not shot, please contact with Chongqing Yeasn Science - Technology Co., Ltd. Maintenance Department or the authorized dealer.

| Trouble	Reasons	Solutions
Displayer is not bright	The power cord is not correctly connected to the socket	Connect the power cord correctly
Visual chart is not clear	The displayer is not clean	Clear up the displayer
Visual chart disappears suddenly	The device enters standby mode	Press any key on the controller
Remote controller keys don't work	There is an obstacle between the controller and the displayer	Move away the obstacle
	Wrong installation of battery	Install the battery correctly
	Insufficient battery capacity	Replace the battery

8. Cleaning and Protection

⚠ Attention: Do not use any corrosive detergent to clean the device, so as not to damage the device surface.

8.1 Clean LCD displayer

You need to clean the LCD screen if it's too dirty to see the visual chart clearly.

1) Cut off power.

2) Unplug the power cord from the socket.

3) Wipe the LCD screen with soft and clean cotton cloth or absorbent wool gently.

⚠ Attention: Cut off power and unplug the power cord from the socket before cleaning. Otherwise, it may cause electric shock.

⚠ Attention: Do not wipe the LCD screen with stiff cloth or paper; otherwise it may scratch the screen.

⚠ Attention: Make sure not to leave water drop on the LCD screen; if there is a water drop, please wipe it away with soft and clean cotton cloth or absorbent wool.

Otherwise, it may leave a stain on the LCD screen,

⚠ Attention: Wipe the LCD screen gently when cleaning it. Otherwise, it may cause device failure.

8.2 Clean external parts

When the external parts, such as the enclosure or panel, get dirty, please wipe them gently with clean and soft cloth.

For intractable stains, please dip the clean soft cloth in mild detergent to scrub the stains away and then wipe it with dry soft cloth.

9. Maintenance

To guarantee the normal and safe operation of the equipment, a preventive check and maintenance should be conducted for the ME equipment and its parts every 6-12 months (Device manager including performance check and safety check)

9.1 Replace battery

Follow below steps to change the battery

1) Remove battery cover.

2) Take out old batteries.

3) Put in new batteries.

4) Install battery cover.

⚠ Attention: Do not use ordinary acid batteries, only alkaline batteries can be used. Otherwise, it may cause device damage due to battery leakage.

⚠ Attention: Pay attention to the polarity of the battery during installation, making sure the polarity of the battery is consistent with the polarity mark $\oplus$ and $\ominus$ in the battery case. Otherwise, the remote controller will not work; moreover, the controller may not work due to battery leakage.

⚠ Attention: Please dispose of the used battery properly to avoid environmental pollution.

9.2 Repairable and replaceable parts, such as remote controller and power adapter, etc., provided by the company can only be used; other unauthorized parts may reduce the minimum safety of the device.

9.3 The fuse of the device is included in the power adapter; if damaged, please replace it with the power adapter provided by the company with fuse type of T2A/250V (Replaced by maintenance personnel).

9.4 Do not disassemble or repair the device arbitrarily when a failure occurs, please contact with local dealer or manufacturer.

9.5 The company is committed to providing users with necessary circuit diagrams, part list and other relevant materials as needed.

10. Environmental Conditions and Service Life

## 10.1 Environmental conditions for normal operation

Environment temperature: 10 °C ~ 35 °C

Relative humidity: 30% ~ 85% (no condensation)

Atmospheric pressure: 800 hPa ~ 1060 hPa
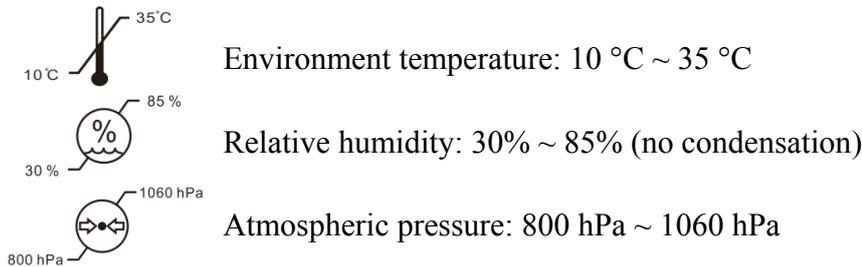
Indoor conditions: clean and without direct high light.

10.2 Environmental conditions for transportation and storage

Environment temperature: -10 °C ~ 55 °C

Relative humidity: 10% ~ 85% (no condensation)

Atmospheric pressure: 700 hPa ~ 1060 hPa
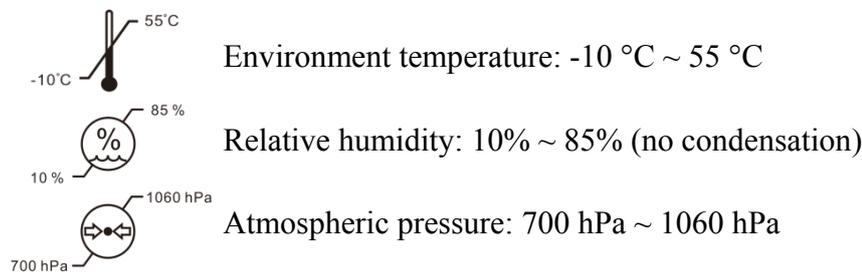
Indoor conditions: good ventilation and without corrosive gas.

10.3 Service life

The service life of the device is 8 years from first-time use with proper maintenance and care.

11. Disposal and Environmental protection

INFORMATION FOR USERS

Please recycle or properly dispose of the used batteries and other wastes to protect the environment.

This product bears the selective sorting symbol for waste electrical and electronic equipment (WEEE). This means that this product must be handled to the local collecting points or given back to retailer when you buy a new product, in a ratio of one to one pursuant to European Directive 2012/19/EU in order to be recycled or dismantled to minimize its impact on the environment.

Very small WEEE (no external dimension more than 25 cm) can be delivered to retailers free of charge to end-users and with no obligation to buy EEE of an equivalent type. For further information, please contact your local or regional authorities. Electronic products not included in

the selective sorting process are potentially dangerous for the environment and human health due to the presence of hazardous substances. The unlawful disposal of the product carries a fine according to the legislation currently in force.

12. Manufacturer's Responsibility

The company is responsible for the safety, reliability and performance impact under below circumstances:

—Assembly, addition, modifications, alterations and repairs are carried out by authorized personnel by the company;

—Electrical facilities in the room are in conformity with relevant requirements, and

—The device is used according to the User Manual.

13. Electrical Schematic Diagram
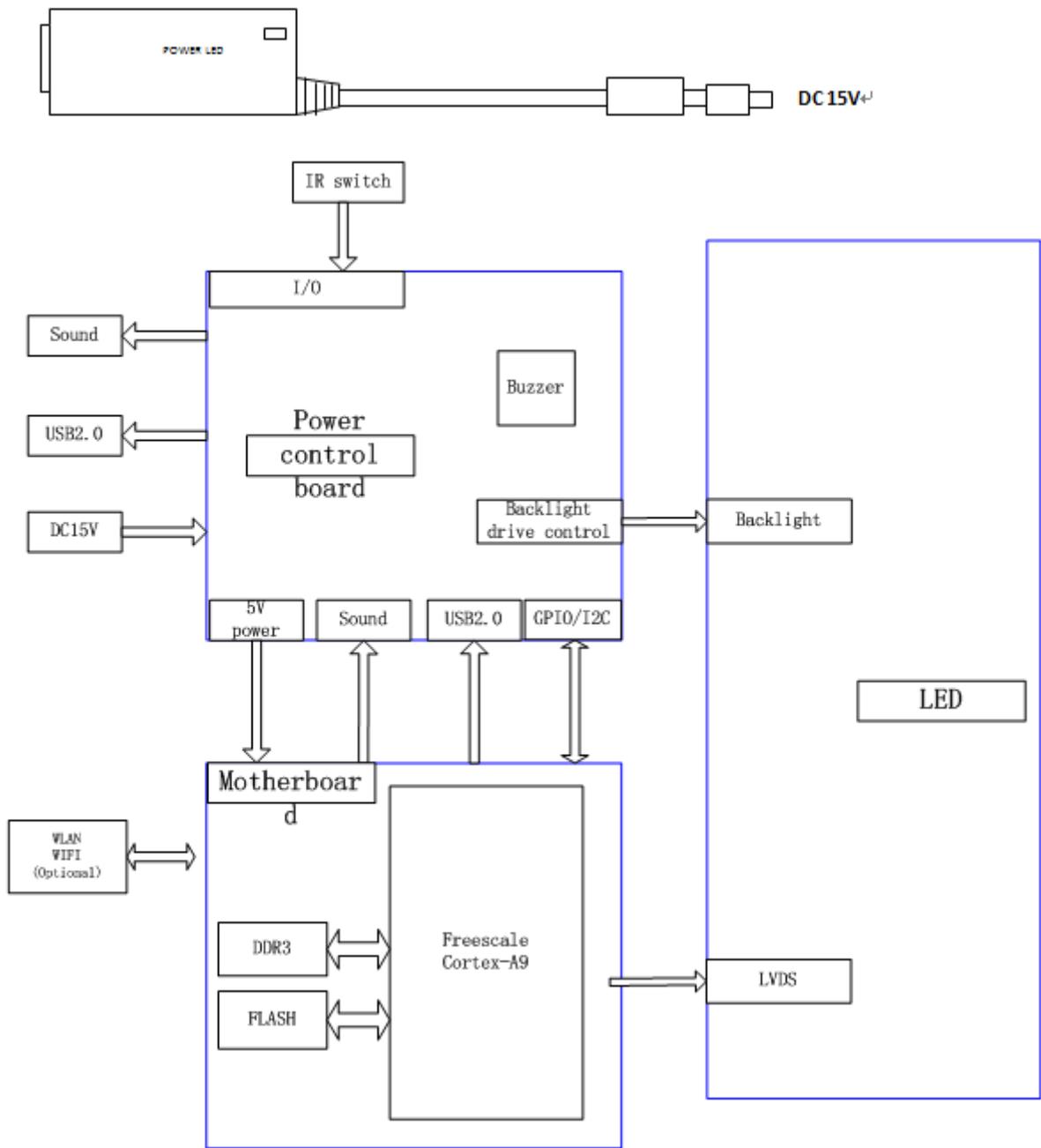
For further information and services, or any questions, please contact with the authorized dealer or manufacturer. We will be happy to help you.

14. Guidance of EMC and other interference

1)* This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, and this unit can be affected by portable and mobile RF communications equipment.

2)* Do not use a mobile phone or other devices that emit electromagnetic fields, near the unit. This may result in incorrect operation of the unit.

3)* Caution: This unit has been thoroughly tested and inspected to assure proper performance and operation!

4)* Caution: this machine should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, this machine should be observed to verify normal operation in the configuration in which it will be used.

Guidance and manufacture's declaration – electromagnetic emission		
The YPB-2100 is intended for use in the electromagnetic environment specified below. The customer of the user of the YPB-2100 should assure that it is used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The YPB-2100 use 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.
RF emission CISPR 11	Class B	The YPB-2100 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.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacture's declaration – electromagnetic immunity			
The YPB-2100 is intended for use in the electromagnetic environment specified below. The customer or the user of YPB-2100 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output 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 line(s) to line(s) ± 2 kV line(s) to earth	±1 kV differential mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the YPB-2100 requires continued operation during power mains interruptions, it is recommended that the YPB-2100 be powered from an uninterruptible power supply or a battery.
Power frequency (50Hz/60Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE UT is the a.c. mains voltage prior to application of the test level.			

<table>
<tr><th colspan="4">Guidance and manufacture's declaration – electromagnetic immunity</th></tr>
<tr><td colspan="4">The YPB-2100 is intended for use in the electromagnetic environment specified below. The customer or the user of the YPB-2100 should assure that it is used in such an environment.</td></tr>
<tr><th>Immunity test</th><th>IEC 60601 test level</th><th>Compliance level</th><th>Electromagnetic environment - guidance</th></tr>
<tr>
<td>Conducted RF
IEC 61000-4-6

Radiated RF
IEC 61000-4-3</td>
<td>3 Vrms
150 kHz to 80 MHz

3 V/m
80 MHz to 2.5 GHz</td>
<td>3 Vrms

3 V/m</td>
<td>Portable and mobile RF communications equipment should be used no closer to any part of the YPB-2100, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Recommended separation distance

$d = 1{,}2\sqrt{P}$

$d = 1{,}2\sqrt{P}$ 80 MHz to 800 MHz

$d = 2{,}3\sqrt{P}$ 800 MHz to 2,5 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 metres (m).
Field strengths from fixed RF transmitters, as determined 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:
$(((\cdot)))$</td>
</tr>
<tr><td colspan="4">NOTE 1   At 80 MHz and 800 MHz, 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.</td></tr>
<tr><td colspan="4">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 YPB-2100 is used exceeds the applicable RF compliance level above, the YPB-2100 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the YPB-2100.
b   Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</td></tr>
</table>

Recommended separation distances between portable and mobile RF communications equipment and the YPB-2100.

The YPB-2100 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the YPB-2100 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the YPB-2100 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 KHz to 80 MHz $d = 1{,}2\sqrt{P}$	80 MHz to 800 MHz $d = 1{,}2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2{,}3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (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.