

JUSHA

**JUSHA DISPLAY
USER MANUAL**



Model

E270AG

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1. Manual instructions





1.1 About this manual












The manual aims to guide users to install, configure and operate this professional medical monitor properly.



- When transfer the monitor to a third-party, please deliver this manual along with the monitor
- If the specification changed in the future, we will not inform again.
- Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.
- For any further questions about this manual, you are welcome to contact Nanjing JUSHA Display Technology Co., Ltd.

1.2 Explanation of symbols

This manual and product use the symbols below.

	Gives extra information about the described subject.
	Indicates general cautionary, warning, or danger level information.
	Indicates a general prohibition.
	Indicates a general prohibition.

	<p>Indicates that a ground that must be connected by the user for a device equipped with a ground terminal.</p>
	<p>Indicates the product meets the requirements of CCC.</p>
	<p>Indicates the product meets the requirements of FCC Part 15.</p>
	<p>Indicates the product meets the requirements of CE Certification.</p>
	<p>Indicates the product has been certificated by SGS and qualified for North American market.</p>
	<p>Gives information of the Authorized European representatives</p>
	<p>Compliance ROHS instruction</p>
	<p>Waste Electrical and Electronic Equipment Directive (WEEE) 2002/96/EC Waste disposal should comply with local regulations.</p>
	<p>Recommend to refer the User Manual</p>
	<p>Manufacturer information</p>
	<p>JUSHA trademark</p>

	Product serial number
	Don' t touch

* This monitor complies with these standards only when a medical grade power supply is used. Power supply is specified as a part of the equipment.

1.3 Safety information



Read all the important safety information before installing and operating your monitor.

About the environment

- The equipment should be installed near an easily accessible outlet.
- Place the device on a flat, solid and stable surface that can support the weight of at least 3 devices. If you use an unstable cart or stand, the device may fall, causing injury to a child or adult, and serious damage to the device.
- Never use the monitor in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide.
- Never expose the monitor to rain or moisture. Never use the monitor near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.
- Please heed necessary space between the monitor and the wall for ventilation. Do not cover or block any ventilation openings in the cover of the set.

- Keep small object away from the product. If small object gets into the monitor, please shut off power supply immediately and contact us for technical support.

About the power and ground

- Please use power cord provided with the monitor, and insert the plug into the socket firmly.
- Don't touch power cord or plug/unplug it when thundering, or it may cause electric shock.
- Please hold the attaching plug when you unplug it. Don't unplug it by pulling power cord, otherwise the power cord may be injured and result in electric shock.
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Please use the power supply within the voltage range specified in this manual, otherwise it may cause fire, electric shock or product damage.
- If the device is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.
- To fully disengage the power to the device, please disconnect the power cord from the AC inlet
- Please make sure that this product connected with a qualified computer or other devices.
- Make sure the monitor is grounded properly

About the maintains and repairs

- Product failure may cause fire, electric shock or equipment damage. If the product gives off smoke or makes unusual noises, cut off the mains supply as soon as

possible and pull out the plug from the socket. Please contact JUSHA for technical support.

- Repairing is limited to trained engineers. Do not try to repair or disassemble the product by yourself. It may cause product damage or personal injury.
- Please don't touch a damaged LCD screen with bare hand. Because the leaking liquid crystal material contains toxic substance. Please contact doctor immediately once it happens.

Some useful recommendations

- For mission critical applications, we strongly recommend that a replacement unit be immediately available.
- Please avoid excessive compression on the LCD screen, which may cause damage to it.
- In order to avoid scratches, don't touch the screen with sharp objects, such as pen or fingernail. Please use a soft cloth to clean the screen.
- The operator should not touch the video interface (such as DVI port, VGA port and etc.), or it may result in potential ESD (Electronic Static Discharge) damage to the monitor.
- The backlight of LCD has a service life limitation. We strongly suggest using this monitor in the recommended brightness to extend its service life. Please turn off the monitor if not use.
- Waste disposal should comply with local regulations.
- If using this monitor improperly, potential interference to other electronic devices around could be possible. Following methods are proposed to eliminate such

interference:

- ◆ Relocate or reorient the device under interference.
- ◆ Set up curtain appliance between the monitor and the device under interference.
- ◆ Plug the monitor and the devices under interference into different power sockets.



warning:

1. This monitor is Class A digital devices. It can only be used indoors.
 2. Class A digital devices may cause radio interference in normal living environment. Users should take practicable measures to reduce the radio interference.
-

2. Overview

Thank you for using JUSHA endoscopic surgery professional monitors. JUSHA endoscopic surgery professional medical monitor is designed for endoscope host, ICU display, operation room to display high-quality video and images.

2.1 Packing list

JUSHA endoscopic surgery professional medical monitor comes with:

- Endoscopic monitor (some monitors don't have the base)
- Power Adaptor
- AC Power Cord
- DVI cable
- SDI cable
- S-VIDEO cable
- CVBS cable (optional)
- RGBS/YPBPR cable (optional)
- After-Sales Service Record
- Packing list
- Warranty Card
- Product Certification
- Desiccant



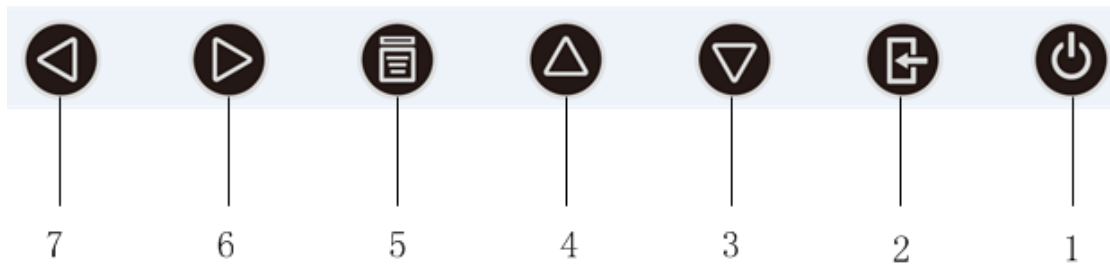
Notice:

3. Please only use the original accessories supplied with the monitor. JUSHA is not responsible for any technical problems caused by using Third-party accessories.
4. Packing list is for reference only, different models need to match different packing list, Please refer to the packing list in the product box. If any of the components are damaged or missing, please contact Nanjing JUSHA Display Technology Co., Ltd. (025-83305050).
5. Please keep the original package well. If you need to transport the product, use the original package.

2.2 Front view and keypad



P2.1 Front view



P2.2 The front keypad

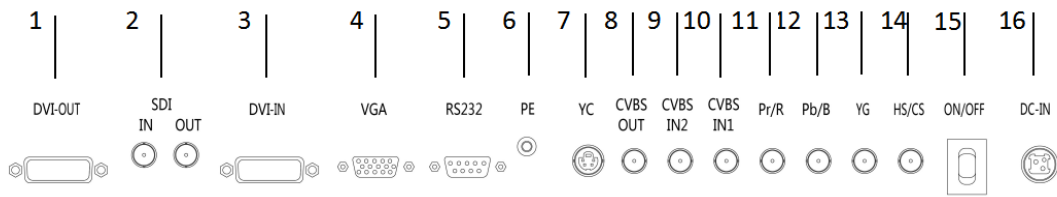
1	Power Key	Indicates the monitor operating status
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		<ol style="list-style-type: none"> 1. Lights up in white, indicates monitor in, power-on state 2. Touch Power Key, lights up in orange, indicates monitor in power-on standby 3. Light off, indicates monitor in power-off status
2	Source Select key	Select the input source
3	Down key	Select the next menu item
4	Up key	Selects the previous menu item
5	Menu key	<ol style="list-style-type: none"> 1. Open the User menu 2. Exit the User menu
6	Right key	Increase the menu option value or go to the next menu level
7	Left key	Decrease the value of the menu option

2.3 The backside view of the monitor



P2.3 Backside of monitor



P2.4 interface definition

Connectors description:

1	DVI outpute	2	SDI input/output
3	DVI input	4	VGA input
5	RS232/reserved	6	Ground hole
7	S-VIDEO input	8	CVBS output
9	CVBS input 2	10	CVBS input1
11	Pr/R input	12	Pb/B input
13	Y/G input	14	HS/CS input
15	DC power switch	16	DC power input

3. Monitor installation

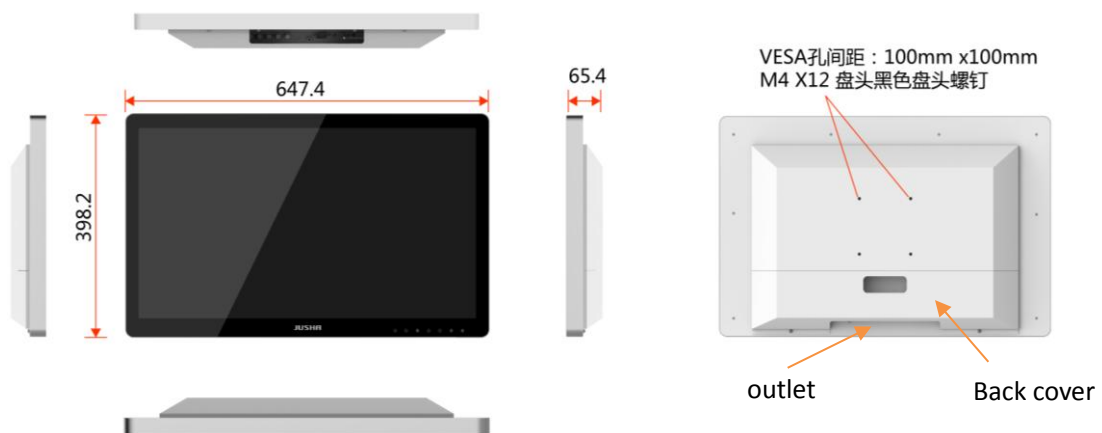
3.1 Installation instruction



Attention:

1. Make sure that endoscopic host and monitors are powered off.
2. Unpack the product and check the accessories according to packing list. Confirm the monitor and accessories are complete.

1. Plug one side of the signal wire into monitor's back interface, and the other side into endoscopic host's interface, then Tighten the screws. E270AG supports desktop, and E270AG-C supports wall design, which should withstand the force of 10kg at least.



P3.1 six views without base



P3.2 six views with base

2. Connect to the operating room grounding system through the PE ground which is on the back of the monitor.
3. Connect power adaptor to power wire firstly, and then plug power adaptor into monitor's power input port, finally power LED indicator will turn orange.



Caution:

- 1 Please use the power cord provided with this monitor. If the power cord is inconsistent with the table below, please contact your supplier. Please make sure the power cord matches the voltage of the power socket and has been approved by and complies with the safety standard of your particular country.
- 2 To avoid risk of electric shock, AC/DC adaptor must only be connected to a power socket with protective earth.
- 3 Power Cord: The monitor should be powered from a center tapped circuit when used at voltages over 120V. And plug type of monitor varies in different countries or areas, as shown in the following table.

Country/Area	USA/Canada	EU (except U.K)	U.K
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Monitor installation

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Plug Shape			
Standard	ANSI/UL 817 CSA-C22.2 No.21	DIN VDE 0620- 1:2010	BS1363/BS546
Standard	120V	230V	230V
Country/Area	Brazil	Japan	Korea
Plug Shape			
Standard	NBR14136	JIS 8303	KSC8305:2002R
Voltage	220V	110V	220V
Country/Area	Denmark	Singapore	China
Plug Shape			
Standard	SB 107-2-D1	SS145	GB15934-2008
Voltage	230V	230V	220V

4. Monitor settings

4.1 Turn on the monitor

Turn the power on, the power indicator will turn white, and the monitor's screen will display the JUSHA boot screen, indicating that the monitor is running.

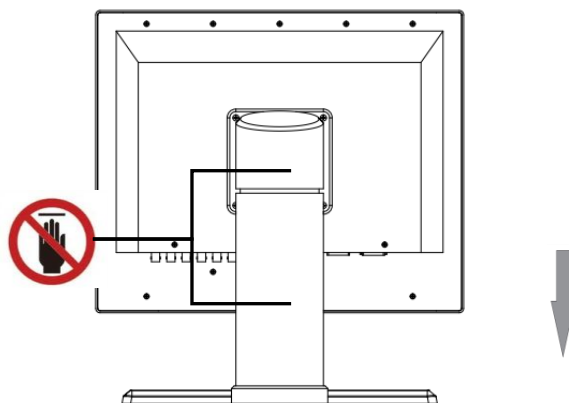


Warning

Only the original power cord and adaptor shall be used. Please guarantee the plug can be wholly plugged into the socket.

Please guarantee the voltage be lower than nominal voltage of the power line.

When pushing the screen down, please don't touch the neck of monitor.



4.2 Monitor sleep

When the monitor is turned on, press power switch button, then the power indicator will turn orange, indicates monitor in power-on standby

4.3 Turn off the monitor

Press the Power Switch key, and the Power Indicator will turn orange, then unplug the power cord.


Recommendation: The connector / cable of the adapter should be placed in an easily accessible place.

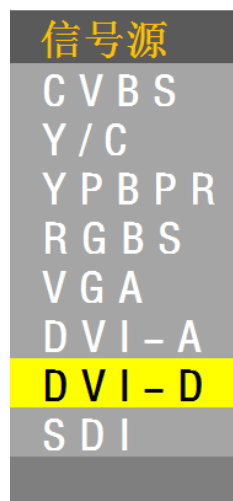
4.4 Menu Instruction

A seven buttons keypad, located at the lower right bottom on the front of the monitor, which allows users to adjust monitor's parameters by using the On Screen Display (OSD) system.

4.5 Operate OSD menu





4.5.1 Choose signal source

To display the standard input menu, please press the “” button once to open the signal source selection menu.




P4.1 Signal source selection menu

4.5.2 Control description

- 1 In the user menu, press “” / “” key to highlight the option you want.
- 2 Then press “” / “” key to adjust the highlight option

in the user menu.

- 3 The target source is selected; press the “” button to change the target source in the signal source selection menu.

4.5.3 Functional specification

- 1 Press the “MENU” key once to open the user menu

OSD	
User Mode	Mode1
Scale	Full
Scale Ratio	Off
Gamma Curve	2.2
AUTO	
Setting	
Color Temp	6500K
Sharpness	Low
3DNR	High
Multi-window	Off
Sub Source	S-VIDEO
Field Invert	Off
RGB2YUV	On
Language	English
Source Scan	Off
Range	Off
KeyLocker	Off

P4.2 User OSD

2 The structure of user menu and functional specification:

Item	description	Default
User Mode	Mode 1 User1 Mode, in this mode, the first user ' s preference parameters(such as brightness, sharpness) shall be stored.	Mode 1
	Mode 2 User2 Mode, in this mode, the second user ' s preference parameters(such as brightness, sharpness) shall be stored.	
	Mode 3 User3 Mode, in this mode, the third user ' s preference parameters(such as brightness, sharpness) shall be stored.	
	Mode 4 User4 Mode, in this mode, the fourth user ' s preference parameters(such as brightness, sharpness) shall be stored.	
	Mode 5 User5 Mode, in this mode, the fifth user ' s preference	

		parameters(such as brightness, sharpness) shall be stored.	
	Mode 6	User6 Mode, in this mode, color parameters(such as brightness, saturation) shall be bypassed.	
Scale Mode	Full	Picture full-screen	full-screen
	original	set the original Ratio	
	Max Ratio	Compare the horizontal and vertical scaling ratio, set the maximum ratio direction full display, set another direction display (maybe full display \not full display \overscan)	
	Min Ratio	Compare the horizontal and vertical scaling ratio, set the minimum ratio direction full display, set another direction display (maybe full display \not full display \overscan)	
	4:3	Set the screen horizontal and	

Monitor settings

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		vertical display ratio as 4:3	
	5:4	Set the screen horizontal and vertical display ratio as 5:4	
	16:9	Set the screen horizontal and vertical display ratio as 16:9	
	16:10	Set the screen horizontal and vertical display ratio as 16:10	
Scale Ratio	Off	Off	Off
	5%	Scale up 5%	
	10%	Scale up 10%	
	15%	Scale up 15%	
	20%	Scale up 20%	
Curve	gamma1.8	Gamma Curve 1.8	gamma2.2
	gamma2.0	Gamma Curve 2.0	
	gamma2.2	Gamma Curve 2.2	
	gamma2.4	Gamma Curve 2.4	
	gamma2.6	Gamma Curve 2.6	
	DICOM	DICOM Curve	
	Custom	Custom	
Auto		Auto adjustment for analog source only(VGA, RGBS)	
Setting	Backlight	0—100	50
	Saturation	0—100	50
	Contrast	0—100	50
	Brightness	0—100	50
	Hue	0—100	50

Color Temp	5500K	5500K color temperature effective	6500K
	6500K	6500K color temperature effective	
	8000K	8000K color temperature effective	
	9300K	9300K color temperature effective	
	Bypass	LCD Panel' s color temperature	
	User	6500K	
Sharpness	High	Sharpness level-high	Low
	Middle	Sharpness level-middle	
	Low	Sharpness level-low	
	Off	Close sharpness	
3D NR	High	Noise reduction function open, high effective	High
	Middle	Noise reduction function open, medium effective	
	Low	Noise reduction function open, low effective	
	Off	Close the 3DNR	
Multi-window	Off	Close the picture in picture mode	Off
	PIP	Open the picture in picture mode	

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	POP 1	Open the picture out picture mode 1	
	POP 2	Open the picture out picture mode 2	
Sub Source		The sub source shall be determined by the main source, please refer to Table 1 to find the selection rule of main source and sub source in Multi-window function	CVBS
Field Invert	On	Close Field Invert (only VGA and RGBS can be selectable)	Off
	Off	Open Field Invert (only VGA and RGBS can be selectable)	
RGB2YUV	On	Close RGB2YUV, turn RGB color space to YUV color space(not selectable)	On
	Off	Open RGB2YUV, do not turn RGB color space to YUV color space(not selectable)	
Language	中文	中文菜单语言	English
	English	Set OSD language to English	
Gray range	On	Open the Function that called out of gray rang	Off

	Off	Close the Function that called out of gray rang	
Key lock	On	Open the Function that key lock	Off
	Off	Close the Function that key lock	
Mirror Image	On	Mirror image on	Off
	Off	Mirror image off	
Buzzer	On	Buzzer on	Off
	Off	Buzzer off	
Factory Reset		Reset user parameters	

Notice:

PIP mode: sub window can't support 1920*1200 and 1600*1200;

POP1: both main window and sub window, can't support 1920*1200 and 1600*1200.

The selection rule of main source and sub source in Multi-window function: (black dots indicate the signal can be used for both main or sub signal, then white dots cannot)

Main window \ Sub window	CVBS	Y/C	YPbPr	RGBS	VGA	DVI-A	DVI-D	SDI
CVBS	○	○	●	●	●	●	●	●
Y/C	○	○	●	●	●	●	●	●
YPbPr	●	●	○	○	○	○	●	●
RGBS	●	●	○	○	○	○	●	●
VGA	●	●	○	○	○	○	●	●
DVI-A	●	●	○	○	○	○	○	●
DVI-D	●	●	●	●	●	●	○	○
SDI	●	●	●	●	●	●	○	○

5. Important information

5.1 Technical specifications

Input voltage	DC 24V
Standby power consumption	<0.5W
Consumption (nominal)	<83W
LCD Panel	27 inches, Color Active Matrix Liquid Crystal Display
Brightness	800cd/m ² (Max)
Viewing Angle	Horizontal 178° , Vertical 178° (CR > 10)
Pixels distance	0.3114(H)mm x 0.3114(V)mm
Resolution	1920x1080
Visual Size	597.888(H)mm x 336.312(V)mm
Video Interface	Input: VGA、DVI-A/D、Y/C(S-Video)、YPbPr、RGBS、CVBS1、CVBS2、SDI Output: CVBS、DVI-D、SDI
Operation Environment	Temperature: 0° C ~ 40° C Humidity: 20% ~ 85%, no condensation Air pressure: 700hPa ~ 1060hPa
Environment for transportation and storage	Temperature: -20° C ~ 60° C Humidity: 10% ~ 90%, no condensation Air pressure: 200hPa ~ 1060hPa
Certification standards	CCC、CE



Notice:

The specifications of JUSHA products are subject to change without notice.

E270AG,E270AGG,E270AG0,E270AG1,E270AG****,JUSHA-E270AG, JUSHA-E270AGG,JUSHA-E270AG0,JUSHA-E270AG1,JUSHA-E270AG**** (*=0-9,A-Z or blank means different customers, not affect product safety and EMC) .

5.2 Safety standards

Safety standards for E270AG:

the Medical Display Safety standards	IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 EN 60601-1-2:2007 EN 60601-1:2006/A1:2013 GB4943.1-2011
Authentication	CCC、CE
Declaration of Conformity	ROHS

5.3 Electromagnetic compatibility

EMC forE270AG and E270AG-C :

Electromagnetic compatibility	EN 60601-1-2: 2007+AC:2010 GB9254-2008;GB17625.1-2012
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Warning: Warning: Display requires special precautions regarding EMC and need to be installed, put into service and used according to the following information.

1. Do not use other cables provided or specified by us.Using other cables may cause the increase of emission or decrease of immunity.
2. Do not put any portable and mobile RF communications equipment close to display.Doing so may affect display.

-
3. Display should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the equipment or system should be observed to verify normal operation the configuration in which it will be used.
 4. Anyone who connects additional equipment to the signal input part or signal output parts, configuring a medical system, are responsible that the system complies with the requirements of IEC/EN60601-1-2.
-

6. Declarations

6.1 Legal notice

The auxiliary equipment that is connected with JUSHA display should meet the corresponding IEC Standard (data processing equipment should meet IEC 60950-1 Standard and armamentariums should meet IEC60601-1 Standard). In addition, all configurations should meet IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard. Before a configuration is connected to signal output or input interface for processing system configuration, technician should make sure that the system meets IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard.

Staffs that are responsible for connecting the monitor with system should make sure that installed devices meet IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard. If there is any question, please contact with JUSHA Engineering Technology Service Department or local marketing representatives.

JUSHA markets its products through armamentarium manufacturers, distributors and franchisers. Therefore, please consult your seller whether he/she provides relevant maintenance service.

JUSHA will neither take any responsibility nor authorize anyone to take any responsibility for product distribution and its use. Please read carefully the related documents, operation instruction and labels on package before you apply the product so that you can use and maintain the product properly.

Declarations

Please note that its performance will be affected by system configuration, software, application program and client' s data and client' s operating control. Though JUSHA product is compatible with many systems, client' s specific function might be come true differently. Whether the product is suitable for specific purpose or application program it depends on clients, therefore, JUSHA should not guarantee for it.

JUSHA expressly disclaims all warranties of any kind, whether statutory, express or implied, including, but not limited to, implied warranties of merchantability, fitness for particular purpose and non-infringement. JUSHA hereby explicitly rejects all warranties and state of any kind, any property or extent whether statutory, express or it leads to any laws ,rules, commercial practice, conventions or trade disputes etc.

In no event shall JUSHA and its suppliers/franchisers be liable for any special, incidental, punitive, indirect or consequential damages (including, but not limited to, delay deliver, non-delivery, fault items, product design or production manufacture, being unable to use the product and service, loss of business or profits or other reasons, and any responsibility caused by buy or sell, lease, install or use related products, these terms and conditions and related articles of agreement.

The limits in this article and/or exclusions are not necessary suitable for some inadmissible exclusion clause, warranties or limited judicial districts. The maximum extent is permitted by applicable law in named jurisdiction under the circumstance.

JUSHA keeps patents, copyright and its exclusive right and all information in this manual including JUSHA all designs and related materials. Anyone cannot plagiarize JUSHA design or copy its product to sell or use without the company' s explicit authority.

6.2 After-sale service declaration

The after-sale warranty is three years from the date of purchase, only if the product has been used with the recommended brightness. We are responsible for the quality problems caused by non-artificial factors and the maintenances are free of charge.



Notice:

The user must contact and get permission from JUSHA before sending back the product for repairs.

To avoid the damage and/or loss during transit, the user must deliver the product in its original package or other adequate package with an equal degree of protection to the local distributor. Meanwhile, user must present proof of the product purchase date.

The user is not allowed to repair the monitor from anywhere except the authorized after-service spots. The original serial number should not be modified or removed. Don't derogate from requirements of this manual, otherwise it may result in quality assurance failure.

This product provides limited responsibility for quality assurance. JUSHA isn' t responsible for malfunction caused directly/indirectly/accidentally by users themselves. Users should pay attention to the settings of the operation system and other applications. Above factors will affect the product performance

6.3 Proprietary rights

Nanjing JUSHA Display Technology Co., Ltd keeps the copyright of this manual and other related ownership. It is not allowed to copy, use or sell this manual without authorization of Nanjing JUSHA Display Technology Co., Lt

7. Contact information

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