



Product Specification

Product: Indoor Full Color P4 1/20 Scan Module

Item No.: Q4-20S-E-2020

Document No.: _____

Version: 2.5

Drafting:	Audit:	Approval: (Seal)

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1. Scope of Application

This technical manual is only applicable to the indoor **Q4-20S-E-2020** LED panel, the following are conventional product parameters, and can be customized if you have special requirements.

2. Precautions

Item		Description
Environmental Precautions	Temperature requirement	Storage temperature range: -10°C - 30°C , over 30°C needs to do cooling treatment. Operating temperature range: -20°C - 40°C , other temperature range, need to install temperature control equipment. Lamp surface temperature (working time): $\leq 60^{\circ}\text{C}$, temperature control equipment is required to be installed when temperature exceeding the standard
	Humidity requirement	Storage humidity range: 10% RH-60% RH, humidity over 60% RH requires dehumidification treatment. Operating humidity range: 10% RH-65% RH, If the humidity exceeds the standard, it must be dehumidified before it can be used normally.
	Storage overdue processing	If the product has been stored for more than one month, need to do 6 hours of aging test before it can be used. The aging mode is: 10%Full brightness setting-1H, 30%Full brightness setting-1H, 60%Full brightness setting-2H, 80%Full brightness setting-1H, 100%Full brightness setting-1H (increase brightness gradually in aging test)
	Dust-proof requirements	Indoor products have no protection level or IP30, and the display should not be exposed to heavy dusty environments, such as decoration and renovation. Special protection is required to protect the display. Installing LED display screen during decoration is strictly prohibited.
	Avoiding corrosive gas	Corrosive gas contains salt or acid gas in the environment, may cause corrosion of electronic components, crystallization, leakage and so on.
	Avoiding electromagnetic radiation	The display screen should not be installed in an environment where electromagnetic radiation and radio frequency radiation exceed the field strength of 5V/m interference source.
	Avoid strong light	Strong light will affect the display effect and life span of screen. It should be install in the direction where there is



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Environmental Precautions		shorter direct sun shining.
	Keep away from water	Indoor products have low level of protection, water can make the module short circuit, and leads to circuit device damage, so it is necessary to keep away from the water source.
	Electrostatic hazard, Prevent lightning strikes	The metal components of the screen, the shell of power supply and the cabinet should be grounded well, and the grounding resistance should be less than $10\ \Omega$. Prevent electrostatic damage to electronic devices in humid environment, while avoiding electric leakage to harm human body.
	Personal injury	The angle and height of the display installation should be appropriate, and the sharp corners should be packaged to prevent damage to the human body from the tough outer casing.
	Special environment	Display screen for special environment (1, seaside, swimming pool, bathing room, basement, tunnel; 2, chemical environment, vulcanization environment, halogen environment; 3, dust, dusty environment; 4, strong ultraviolet environment; 5, the environment of strong electromagnetic fields; 6, less than -20 degrees, higher than $+40$ degrees of the environment), The review process is required before placing the order.
Operational precautions	Electro-static Protection	The worker must wear an anti-electrostatic wrist strap and anti- electrostatic glove. Various tools must be strictly grounded during assembly
	Product batch control	Different batches of products cannot be installed in the same screen, otherwise there will be color blocks (mosaic) on the display.
	Product wiring	The module cannot be directly connected to 220V, and the module positive and negative poles connection must be right.
	Disassembly and transportation	Do not throw, push, squeeze or press the module to avoid damaging the display screen.
	Disassembly and maintenance liquid protection	Sweat or other liquid cannot be dripped on the display screen during disassembly and assembly operation. If it is dripped, then use alcohol to clean the product, to prevent the liquid from corroding the product.
	Installation Torque	In connection with power supply, it is necessary to ensure tightening of terminal joint screw to prevent joint position



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Operational precautions	Control	from loosening, resulting in wire burning or product damage caused by high contact resistance. Torque of M4 screw is 6.0-8.0 Kgf.cm, and that of M3 screw is 4.0-6.0 Kgf.cm.		
	Prohibited work with electricity	It is forbidden to assemble the LED module when the power is on. The LED module should be assembled with the main power input disconnected. It is not allowed to insert the power wire and signal cable when there are with electricity.		
	Prohibited touch with electricity	It is forbidden for people to touch the LED display screen when the LED screen is in usage, so as to avoid electrostatic breakdown of LED lights and chips and other components caused by human body friction.		
	Environmental inspection	Temperature and humidity meters should be equipped on the installation site to monitor the surrounding environment of the screen in time. After heavy rain, it is necessary to check whether there are any problems such as dampness, water droplets and over humidity in the screen in time.		
	Requirements for moisture proof	Fixed Installation Display Screen		Within 10% ~ 65% RH relative humidity range, it is recommended to turn on the display 1 time per day, and work at least 4 hours to remove moisture on the display.
				When the relative humidity of the environment is over 65% RH, dehumidification treatment should be carried out for the operating environment. It is suggested to use the screen for more than 8H per day in this environment, and doors and windows should be closed at night to prevent the display from dampness.
				When the display screen is not used for a long time, it is necessary to preheat and dehumidify the whole screen for 8H before using, so as to avoid damaging the lamp tube after dampness. The dehumidification methods are: full brightness set 10%- 1H, full brightness set 30% 2H, full brightness set 60% -2H, full brightness set 80% -2H, full brightness set 100% -1H (brightness gradually increasing aging).
				After usage , immediately put into flight case and seal the flight case;
				In each flight case, please put a desiccant or hygroscopic bag of not less than 50g.
				In the range of 10% to 65% RH relative humidity, the screen should be lighted on more than 2H every half month; More than 65% RH



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Operational precautions	Requirements for moisture proof	Rental screen display: and in the resurgence weather, the screen must be lighted on more than 2H every week. After finished the display, need to put it back to flight case, sealed and stored. (please check whether there is any failure of the desiccant or hygroscopic bag in the aviation, it needs to be replaced every 2 months, and more desiccant can increase the dryness inside the box.) When the display screen is not in use for a long time, it is necessary to reduce the brightness of the whole screen by 50% in advance and play it for 12 hours, and preheat it for "dehumidification" 12H to avoid damaging the light tube after the LED screen is damped. While renting, do not touch the display screen with water. If there is any water, make sure that the water on the screen is dried. After 2H, light the display screen 2H, and evaporate the water by lamp and IC heat. It is strictly forbidden to use indoor rental screens as outdoor rental screens, especially in the open air environment.
	Avoid construction work to the installed LED screen	It is strictly forbidden to rebuild after the installation of the LED display screen, so as to prevent the LED display screen from being affected by the impact of high current and dust, such as welding, electric saw and other equipment.

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3. Product Specification

3.1.The indoor full color display has a clearer and more detailed display, and the resolution can reach above 1080P; it can achieve high refresh rate, high grayscale and higher lamp utilization. And it has the functions of no afterimage, anti-caterpillar, low power consumption, low surge, etc.

3.2.The indoor full color display is mainly composed of a red LED chip, a green LED chip and a blue LED chip packaged into a matrix of pixels, and then fixed to a plastic package.

3.3.The indoor full color display contains driving IC and input buffer chip, which can display video, image and text information when connected to the LED display control system.

3.4.Through the system control to drive the red LED, green LED and blue LED driving IC, 4,398 billion color conversions can be formed.

3.5.The panel and the cabinet can be spliced arbitrarily in the horizontal and vertical directions to form different sizes of display screens.

3.6.Features

- High-quality lamps, high-efficiency lamp brightness utilization rate, while guaranteeing lamp lifespan and high-quality plastic component.
- High contrast can achieve good display effect.
- The weight is easy to install and disassembly.
- Single point and single lamp maintenance can be carried out, with low cost.
- It is driven by a constant current, with uniform light emission and low power consumption.

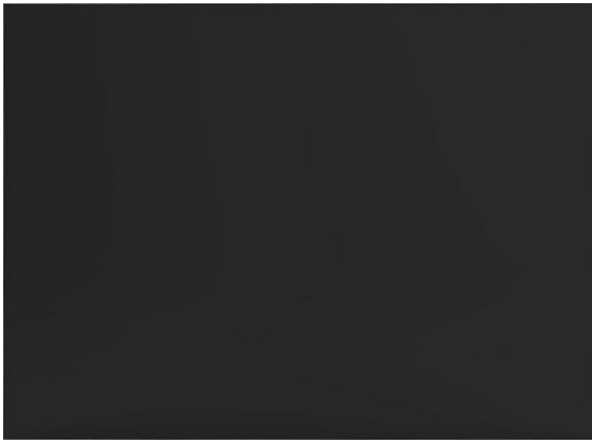
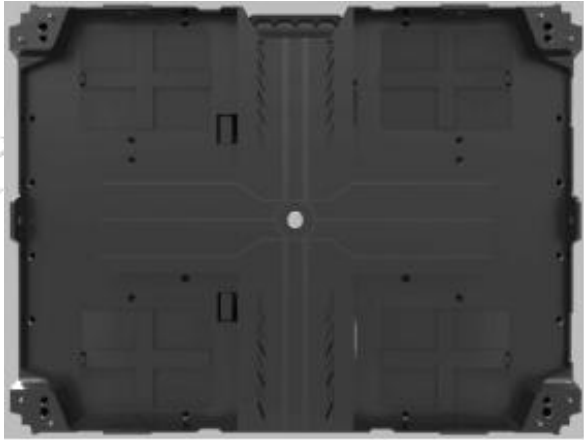

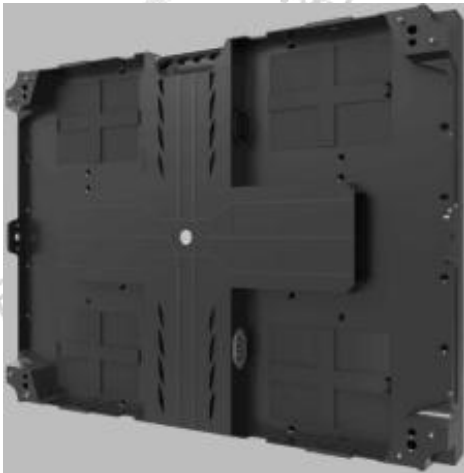
3.7.Module Picture

Front View		Remarks: The driving IC uses a SSOP packaged constant current driving IC.
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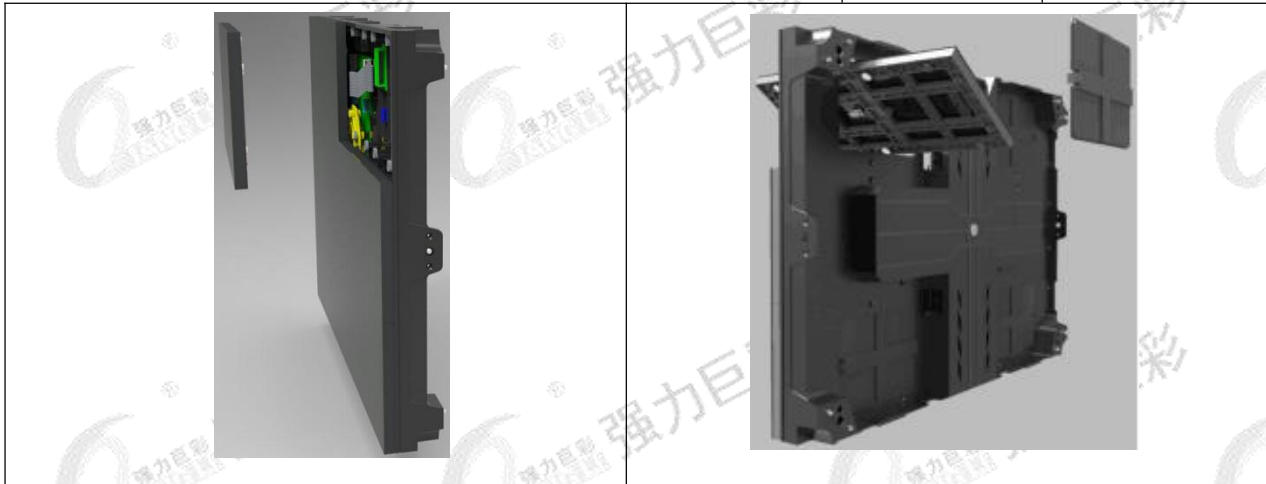


3.8.Suggestion Cabinet -(640*480 MGLED)

Front View	Rear View
	
Side view 1	Side view 2
	
Front Service	Rear Service



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4. Technical Specification

4.1. Screen

Brightness	≥450cd/m ²	Brightness Uniformity	> 0.95
Horizontal Viewing Angle	140 ± 10 degree	Vertical Viewing Angle	130 ± 10 degree
Best Viewing Distance	≥4m	Operation Environment	Indoor
Max Power Consumption	≤465W/m ²		
Distribution power (maximum power per square ÷ 78% ÷ 85%)		≤701W/m ²	
Grayscale	14-16bits (RGB each)	Display Color	4398 Billion
Frame Frequency	≥60 frame/sec	Refresh Frequency	≥1920Hz
Control Mode	Computer control, Point-to-point Video synchronization Real-time display	Brightness Adjustment	256-grade manual / automatic
Input Signal	DVI/VGA , Video (multiple formats)RGBHV、 Composite video signal、 S-VIDEO YpbPr(HDTV)		
Life Span	≥100,000 hours	Average Failure Free Time	≥10,000 hours
Attenuation (3 years later)	≤15%	Continuous out of control point	0
Discrete Out of Control Point	< 0.0001, 0 when leaving the factory	Blind spot rate	< 0.0003, 0 when leaving the factory
Operating temperature range	-20-40℃	Operating Humidity	10 % -65 % RH(No condensation)

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Protection performance	Over temperature / overload / power down / image compensation / various correction technologies / overcurrent / overvoltage / lightning protection (optional)
Horizontal flatness of the screen	< 1mm/m ²
Vertical flatness of the screen	< 1mm/m ²

4.2.Cabinet (MGLED)

Cabinet Size (Width*Height*Thickness)	640*480*84mm (with module, cabinet, connecting plate)
Cabinet Pixel Density	160*120=19200 Dots
Cabinet Area	0.307 m ²
Cabinet Weight	6.95kg ± 0.05 kg
Cabinet Max Power Consumption (panel power * number of panel in a cabinet)	≤ 143W
Average Power Consumption (1/3 Max)	≤ 48W
Distribution power (78% power utilization rate, i.e. max power ÷ 78%)	≤ 183W

4.3.Module

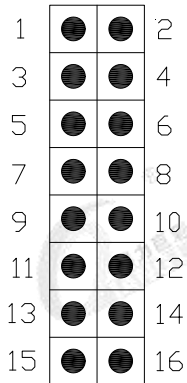
Pixel Pitch	4mm	Pixel Density	62500Dots/m ²
Configuration	1R1G1B	LED Lamp	SMD2020
Size (Width*Height*Thickness)	320*160*14mm	Weight	0.35kg±0.01kg
Structure	Lamp & IC in same PCB	Resolution	80*40=3200Dots
Input Voltage (DC)	4.5±0.1V	Maximum Current	≤5.3A
Power Consumption	≤24W	Driving Method	Constant Current 1/20 Scan
40A Power Supply for	5-6 pcs module	50A Power Supply for	6-7 pcs module
40A PFC Power Supply for	6-7 pcs module	80A Power Supply for	10-12 pcs module



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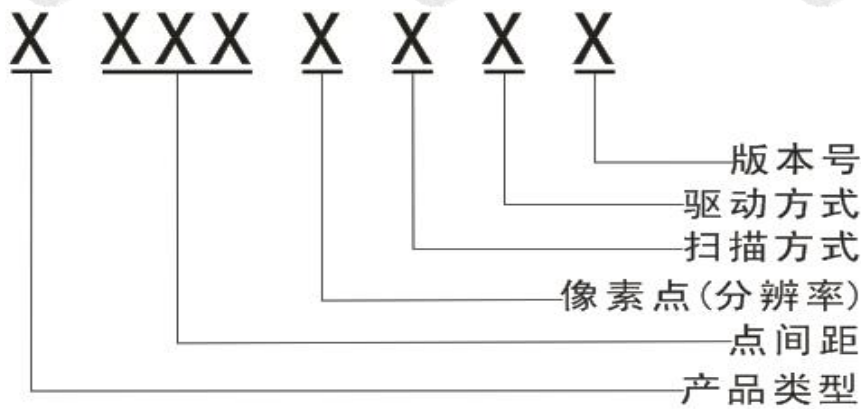
5.Signal Pin

HUB75E



Pin	Signal	Function	Pin	Signal	Function
1	RD1	Red data signal	2	GD1	Green data signal
3	BD1	Blue data signal	4	GND	GND
5	RD2	Red data signal	6	GD2	Green data signal
7	BD2	Blue data signal	8	E	Line power control signal
9	A	Line power control signal	10	B	Line power control signal
11	C	Line power control signal	12	D	Line power control signal
13	CLK	Clock signal	14	LAT	Data latch signal
15	OE	Enable signal	16	GND	GND

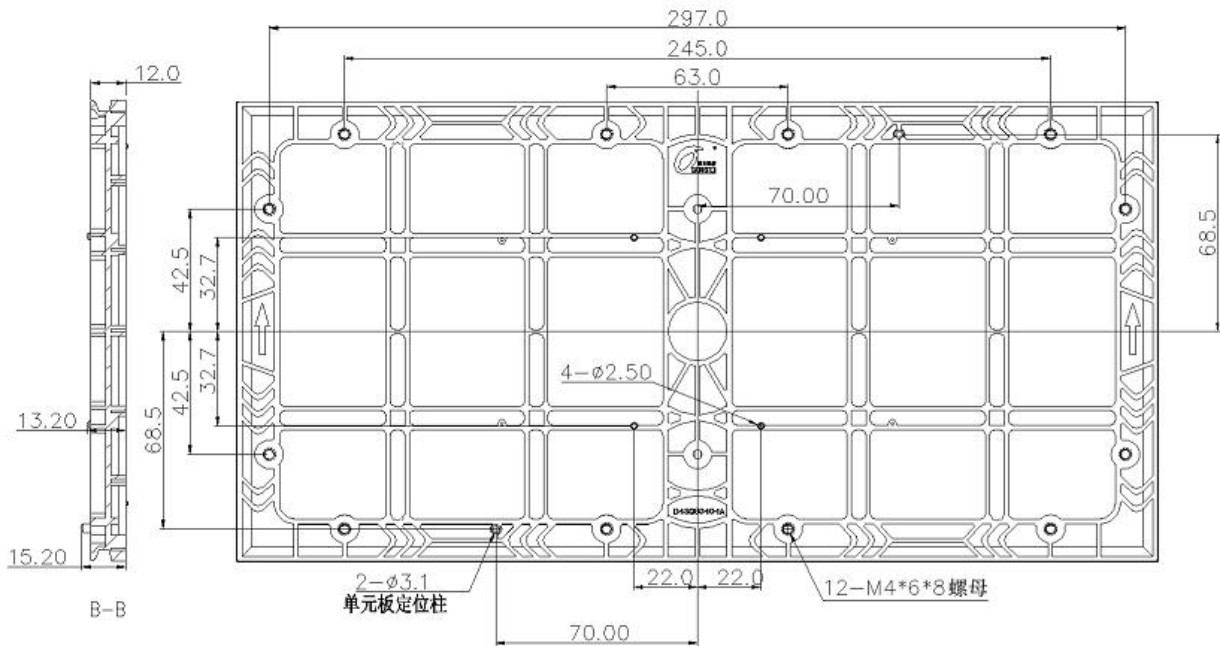
6.Product Model Naming Instructions



7.Mounting Hole Bitmap

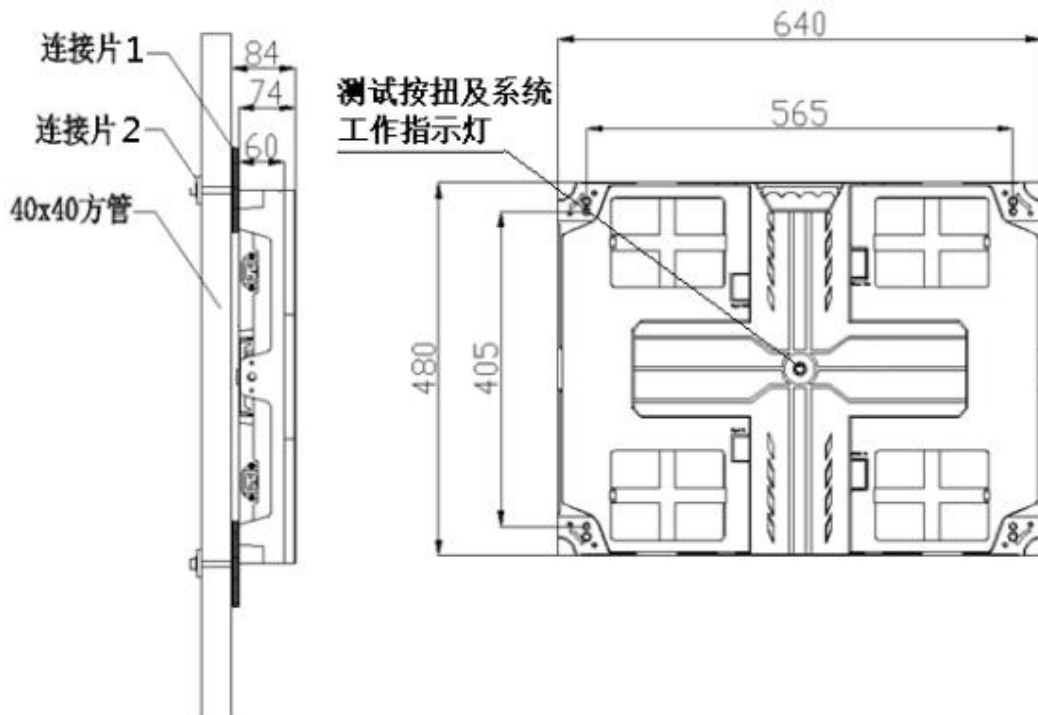
7.1. Installation hole bitmap of panel:

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Remarks: "If you need to make a cabinet, please inform the office in advance and confirm the hole bitmap of the ordered product. Please refer to the CAD drawing for details." All dimensions are in mm.

7.2 Suggestion 640*480mm cabinet hole bitmap



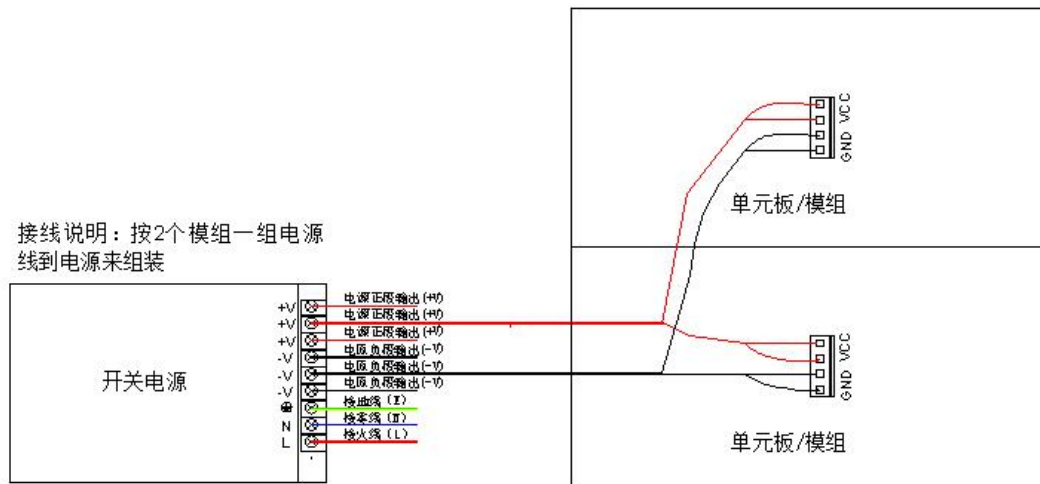
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Remarks: All dimensions are in mm.

This panel and cabinet adopt magnetic attraction and front maintenance technology, which is convenient for disassembly and assembly.

8.Installation Instructions

8.1. Diagram of wiring between power supply and panel (this picture is for reference only, and the specific wiring method refers to the actual product):



8.2. Introduction to Installation

8.2.1.Display installation method: It can be used as an indoor rental, and it supports installation methods such as fixed installation, hoisting and wall-mounted installation to meet the needs of various indoor installation environments.

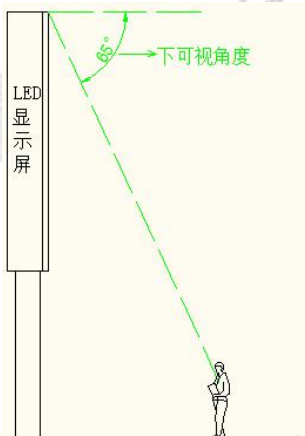


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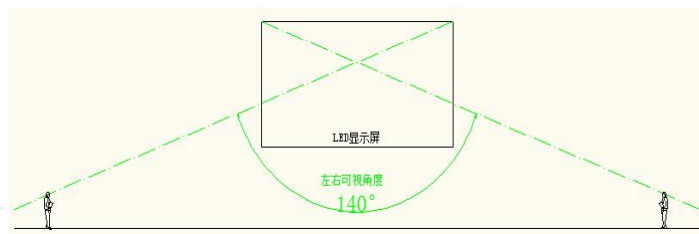
8.3. Requirements and methods for display screen acceptance

8.3.1.Screen brightness: The screen needs to be adjusted to full brightness, and the brightness in the test software is effectively adjusted to 80% on the computer. And then use a light gun to measure the brightness of the screen within 10 minutes. Measuring brightness requires the light gun to be aligned with the screen. It is best to measure the light gun to be level with the screen, make sure that the black position of the observation window covers more than 16 pixels, and adjust the focus for measurement.

8.3.2.Viewing angle: When measuring, people need to stand at the position of 140° left and right of the screen and 65° under the screen to watch (that is, the vertical viewing angle of the screen is 130°). It is required that the screen has no obvious dark spots or obvious dark blocks.



Top and bottom viewing angles of the screen



Left and right viewing angle of screen

8.3.3.Grounding: The shell of power supply, cabinet and display screen structure shall be properly grounded, and grounding point shall be correctly grounded with the landmark sign. Point inspection is carried out every six months.

8.3.4.Lightning protection treatment: The building is required to have lightning rods or lightning protection belt facilities and effective grounding, and the distribution box is required to be equipped with surge protectors. The lightning protection facilities are inspected every six months.