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PN-HB851/HB751/HB651 PN-HM851/HM751/HM651 Installation Guidelines

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**Visual Solutions Business Unit
Business Solutions BU
SHARP Corporation**



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1. Overall precautions



1.1 Overall precautions

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Precautions for Usage, Installation

- Do not use the LCD monitor under following conditions ;
 - 1) Usage beyond its capability, feature/function, accuracy/precision
 - 2) Usage that could develop into injury or life-threatening situation under product breakdown
 - 3) Usage that could lead to major monetary damage

We will not take any responsibility if the product was used under above conditions.

<Example>

Control of all types of safety related usage of transportation equipment (air plane, train, car, etc.), aerospace equipment, communication equipment, nuclear control equipment, medical equipment, disaster-prevention/security equipment, all types of safety equipment, etc.

- We will not take any responsibility for any failure, damage, loss, etc. which arise from particular installation (high-ceiling mounting etc.) and/or installation by non-Sharp related parties. Prior to the installation, please examine the potential problems by the installation location and installation method, and only operate within the appropriate environment.

In case of product failure, regardless of warranty period, removal and installation expenses incurred will be the customer's responsibility.

Repairing may take a certain time period. For that reason, arranging of a back-up is recommended.

- Installation environment of the LCD monitor differs by individual cases. Please make appropriate installation by referring to this material. If you have any difficulty in making judgment about installation or have any comments/questions about the contents of this material, please ask SHARP sales subsidiaries.



1.2 Peculiar terms of use

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Before using the models of this series, please be aware of the following notes.

Continuous operation time for HB Series

The monitor runs for 16 hours continuous operation

Built-in Android run in HB/HM Series

The built-in Android run for 24 hours continuous operation. When setting “Power Save Mode” “OFF”, the built-in Android controller keeps turning ON even in the standby mode to receive the distributed content or to be managed by the server PC. To maintain the stability of the digital signage operation, OS should be rebooted once a day. Please check “software setup manual” about rebooting OS.



2. Design precautions



2.1 Precautions for temperature and clearance space

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Temperature control and clearance space conditions

- Usable temperature range ※1
→ **0°C-40°C (Horizontal Installation : 0 ~ 30°C)**

- Temperature of LCD surface → **Under 60°C**

Please follow these requirements when setting the monitor. Refer to them and install the monitor according to its requirements.

※1: this range may change by requirements.

The thermal influence

- If the temperature is too high → Electronic component's life time will be shortened or break down.

- If the temperature on LCD surface is too high
→ Monitors will break down or uniformity issue will occur

- If the temperature is too low → Monitors will break down, will not launch or monitor issue will occur.

Space requirement

Securing space at the Top/ Bottom/ Left/ Right/ Behind/ Surface of the monitor is necessary regardless of wall-hanging or stand type installation.

	Landscape / Portrait Installation	Horizontal Installation (Only faceup)
Top	20.0cm	20.0cm
Bottom	5.0cm	20.0cm
Side	5.0cm	20.0cm
Behind	3.5cm	20.0cm
Surrounding temperature	0~40°C	0~30°C

*** this figures are without outer casing.**

If you install with outer casing, requirements are changed by size/location of vent hole, whether or not fan.

The effectiveness of each measure differs depending on the environment. Please choose the best measure for respective environment as follow.

- Adding a cooling fan(please use the filter and clean it regularly.)
- Improve the ventilation by widening its space
- Adding a heat exchange



Heat prevention unit
(Apiste co.)



Example of fan installation



2.2 Precautions for sunlight

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This monitor is indoor use only. Please set this monitor to avoid the direct sunlight, wind, or rain. These conditions may cause failure and/or deterioration.

About sunlight

The product must not be exposed to the direct sunlight
Please keep the product away from direct sunlight. Please install the product in shaded areas especially when using in an outdoor or semi-outdoor environment.

The effect of direct sunlight

If the product is being used under direct sunlight

- The effect of brightness
 - > Monitor would look much darker than the normal use
- The effect of ultraviolet rays
 - > LCD or color filter will deteriorate
- The effect of the heat
 - (Even though the environmental temperature is fairly low, the temperature of the area under direct sunlight could be high)
 - > Monitor will break down or uniformity issue will occur.
 - Cabinet will also deform.



Example of LCD darkening



Example of LCD darkening

Countermeasure

- Set a sun-shade above the monitor
- Utilize the shade of the building
- Place the monitor where there is no direct sunlight
- Change the direction of the monitor to avoid sunlight
- Using some object which can block out the direct sunlight
(You should pay attention to strong winds like hurricanes.)



A shade above the product



Utilizing the shade of the building



Setting the monitor back to the place where there is no direct sunlight



2.3 Precautions for dust

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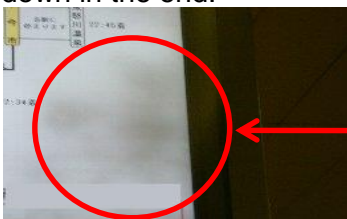
About dust

- Fundamentally, LCD monitor is designed for indoor usage.
- When it is being used outdoor, or at dusty places, such as railway station or close to the traffic, the solutions against dust must be considered.

The effect of dust

-If the anti-dust solutions are not being considered ->

The dust will enter into the LCD panel through the gaps and will cause the distorted image (see example below), and will break down in the end.



The dust enters into the LCD panel and causes the distorted image.

Please don't set up vent, when installing the monitor on to the pole and the wall. The dust causes the above phenomenon by intrusion of dust to inside of the product.

Countermeasure against dust

- Create a completely sealed enclosure.
- The completely sealed enclosure shut off dust so it is advantageous for installation in locations with excessive amounts of dust, outdoor, and that may occur in salt.
- You will need to be a combination of countermeasure against thermal, such as the heat exchanger and the air conditioner.

Precautions for using anti-dust display

- When using the anti-dust display(enclosure), please remove the dust with filter.

Precautions for using the filter

(1)it is possible to prolong the filter life by using two filter and exchanging the fine screen pre-filter.



(2)it may raise the internal temperature for a monitor when using the filter, because of raising the air resistance.

Please reduce the air resistance by increasing the area of filter, etc.

(3)when making the enclosure, it needs the caution whether the fan air-breathe or exhaust the air.

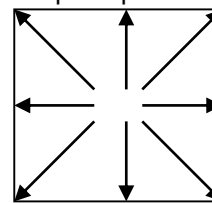
Intake air fan:

The pressure in the enclosure is higher than out of enclosure. Therefore, dust does not break in the housing. It is limited the size of intake vent. And it is difficult to suck in much air(when using in dusty area).

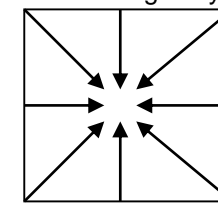
Exhaust air fan:

The pressure in the housing is lower than out of enclosure. Therefore, dust breaks in the housing. It has much size of intake vent. And it is easy to control the temperature(when using in less dusty area and severe temperature requirements).

※to keep the performance, please clean the filter regularly



Intake air fan



Exhaust air fan



2.4 Reflected glare

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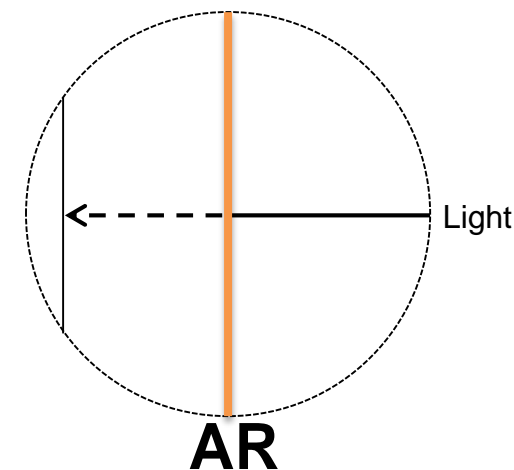
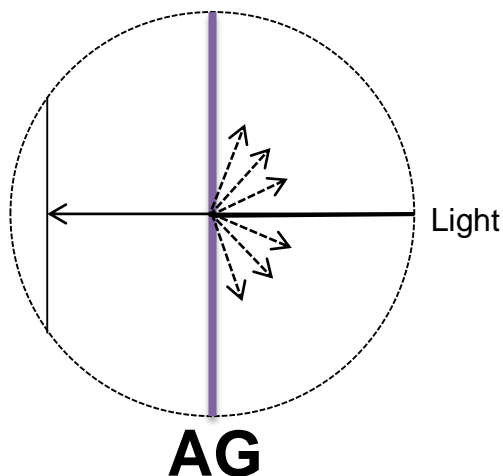
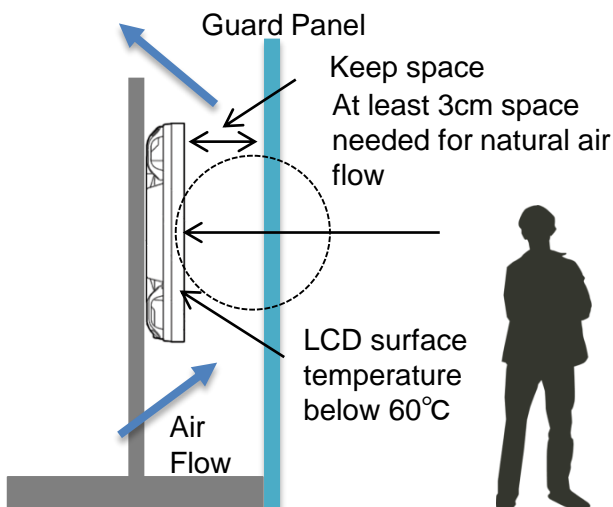
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Reflected Glare

- With a guard panel, reflected glare may occur and may degrade visibility.
- Anti glare screen protector is effective to prevent reflected glare.
- There are two methods of anti glare finish.
 1. AR coating which reduces reflection and eliminates stray light.
 2. Silica coating (AG coating) which reduces reflection with scattered reflected light. AG coating is lower price than AR coating. However, images easily defocus and view angle is narrow with AG coating. Please select the right screen protection for your purposes .

Panel surface treatment : Anti-glare treatment (Haze Value 1%)

- Generally, when decreasing glare, image quality comes down. Therefore, please select the suitable protection panel in each installing site.
- The closer a distance from the protection panel to the LCD panel get more clear image. However, LCD surface temperature rises.
- Please make sure that the LCD surface temperature is below 60°C by keeping a space (at least 3cm) between monitor and guard panel for natural air flow. a monitor and a wall to flow the air. The space size may differ depending on installation condition and ambient air temperature. If air flow fan is required, sufficient examination is needed.





2.5 Precautions for installation location, dew condensation, water drops and salt damage

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About installation location, dew condensation, water drops and salt damage

- This model is only for internal use. Please avoid weather and direct sunlight when installing. They cause breakdown and degradation.
- Humidity condition for IDP
 - Range of humidity condition for IDP : **From 20% to 80%(no condensation)**
- Dew condensation and/or liquid drops will cause the breakdown of the circuit and/or LCD panel. Please install LCD away from condensation and liquid drops.
- About dew condensation

The back cabinet of the product is plate. So dew condensation occurs easily.
The environment which has high possibility of condensation

 - Place where temperature is generally low but has frequent warm air flow.
(Example : the place in front of the vents of radiators. When the radiator is turn on in a cold winter morning, condensation occurs.)
 - Near the sea, lake, mountain and so on where humidity is high
- The environment which has high possibility of water drops
 - “Semi-outdoor” place where strong winded-rain(typhoon) could potentially reach the monitor. The place which is below the pipes inside the ceiling. (When installing in these places, countermeasures should be taken to avoid water drops to reach the monitors. For example, covering the LCD monitor with box. In such a case, consideration should be given for direction of vent.)
- Caution for the wind of the typhoon
 - Please install so that you can remove the influence from the wind.
- Caution for salt damage
 - Please hold counsel with us in advance when installing near the sea where salt damage may occur.
- Caution for sulfide
 - Please don't install near the hot spring and volcano where there may occur the influence from sulfide.
- Caution for organic gas and flammable gas
 - Please don't install the place where there may be organic gas and flammable gas.





2.6 Vibration/Afterglow/Expansion precautions

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Vibration

This monitor is not designed to set in any places with strong vibrations, such as in motor vehicles.

If the monitor will be used in the place with possibility of even small vibration, such as at railway station's platform, take some measures such as using a shock absorber .

Expansion

When using acrylic or polycarbonate protection panel, be aware of expansion due to heat or moisture absorption.

Acrylic protection panel can expand about 0.4%
(approx. 6.2 mm : 70")

Install the protection panel with a space so that it won't be distorted due to expansion.

Afterglow

- When a still image is being displayed for a long period, afterglow might occur.

It can be removed by playing videos or turning off the monitor. The longer period of time a still image is being displayed, the harder it is to remove afterglow. Change the image occasionally.

- The followings are expected to prevent afterglow.
 - Display video as long as possible. (e.g. Display 10 seconds' video after 5 minutes' still image)
 - Prevent increase of the contrast difference between background and content. Change the color occasionally.



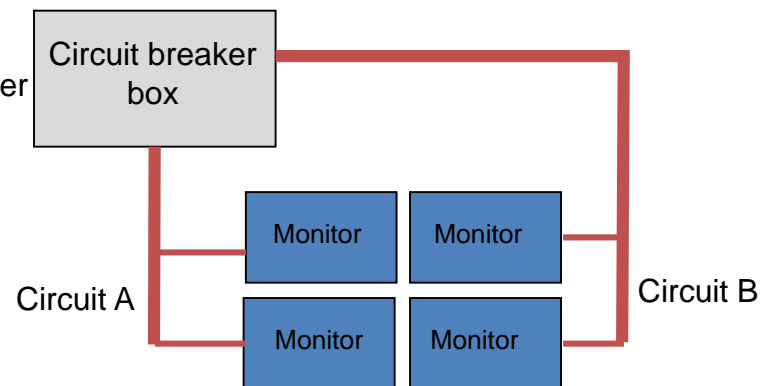
2.7 Power supply precautions

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Power Supply and Voltage

- This monitor are designed to be used under commercial 100V-240V power supply, but shortage of power supply may occur in wall video installation.
- Arrange plural circuit and level power consumption in each circuit.
- Avoid over power consumption such as by delaying the wake-up time using power-on delay function.





2.8 Connecting devices 1

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RS-232C/LAN

You can control monitor functions by PC by connecting RS-232C or LAN. (e.g. power on/off function)

We recommend connecting RS-232C or LAN to monitors before installing them in higher place or other places where it is hard to connect cables after installation. They may need in future monitor maintenances.

Media Devices and Peripheral Equipment

When you use media devices (e.g. personal computer, DVD player) or peripheral equipment (e.g. distributor, video switching unit), check the connection operation of the devices beforehand.

Cable

-In analog connection, image quality might be influenced by a video board or cable. All monitors requires adjustment when installed. We recommend digital connection(e.g. HDMI or DisplayPort connection) for high quality images.

-When you use light conversion cable to extend the transmission distance, EDID may not be read accurately. Not reading EDID accurately, monitors cannot display correctly. Check the image quality beforehand when using these devices.



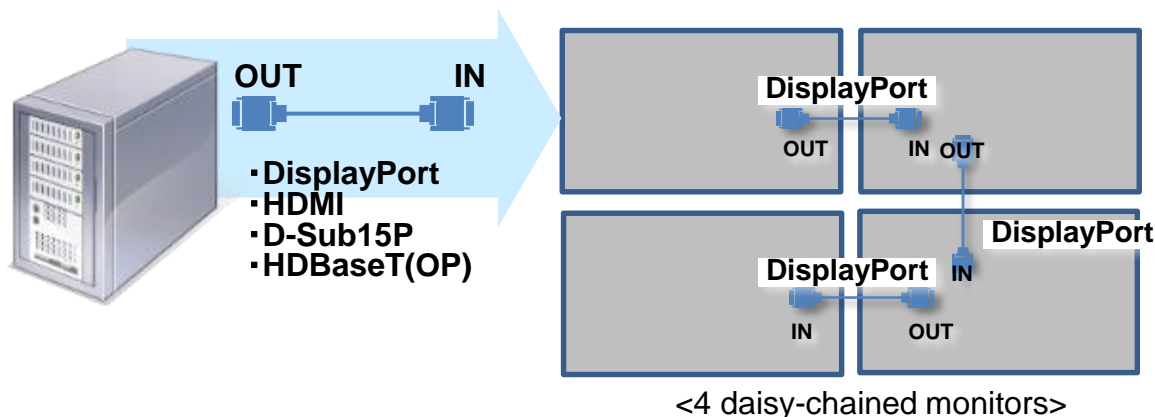
2.8 Connecting devices 2

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DisplayPort Output Terminal

- Videos of the current input mode can be output to an external device by a DisplayPort output terminal.
- This terminal allows the daisy chain connection of **up to 4 monitors** by connecting the monitors to each other through the DisplayPort input terminal. If the number of daisy-chained monitors exceeds the maximum limitation number, video might not be displayed properly.
- In daisy-chained connection, the length of DisplayPort cables is up to **3m**
The monitors are connected by commercially available 4K-compatible cables.
- This terminal can be used to make a daisy chain connection* by connecting same series monitors to each other through the DisplayPort input terminal of each monitor.





2.9 Precautions for space between monitors

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About thermal influence

-In particular, when monitors are installed one above the other, the temperature raise of topside monitor cause of the exhaust heat from downside monitor.

Regarding the countermeasure against temperature, Please keep the clearance in P.4.

In fact, when installing multi-display, it is hard to keep the clearance in P.4. Therefore, please keep the temperature requirements to do the countermeasures as below.

- 1) Reduce the surrounding temperature(using an air-conditioner)
- 2)Get down the brightness(when a brightness gets down, a power consumption and heat gets down)
- 3)Keep much clearance between the monitors
- 4)Flow the air forcibly between monitors
It is effective to use the spot cooler or fan in the back(when the monitors catch the wind, they are easily attached the dust).

About expansion

The cabinet and frame of the LCD monitor is expanded due to heat.

It is necessary to reserve enough space when aligning multiple monitors.

If the space between monitors is small, the weight is loaded to LCD panel by heat expansion.

It is necessary to increase the gap when installing more large monitor. (Standard about 5 mm)

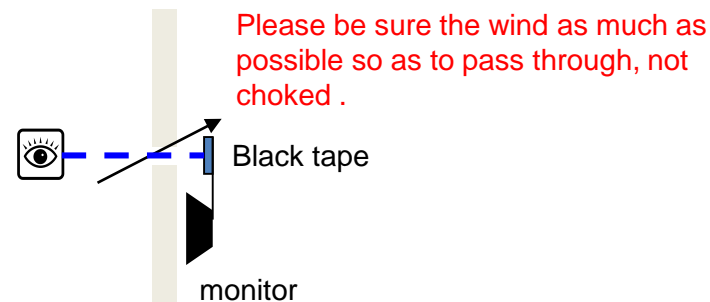
Hiding the gap between the bezels

If the gap between monitors spoils appearance (e. g. back of the monitor can be seen through), please hide it by affixing black tape at the rear.

Note: DO NOT seal the “exhalation fan and intake-nozzle” by black tape.

Please attach the tape before connecting cables.

It is necessary to check the tape periodically to make sure that the tape isn't detached from the monitor as time goes by.





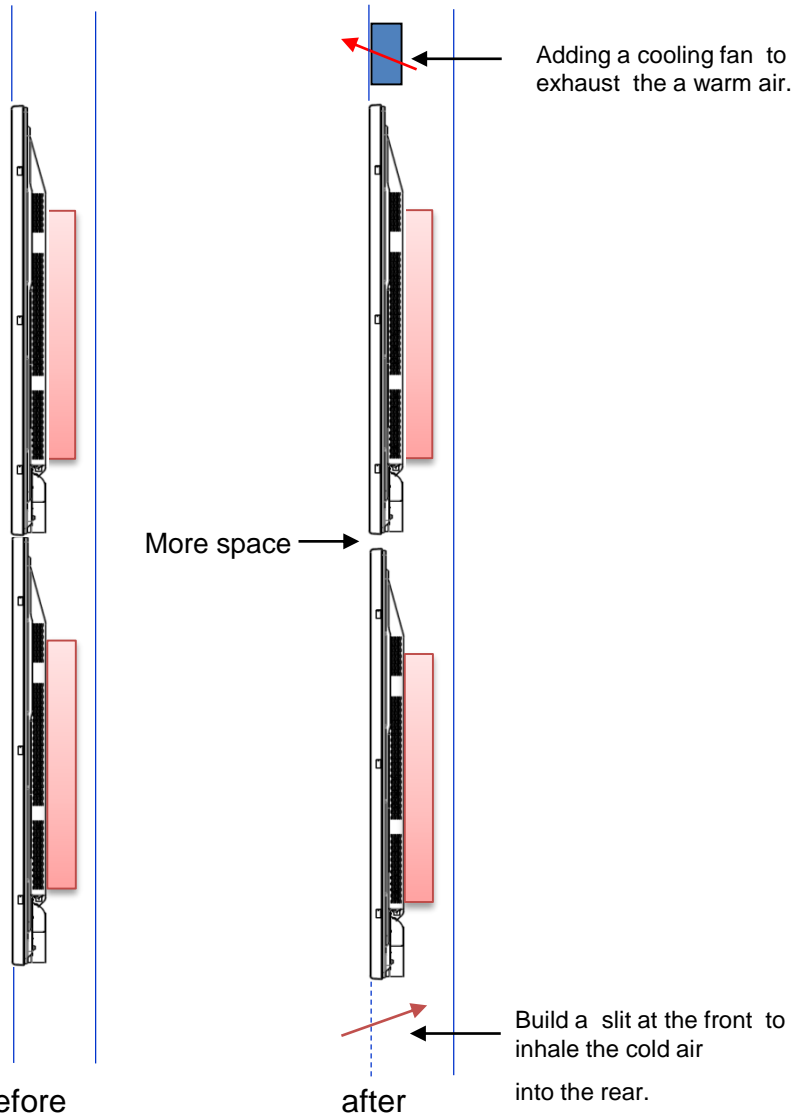
2.10 Precautions for space between monitors (Case Study)

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Please reserve enough space between monitor and stick blind sheet up on the wall.

Please reserve enough space on all sides.





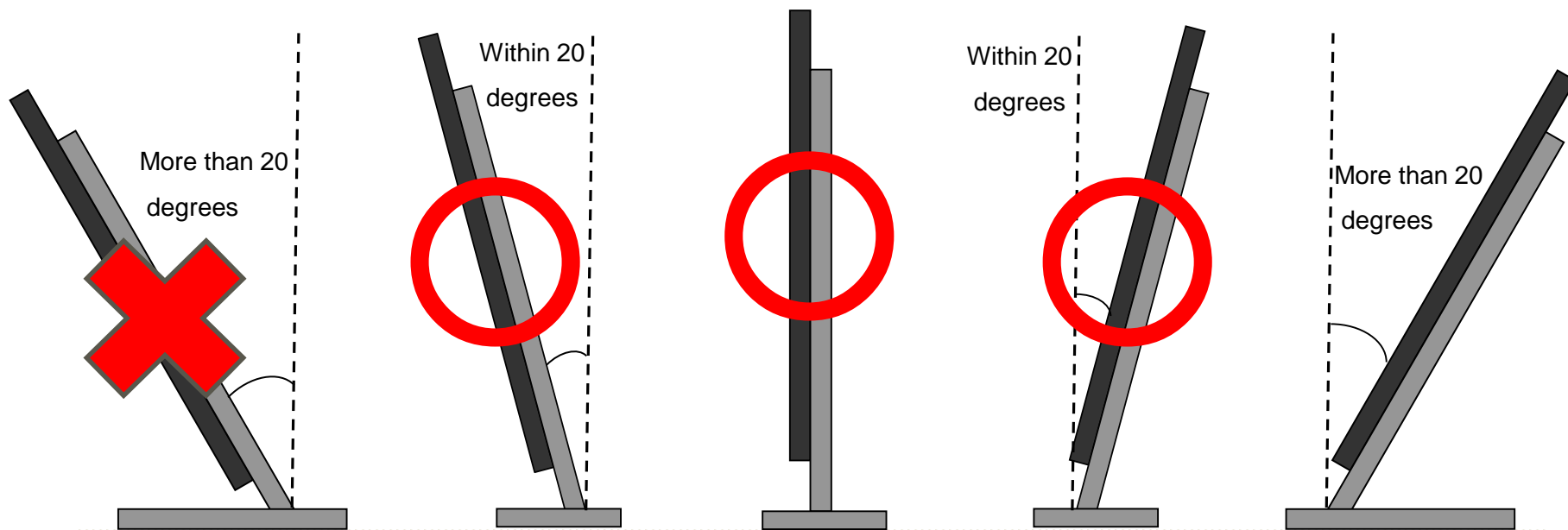
2.11 Precautions for orientation 1

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About orientation

- This model basic inclination angle is between 0 to 20 degrees upward/downward.
- For installation for more than 20 degrees, (horizontal installation included), special precaution and setting is needed. Please see horizontal installation details in the next page.



下向き20度を超える設置はできません。

Separate Settings and
Condition in the next page



2.11 Precautions for orientation 2

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For Installation more than 20° below settings are required

① Set HORIZONTAL INSTALLATION in the MONITOR menu

(when the monitor is tilted 20 degrees or more upward from the perpendicular in relation to a level surface)

■ For Facing Up or more than 20 degrees upward.

「MENU」 → 「MONITOR」 →
「HORIZONTAL INSTALLATION」 → 「UPWARD」

* This model cannot be installed with more than 20 degrees tilting angle downward.

② Operational environment (installation condition, temperature conditions, space conditions, etc.) will be stricter.

Details are in the next page.



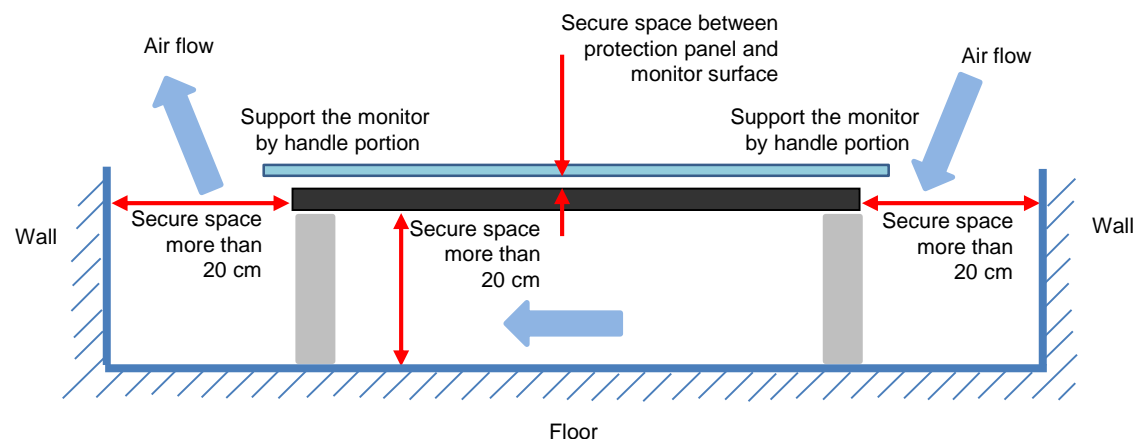
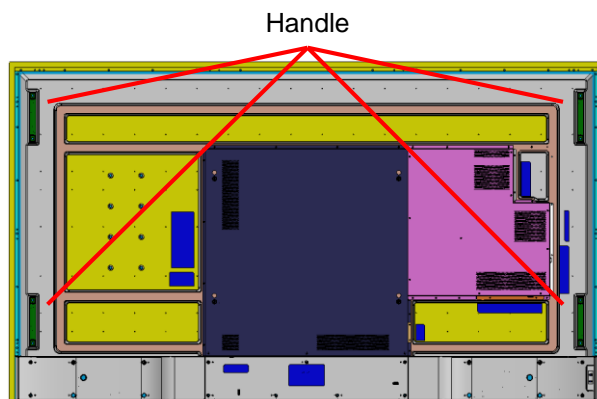
2.11 Precautions for orientation 3

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Face-Up installation

- Ambient temperature must be below 30 °C (Place with working air conditioned). ※ If securing the space is difficult, and the ambient temperature exceed 30 °C, please install a cooling system such as fan to ensure that the ambient temperature is 0 °C ~ 30 °C
- Please secure space more than 20 cm from wall and floor in order to flow air smoothly.
- If monitors are overlaid with protection panel, the temperature of the space between monitor surface and protection panel must be kept under 40 °C with cooling system.
- The protection panel may transform and curves inward by heat depending on its material, therefore please adjust a necessary space between monitor and protection panel based on the flexure of protection panel, load from upper part, and the installation method. Please be sure that **protection panel do not touch the monitor surface** even if it is curved.
- Do not press the monitor surface and drop anything on the monitor surface.
- Please be careful not to nip cables between monitor and mounting bracket.
- **Remove handles and support the monitor by the portions where handles used to be. (Do not use mount screw holes to support the monitor.)**





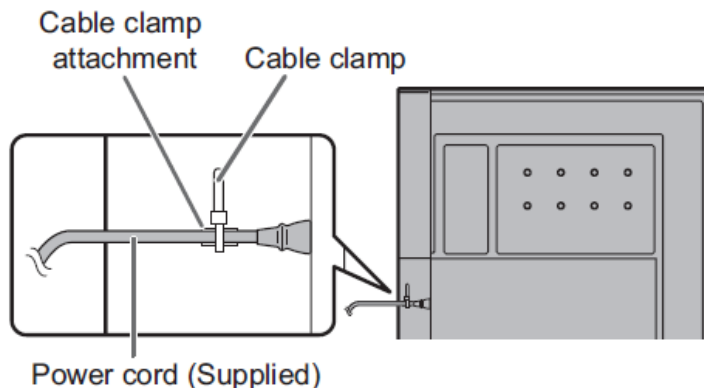
2.12 Precautions for cable wiring

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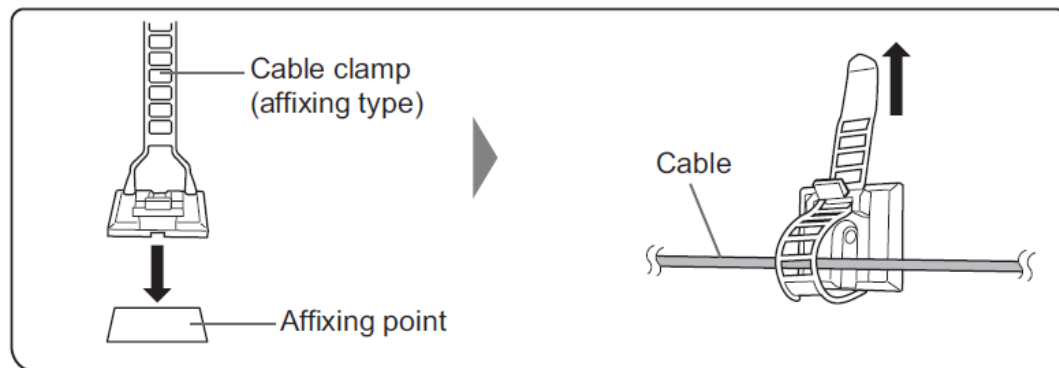
Binding Cables

Be sure to clamp the power cord (supplied) by using the supplied cable clamp (affixing type). When clamping the power cord, take care not to stress the terminal of the power cord. Do not bend the power cord excessively.



The supplied cable clamps (affixing type) can be used to clamp the power code and cables connected to the back of the monitor.

- Attach the supplied cable clamps to a flat surface. Do not attach over a vent.
- Remove any dust or dirt before attaching.





3. Installation precautions



3.1 Precautions for opening package

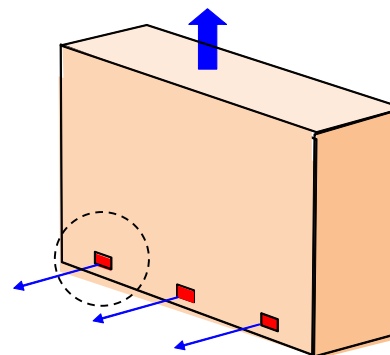
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Precautions for Unpacking

- Please open the package with at least 2 persons.
- Remove joints from the package. (6 points)
- Take the upper part of the package off, and remove the monitor from the package.
- Accessories are packed in the box at the back. Remove the relevant joint from the bottom of the package to take out the box. (One joint)



Please remove joint directed downwards with keeping holding inner tabs from each side.



Remove 6 joints at the bottom part of the package, and then lift up the box to open.





3.2 Operations by remote control when unpacking

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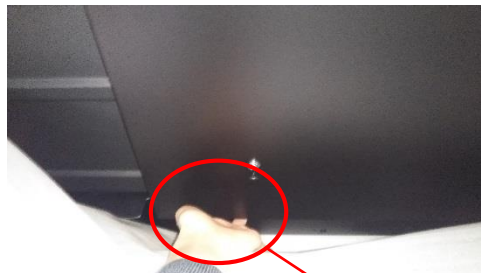
How to operate by remote control when unpacking the monitor

You can operate the remote control with the monitor standing on the bottom box with power code connection.

Remove the upper box and pull down the protection cover.



After removing the accessory box at the back, you can connect the power code to the monitor by inserting your hand in the gap between protection cover and the monitor.



AC Input Terminal



You can operate the remote control by holding the remote control sensor part to close to the joint hole at the front left of the bottom box.



3.3 Precautions in installing and handling

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Precautions when carrying the monitor

- Use the cart to carry the monitor in the package.
(The monitor in the package must be carried by at least two persons.)
- Carry the monitor in landscape orientation. **You cannot carry it in portrait orientation.**
(This monitor must not be carried in a portrait orientation even for a temporary period.)

<Packing size and weight>

	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
PN-HB651/HM651	1,610	278	967	40
PN-HB751/HM751	1,852	298	1,122	50
PN-HB851/HM851	2,092	291	1,251	64



The task should be done by two persons or more
when carrying the package on the cart.



**This monitor must not be carried
in portrait orientation.**



3.3 Precautions in installing and handling

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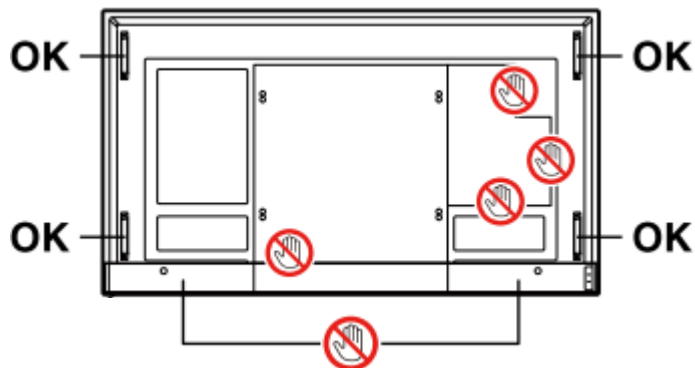
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Worker position, assignment of work and cautions at lifting up the monitor.

Please wear gloves and safety shoes when you lift up this monitor.

When lifting up the monitor in the installation, the task must be conducted by **at least 2 persons for 65" monitor and at least 4 persons for 75"/85" monitor.**

Following the image below, please check the position and assignment for each worker.



LCD is made from glass.
Please use the bezel to hold
when installation and refrain
from touching the LCD screen.

OK (All 4 bezels)

- This monitor can be held by handles and it is also possible to hold any parts of bezel.
- When holding, please hold the monitor with the bottom hand, and the top hand hold to support the monitor balance.
- For portrait installation, refer to "UP" mark label.

Do not hold the monitor by power connection part at the back and terminal part at the bottom/side to avoid injury, damage and malfunction. Be careful not to touch those portions.

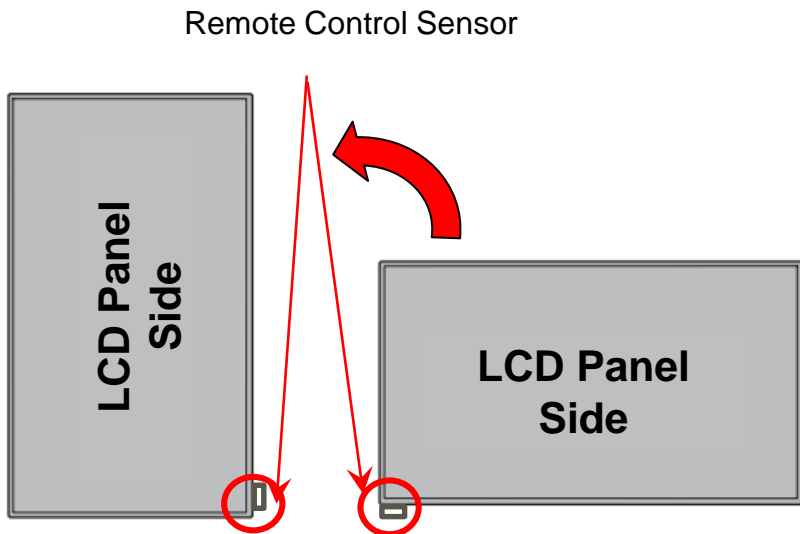


3.4 Rotation direction for portrait installation

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Caution

• In case of portrait installation, please rotate the products counterclockwise 90 degrees when viewed from the front.



-Please check indication label and pay attention to rotation direction in case of portrait installation by using mounting hardware.

-Please change OSD indication from landscape to portrait in case of portrait installation.

「MENU」 → 「MONITOR」 → 「PORTRAIT/LANDSCAPE INSTALL」 → 「PORTRAIT」

Indication (Rating Label)



Rotation 180° Function

This model has a function to rotate displayed content 180°

To activate this function, from OSD menu 「MENU」→「MONITOR」→「ROTATE 180」→「ON」
(Interlaced signals may not be displayed properly.)



Rotate 180 「OFF」



Rotate 180 「ON」



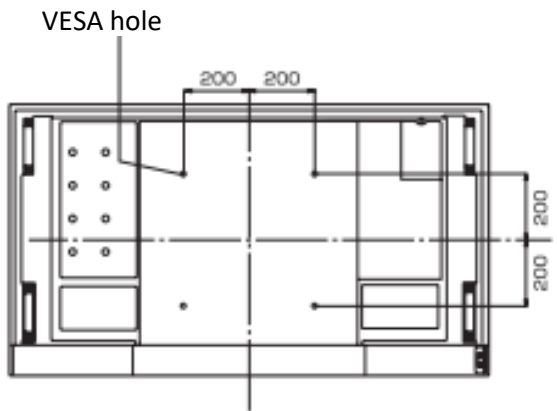
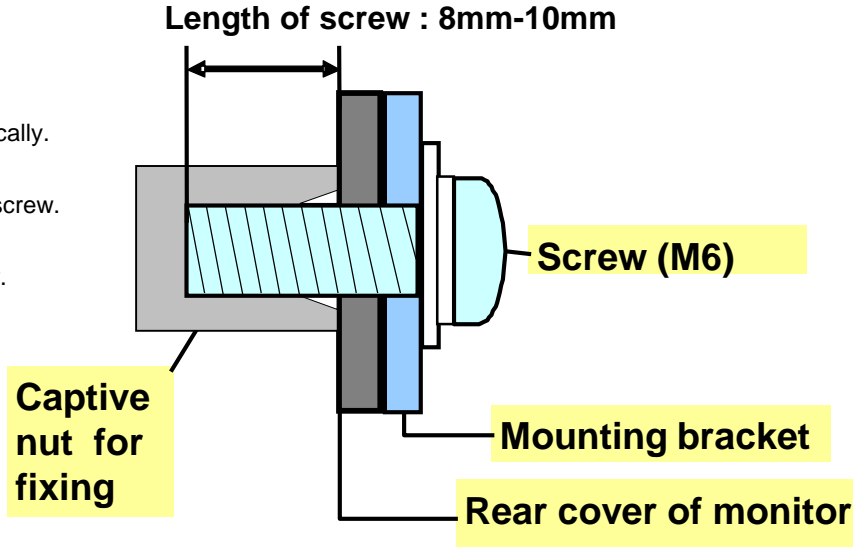
3.5 Attachment precaution

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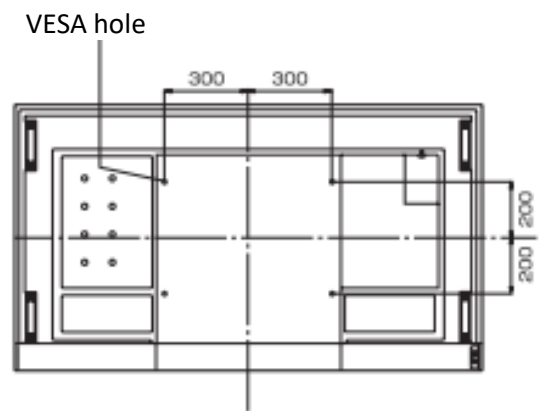
Mounting bracket for monitor (M6 screw)

-Please take attention to following items for using screw holes behind IDP.

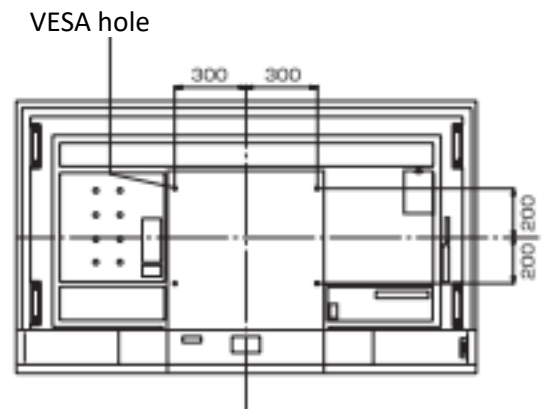
- 1) Please use more than 4 mounting screws to fix the monitor.
- 2) Please use symmetrical screw holes across the center line.
*It can cause malfunction or deformation of the monitor to use screw holes asymmetrically.
- 3) Please use a mounting bracket having not more than 7.5mm hole diameter.
*Oversize of hole diameter can cause unfastening of the captive nut by the mounting screw.
- 4) Please use screws being correct length written in operation material of monitor.
*Over length of screw can cause unfastening of the captive nut by the mounting screw.
- 5) Please take measures by all means to prevent the screws loosening.
(For example : using screws with washer)
- 6) Please tighten screws hard with not more than 3N*m strength.
(Tightening torque: 3N*m)



PN-HB651/HM651
VESA 400 x 400



PN-HB751/HM751
VESA 600 x 400



PN-HB851/HM851
VESA 600 x 400



3.6 Precautions on PC installation

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Consideration for PC installation

- Sufficient consideration for the ambient temperature is necessary, when multiple PCs are set up in the same space . Likewise, when one PC is set up together with monitor in the same space .

Based on the temperature actually measured, please estimate the temperature of each part during the condition that the room temperature is highest, and take necessary countermeasures against heat. For instance, it is effective to install a ventilation fan to reduce the chance of overheating

- We recommend you to use a wireless mouse and keyboard to assist with PC operation.



3.7 Maintenance & checking items

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Maintenance & Checking Items

For safety use, both daily and periodical maintenance are necessary.

1. Daily maintenance

- 1-1. Cleaning of LCD surface
- 1-2. Monitoring operating conditions

2. Periodical maintenance

- 2-1. Checking the installation conditions. Checking the mounting bracket for the main units, for loose mounting bolts and screws, etc.
- 2-2. Checking the peeling off of black tape to maintain good looking appearance between panels
- 2-3. For wire hanging installation, check wire condition.

Cleaning of LCD surface

- Please wipe the LCD surface lightly with a soft cloth (lens cleaner and gauze, etc.).
Please ensure that the surface is not damaged with a hard cloth and do not rub strongly .
- Please use a static electricity removal brush (dustproof brush) commercially available when dust attaches to the LCD.
- Please do not wipe with a damp or dusty cloth, in order to protect the LCD.



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