



# User's Manual


MM/MC series

## CONTENTS

1. Safety Instructions.....	4
2. Regulatory Information.....	5
3. Precautions.....	6
4. Before setting up.....	7
5. Features & checking the products.....	8
Features of Products.....	8
Checking the products.....	8
6 Setting up the LCD Monitor.....	9
Features of Connectors.....	9
Description of Connectors.....	9
Connecting the LCD Monitor.....	10
Warm-up Time.....	10
7. Adjusting of OSD Menu.....	11
Features of OSD Controls.....	11
Description of Control ports.....	11
OSD Operation.....	12
8.Adjusting the Viewing angle.....	13
9.Appendix.....	14
DVI-D connector Pin Description.....	14
Power Saving Mode.....	14
Specification.....	15
Trouble shooting.....	18
Contact.....	18





## Safety Instructions

Symbol		Explanation
	CAUTION !	RISK OF ELCTRIC SHOCK DO NOT OPEN
		TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER(OR BACK) NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

	<p>MEDICAL EQUIPMENT</p> <p>13XX</p> <p>E246477</p> <p>WITH RESPECT TO ELECTRIC SHOCK.FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL60601-1, AND CAN/CSA C22.2 NO. 601.1 MEDICAL EQUIPMENT CERTIFIED FOR CANADA</p>
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Grounding Reliability can only be achieved when the equipment is connected to an equivalent receptacle with marked “Hospital Only” or “Hospital Grade”

## Explanation of Graphical Symbols

	Attention, consult ACCOMPANYING DOCUMENTS
	The lightning flash with arrowhead symbol, within an equilateral triangle ,is intended to alert the be user to the presence of un-insulated ”dangerous voltage” within the product’s enclosure that of may sufficient magnitude to constitute a risk of electric shock to persons
	Stand-by Switch. Press to turn the monitor on or off(Stand-by mode).
	Alternating Current

## Regulatory Information

### FCC RF INTERFERENCE STATEMENT

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 receptions, 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the or an experienced radio /TV technician for help.

**CAUTION:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### CE MARKING DECLARATION OF CONFORMITY

This LCD Monitor complies with the requirements of the EC Directive 89/336/EEC"EMC Directive" and 93/42/EEC – Medical Device directive

The electro-magnetic susceptibility has been chosen at a level that gives correct operation in residential areas. Business and light industrial premises and small-scale enterprises, inside as well as outside of the buildings. All places of operation are characterized by connection to the public low voltage power supply system.

### Classification:

- Protection against electric shock: Class I
- Applied Parts No Applied Parts.
- Protection against harmful ingress of water: ordinary IPX0
- Mode of operation: Continuous
- Degree of safety in the presence of flammable anesthetics mixture with air or with oxygen or with nitrous oxide
- Not suitable for use in the presence of a flammable anesthetics mixture with air or with oxygen or with nitrous oxide.

## Precautions

- Plug the power cord into a properly grounded outlet. There is the risk of electric shock.
- If you hear a noise or smell smoke from the view box or power cord, unplug the power cord immediately, and call service center. There is the risk of electric shock or fire
- Do not overload an electrical outlet with too many devices. There is the risk of fire
- Do not unplug from the outlet by pulling the power cord or when your hands are wet.

Do not bend the power cord excessively or place heavy objects on it.

Keep children and pets away from the power cord as they may cause damage the power cord.

- Do not use a damaged power cord or plug. Make sure the plug fits snugly into the outlet.
- Unplug the Power cord for isolation from supply if you use not monitor for a long time..
- Do not expose this monitor to the direct sun-light.
- Do not allow any object or liquid to enter inside this monitor.

There is the risk of electric shock, fire, or damage to the monitor

- Do not attempt to disassemble, unfix or modify the monitor.
- Keep the monitor away from high temperature, humidity and dust etc..

-> Operating environment Temperature : 10~40 degrees Celsius (°C)

Humidity : 10~80 relative humidity (%)

- Use a proper voltage/current level indicated.
- The device could be send back to the manufacturer for recycling or proper disposal after their useful lives. Alternatively the device shall be disposed in accordance with national laws after their useful lives.
- Equipment with signal input / signal output connectors should either indicate the connected equipment comply with IEC 60601-1 and / or IEC 60601-1-1 harmonized national standard or the combination should be evaluated.
- This medical monitor is designed for viewing medical X-Ray Images

## Before setting up

Before setting up the LCD monitor, please read this manual to help your understanding of the Monochrome TFT-LCD Monitor.

- Install the LCD Monitor on a flat place.
- Don't install in the place with much of water or moisture
- Put the LCD Monitor in a place with low humidity and a few of dust.
- Don't overload an electrical outlet with too many devices. There is the risk of fire.
- Don't expose the LCD monitor to the direct sun light.
- Keep the monitor away from high temperature.
- Do not place the monitor in hazardous position.

### NOTICE

- Please clean the panel and cabinet of monitor with a clean damp cloth and then wipe and dry with a clean soft cloth
- Please do not use volatile organic solvents such as alcohol, thinner, and benzenes when cleaning.

These can be damaged to the front panel

- Do not attempt to service, modify or dismantle this product.

Recommended service should be done at the prescribed intervals by Heeyoung Service engineer, Agent or a trained Technician.

## Features & checking the products

### Features of Waveric series

- High luminance & High contrast ratio
- Built-in 11.5-bit LUT
- Integrated Stable Brightness Control System
- Built-in Power Supply
- OSD control for user control
- Digital Video Interface
- Ultra Power saving mode
- Narrow bezel design for space-saving

### Checking the products

The following accessories are included in package.

Check to see if they are enclosed with the monitor.

If anything is missing or damaged, please contact your local dealer.

#### ■ Monitor

- TFT-LCD Monitor

#### ■ Accessory Box

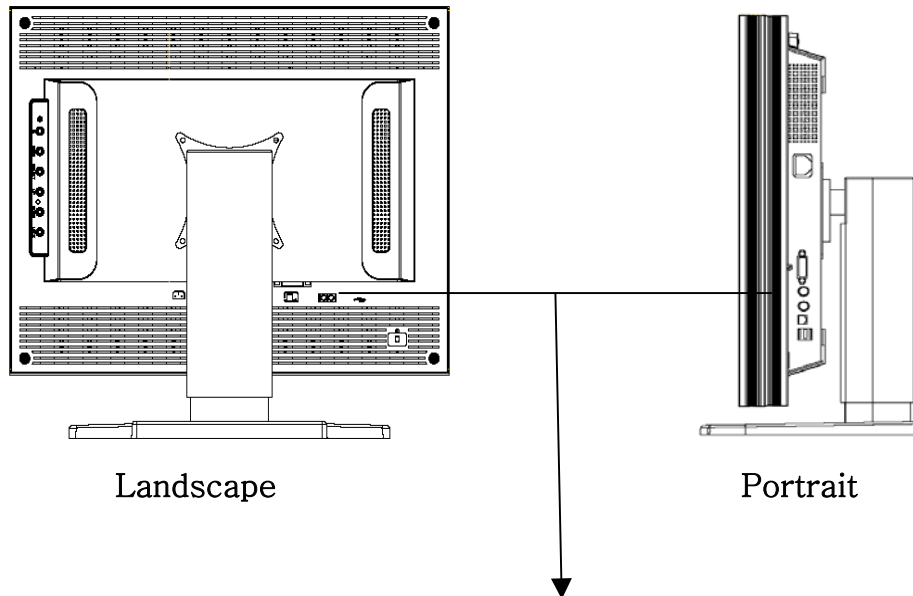
- Power Cord
- User Manual
- DVI-D Signal Cable
- External Photo-sensor(optional)
- Calibration CD(optional)

#### ■ Graphic Board Box(optional)

- Graphic Board
- Install CD
- Install Manual

## Setting up the LCD Monitor

### Feature of Connectors



### Description of Connectors

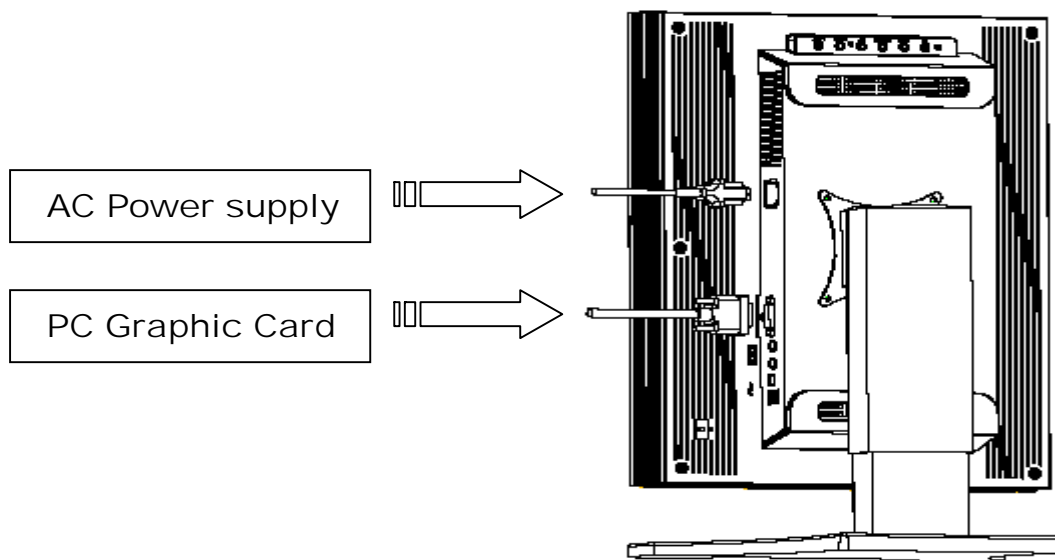
No	Name	Cable Connections
①	AC Inlet	Connect the plug of AC power cord
②	Serial In	Use for factory set-up and service purpose
③	DVI	Digital Video Interface connection from PC
④	USB(Up stream)	Connect the USB cable to PC
⑤	USB(Down stream)	Connect the USB cable to external equipments



## Setting up the LCD Monitor

### Connecting the LCD Monitor

- 1) Connect the DVI-D signal cable to the signal port of the Graphic Card in your computer.
- 2) Connect the another connector of the DVI-D signal cable on the rear side of the monitor.
- 3) Connect the power cord to the AC inlet on the rear side of the monitor
- 4) Try to collect the cable and power cord like the below pictures
- 5) Turn on the monitor with the power switch of the user control port.



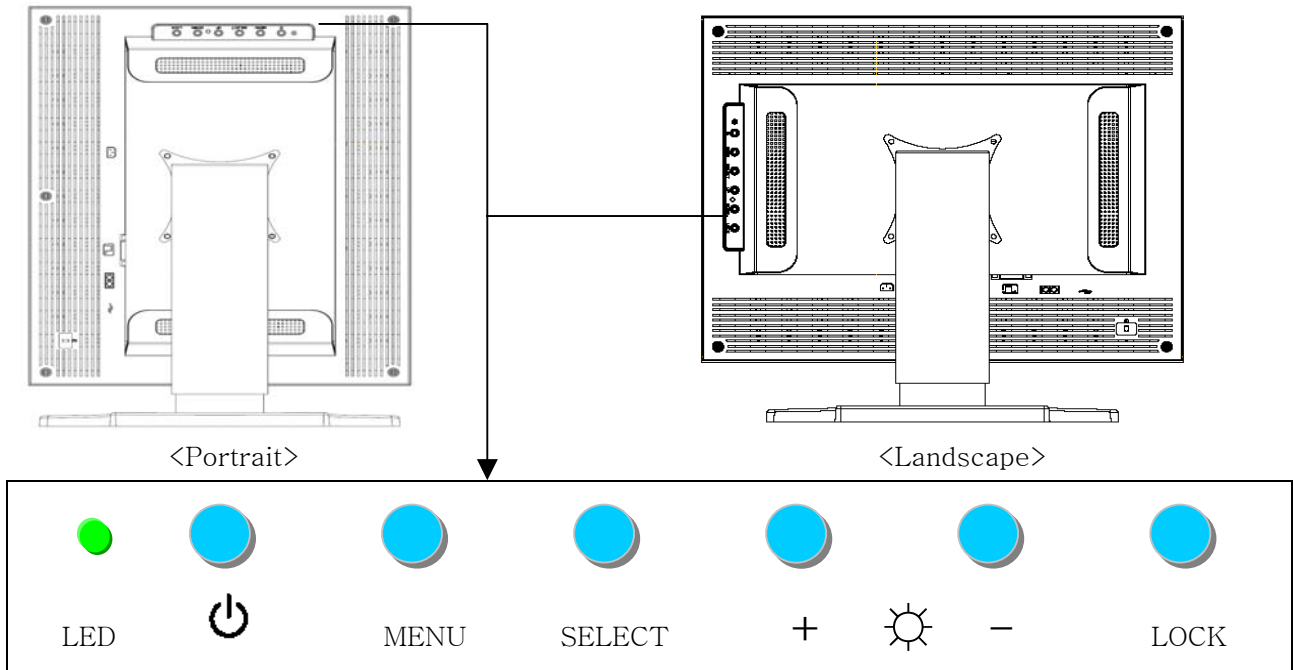
### Warm-up Time

All LCD monitors need time to become thermally stable whenever you turn on the monitor. After letting the monitor be turned off for a couple of hours.




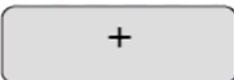


Therefore, to achieve more accurate adjustments for parameters, allow the LCD monitor to be warmed up for at least 20 minutes before making any screen adjustments.

## Adjusting of OSD MENU

### Features of OSD Controls



### Description of Control ports

	Power On/Off toggle button
	1. First click : The OSD main menu appears 2. Second click : The OSD menu disappears
	Select a command function
	Up key    1. Move the shift button 2. Increase the current option value Hot key    You can adjust directly brightness
	Down key 1. Move the shift button 2. Decrease the current option value Hot key    You can adjust directly brightness
	Lock button can control the OSD operation. Whenever press the button, Lock function is changed.

## Adjusting of OSD MENU

OSD Set the OSD ,menu display position

- POSITION : Moves the OSD menu to the any direction
- TIMER : Shows the OSD TIME displays from 5 to 30 sec.
- PIVOT : Select as a landscape or portrait mode, OSD

## DATA LEVEL

Select the gray scale level

- 8Bit : Select the 256 gray scale
- 10Bit : Select the 1021 gray scale

## SBC SET

Support the preset value for luminance

### LUMI

- USER, OFF, 350, 400, 450, 500, 550, 600, 650

Select the each value.

USER : Value of brightness hot-key control.

OFF : SBC function is not operated.

350 ~ 650 : Preset value of luminance.

## INPUT

Support the selection mode for Packed-Pixel and Dual-link signal.

- PACK

Support the Packed-pixel signal graphic card

(Matrox, RealVision)

- DUAL

Support the dual-link signal graphic card (nVidia, ATi...)

This menu is hidden in OSD MENU

**This menu can be only selected in Aging mode**

Entrance of Aging mode :

Press the switch of “power” & “+” button for 5~7 sec  
at the same time. It will be displayed the self-pattern.

And then you can select dual mode by OSD menu control.

## Adjusting of OSD MENU

## LUMINANCE

Select the luminance value of the factory preset .

- DEF.1 : Support 650cd/m2 with LUT.(MM series model)  
Notice : \* 350cd/m2 (MC20H) \*200cd/m2(MC20/MC30)
- DEF.2 : Support 550cd/m2 with LUT.(MM series model)  
Notice : \* 300cd/m2 (MC20H) \*150cd/m2(MC20/MC30)
- DEF.3 : Support 450cd/m2 with LUT.(MM series model)  
Notice : \* 200cd/m2 (MC20H) \*100cd/m2(MC20/MC30)
- USER : Support the value of range by Hot-key's brightness control.

## FACTORY

Discards the current setting values

- Reset : Replace to the factory default values

## INFORMATION

Display the information of the monitor status,

- Model Name,
- Maximum Resolution,
- Time of using : Display the used time

## EXIT

- Version : Firmware Version
- M···xxx : Serial number

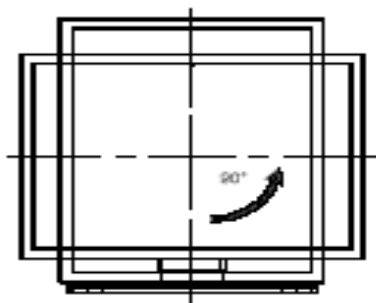
## Adjusting the Viewing angle

- For optimal viewing, it is recommended to look at the full face of the monitor and then adjust the monitor's height and angle to your own preference.
- Height ,Tilt ,Swivel
  - You are able to adjust the monitor's height up to 110mm, angle up to 35degrees right and left, 35 degrees upward
  - Adjust the monitor's height to the maximum.
- Rotation(Pivot) Function
  - Rotate the panel 90 degree
    - > Portrait : Turn clockwise.
    - >Landscape : Turn counter clockwise.

### NOTE

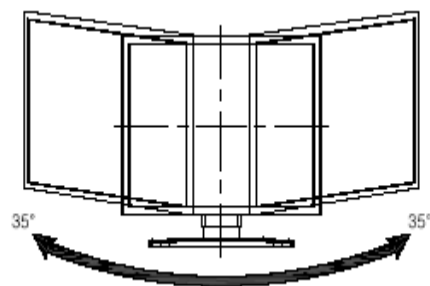
- Do not touch the LCD screen when you change the height or the angle.
- It may cause damage or break the LCD screen.
- Careful attention is required not to catch your fingers or hands when you change the height or the angle

<Height>



<Rotate>

<Tilt>



<Swivel>

## Appendix

### DVI-D Connector Pin Description

Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S.Data2-	9	T.M.D.S.Data1-	17	T.M.D.S.Data0-
2	T.M.D.S.Data2+	10	T.M.D.S.Data1+	18	T.M.D.S.Data0+
3	T.M.D.S.Data2/4 Shield	11	T.M.D.S.Data1/3 Shield	19	T.M.D.S.Data0/5 Shield
4	T.M.D.S.Data4-	12	T.M.D.S.Data3-	20	T.M.D.S.Data5-
5	T.M.D.S.Data4+	13	T.M.D.S.Data3+	21	T.M.D.S.Data5+
6	DDC Clock	14	+ 5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground	23	T.M.D.S. Clock+
8	N.C	16	Monitor sense	24	T.M.D.S. Clock-
C1	N.C	C2	N.C	C3	N.C
C4	N.C	C5	N.C		

### Power-Saving Mode

This monitor complies with the DVI-DMPM.

Mode	LED Indicator	Power Dissipation
Normal Operation	Green	Normal consumption
Power Saving Mode	Amber	Less than 2W
Off Mode	Off	Less than 2W

## Appendix

### Specification of MM-series

ITEM		MM50		MM20
PANEL	Size	20.1"	21.3"	21.3"
	Type	a-Si TFT active matrix	a-Si TFT active matrix	a-Si TFT active matrix
	Manufacturer	NEC	IDTECH	NEC
	Display size	399(H)x319(V)mm	423(H)x337(V)mm	432(H)x324(V)mm
	Brightness	850cd/m2	1,000cd/m2	1200cd/m2
	Viewing Angle	170(H),170(V)	170(H),170(V)	170(H),170(V)
	Pixel Pitch	0.156mm x 0.156mm	0.165mm x 0.165mm	0.270mm x 0.270mm
	Contrast Ratio	600:1	600:1	700:1
Resolution	Landscape	2560 x 2048	2560 x 2048	1600 x 1200
	Portrait	2048 x 2560	2048 x 2560	1200 x 1600
Gradation Display	Packed Type	11.5bit LUT		
	Dual-link	10 bit LUT		
Digital Interface		DVI-D Connector		
USB Port		1Up stream ,2Down Stream		
User Control	Method	OSD Control		
	Button Function	Power, Menu, Select +, -, Lock		
Plug & Play		VESA DDC2B		
Power	AC Input	100-240Vac,50/60Hz		
	Consumption	75W	80W	70W
	Saving Mode	Less than 2W		
Regulation	Emission	FCC class B,CE,FDA510(k)		
	Safety	cUL(UL2601-1,CSA C22.22) CE(EN60601-1),MDD		
Vesa Wall/Arm Mounting		VESA-standard ,100 x 100 mm		
Mechanical Function		Height/Tilt/Pivot/Swivel		
Dimension(mm) (W x H x D)	Net	438 x 458 x 236	476 x 523 x 236	472 x 495 x 236
	Packed	610 x 535 x 350		
Optional Item		Calibration Photo-sensor, Calibration software		
Enviromental	Operating	Temperature :10℃ to 40℃		
		Humidity : 10% to 80%		
	Storage	Temperature: -15℃ to 60℃		
		Humidity: 5% to 90%		

## Appendix

### Specification of MM-series

ITEM		MM30	
PANEL	Size	21.3"	20.8"
	Type	a-Si TFT active matrix	a-Si TFT active matrix
	Manufacturer	NEC	IDTECH
	Display size	433(H)x324(V)mm	423(H)x318(V)mm
	Brightness	1000cd/m2	1000cd/m2
	Viewing Angle	170(H),170(V)	170(H),170(V)
	Pixel Pitch	0.2115mm x 0.2115mm	0.207mm x 0.207mm
	Contrast Ratio	700:1	900:1
Resolution	Landscape	2048 x 1536	2048 x 1536
	Portrait	1536 x 2048	1536 x 2048
Gradation	Packed Type	11.5bit LUT	
Display	Dual-link	10 bit LUT	
Digital Interface		DVI-D Connector	
Calibration Sensor		Built-in Front sensor	
USB Port		1Up stream ,2Down Stream	
User Control	Method	OSD Control	
	Button Function	Power, Menu, Select +, -, Lock	
Plug & Play		VESA DDC-CI	
Power	AC Input	100-240Vac,50/60Hz	
	Consumption	75W	80W
	Saving Mode	Less than 2W	
Regulation	Emission	FCC class B,CE,FDA510(k)	
	Safety	cUL(UL2601-1,CSA C22.22) CE(EN60601-1),MDD	
VESA Wall/Arm Mounting		VESA-standard ,100 x 100 mm	
Mechanical Function		Height/Tilt/Pivot/Swivel	
Dimension(mm) (W x H x D)	Net	476 x 523 x 236	473 x 508 x 236
	Packed	610 x 535 x 350	
Environmental	Operating	Temperature :10℃ to 40℃	
		Humidity : 10% to 80%	
	Storage	Temperature: -15℃ to 60℃	
		Humidity: 5% to 90%	



## Appendix

### Specification of MC-series

ITEM		MC30		MC20	MC20H
PANEL	Size	20.8”		21.3"	21.3"
	Type	a-Si TFT active matrix		a-Si TFT active matrix	a-Si TFT active matrix
	Manufacturer	IDTECH		NEC	NEC
	Display size	423(H)x318(V)mm		433(H)x324(V)mm	432(H)x324(V)mm
	Brightness	400cd/m2		250cd/m2	450cd/m2
	Viewing Angle	170(H),170(V)		170(H),170(V)	170(H),170(V)
	Pixel Pitch	0.207mm x 0.207mm		0.270mm x 0.270mm	0.270mm x 0.270mm
	Contrast Ratio	450:1		450:1	450:1
Resolution	Landscape	2048 x 1536		1600 x 1200	1600 x 1200
	Portrait	1536 x 2048		1200 x 1600	1200 x 1600
Gradation Display		10bit(1021)grayscale    from 3061 Pallet(11.5bit)			
Digital Interface		DVI-D Connector			
Serial Port		RS-232C			
USB Port		1Up stream ,2Down Stream			
User Control	Method	OSD Control			
	Button Function	Power, Menu,    Select    + , - , Lock			
Plug & Play		VESA DDC2B			
Power	AC Input	100-240Vac,50/60Hz			
	Consumption	75W	60W		70W
	Saving Mode	Less than 2W			
Regulation	Emission	FCC class B,CE			
	Safety	cUL(UL60601-1,CSA C22.2)    CE(EN60601-1) CB(IEC60601-1)			
Vesa    Wall/Arm Mounting		VESA-standard ,100 x 100 mm			
Mechanical Function		Height/Tilt/Pivot/Swivel			
Dimension(mm)	Net	473 × 508 x 236	476 x 523 x 236		476 x 523 x 236
(W x H x D)	Packed	610 x 535 x 350			
Optional Item		Calibration Photo-sensor, Calibration software			
Enviromental	Operating	Temperature :10℃ to 40℃			
		Humidity : 10% to 80%			
	Storage	Temperature: -15℃ to 60℃			
		Humidity: 5% to 90%			

## Appendix

### Trouble Shooting

What you see	Suggested Actions
Screen is blank and power indicator is off	Make sure that the power cord is firmly connected and the LCD monitor is on.
No signal message	Make sure that the signal cable is firmly connected to computer Make sure that the computer is turned on
The display image is too dark or too light	Adjust the brightness
Screen is blank and power indicator light is steady red or blinks	The monitor is using its power saving system.(DMPM) Move the computer's mouse or press a key on the keyboard.

### Contact

HEEYOUNG Co., Ltd.

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