User's manual

HITACHI

Hitachi High-Definition
LCOS Rear-Projection Monitor

Model: ES50-116CMW, ES70-116CMW

Features

■**Real SXGA+, up to UXGA signal, can be displayed by adopting LCOS panel.**

■**Clear text, graphics and pictures are displayed with high definition.**

■**High contrast screen, which is less affected by ambient light, is used.**

■**High Speed Lamp switching by New Automatic Lamp-Changer.**

Thank you very much for purchasing this Hitachi High-definition Liquid crystal projection display. Read this instruction manual carefully for proper use, and keep it for future reference.

Contents

Before Using

＜**Before Using**＞

About the Symbols Various symbols are used in this manual, the user's manual and on the product itself to ensure correct usage, to prevent danger to the user and others, and to prevent property damage.
The meanings of these symbols are described below. It is important that you read these descriptions thoroughly and fully understand the contents.

⚠ **Warning**	This symbol indicates information that, if ignored, could possibly result in personal injury or even death due to incorrect handling.
⚠ **Caution**	This symbol indicates information that, if ignored, could result possibly in personal injury or material damage due to incorrect handling.

△ This symbol indicates an additional warning (including cautions).
An illustration is provided to clarify the contents.

⊘ This symbol indicates a prohibited action. The contents will be clearly indicated in an illustration or nearby (the symbol on the left indicates that disassembly is prohibited).

● This symbol indicates a compulsory action. The contents will be clearly indicated in an illustration or nearby (the symbol on the left indicates that the power plug should be disconnected from the power outlet).

Safety Precaution

⚠ Warning

■ Never use the projector if a problem should occur.

● **Abnormal operations such as smoke, strange odor can cause a fire or electrical shock. In such case, immediately turn off the power switch** and then disconnect the power plug from the power outlet. After making sure that the smoke or odor has stopped, contact your dealer. Never attempt to make repairs by yourself because this could be dangerous.

● **Never use the projector with no sound from the speaker or unusual noise.** Failure to heed this warning may result in fire or electric shock. Immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer.

Remove the plug from the power outlet.

● **If liquids or foreign object should enter the projector, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer.** If you keep using the unit, a fire may break out or you may receive an electric shock.

■ Do not place the projector on an unstable surface.

If the projector should be dropped and/or broken, it could result in an injury, and continued use could result in fire or electrical shock.

■ Never open the cabinet.

The projector contains high voltage components. Modification could result in fire or electrical shock. Ask your dealer to repair and clean insider.

Never modify   Be careful electrical shock.

■ Never modify.

Failure to heed this warning may result in a fire or electric shock.

Never modify

■ Do not place the projector in a bathroom.

Failure to heed this warning may result in a fire or electric shock.

Do not place the projector in a bathroom.

■ Do not place foreign objects inside this unit.

● **Do not insert or drop objects anything into the unit through the ventilation holes or other parts of the unit.** Failure to heed this warning may result in a fire or electric shock.

● **In the event that a foreign object gets into the unit, first turn off the power switch, unplug the power plug from the power outlet, then contact your dealer.** If you continue using the unit, a fire may break out or you may receive an electric shock. Be particularly careful when using the unit where children are present.

■ Do not give the projector any shock or impact.

If the projector is shocked, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer. If you continue using the unit, a fire may break out or you may receive an electric shock.

Remove the plug from the power outlet.

■ Do not place a container of liquid or other objects on the unit.

Do not place small metallic objects on the unit. Also, do not place a flower vase, flower pot, drinking glass or a jar containing cosmetics, chemicals or water on the unit. If you spill or pour liquid into the unit, a fire may occur or you may receive an electric shock.

■ Use only the correct power outlet.

Use only the correct power outlet depending on the indication on the projector and the safety standard. Failure to heed this warning may result in a fire or electric shock.

■ Do not use a power outlet other than a grounded one.

Failure to heed this warning may result in a fire or electric shock.

Safety Precaution

⚠ Warning

■ **Handle the power cord with care.**

● **Do not nick the power cord, break it, process it or bend it with unreasonable force.** Also, do not place heavy objects on it, heat it or pull it. Failure to heed this warning may cause the power cord to break or result in a fire or electric shock.

　・Pulling the cord.
　・Placing heavy objects on the cord.
　・Breaking the cord.
　・Placing the cord near a heating appliance.

● **Be careful that the power cord does not get lodged beneath the unit.**
Also, do not place heavy objects on it, heat it or pull it.　Failure to heed this warning may cause the power cord to break, result in a fire or electric shock.

● In the event that the power cord becomes damaged (the core is exposed or broken, for example), contact your dealer and replace a power cord. Failure to do this may result in a fire or electric shock.

● Confirm that dust does not adhere to the power plug, and insert the plug as far as it will go. If the plug has dust on it or it is improperly inserted, a fire may break out or you may receive an electric shock.

Safety Precaution

⚠ Caution

■Do not stand on the unit or place a heavy object on it.

●**Do not stand on the unit.**
Be particularly careful where there are small children. Failure to heed this precaution may cause the unit to topple over, break or cause injury.

●**Do not place a heavy object on the unit.**
Failure to heed this precaution may cause the unit to become unbalanced and topple over or drop, resulting in injury.

■Do not block off the ventilation holes.

If you block off the ventilation holes, the inside of the unit will become hot, which may result in a fire. For this reason, do not place the unit on its side, or push it into a confined space where the ventilation is poor. Also, do not cover it with a blanket, cushion, tablecloth, and so on. Install the unit with the ventilation holes at least 30 cm away from the wall.

■Before cleaning the unit

Before cleaning the unit, unplug it from the power outlet for safety. Remove the plug from the power outlet.

Remove the plug from the power outlet.

■When using the battery

●**Use only the battery specified in the user's manual and do not mix new and old batteries.**
Incorrect handling of the battery could result in fire or personal injury. The battery may explode if not handled property.

●**Make sure the plus and minus terminals are correctly aligned, when loading the battery.**

■Do not carry up with Handle of Back cover.

It could result in an injury or the unit may break down.

■Do not place the unit in a humid or dusty location.

●**Do not place the unit in a humid or dusty location**. Failure to heed this precaution may result in a fire or electric shock.

●**Do not place the unit near a cooking table, humidifier or any other place here it is likely to be exposed to oil smoke or steam.** Failure to heed this precaution may result in a fire or electric shock.

■Do not handle the power cord roughly.

●**Do not place the power cord near a heating appliance.**
Failure to heed this precaution may cause the insulation of the cord to melt, which may in turn result in a fire or an electric shock.

●**Do not remove or insert the power plug with wet hands.** Failure to heed this precaution may result in an electric shock.

●**When pulling out the power plug, do not pull on the power cord.** Failure to heed this precaution may damage the cord, which may result in a fire or electric shock. Be sure to grasp the power plug when pulling it out.

■When not using the unit for a long period

When you are not going to use the unit for a long period, such as when you are going on a trip, for example, be sure to remove the power plug from the power outlet for safety's sake

Remove the plug from the power outlet.

■Clean the inside of the unit once every two years

About once every two years, ask your dealer to clean the inside of it. If you use the unit for a long period without removing dust accumulated inside it, a fire may break out or the unit may break down.
It is a good idea to have the unit cleaned before the rainy season when the humidity is high. Consult your local dealer regarding the cost of cleaning the unit.

General Precautions

■Do not place the unit in a place where the temperature becomes high.

Do not place the unit on the roof of a building or other place where it is exposed to direct sunlight, or near a heating appliance such as a stove.

Failure to observe this precaution may adversely affect the cabinet and other parts of the unit.

■Cleaning the cabinet

● The surface of the cabinet uses a high percentage of aluminum. Do not attempt to clean it with benzene, thinners or other organic solvent.   The use of such solvents may cause degradation of the cabinet or peeling of the paintwork.

● When using a chemically treated cloth, follow the written precautions that come with it.

● Do not apply insecticide or other volatile substances to the cabinet.   Also, do not leave rubber or vinyl products in contact with the cabinet for a long period. Failure to observe this precaution may cause degradation of the cabinet or peeling of the paintwork.

● Gently wipe dirt off the cabinet and the operation panel with a soft cloth. If these parts are very dirty, wipe them with a cloth that has been immersed in a solution of a neutral detergent in water then wrung hard. Finish off with a dry cloth.   Do not apply detergent directly to the cabinet or the operation panel.

■When looking at the screen for a long period

When looking at the screen for a long period, rest your eyes from time to time to prevent eye fatigue.

■Condensation

If you abruptly bring the unit into a warm room from a cold place, condensation may form on the projection lens and mirrors, causing the image to be unclear.   If you leave the unit to stand for a while, the condensation will gradually disappear as the unit becomes acclimatized to the room temperature, and the image will return to normal.

■ Lamp

● Auto lamp changer function is that lamp is automatically changed another lamp. After lamp changed, it is necessary to adjust color balance. Please contact your dealer for more information.

● Special technique is required to replace the lamp: Contact your dealer before replacing the lamp. The lifetime of the lamp is 8,000 hours[**]. However, if the projector runs continuously as 24 hours, Projector's lamp is no-warranty. So, we suggest you to use the alternative lamp operation of Automatic lamp-changer.
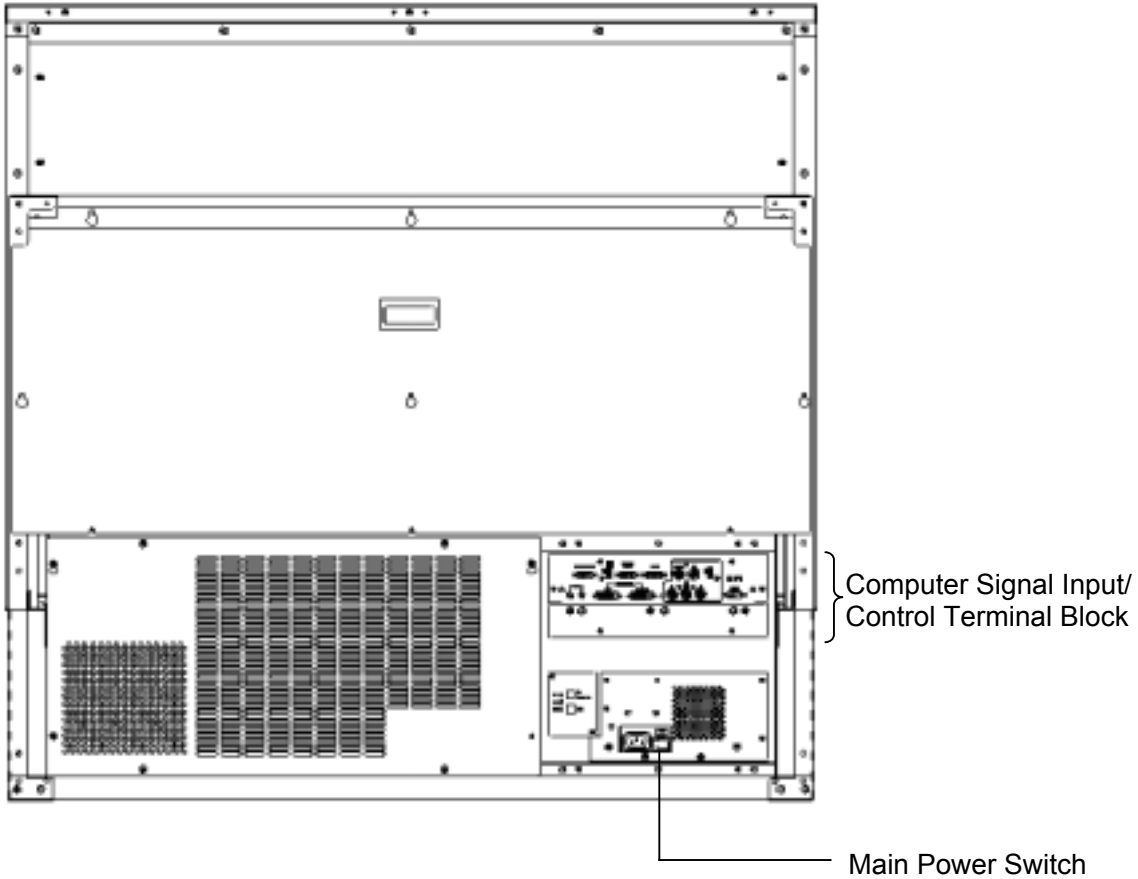
> [**] Lifetime of Lamp is defined as the average time that mortality of Lamp is 50%. The Intermittent condition is defined as the cycle that ON-time is 3.5 hours and that OFF-time is 0.5 hour.
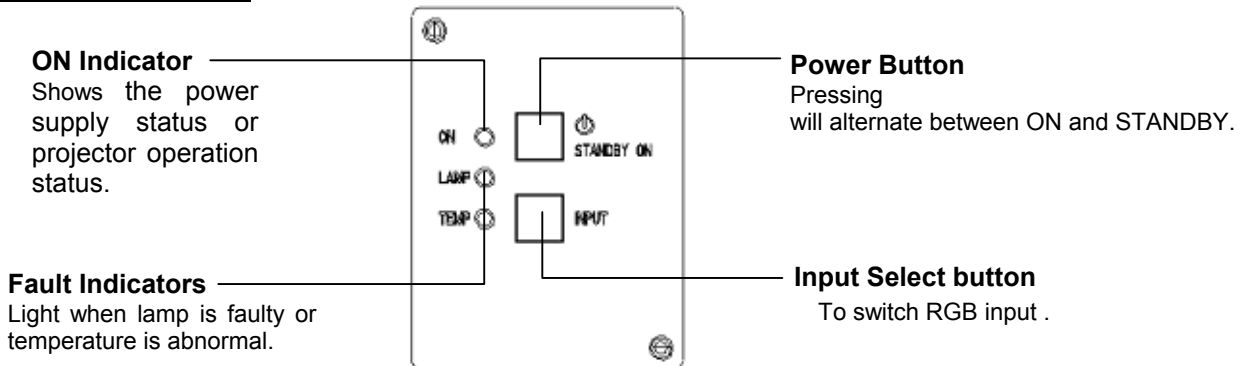
Projector
Terminal Plate and Power Switch   ［It shows model ES50-116CMW below］

Computer Signal Input/
Control Terminal Block

Main Power Switch

Control Plate

ON Indicator
Shows the power supply status or projector operation status.

Fault Indicators
Light when lamp is faulty or temperature is abnormal.

Power Button
Pressing will alternate between ON and STANDBY.

Input Select button
To switch RGB input .

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Names and Functions of Each Part：projector

Projector

Terminal Panel (Computer Signal Input/Control Terminal Block)

RS-485 termination setting switch

To set the RS-485 termination/open. Always set to termination for unicast connection. With broadcast connections, terminate only the last projector.

AUX. controller connection terminal
(D-SUB 9P female)

The control Equipment designated by Hitachi allows you to control the projector, e.g., switching power supply or selecting signal.

RS-232C/RS-485 control terminal
(D-SUB 9P male)

You can control the 2 function of the projector,RS-232C/RS-485.

When you choose RS-485, Cascade connection is allowed using the "COM2" terminal.

RS-485 control terminals
(input/output) (D-SUB 9P male)

Communicate with projector and control it on RS-485.

Cascade connection is allowed using the input/output terminals.

Sync signal input jacks
(BNC)
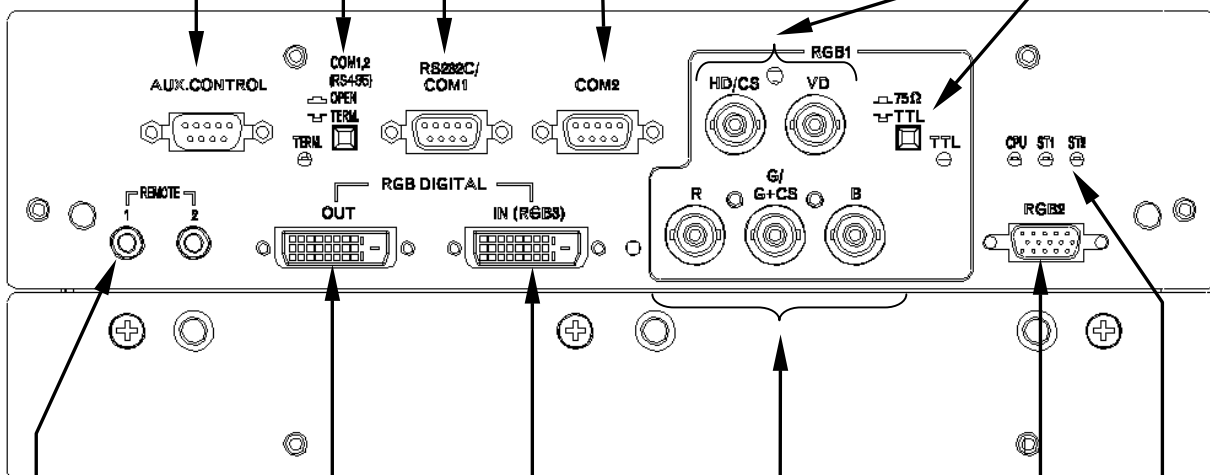
Analog sync signal is connected, and the 75 ohm termination or TTL input can be selected using the switch on the right.

Sync signal termination switch

To switch the RGB1 input sync signal between 75 ohm termination and TTL input. (normally set to 75 ohm termination).

Digital interface output terminal
(DVI-D)
This outputs digital RGB signal.
The selected RGB 1-3 input signal will be output as digital signal.

Remote control connection terminal
(stereo mini-jack)
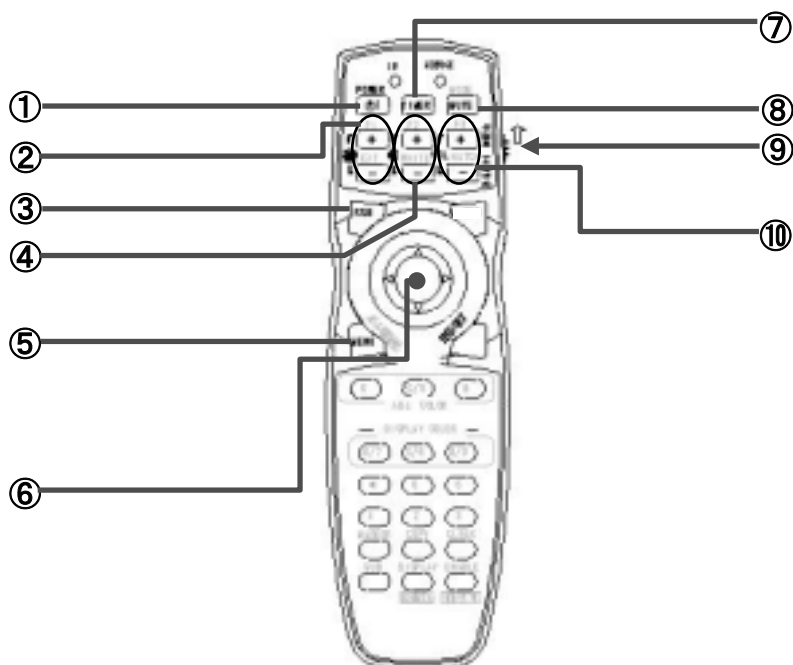When using a large remote control with wire, connect it here.

Digital interface input terminal
(RGB3 input) (DVI-D)
Digital RGB signal is connected, so be sure to connect the signal of TMDS format.

RGB signal input jacks
(RGB1 inputs)(BNC)
Analog video signal is connected. terminated with 75 ohm.

RGB signal input terminal
(RGB2 input) (D-SUB 15P shrink male)
Analog video signal is connected.
The sync signal is input with TTL
(not terminated with 75 ohm).

Indicators for servicing
Show the status of internal circuits.
Used to locate faulty circuit when a defect occurs.

① POWER(STANDBY/ON) BUTTON
・Turns the projector on and off.
　(Turning off will set to standby status) (See p.15)

② BLACK LEVEL BUTTONS
・Adjusts the black level of screen. (See p. 18)

③ RGB BUTTON
・Switches the input (See p. 16, p. 22～24)

④ PICTURE BUTTONS
・Adjusts the brightness of image (See p. 18)

⑤ MENU BUTTON
・Displays the adjustment menu screen.
・Pressing MENU when the adjustment menu screen
　appears will store the adjusted value of the menu item
　in memory, and then return the cursor to one item
　before.(See p. 17)

⑥ DISK PAD
・Used to select menu item and adjust when the menu
　screen appears (See p. 17).
　　Note:The arrow keys in the text (⬆ ⬇ ⬅ ➡)
　　　　　correspond to the operation of upper, lower, left
　　　　　and right keys on disk

⑦ TIMER BUTTON
・Displays the accumulated projector operation hours
　and lamp use time on the menu screen (See p. 21)
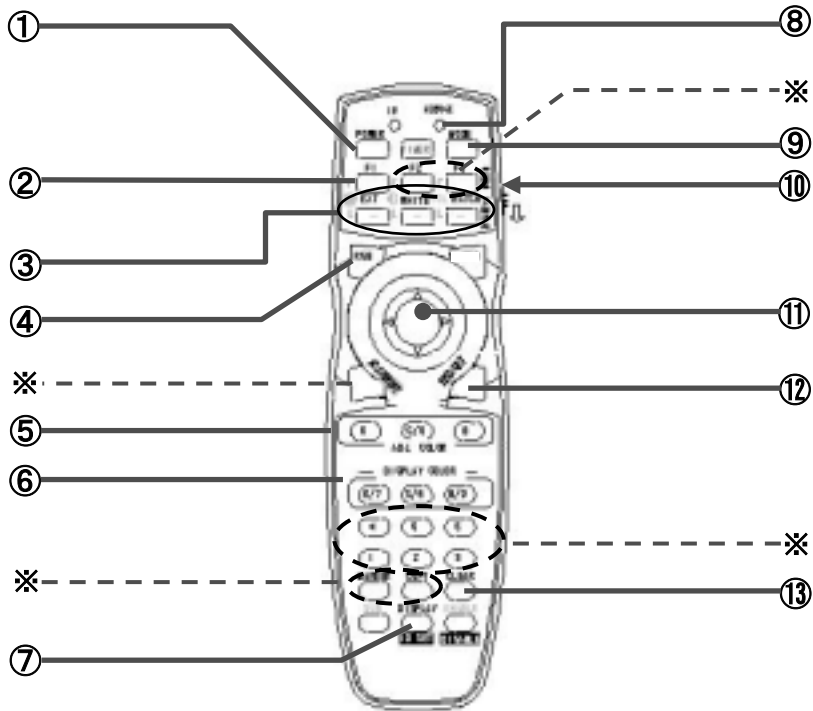
⑧ MUTE
・Has no function.

⑨ MODE SELECT SWITCH
・If you use the remote controller in the "USER " mode,
　set the slide switch on the right side to "USER".

⑩ VOLUME BUTTON
・Has no function.

「SERVICE」 mode : Names and Functions of Each Part

※ Do not use this buttons for service man.

① POWER(STANDBY/ON) BUTTON
・Turns the projector on and off.
 (Turning off will set to standby status) (See p.15)

② F1
・Pressing ADJ simultaneously will display the accumulated operation hours. (See p. 21)

③ EXT
・Displays external video. (See p. 16)
WHITE
・Displays an entire white screen. Pressing repeatedly will vary the brightness.
・Pressing WHITE continuously will display the minimum brightness screen (0/255) and then the grayscale screen. (See p. 16)
HATCH
・Displays a crosshatch screen. (See p. 16)

④ RGB
・Switches the display to RGB input.
・ Pressing RGB will switch the input from RGB1 to RGB2, RGB3, and back to RGB 1.

⑤ ADJ. COLOR RGB
・Selects adjustment color when adjusting any color.

⑥ DISPLAY COLOR RGB
・ If the DISPLAY COLOR key (R, G or B) is pressed , red, green, blue will switch red on and off.
・If the DISPLAY COLOR key (R, G or B) is pressed while the ADJ key is held down when any part of display (or whole display) is off, all colors will appear. Doing this when all colors are appearing will switch all colors off.

⑦ DISPLAY
・Turns on or off any on-screen information.

⑧ SERVICE setting indicator
・ The indicator lights in the "SERVICE" mode.
 # The indicator turns on after push any effective key.
 # The light turns off if you push no key within a time.
 # If you push unavailable key, the light turns off for a while, even if the indicator is ON.

⑨ MODE
・Checks the frequency of RGB input set at each scan mode, or to check the present status of RGB input.

⑩ MODE SELECT SWITCH
・ If you use the remote controller in the "SERVICE " mode, set the slide switch on the right side to "SERVICE".

⑪ DISK PAD
・Used to select menu item and adjust when the menu screen appears (See p. 17).
  Note:The arrow keys in the text (↑ ↓ ← →) correspond to the operation of upper, lower, left and right keys on disk

⑫ END/SET
・Pressing this during adjustment will terminate the adjustment status.

⑬ CLEAR
・Pressing CLEAR during adjustment will return the data being adjusted to a default. However, this may vary depending on the adjustment item: Check the explanation for each adjustment.

Wired or Infrared transmission of remote control

(1) Wired transmission

Connect the provided remote cable when using the remote control in the following conditions.

・When using at least two projectors
Using infrared transmission may cause malfunction, or rewrite the projector internal data.

・When the projector is inoperable because of illumination or is affected by remote control of another device.

・When projector is operated from a distance or angle which is outside the usable range of infrared transmission. (see "(2) Infrared transmission" shown below)

(2) Infrared transmission

・Point the signal transmission window at the projector screen to operate.

・The usable range of infrared remote control is as follows

Usable range	Angle: Within 20 degree from top, bottom, left or right of screen Distance: Up to 7m from screen

Inserting Batteries

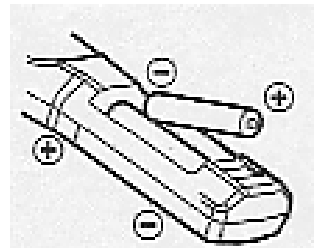| 1	Remove the battery compartment lid.

Push the lid and move it in the direction of the arrow.
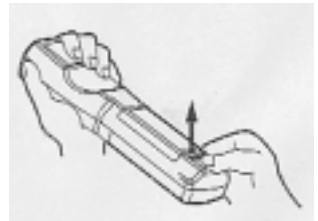
2	Insert batteries.

Be sure to match the polarity indications (+, −).

3	Close the battery compartment lid.

⚠ **CAUTION** (When using batteries)
●Replace only with the same or equivalent type recommended by the manufacturer.
●Recycle or dispose of used batteries according to your community's guidelines.
●Do not use batteries other than those specified, or mix new and old batteries for use: Doing this could damage the batteries or cause leakage of liquid, which could result in fire, injury or damage to surroundings.
●Insert batteries as instructed on the remote control: Reversing polarities could burst the batteries or cause leakage of liquid, which could result in injury or damage to surroundings.

⚠ **CAUTION** (When using remote control)
●When not using remote control for a long period of time, remove the batteries from it.
●Do not allow the remote control to fall and do not subject it to impact.
●Do not splash water on remote control or place it on wet surface: Doing this could cause a fault.

Precautions Concerning the Installation

● **Floor**
Install the projector on a horizontal, stable surface. Do not install it on a wall or a ceiling or a weak and rickety place that is subjected to vibration. Be sure to install it on a firm, stable surface. Failure to heed this precaution may result in the unit toppling over and fall down.

● **Fixing Projector**
Be sure and fix Projector with a bolt, etc. Failure to heed this warning may result in a slip down for itself if earthquake.

● **Water**
・ Install the projector in a place where it is not exposed to rain, and so on.
・ When cleaning the floor, ensure that water does not get onto the projector.
・ In regions that are subject to flooding, study in advance a method of moving the display to safety.

● **High frequency waves**
Note that if a high frequency device is used in the vicinity, the high frequency waves emitted by it may cause the projector to malfunction. Note also that the projector itself emits high frequency waves, although they are weak. This can conceivably cause interference to a television set that uses an indoor antenna, a radio receiver or a transceiver. For this reason, keep the unit at least 30 m away from such appliances.

● **Ambient light**
・Although you can use this projector even in a brightly illuminated room, do not install it in a place where light strikes the screen directly.
  (Recommended conditions of use: Incident illumination of screen: 100 lx max)
・ Install the projector in a location where there is no light source brighter than the light emitted from the projector, including any light source at the rear of the projector, within the visual field of the projector. Failure to heed this precaution will result in eyestrain.

Assembly and Securing of Anchor

Contact your dealer when projector is installed.

Professionals carry out assembly and securing of anchor.

■Caution

・Professionals carry out assembly and adjustment of install to keep up image performance.

・Professionals carry out securing of anchor to prevent projectors from falling.

⚠ Please be sure to carry out securing of anchor.
    Contact your dealer when projector is installed.

Basic Operation

Turning Projector On and Off

CAUTION

・ **When turning power on again, wait until the fan stops (after the STANDBY indicator changes from blinking to a steady light) The power ON switch will not be active until then.**
・ **The power switch on the projector must be ON.**

Operational procedure

1. To turn power on

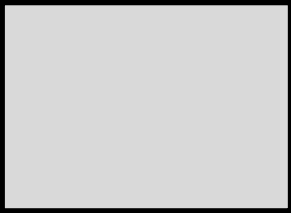| Step	Details of operation	
1	・Turn on the main power switch on projector. ・The ON indicator on control panel will light orange to show that the projector is in the standby status.(If the projector is connected to a system, also turn on system equipment in addition to the projector.)	Main Power SW & ON indicator
2	・Press the POWER button on remote or the power button on control panel to turn the projector on. ・The ON indicator on control panel will change to blinking in green, and the projector will enter the setup operation to light the lamp of light source. ・After several seconds, the lamp of light source will light, and the ON indicator on control panel will change to a steady green light.	Power Button

2. To turn power off

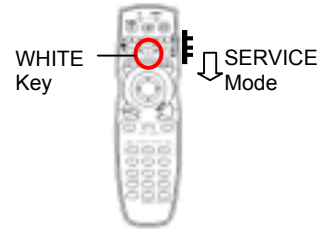| Step	Details of operation	
1	・Hold down the POWER button on remote control or the power button on control panel for approximately one second: The lamp will turn off. ・The ON indicator on control panel will change to blinking in orange, and the projector will enter the operation to cool the lamp of light source (cooling after use) . ・After approx. one minute, the cooling fan will stop, and the projector will enter the standby status for next power on.	Power Button
2	・Turn off the main power switch on projector. ・The ON indicator on control panel will go out. Caution **Do not turn the main power switch off until the fan stops completely. Turning the switch off while the fan is in rotation may damage the lamp.**	Main Power SW & ON indicator

Basic Operation

Switching to Internal Signal Image

・Perform switching between external video signal and projector internal test signal.

1. Operational procedure (Displaying entire white image)

Step	Display	Details of operation	
1	Entire white image	Set the remote control to "SERVICE" mode. ・Press the WHITE key on the remote control. ・The entire white image will appear on the screen. ・Pressing WHITE key on the remote control will vary the brightness as follows. 255⇒240⇒204⇒165⇒127⇒72⇒48⇒0 (⇒Grayscale)⇒255...	WHITE Key — SERVICE Mode

2. Operational procedure (Displaying grayscale image)

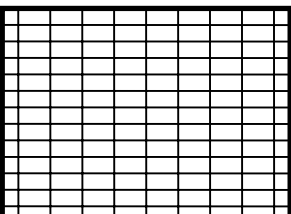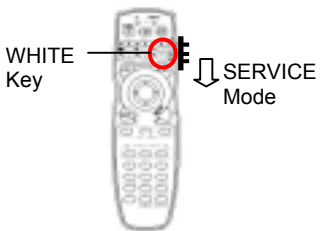| Step	Display	Details of operation	
1	Grayscale image	Set the remote control to "SERVICE" mode ・Press the WHITE key on the remote control. ・The entire white image will appear on the screen. ・Pressing WHITE key on the remote control will vary the brightness as follows. (255⇒240⇒204⇒165⇒127⇒72⇒48⇒0) ⇒Grayscale(⇒255…)	WHITE Key — SERVICE Mode
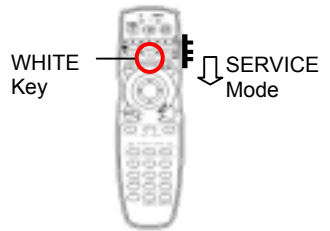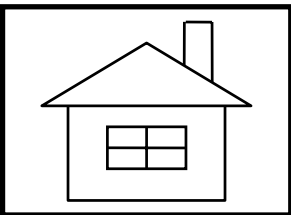
3. Operational procedure (Displaying crosshatch image)

Step	Display	Details of operation	
1	Crosshatch	Set the remote control to "SERVICE" mode ・Press the HATCH key on the remote control will display ・The crosshatch image will appear on the screen.	WHITE Key — SERVICE Mode

4. Operational procedure (Displaying external image)

Step	Display	Details of operation	
1	External image	(In case of "USER" mode) ・Press the RGB key on the remote control. (In case of "SERVICE" mode) ・Press the EXT key on the remote control. The external image will appear on the screen.	USER Mode / RGB Key / EXT Key / SERVICE Mode
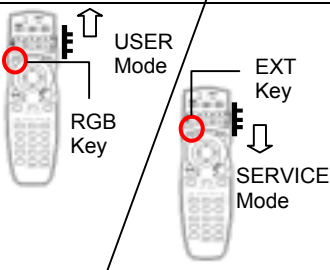
Adjustment Method (Adjustment Using Menu Screen)

・The following items can be adjusted for each input signal.
・If multiple signals are switched and used, previously adjusted data may be overwritten when the frequencies and resolutions of signals are similar.(See p.20)
・Adjustments other than those listed must be left to service engineers.

1．Adjustment Items

This number shows Scan Mode allocated to the signal currently connected.

USER xxx	・・・	Shows user adjustments
→ POSITION	・・・	To adjust the position of image
SAMPLE CLOCK	・・・	To adjust the Horizontal image size
SAMPLE PHASE	・・・	To adjust if there is flickering noise in image
PICTURE	・・・	To adjust the brightness of the bright portion of image
BLACK LEVEL	・・・	To adjust the brightness of the dark portion of image
COLOR BALANCE	・・・	To adjust the brightness of red and blue
ZOOM	・・・	Zoom up a portion of image
VOLUME	・・・	Has no function
TIMESETTING	・・・	To adjust the time
DIGITAL I/0	・・・	To set the polarity of edge in digital input/output
MORE → +	・・・	To set the clamp pulse position that determines

When select the MORE→+

USER xxx	・・・	Shows user adjustments
SPEAKER OUT	・・・	Has no function
CLAMP POS.	・・・	To set the clamp pulse position that determines the black level of image

2. Basic Key Operations

2.1 Operating menu screen

Step	Details of operation	
1	・ Set the remote control to "USER" mode ・ Press the MENU key. The above adjustment items will appear on the screen. ・ Use the ↑ or ↓ key to move the marker to the item to be adjusted, and then press → to designate. ・ Press the MENU key to return to previous items one by one.	USER Mode MENU Button　DISK PAD (↑↓→←)Key

Adjustment procedure (basic adjustment)

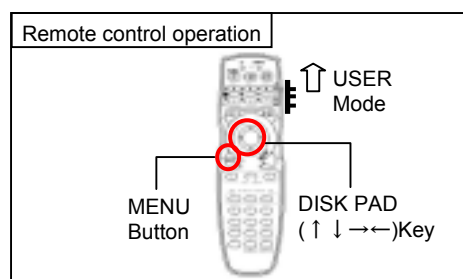| Item	Input	Procedure
POSITION Image position adjustment	**RGB1** **RGB2** **RGB3**	・Press the ⬆ or ⬇ key to move the image up or down. ・Press the ⬅ or ➡ key to move the image left or right.
SAMPLE CLOCK Horizontal size adjustment	**RGB1** **RGB2**	・Press the ⬅ or ➡ key to change the horizontal size of image. （The sampling clock frequency of input signal will change. If the sampling clock frequency is known, set the on-screen display value to that.）
SAMPLE PHASE Adjust if the image is noisy	**RGB1** **RGB2**	・Press the ⬆ or ⬇ key to adjust to the optimum value. ※ Adjust to minimize noise in image. If the adjustment is incomplete, fine lines of image will be distorted. ※Adjust so that vertical lines are clear and sharp.
PICTURE Brightness (picture level) adjustment	**RGB1** **RGB2** **RGB3**	・Press the ⬆ or ⬇ key to adjust the brightness of bright (white) portion of image. Caution "0" is the reference of adjustment value displayed on screen. Note that if the value is larger than necessary in the plus (+) direction, the bright portion of image will be crushed.
BLACK LEVEL Black depression adjustment	**RGB1** **RGB2** **RGB3**	・Press the ⬆ or ⬇ key to adjust the brightness of dark (black) portion of image. Caution "0" is the reference of adjustment value displayed on screen. If the value is negative, the dark portion will be depressed. Basically, perform adjustment in the direction that will make the dark portion bright [the value will be plus (+)].
COLOR BALANCE Tint adjustment	**RGB1** **RGB2** **RGB3**	・After entering this adjustment, use the arrow keys to select the color「R ADJ.」（red）or 「B ADJ.」（blue）to be adjusted. ・The brightness of the selected color can be adjusted using the ⬆ and ⬇ keys. Caution ・"0" is the reference of adjustment value displayed on screen. Note that if the value is larger than necessary in the plus (+) direction, the bright portion of image of that color will be crushed. ・If green is too intense, use PICTURE to decrease the brightness, and then perform this adjustment.

Remote control operation

⬆ USER Mode

MENU Button

DISK PAD (⬆⬇➡⬅)Key

Adjustment procedure (basic adjustment)

Item	Input	Procedure
ZOOM Setting zoom magnification	**RGB1** **RGB2** **RGB3**	・ Use the ↑ or ↓ key to change the magnification. ・ The image can be magnified up to approx. 4 times. ・ After changing the magnification, use POSITION to adjust the position of image on screen.
VOLUME	-	・ Has no function.
TIME SETTING	-	・ Adjust the time of projector. ・ ↑ ↓ key to change number of green display. ・ ← → key to change position of green display. (Hours or minutes) ・ If the projector is turned on and off, setup data can be erased. ・ Clock error: about ±2 minutes every month.
DIGITAL I/0	*RGB3	・ To select the polarity of trigger of digital input/output. ・ If this polarity is reversed, glittering noise may occur in image. ・ After entering this adjustment, use arrow keys to select "INPUT" or "OUTPUT". ※Select only RGB3 in "INPUT" and RGB1,2,3 in "OUTPUT". ・ Press the ← to select "RISE". ・ Press the → to select "FALL".
SPEAKER OUT	-	・ Has no function.
CLAMP POS Adjusting the clamp position of black level of video signal	**RGB1** **RGB2**	・ To adjust the clamp position of black level (pedestal). ・ Press the ↑ to move the clamp position to the left when the image is too dark. ・ Press the ↓ key to move the clamp position to the right when only green is bright and floating. Caution ・ This adjustment is not necessary when a normally bright image appears. ・ Perform the CLAMP POS. adjustment after completing the H SIZE adjustment. ・ ↓ key is held down to decrease the value, black vertical stripes will appear on screen: Perform adjustment in the range where not this phenomenon appears.

Remote control operation

USER Mode

MENU Button

DISK PAD (↑ ↓ → ←)Key
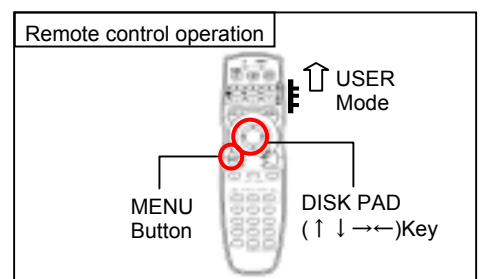
Storing adjustment data

・The projector will automatically allocate the addresses of memory in which adjustment data is to be stored (called " mode number"), according to the resolution and frequency of input signal.
・If the resolutions and frequencies are similar when multiple signals are adjusted, the same mode will be allocated, and the previously adjusted signal data will be overwritten the later adjustment data.
・The allocated mode can be checked using the following procedure.

・If the same mode number should be allocated (*) to different signals, use the following method.
　①Change Resolution or Refresh rate with Display Properties settings on PC, so that each mode has a different number. The allocated modes can be checked using the following procedure.
　②If PC settings cannot be changed, mode numbers can be allocated to each signal in detail using special settings: Consult your dealer.

・The mode number that the projector has automatically been allocated can be checked by pressing the MENU key on remote control (or MODE key in case of "SERVICE" mode) and viewing the display on the following screens.

Check the mode number in the Input signal

(When MENU key is pressed in case of "USER" mode.)

```
                        ─────── Scan mode number (*1)
   USER    120 (RGB1)
 → POSITION
    SAMPLE CLOCK
    SAMPLE PHASE
    PICTURE
```
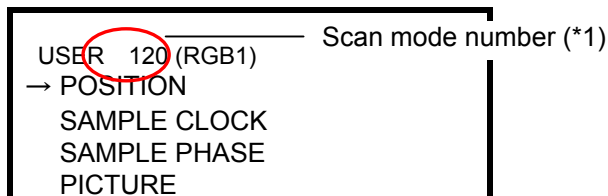
Pressing the MENU key will restore the original screen.

Remote control operation

USER
Mode

MENU
Button
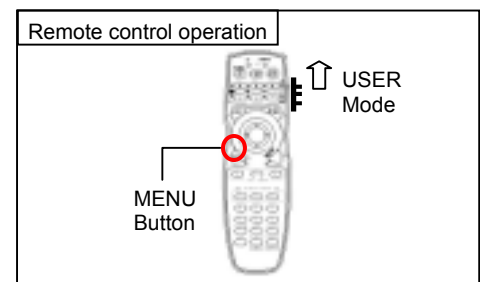
(When MODE key is pressed in case of "SERVICE" mode.)

```
   MODE    120 ─────── Scan mode number (*1)
    H   xx.xkHz
    V   xx.x Hz
    Preset : S---
    H   xx.xkHz
```
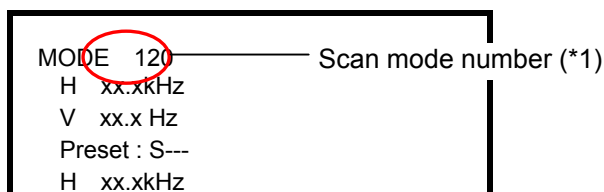
Pressing the END key will restore the original screen.

Remote control operation

MODE
Key

SERVICE
Mode

END
Key
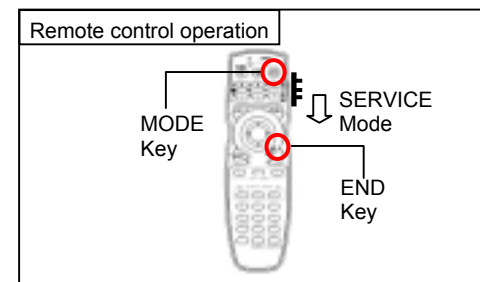
*1：This number shows the scan mode allocated to the signal currently connected.
　　If this number is the same even when a different signal is connected, the adjustment data will be stored in the same memory.

Displaying Accumulated Operation Hours
・The projector operation hours can be displayed, as a reference for replacing the lamp.

1．**On-screen information**

UNIT　　　　　　5000h	・・・ Shows projector operation hours.
LAMP1	・・・ Shows hours of Lamp1.
TOTAL　　　:　512h	・・・　Shows lamp operation hours as total.
CONTINUOUS :　 12h	・・・　Shows continuous operation hours.
P-ON COUNT :　101	・・・　Shows the number of lamp lightings.
LAMP2	・・・ Shows hours of Lamp2.
TOTAL　　　:　500h	・・・　Shows lamp operation hours as total.
CONTINUOUS :　 --h	・・・　Shows lamp off.
P-ON COUNT :　100	・・・　Shows the number of lamp lightings.
	※Lamp off side is display in gray.

When the lamp is trouble
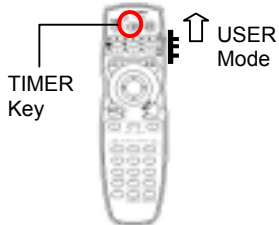
LAMP2　　　　　: FAILURE	・・・ Shows trouble of lamp2. (Red display in the case.)
	※Contact your dealer to lamp replacement.
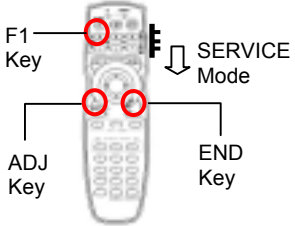
2. Operational procedure
（**When setting the "USER" mode for the remote control**）

Step	Procedure	
1	・Press the TIMER key. ・The projector, LCD panel and lamp operation hours with the number of lamp lightings will appear on screen.	USER Mode TIMER Key
2	・Press the TIMER key to terminate the display.	

（**When setting the "SERVICE" mode for the remote control**）

Step	Procedure	
1	・Press the ADJ key while holding down the F1 key. ・The projector, LCD panel and lamp operation hours with the number of lamp lightings will appear on screen.	F1 Key SERVICE Mode ADJ Key　END Key
2	・Press the END key to terminate the display.	

When displaying analog computer signal

1. Signal connection
   Connect the computer signal to the RGB1 or RGB2 input terminal.

2. Adjustment procedure
①Select the input to which the signal is connected.
   ●Press the RGB key on remote control.
   When the input is selected, RGB1, RGB2 or RGB3 will appear on screen.
   If the image does not normally appear even when the input to which the signal has been connected is selected, or "NO SIGNAL" or "SYNC IS OUT OF RANGE" appears, consult your dealer.

②Use the remote control to adjust the following items, so that the position and size of displayed image are correct.
   ● 「SAMPLE CLOCK」 (See p.17～18)
   ● 「POSITION」   (See p.17～18)

③Adjust the phase of image.
   Finely adjusting the phase of image will display a sharp image.
   ●Use the "SAMPLE PHASE" adjustment to adjust so that small characters and vertical lines are brightest.(See p.17～18)
   ●If the "SAMPLE PHASE" value which makes the small characters and vertical lines brightest varies depending on the portion of screen, there may be a problem in "SAMPLE CLOCK" adjustment.

Tip on SAMPLE CLOCK adjustment (using detailed image)

   Fill the screen with small characters. Or when Windows 2000 PC is used, select "Shut Down" in the "start" menu (It is not necessary to actually terminate Windows. When "SHUT DOWN" is selected, a small check pattern will appear on screen).
   If the size adjustment is incomplete, stripes will appear on screen vertically. Use "SAMPLE CLOCK" to adjust so that vertical stripes disappear. (See p.17～18)

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④Adjust the brightness.
   ●To brighten or darken the image, adjust "PICTURE".   (See p.17～18)
   ●To adjust the dark portion of image, adjust "BLACK LEVEL".   (See p.17～18)

⑤Adjust the color.
   ・To adjust the color, select "COLOR BALANCE" . (See p.17～18)
      If the image is bluish, select "B ADJ." and use the ↓ key to darken blue.
   If the image is reddish, select "R ADJ." and use the ↓ key to darken red.
      If the image is yellowish, select "B ADJ." and use the ↑ key to brighten blue.
      If the image is light bluish, select "R ADJ." and use the ↑ key to brighten red.

If the image appears but is extremely dark, perform the "CLAMP POS" adjustment using the following procedure.
- ●Select the "CLAMP POS." adjustment. (See p.17, p.19)
- ●Make note of the number displayed under "CLAMP POS.".
- ●Press the → key until a black vertical band appears from the left edge of screen.
- ●Press the ← key to adjust so that the black band just disappears from the screen, and then adjust the value by adding 10.
- ●If the image is not bright enough even after the above adjustment, there may be some other cause: Reset the value to default and consult your dealer.

When displaying digital computer signal

1. Signal connection
   Connect digital computer signal to the RGB3 terminal.

   ※The following shows the specifications and input terminal of digital computer signal used in this projector. If a terminal with other specifications is to be connected, the shape must be changed to match the following pin assignment.

   ※This projector conforms to VESA standard signal: It may not display another digital signal normally.

Signal format TMDS Format
Input jacks DVI-D

Figure of jack
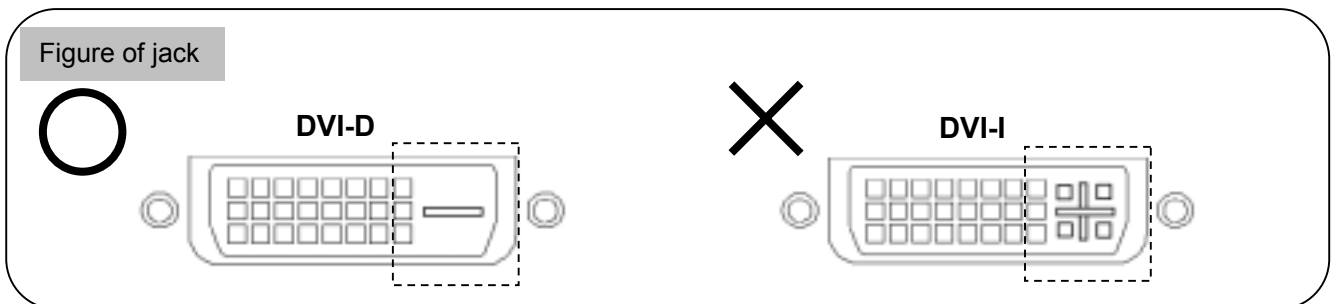
DVI-D   DVI-I

※Please use cable for DVI-D because figure of jacks differ between DVI-D and DVI-I.

Resolution・Refresh rate
- ●640x480@60Hz   ●640x480@72Hz
- ●640x480@75Hz
- ●800x600@60Hz   ●800x600@72Hz
- ●800x600@75Hz
- ●1024x768@60Hz   ●1024x768@70Hz
- ●1024x768@75Hz
- ●1280x1024@60Hz   ●1280x1024@75Hz

Pin	Terminal name		Pin	Terminal name		Pin	Terminal name	
---	Input	Output	---	Input	Output	---	Input	Output
1	RX2-	TX2-	9	RX1-	TX1-	17	RX0-	TX0-
2	RX2+	TX2+	10	RX1+	TX1+	18	RX0+	TX0+
3	GND	GND	11	GND	GND	19	GND	GND
4	NC	NC	12	NC	NC	20	NC	NC
5	NC	NC	13	NC	NC	21	NC	NC
6	SCL/DD	SCL/DD	14	+5V	+5V	22	GND	GND
7	SDA/D	SDA/D	15	GND	GND	23	RXC+	TXC+
8	NC	NC	16	Hot	Hot	24	RXC-	TXC-

2. Adjustment procedure
 ① Select the input to which the signal is to be connected.
  ・Press the RGB key on remote control.
    When the input is selected, RGB1 or RGB2, RGB3 will appear on screen.
    If the image does not normally appear even when "RGB3" is selected, or "NO SIGNAL" or "SYNC IS OUT OF RANGE" appears, consult your dealer.

 ②Use the remote control to adjust the following item, so that the position of displayed image is correct.
  ・「POSITION」　(See p.17～18)

 ③Adjust the color.
  ・To adjust the color, select "COLOR BALANCE".
     If the image is bluish, select "B ADJ." and use the ↓ key to darken blue.
     If the image is reddish, select "R ADJ." and use the ↓ key to darken red.
     If the image is yellowish, select "B ADJ." and use the ↑ key to brighten blue.
     If the image is light bluish, select "R ADJ." and use the ↑ key to brighten red.

Digital output signal

 The signal obtained by digitizing the selected signal will be output from the digital output terminal.
 The specifications of digital signal and terminal are the same as those for digital input.

If star-like glittering noise is noticeable on the screen, perform the following adjustment.
  ●Choose "DIGITAL I/O" and then "INPUT EDGE GOING". (See p.17, p.19)
  ●Use the ← or → key to set to "FALL": If star-like noise decreases, keep the "FALL" setting (slight glittering noise may remain). If noise does not change or increases, keep the "RISE" setting.

Lamp and Auto Lamp Changer

⚠️ ⚡ ♨️ 💥 **HIGH VOLTAGE**
HIGH TEMPERATURE
HIGH PRESSURE

Contact your dealer before replacing the lamp. For the optional lamp, see the table 'Spare Parts' of the p.32. The lamp may explode if handled at high temperatures.

⚠️ <u>WARNING</u>

A mercury lamp used in Projector is made of glass and has high internal pressure. The mercury lamp can burst with a big noise due to deterioration resulting from a shock, crack and passage of time, and can end its service life in unit condition. Lamps also have a considerably different service life and can sometimes end up in burst or turn to unit condition soon after use. Furthermore, when the lamp is blown up, glass fragments can get scattered around the lamp house and some gas containing mercury inside the lamp can leak out of the projector's air vent.

●**About disposal of a lamp**

This product contains a mercury lamp; do not put in trash. Dispose of in accord with environmental laws. For lamp recycling, go to www.lamprecycle.org (for US only).
For product disposal, contact your local government www.eiae.org (for US only) or www.epsc.ca (for Canada only). Please return to Hitachi Data Systems for proper disposal.
For more information, call at 1-800-555-6820 (North America).

●Handle the lamp with utmost care as it can burst during use if subjected to a shock or impact or if scratched or cracked.

●Probability for the burst will increase if the lamp is used for extended period of time or used exceeding the period of replacement. You are advised to follow instructions for lamp replacement as soon as they are given (See p.26, p.27). Avoid any reuse of an old lamp (used lamp) since such reuse can result in burst.

●In case the lamp gets blown up in a short period of time after use, some electrical failures or troubles other than the lamp itself may be suspected as causes. Under such circumstances, consult the store where you purchased it or a service company.

●Should the lamp burst (accompanied by big bursting noise), perform ventilation sufficiently, and exercise maximum caution not to inhale any gas out of the projector's air vent or not to let it enter your eyes or mouth.

●Should the lamp burst (accompanied by big bursting noise), make absolutely sure to unplug the power cord from the outlet and ask the store where you bought the lamp for immediate replacement. You should not engage in cleanup or replacement of the lamp by yourself since scattered glass fragments can damage the inside of projector or can result in personal injury when you handle it.

●When you dispose of any used lamps, be sure to observe and follow local ordinances and regulations of the area or district where they are subjected to disposal. Generally speaking, the lamps are treated similarly as glasses and bottles in most cases, but there are areas or districts where lamps are classified as a separate collection, and so be sure to use caution.

●Never use the lamp in a state where the lamp cover is removed.

Lamp and Auto Lamp Changer

Projector lamps have a finite life, the image will became darker, and hues will become weaker, after a lamp has been used for a long period of time. Please sure to replace lamp.
Projector displays to the following the on-screen information corresponding to the lamp operation hours to send a message of replace period. Lamp is not turned off forcibly.

Auto lamp changer function is that lamp is automatically replaced.
Contact your dealer before replacing the lamp.

※Caution

The lifetime of the lamp is 8,000 hours[**]. However, if the projector runs continuously as 24 hours, Projector's lamp is no-warranty. So, we suggest you to use the alternative lamp operation of Automatic lamp-changer.

[**] Lifetime of Lamp is defined as the average time that mortality of Lamp is 50%.
The Intermittent condition is defined as the cycle that ON-time is 3.5 hours and that OFF-time is 0.5 hour.

● The following shows the on-screen information, corresponding to the lamp operation hours.

Operation item	
After 6000 hours elapse	・Message[※] 　"LAMP1 TIME ＿＿h" 　"LAMP2 TIME ＿＿h" ・Timings for display 　Power ON （10 seconds after power is turned on）

*1 The display will disappear in approx. 20 seconds, but it will reappear whenever power is turned on again.

List of OSD Messages

On-screen Information

(The following messages will appear on screen, depending on the status of projector.)

Message	Contents	Remedy
LAMP1 TIME ****h. **LAMP2 TIME ****h.**	Appears when the lamp-accumulated time exceeds 6000 hours. [*1]	Ask the dealer to replace the lamp.
LAMP1 TIME ****h. **LAMP2 TIME FAILURE.** **PLEASE REPLACE** **LAMP2**	When other lamp is off, message is displayed in approx. 20. （This case is when "LAMP2" is off.）	
LAMP TIME ****h. **LAMP CHANGE AFTER** *****h**	Appears lamp operation hours as total from 100 hours of "forced lights out time function" before.[※1] "**h" displays time to replace the lamp.	
LAMP TIME ****h. **LAMP CHANGE IN A** **MINUTE.**	Appears message when exceed "forced lights out time function" lamp operation hours as total. Lamp is off after 15 seconds forcibly and lamp is replaced the lamp automatically. When other lamp is trouble, lamp is off after 15 seconds forcibly.	
CONTINUOUS **LAMP1 TIME **h** **LAMP2 TIME --h**	Appear when other lamp is trouble or continuous operation hours exceed 25 hours. （This case is when "LAMP1" is on.）	
ABNORMAL **TEMPERATURE**	The temperature is extremely high.[※3]	Ask the dealer for inspection.
FAN FAILURE **F2**	Fan is faulty.[※4] （The case is that fan of "F2" is trouble..）	Ask the dealer to replace the fan.
8 : 12	Appear the time after power on in auto lamp change function. Not appear the time when this function is invalid. （This case is when the time is 8:12.）	Set the present time.。 (See p.19-TIME SETTING)

[※1] The message will disappear in 20 seconds, but reappear whenever power is turned on again.
[※2] When set the function of forced lamp out .
[※3] The message will disappear in approx. 1 seconds, and power will also go off.
[※4] The message will disappear in approx. 1 minute, and power will also go off.

Indicators (LED lamps)

No	Name	Operation	Remarks
1	Power indicator (ON/STAND BY) (Terminal plate)	・Lights orange in the standby status (main power on). ・Blinks green during warm-up (power on by power switch or remote control). ・Lights green during operation. ・Blinks orange during cooling down (power off by power switch or remote control). ・Lights red when the projector is faulty or the lamp does not light.	2-color LED used
2	Fault judgment indicators (LAMP, TEMP) (Terminal plate)	Indicate the circuit that is faulty, or stops and gives its status. If the following indicators light or blink simultaneously when the ON/STANDBY indicator lights red, ・LAMP: Lights when the lamp is faulty; blinks when there is no lamp. ・TEMP: Lights when the temperature is abnormal; blinks when the fan operation is faulty.[※1] Indicate the fan is faulty, indicator lights blink. [※2] ・TEMP, ST1 : Lights when main circuit board is abnormal voltage. ON/STANDBY indicator lights green and lamp lights, ・Other lamp is trouble when lamp changer is mounted.	A fault could have occurred or it is necessary to replace lamp. Consult your dealer.
3	Status indicators on main circuit board (Terminal plate)	・CPU: Lights red or blinks during faulty run of program. ・ST2: Lights red when lamp changer communication is faulty. ・TERM: Lights green when RS485 termination is set.	A fault could have occurred: Consult your dealer.

[※1] Since power will turn off in approx. 1 seconds, the lamp indicator will also turn off.
[※2] The message will disappear in approx. 1 seconds, and power will also go off

Failure Analysis of Projector?

Symptom	Probable cause	Check to see	Page
No power	● Main power is not turned on. ● The power cord is unplugged.	● Turn the main power switch on. ● Plug in the power cord securely.	● P8
No image	● Cables are not correctly connected to the projector. ● Brightness adjustment is set to the darkest position.	● Connect them correctly. ● Check the following adjustments. ・ PICTURE (Brightness: Basic adjustment) ・ BLACK LEVEL (Black level: Basic adjustment)	● P9 ● P18
No image of digital signal	● Digital signal is not outputted because computer signal is run before connecting DVI cable.	● Check the specifications of computer.	
Bright portion of image is likely crushed.	● Termination of video signal is off. ● Amplitude of input video signal is too high.	● Correct video cable connection. ＜**In case of computer signal**＞ ● It is necessary to adjust the amplitude of input signal with amplitude exceeding 0.75 V. Consult your dealer.	● P9
Adjustment status varies.	● Signals with similar timings are connected, and the adjustment data may be overwritten.	● (1) Change the signal so that a different scan mode is selected. (2) Or set the scan mode to a different number: Consult your dealer.	● P20
Color is faint, or tint is bad.	● The lamp is nearly dead.	● Verify lamp operation hours, using the procedure on p.21. If the lamp is nearly dead, it must be replaced.	● P21

May be Failure of Projector?

Symptom	Probable cause	Check to see	Page
Image is dark.	●Adjustment is incomplete. ●The lamp is nearly dead.	●Check the following adjustments: ・PICTURE (Brightness) ・CLAMP POS (Clamp position) ●Verify lamp operation hours, using the procedure on p.21.	●P18 ～ P19 ●P23 ●P21
Black portion of image floats white or green.	●Adjustment is incomplete.	●Check the following adjustments: ・BLACK LEVEL (Brightness: Basic adjustment) ・CLAMP POS(Clamp position : Basic adjustment)	●P18 ～ P19
Vertical stripes are seen in image	●Adjustment is incomplete.	●Check the following adjustment: ・CLAMP POS (Clamp position: Basic adjustment)	●P19
Image is blurred	●This does not indicate a fault.	●It becomes clear image after 30 minutes since power on. If image is not back to normal, check the following adjustment: ・SAMPLE CLOCK ・SAMPLE PHASE	 ●P18 ●P22
When a still image remains displayed, an after-image occurs.	●This does not indicate a fault. ●Anytime the same image is displayed for several dozen hours, an after-image may occur.	●Display another image: Normal display will be restored.	
There are black spots (which do not light) or bright spots (which remain light) on screen.	●This does not indicate a fault: Some black spots and bright spots may occur, which are peculiar to liquid crystal panel.		

Cleaning

Cleaning the screen

If the surface of the screen or the LCD projector is dirty, the clarity of the screen and the focusing will deteriorate. To prevent this, clean the screen about once every six months using the following procedure.
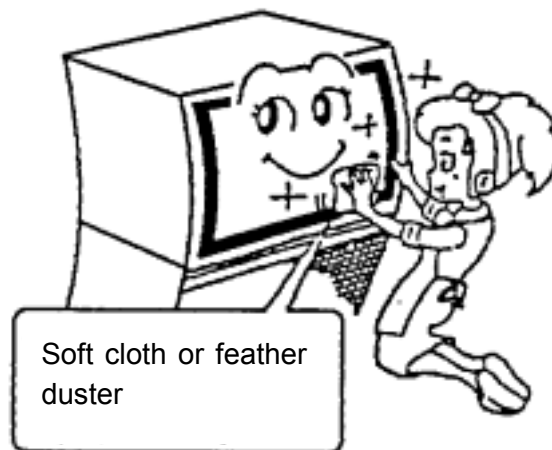
(1) Cleaning the front of the screen

Gently wipe the front of the screen with a soft cloth (gauze, flannel, etc.) or flick it with a feather duster.

Be careful not to rub the screen hard or beat it because this may result in it being covered with fine scratch marks.

f the screen is noticeably dirty, gently wipe off the dirt with a cloth that has been immersed in water or water to which a small quantity of a neutral detergent has been added (about 0.5 cc of detergent in about 2 liters of water) then wrung hard. Finish off with a soft, dry cloth.

Never use a luster, a chemically treated cloth or a volatile solvent to clean the screen.

Soft cloth or feather duster

(2) Cleaning the back of screen and the lens

A special technique is necessary to clean the back of the screen and the lens of the LCD projector.

Please contact our designated service company through your dealer.

Product Specifications

No.	Item		ES50-116CMW	ES70-116CMW
1	Screen size (aspect ratio)		Approx.1016mm X 762mm (4:3)	Approx. 1414mm X 1061mm (4:3)
2	Input frequency	Horizontal	15kHz ～ 100kHz （reference[※1]）	
		Vertical	40Hz ～120Hz （reference[※1]）	
3	Number of pixels	Horizontal	1400 dots	
		Vertical	1050 dots	
4	Brightness (Normal white)[※2]		1000cd／m^2 ±20%[※2]	500cd／m^2 ±20%[※2]
5	Contrast		Typ.1300:1[Min.1000:1 以上] entire white : entire black	
6	Range of appropriate view	Horizontal	120°peak-peak	
		Vertical	50°peak-peak	
7	RGB input jacks	Analog	R. G. B. H. V. （BNC jacks×5） X 1system R. G. B. H. V. （15P shrink D-sub） ×1system	
		Digital	TMDS format（DVI-D）	
8	RGB outputs		Digital（TMDS format; DVI-D）	
9	Power consumption		170 W(Quick lamp change mode (approx. 2 minutes): 300W)	
10	Lamp		100 W super hight pressure mercury lamp	
11	Weight		59kg[※3]	100kg[※3]
12	Operating temperature humidity ranges		Temperature：5℃～35℃（during non-operation　0℃～40℃） Humidity：20%～80%（during non-operation　8%～90%）	
13	Provided accessories [※4]		Remote Transmtte ・・・・・・ 1 "AA" batteries ・・・・・・ 2 User's manual ・・・・・・ 1 Power cord ・・・・・・ 1 Remote Control Cable (for repair service) ・・・・・・ 1 Joint Parts ・・・・・・ 1(set) Cleaning Cloth ・・・・・・ 1	

※1 The frequencies shown are for reference. The actual range of frequencies that can be input may be narrower, depending on the display resolution of signal. It can display up to SXGA (1280x1024dot(60Hz)) at Digital Input.

※2 The brightness is initial value at production.

※3 The weight is not included the face panel and the mout.

※4 Accessories other than those shown above may be provided for maintenance of repair service engineers: Retain them with care.

・ This projector is subject to production changes without notice, to make improvements.

・ This projector is designed exclusively for commercial use.

Warranty and After-sales Service

After-sales service

If the projector is not functioning properly, first read the instruction manual once again.
If you still experience trouble, consult the shop where you purchased the projector or our service company.

List of spare parts (periodically replaced)

Item No.	Replacement part	Quantity used
1	Lamp ASSY LCOS	One per screen
2	FANASSY-109R0812F4J03 (Lamp, PWB Unit)	Three per screen
3	FANASSY-109R0612H4J04 (Circuit Power supply)	One per screen
4	FANASSY-109L0812F4J03 (LCD panel)	One per screen
5	FANASSY-109L0612H4J03 (Optical Unit)	One per screen
6	LCOS panel・Lens ASSY	One per screen

Warranty and After-sales Service

FCC Statement Warning

WARNING: This equipment has been tested and found to comply with the limits for a Class A 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Hitachi, Ltd.

Digital Media Division