

B/W CCD camera

About this manual  
Before installing and using the camera, please read this manual carefully. Be sure to keep it handy for later reference.

#### Features

- Backlight compensation
- 1/3-inch CCD solid-state image device (about 410,000 pixels)
- Horizontal resolution of 570 TV lines, S/N ratio of 50 dB min.
- Minimum required illumination of 0.07 lx (F1.2 lens, 50 IRE)
- High speed electronic shutter: 1/60 – 1/100,000 sec.
- Power supply: 24 V AC and 12 – 15 V DC

Depending on the conditions of use, installation and environment, please be sure to make the appropriate settings and adjustments. If you need help with installation and/or settings, please consult your dealer.

## INFORMATION TO USER

### Safety Guard

**!** THIS SYMBOL INDICATES THAT THERE ARE IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THIS UNIT.

**WARNING:**  
TO PREVENT THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

#### For the customers in Canada

This Class B digital apparatus complies with Canadian ICES-003.

#### Pour la clientèle canadienne

Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada.

This installation should be made by a qualified service person and should conform to all local codes.

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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 reception, 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 and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Sanyo may void the user's authority to operate this camera.

## PRECAUTIONS

### In case of problem

Do not use the camera if smoke or a strange odor comes from the unit, or if it seems not to function correctly. Disconnect the power cord immediately, and consult your dealer or a Sanyo Authorized Service Center.

### Do not open or modify

Do not open the cabinet, as it may be dangerous and cause damage to the unit. For internal settings and repairs, consult your dealer or a Sanyo Authorized Service Center.

### Do not put objects inside the unit

Make sure that no metal objects or flammable substance get inside the camera. If used with a foreign object inside, it could cause a fire, short-circuits or damages. If water or a liquid gets inside the camera, disconnect the power cord immediately, and consult your dealer or a Sanyo Authorized Service Center. Be careful to protect the camera from rain, sea water, etc.

### Be careful when handling the unit

To prevent damages, do not drop the camera or subject it to strong shock or vibration.

### Install away from electric or magnetic fields

If installed close to a TV, radio transmitter, magnet, electric motor, transformer, audio speakers the magnetic field they generate will distort the image.

### Protect from humidity and dust

To prevent damages to the camera, do not install it where there is greasy smoke or steam, where the dampness may get too high, or where there is a lot of dust.

### Protect from high temperatures

Do not install close to stoves, or other heat generating devices, such as spotlights, etc., or where it could be subject to direct sunlight, as that could cause deformation, discoloration or other damages. Be careful when installing close to the ceiling, in a kitchen or boiler room, as the temperature may raise to high levels. Install where the temperature range will stay between -10°C (14°F) and 50°C (122°F). (no condensation)

### Cleaning

- Dirt can be removed from the cabinet by wiping it with a soft cloth. To remove stains, wipe with a soft cloth moistened with a soft detergent solution and wrung dry, then wipe dry with dry soft cloth.
- Do not use benzine, thinner or other chemical product on the cabinet, as that may cause deformation and paint peeling. Before using a chemical cloth, make sure to read all accompanying instructions. Make sure that no plastic or rubber material comes in contact with the cabinet for a long period of time, as that may cause damage or paint peeling.

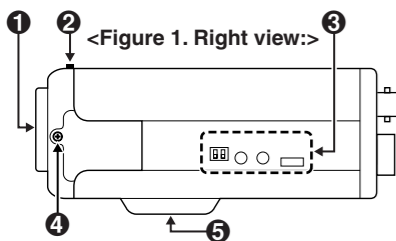
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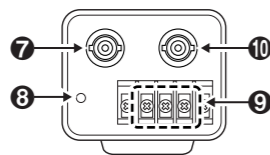
# SANYO

SANYO Electric Co., Ltd.  
Printed in Taiwan

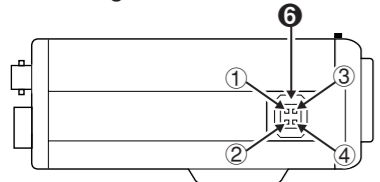
## NAMES AND FUNCTIONS OF PARTS



<Figure 3. Rear view:>



<Figure 2. Left view:>



<Figure 1. Right view:>

- 1 Lens cap**  
Protects the lens from damage.
- 2 Flange-back adjustment dial**  
Adjusts the flange-back distance when a zoom lens is attached.
- 3 Camera adjustment/setting panel**  
Contains camera adjustment dials and setting switches.
- 4 LOCK**  
Locking screw for the flange-back adjustment dial.
- 5 Camera attachment bracket**  
Used to attach the camera.

<Figure 2. Left view:>

### 6 LENS (lens iris output terminal)

Used to connect the lens plug when the lens is attached.

- 1 Brake coil (-)
- 2 Brake coil (+)
- 3 Drive coil (+)
- 4 Drive coil (-)

<Figure 3. Rear view:>

### 7 VIDEO OUT (video output terminal: BNC connector)

Connects to the VIDEO IN (video input) terminal on the peripheral equipment.

### 8 POWER (power indicator)

Lights (red) when the camera power is ON.

### 9 GND, AC24V, DC12V (ground terminal, 24 V AC or 12 V DC input terminal)

### 10 VS IN (External sync composite video signal input terminal: BNC connector)

## TROUBLESHOOTING

Before sending the camera out for repair, check the items below. If the problem persists after checking these items, contact your place of purchase or a Sanyo Authorized Service Center.

### If no image appears

- Is the power ON?
- Is the coaxial cable attached securely?
- Are the power and voltage normal?
- Is there adequate illumination?

### If the image is unclear

- Is the lens in focus? Is the flange back distance adjusted correctly?
- Is the lens dirty?  
Dirt or fingerprints on the lens can adversely affect the image. Gently wipe any dirt or fingerprints off the lens with a soft cloth or lens cleaning paper and cleaning fluid (commercially available).
- Is the monitor adjusted correctly?

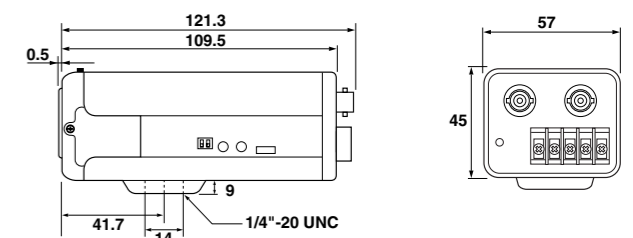
## SERVICE

The camera is a precision instrument. Handle it carefully and always follow the safety precautions. If the camera requires service, never try to repair it yourself or open the casing. For servicing, maintenance, or repairs, contact your place of purchase or a Sanyo Authorized Service Center.

## SPECIFICATIONS

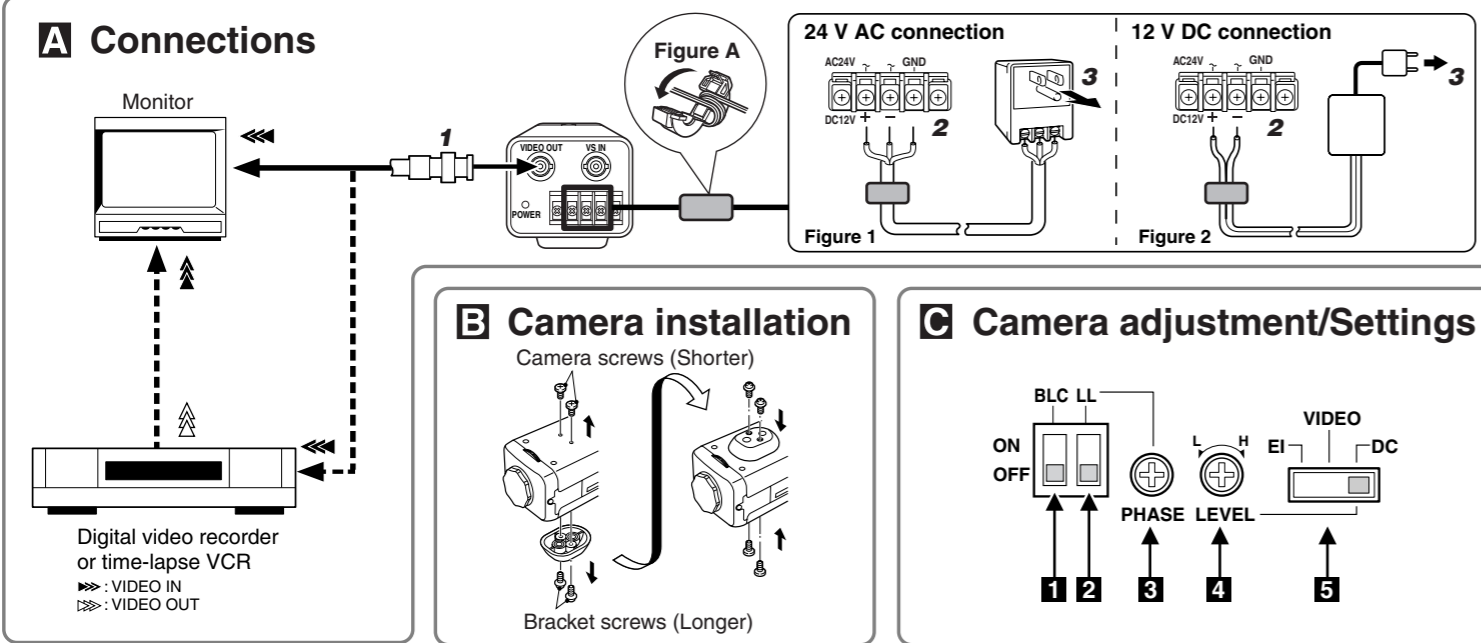
Scanning system	: EIA standard (525 scanning lines, 30 frames/second)
Interface	: PLL 2:1 interlace
Image device	: 1/3-inch solid-state CCD
Number of pixels	: 811 (H) × 508 (V)
Number of pixels in image area	: 768 (H) × 494 (V)
Sync system	: External sync (automatic switched) Internal sync/Line lock (manually switched)
Resolution	: 570 TV lines
Video output terminal	: 1.0 V(p-p)/75 Ω, composite
Image S/N ratio	: 50 dB min.
Minimum required illumination	: 0.07 lx approx. (with F1.2 lens, 50 IRE)
Backlight compensation ON/OFF	: Set to "ON" or "OFF"
Auto-iris lens output	: DC output (variable DC level), 4-pin terminal
Lens mount	: CS mount
Flange-back	: 12.5 mm (adjustment range: ±0.5 mm)
Auto-iris lens switching	: EI/VIDEO/DC
Attachment screw hole diameter	: 1/4"-20UNC (top or bottom surface)
Operating environment	: Ambient temperature: -10 to +50°C (14 to 122°F) Humidity: 90% RH max.
Power supply	: 24 V AC/60 Hz, 12 – 15 V DC
Power consumption	: 3.0 W approx.
Weight	: 245 g approx.
Accessories	: Clamping core (1 pc.)

Appearance and specifications are subject to change without prior notice.



# CONNECTIONS, SETTINGS

## A Connections



## A Connections

### What you will need

- Peripheral equipment (such as monitor, digital video recorder or time-lapse VCR)
- Cables for connecting peripheral equipment and camera (coaxial cables, connecting plugs)
- Power adapter (24 V AC or 12 V DC)
- Attachable lens (Auto-iris lens recommended.)

### Coaxial cables supported

You can use any of the following coaxial cables:

- RG-59U (3C-2V) Length: About 250 m max.
- RG-6U (5C-2V) Length: About 500 m max.
- RG-11U (7C-2V) Length: About 600 m max.

### CAUTION

- When using an RG-59U (3C-2V) cable, do not use it on piping or air wiring.
- Select the cable to use according to the distance between the devices to connect.
- If you use a cable other than the types above, the image or sync signal will be attenuated and will not be transmitted correctly.

### Attaching a lens

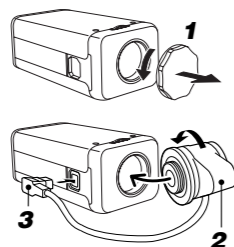
The 1/3-inch DC-type, CS mount auto-iris lens (sold separately) is recommended.

#### 1 Remove the lens cap.

#### 2 Attach the lens.

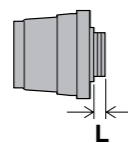
Turn the lens slowly to attach it to the camera.

#### 3 Connect the lens plug to the LENS terminal.



### CAUTION

- Depending on the type of lens, the shape of the lens plug may differ. In this case, contact the place of purchase or a Sanyo Authorized Service Center.
- When attaching the lens, use a lens with a mount screw (L) that is less than 7 mm in length. If a lens that exceeds this size is used, the camera may be damaged and you may not be able to attach it correctly.
- When attaching a C mount lens, attach the lens to the camera after inserting the C mount ring (sold separately).



### Making connections

- Connect the camera and peripheral equipment with cables.
- Connect the power cable.

Secure the supplied clamping core to the power cable as shown in Figure A.

#### <When using a 24 V AC adapter>

Connect 3 wire grounded cable# (use 18AWG+) to the ground (GND) terminal as shown in Figure 1.

#### <When using a 12 V DC adapter>

Connect the cable as shown in Figure 2.

### CAUTION

- When connecting the power cable to the camera, check that the polarity is correct.
- To prevent fire hazard any UL listed wire rated VW-1, should be used for the 24 V AC cable input terminal.

#### 3 Insert the power adapter plug into the wall outlet.

The "POWER" indicator (red) lights.

## B Camera installation

### Camera attachment bracket

As shown in Figure B above, you can remove the camera attachment bracket and reattach it to the camera bottom if you want to attach the camera to the top of an object. If you remove the camera attachment bracket, be sure to use the removed screws when reattaching it (other screws may not fit).

### CAUTION

When using the camera attachment stand (sold separately), select a location that will be able to withstand the weight of the camera and stand for many years, and fix them securely in place.

## C Camera adjustment/Settings

The camera comes pre-adjusted and ready to install at time of factory shipment, but you may want to make adjustments or settings to adapt to the operating conditions or installation environment, if necessary.

If you have trouble adjusting the camera, contact your place of purchase or a Sanyo Authorized Service Center.

- The settings shown for switches 1, 2 and 5 are the settings at time of factory shipment.
- Use a Phillips-head screwdriver to adjust dials 3 and 4. (★ = Factory default setting)

### 1 Backlight compensation (BLC)

For adjusting backlight compensation. Use this setting to adjust the backlight compensation when an image is backlit.

ON	Backlight compensation
OFF ★	No backlight compensation is applied.

### 2 Sync setting (LL)

Vertical sync disturbance may occur when a selector is used to switch between multiple cameras connected to one monitor. To prevent vertical sync disturbance, set to "ON."

ON	Line-Lock
OFF ★	Internal Sync

- Line-Lock: Synchronizes the unit with power frequency.

### CAUTION

If the image disturbance doesn't disappear after adjusting the PHASE dial (3) on the second and subsequent cameras, adjust the PHASE dial (3) on the first camera. If the problem persists, check that all the devices have been connected with the correct power cable polarity.

### 3 Line phase (PHASE)

When sync setting (2) is ON, use a Phillips-head screwdriver to adjust the line phase.

### 4 Lens iris (LEVEL)

When using a DC-type auto-iris lens, adjust the LEVEL dial if the entire image is too dark or too bright.

L (Low)	Closes the lens iris, making the entire image darker.
H (High)	Opens the lens iris, making the entire image brighter.

### 5 Lens switching

Set this as appropriate for the type of lens you are using.

EI	Electronic iris lens
VIDEO	Video auto-iris lens (lens with built-in amp circuits)
DC ★	DC-type auto-iris lens (lens without built-in amp circuits, powered by DC power only)

### CAUTION

When using a video auto-iris lens

- Turn the ALC (light control) dial on the lens barrel fully to AV (average).
- If the backlight compensation is not correct, adjust the LEVEL dial on the lens barrel.

### Flange-back adjustment (only when zoom lens is attached)

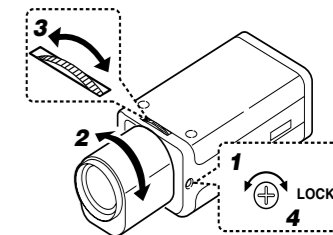
Flange back is the distance between the lens and the camera (CCD). Follow the steps below to adjust the flange back distance, since the image can become out of focus when you are zoomed-in on an object.

#### 1 Loosen the LOCK screw with a Phillips-head screwdriver.

#### 2 Zoom-in with the zoom lens, and adjust the focus with the focus ring on the lens.

#### 3 Set the zoom lens to wide angle, and adjust the focus with the flange-back adjustment dial.

#### 4 Repeat steps 2 and 3 to check that the focus is not lost when switching between wide-angle and zoom, and then tighten the LOCK screw.



## SANYO INDUSTRIAL VIDEO B/W VIDEO CAMERA LIMITED WARRANTY

### OBLIGATIONS

In order to obtain warranty service, the product must be delivered to and picked up from an Authorized Sanyo Service Center at the user's expense, unless specifically stated otherwise in this warranty. The names and addresses of Authorized Sanyo Service Centers may be obtained by calling the toll-free number listed below.

For product operation, authorized service center referral, service assistance or problem resolution, call  
**CUSTOMER INFORMATION 1-800-421-5013**  
 Weekdays 8:30 AM - 5:00 PM Pacific Time

For accessories and/or parts, call  
**PARTS ORDER INFORMATION 1-800-726-9662**  
 Weekdays 8:30 AM - 5:00 PM Pacific Time

THIS WARRANTY IS VALID ONLY ON SANYO PRODUCTS PURCHASED OR RENTED IN THE UNITED STATES OF AMERICA, EXCLUDING ALL U.S. TERRITORIES AND PROTECTORATES. THIS WARRANTY APPLIES ONLY TO THE ORIGINAL RETAIL PURCHASER OR END-USER. THE ORIGINAL DATED BILL OF SALE, SALES SLIP OR RENTAL AGREEMENT MUST BE SUBMITTED TO THE AUTHORIZED SANYO SERVICE CENTER AT THE TIME WARRANTY SERVICE IS REQUESTED.

Subject to the OBLIGATIONS above and EXCLUSIONS below, SANYO Fisher Company warrants this SANYO product against defects in materials and workmanship for the periods specified below. SFC will repair or replace (at its option) the product and any of its parts which fail to conform to this warranty. The warranty period commences on the date the product was first purchased or rented at retail.

LABOR	PARTS	IMAGE DEVICE
3 YEARS	3 YEARS	3 YEARS

### EXCLUSIONS

This warranty does not cover (A) the adjustment of customer-operated controls as explained in the appropriate model's instruction manual, or (B) the repair of any product whose serial number has been altered, defaced or removed. This warranty shall not apply to the cabinet or cosmetic parts, batteries or routine maintenance.

This warranty does not apply to uncrating, setup, installation, removal of the product for repair or reinstallation of the product after repair.

This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of SFC including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modification or repair by the user, abuse, misuse, neglect, accident, incorrect power line voltage, fire, flood or other Acts of God, or normal wear and tear. The foregoing is in lieu of all other expressed warranties and SFC does not assume or authorize any party to assume for it any other obligation or liability.

SFC DISCLAIMS ALL OTHER WARRANTIES EXPRESS OR IMPLIED, WITH REGARD TO THIS PRODUCT (INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS). IN NO EVENT SHALL SFC BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE OWNERSHIP OR USE OF THIS PRODUCT OR FOR ANY DELAY IN THE PERFORMANCE OF ITS OBLIGATIONS UNDER THIS WARRANTY DUE TO CAUSES BEYOND ITS CONTROL. SFC'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM ANY CAUSE WHATSOEVER, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR OWNERSHIP OF THIS PRODUCT INCLUDING WARRANTIES OF MERCHANTABILITY, ALLEGED DEFECTIVE OR DEFECTIVE GOODS, WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCT.

### ATTENTION

For your protection in the event of theft or loss of this product, please fill in the information below for your own personal records.

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 (Located on back or bottom side of unit.)

Date of Purchase \_\_\_\_\_ Purchase Price \_\_\_\_\_

Where Purchased \_\_\_\_\_